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Good morning. Thank you for this opportunity. Chair Prozanski. (Prozahnskee) and members of the Committee, my name is Dr Patricia Warford. I am an Oregon-licensed psychologist specializing in clinical and forensic work. I began working with female victims of domestic violence in 1992 and added work with sexually abused children, boys and girls, in 1993. I completed my dissertation on female victims of domestic violence and received my doctorate in Clinical Psychology in 1996. I have been member of the Yamhill County Domestic Violence Task Force since its inception in the mid-1990s except for a brief period when I worked outside of Yamhill County. I have been an licensed psychologist since 1998. I began doing forensic work in 1999 including work with court-mandated domestically violent men for 15 years beginning in 2003. I have been an Oregon Certified Forensic Evaluator since that program began in 2012. I am recognized in state and federal courts as an expert in domestic violence. My forensic work has predominantly involved issues related to domestic violence and includes criminal cases (including nearly two dozen murder cases) and civil cases (such as cases involving those involved with DHS.) I have done Critical Incident Stress Debriefing pro bono for local law enforcement agencies in my community, including those involving domestic violence murder and/or murder suicides. I have worked with first

responders in addressing trauma. I was a member of the Governor's Council on Domestic Violence and currently serve on the Oregon Domestic Violence Fatality Review Team.

My only possible conflict of interest is that I am interested in conducting research with Drs John Gottman, Julie Gottman, and Julie Babcock of the University of Houston. However, I have no financial gain from testifying here today or in a change in this ORS or the OARs. I have also submitted a compendium of articles as support to my testimony today.

First I would like to voice my support for gender inclusive language, because the current Oregon Administrative Rules related to domestic violence, or in the words of the current law, **Batterers**, are hetero-normative (male specific) and ignore the reality of experience of the LGBTQ community as well as those cases where women are the primary aggressors. Representatives of law enforcement will remind us of how essential this language change is.

Next, I will guide you through research language so that you can understand the need for empirically supported interventions. The language currently used is for evidence based treatment, however, Evidence based requires only research which can translate to another arena. Empirically supported, is research that has been scientifically validated on a specific population.

The OARs for Oregon's Batters Intervention Program are based on the Duluth model developed by Ellen Pence and as such, limit the options for treatment of men convicted as Batterers. Ms. Pence postulated that patriarchal (male) beliefs formed the basis of domestic violence. Current "Intervention" to

remediate, consists of classes that challenge the beliefs of the male batterers. As no one believes that hitting another human being is acceptable, the beliefs alluded to in the OARs then become such beliefs as: the man is the head of the home, belief in specific gender roles, and/or beliefs that women should be submissive to their husbands. Research does not support that these beliefs lead to domestic violence any more than the absence of these beliefs results in the absence of domestic violence.

Ms. Pence eventually came to reject her initial position even before Oregon's OARs were written. In 1999, she wrote : quote "By determining that the need or desire for power was the motivating force behind battering, we created a conceptual framework that, in fact, did not fit the lived experience of many of the men and women we were working with.[Ms. Pence later continued] ... Speaking for myself, I found that many of the men I interviewed did not seem to articulate a desire for power over their partner. Although I relentlessly took every opportunity to point out to men in the groups that they were so motivated and merely in denial, the fact that few men ever articulated such a desire went unnoticed by me and many of my coworkers. **Eventually, we realized that we were finding what we had already predetermined to find.**" In 2004, Dr. Julia Babcock performed a meta-analysis of the use of research as a foundation for prescribing treatment, post adjudication, and found that the Duluth/belief model had minimal improvement compared to probation-only (35% vs 40% recidivism rates respectively), a statistically insignificant difference. These caveats were all publicly available before the OARs were written. I have submitted a summary of the research completed by 17 researchers in the compendium

Researchers have desired to do research in Oregon which could have lead to an “evidence-based” intervention but they have been thwarted by the current philosophically based OARs and gatekeepers who wrote those rules. Despite this, a few research projects have shown that evidence based interventions can be empirically supported. For example, a project at the University of Iowa found that Acceptance and Commitment Therapy (also known as ACT) had better outcomes than Duluth/belief based interventions and with fewer required sessions (24 sessions.) Additionally, Zarling the author of this study, subsequently conducted an evaluation of 3,696 men arrested for domestic assault in Iowa who were court-mandated to treatment from 2011-2013. This analysis showed that participants in ACTV had half the recidivism rates for domestic assault and two-thirds less violent charges than those who participated in treatment as usual (a combination of Duluth and CBT). In addition, ACTV participants who were re-arrested had significantly fewer charges than those in treatment as usual. The results held for both people who completed the ACTV program and those who left before completion.

More problematic, in my mind, is that the philosophically-based beliefs in the OARs prohibit intervention in areas in which a plethora of research shows activities that do cause aggression.

For example, Oregon’s OARs prohibit attributing domestic violence to substance abuse.

However, current research shows that use of methamphetamines increases aggression, hostility, and paranoia. The OARs prohibit attributing domestic violence to mental health issues.

This means that the returning veteran who lashes out during a nightmare or a flashback from posttraumatic stress would be required to take a class which changes his patriarchal belief. Or the man with bipolar who acts aggressively with a female domestic partner during a manic or psychotic phase is required to take classes which challenge his beliefs. By this logic, those hospitalized at the state hospital for violence against a family member only need to take classes to change their beliefs to stop their violence. This would be irresponsible and ineffective.

Finally, research that brought us an understanding of Adverse Childhood Experiences has shown that the effect of being in a domestically violent home has lifelong negative consequences. Yet Oregon's OARs prohibit addressing past experience. Trauma-informed interventions drawn from the ACT research form the basic philosophy used by workers in our Child Welfare system as well as in most of the interventions used in schools - but are currently prohibited under these outdated OARs. This brings us full circle to the research which shows ACT to be efficacious. ACT addresses mindfulness and trauma. It has been found to be effective in treatment some mental health issues such as anxiety, depression, and PTSD. An integral part of the process used by the majority of treatment and intervention service providers in Oregon, is prohibited by one set of OARs which were adopted in 2012 and have never been given a rigorous review. In addition, an ethical concern is that men and women have been required by

corrections and DHS to pay for their own participation in these mandated courses which have been indefensible as effective in research or practice since 2004.

It is well past the time for these rules to be changed.

Thank you for your time. I would be happy to answer any questions.

A Randomized Controlled Trial of Acceptance and Commitment Therapy for Aggressive Behavior

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Objective: The objective of the current research was to test the efficacy of a group-based Acceptance and Commitment Therapy (ACT) intervention for partner aggression, compared with a support and discussion control group, in a clinical sample of adults. **Method:** One hundred one participants (mean age = 31; 68% female; 18% minority) who endorsed recently engaging in at least 2 acts of partner aggression were randomly assigned to receive ACT or a support-and-discussion control condition. Both interventions consisted of 12 weekly 2-hr sessions. Assessments at pretreatment, during treatment, posttreatment, and 3 and 6 months after treatment measured psychological aggression (Multidimensional Measure Emotional Abuse Scale [MMEA]), physical aggression (Conflict Tactics Scales [CTS-2]), experiential avoidance (Avoidance and Action Questionnaire [AAQ]), and emotion dysregulation (Difficulties in Emotion Regulation Scale [DERS]). **Results:** Results of growth curve modeling analyses demonstrated that participants in the ACT group had significantly greater declines in psychological and physical aggression from pre- to posttreatment and from pretreatment to follow-up and that 6-month treatment outcomes were partially mediated by levels of experiential avoidance and emotion dysregulation at posttreatment. **Conclusions:** The results of this first trial of ACT for aggressive behavior indicate that the ACT group significantly reduced both physical and psychological aggression and that these changes were significantly greater than those of the control group, suggesting that an ACT approach to aggression may serve as an efficacious treatment for aggression.

What is the public health significance of this article?

This study suggests that a form of psychotherapy, termed *Acceptance and Commitment Therapy*, can be effective in reducing physical and psychological aggression toward a partner.

Keywords: Acceptance and Commitment Therapy, aggression, randomized controlled trial

Aggressive acts directed toward another person represent the most serious and detrimental forms of individual and relationship dysfunction. Of the various forms of interpersonal aggression, the most common form occurs in the context of intimate relationships, including targets of unrequited interest, dating, cohabiting, engaged and newlywed couples, and separated and divorced couples (Graham-Kevan & Archer, 2003; M. P. Johnson, 2005). Even mild and infrequent forms of partner aggression have negative consequences for victims, relationships, and children raised in these homes (e.g., Coker et al., 2002; Umberson, Anderson, Glick, &

Shapiro, 1998). Unfortunately, little progress has been made toward developing efficacious treatments targeting aggressive behavior (e.g., Babcock, Green, & Robie, 2004).

Most current programs for partner aggression are based on feminist theory (also known as *patriarchal theory*) and the Duluth model, wherein the primary origin of male-to-female violence is conceptualized to be patriarchal ideology and societal sanctioning of men's power and control over women (Pence & Paymar, 1993). Other programs for aggression are based on social learning theory and utilize a cognitive behavioral (CBT) approach to treatment. These treatments focus on modifying faulty or problematic cognitions, beliefs, and emotions to prevent future violent behavior. In practice, most current interventions comprise a blend of the Duluth model and CBT, and the techniques employed in each approach overlap substantially.

The treatment outcome literature suggests that Duluth and CBT interventions are similarly efficacious (e.g., Babcock et al., 2004). However, both types of intervention are only *modestly* efficacious. Treatment outcome studies based on these programs show very small effects on aggressive behavior beyond the effects of mandatory arrest alone. Physical aggression rates remain high after treatment (up to 47%), and psychological aggression (e.g., threats of violence) often remains elevated as well (e.g., Edleson &

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Grusznski, 1989). A meta-analysis of experimental studies revealed that, on average, a man who has been arrested, sanctioned, and completed an intervention program (Duluth, CBT, or a combination of both) is only 5% less likely to perpetrate physical aggression toward a female partner than a man who has only been arrested and sanctioned (Babcock et al., 2004). Moreover, these treatments are less effective at reducing physical aggression than mental health treatments are at reducing depression, anxiety, and marital distress (e.g., S. Johnson, Hunsley, Greenberg, & Schindler, 1999). In sum, there is need for efficacious treatments for individuals engaging in partner aggression.

Acceptance and Commitment Therapy (ACT)

Mindfulness and acceptance-based interventions have received increasing attention as effective treatments for psychopathology, and they may address some of the problems with traditional interventions for aggression. One such treatment, Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999), has led to tremendous progress in theory and research on mechanisms of therapeutic change and has shown impressive outcomes across a broad range of problems such as substance abuse (e.g., Luoma, Kohlenberg, Hayes, & Fletcher, 2012), high-risk sexual behaviors (e.g., Batten, Follette, & Aban, 2002), exhibitionism (e.g., Paul, Marx, & Orsillo, 1999), posttraumatic stress disorder (e.g., Orsillo & Batten, 2005), self-harm (e.g., Chapman, Gratz, & Brown, 2006), and smoking (Gifford et al., 2004). ACT aims to increase *psychological flexibility* through six core processes; present moment awareness, acceptance of difficult emotions or thoughts, decrease in believability of (or attachment to) thoughts, perspective-taking, identification of values, and committed action in service of values. These processes are postulated to have an impact on problematic behaviors in part through their reduction of *experiential avoidance*.

Experiential avoidance is a key theoretical construct underlying the ACT model, defined as the attempt to alter the form, frequency, or situational sensitivity of unwanted private events such as thoughts, feelings, and physiological sensations (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Experiential avoidance becomes a pathological process when it is applied rigidly and inflexibly such that it leads to harmful consequences or to devoting enormous time, effort, and energy to controlling or struggling with internal experiences. Therefore, from an ACT perspective, it is not negative affect or cognition per se that is the problem, it is experiential avoidance (which also increases the intensity and frequency of negative affect and cognition) and one's unhelpful behavioral responses to unwanted internal experiences. Experiential avoidance has been broadly implicated in the development and maintenance of many forms of psychopathology (e.g., mood and anxiety disorders; Marx & Sloan, 2002; Tull & Gratz, 2008) and behavioral problems (e.g., self-harm and substance abuse; Chapman et al., 2006; Forsyth, Parker, & Finlay, 2003). Although there are other important targets of the ACT approach (e.g., cognitive fusion; Hayes et al., 1999), a reduction in experiential avoidance is a fundamental goal of treatment.

ACT for Partner Aggression: Theoretical and Empirical Evidence

Given the applicability and efficacy of applying ACT processes to a variety of mental health symptoms and behaviors, we chose to adapt the ACT model to explain partner aggression (Langer & Lawrence, 2010). Several lines of research support the applicability of an ACT model to the study of aggression. In the general aggression literature, there is support for the tension-reducing and reinforcing effects of aggression. For example, Bushman and colleagues (Bushman, 2002; Bushman, Baumeister, & Philips, 2001) have found evidence that aggression serves an affect regulatory function, such that individuals are significantly more likely to engage in aggressive behavior when told it will provide emotional relief or improve an aversive mood. Similarly, Verona and Sullivan (2008) found that physiological reductions following aggression reinforced subsequent aggressive acts and that heart rate reductions following aggressive responding were associated with the probability of increased aggression.

In the partner aggression literature, there is increasing evidence that aggressive behavior is associated with experiential avoidance and related emotional skills deficits. First, many forms of psychopathology characterized by the presence of experiential avoidance, including borderline personality disorder (e.g., Chapman, Specht, & Cellucci, 2005), posttraumatic stress disorder (e.g., Marx & Sloan, 2002), substance use (e.g., Forsyth et al., 2003), and mood disorders (e.g., Tull & Gratz, 2008), are particularly prevalent among individuals who engage in partner aggression. Second, individuals who engage in partner aggression are less aware of their internal states and have greater difficulty recognizing emotions, particularly sadness and dysphoria (e.g., Umberson, Anderson, Williams, & Chen, 2003; Yelsma, 1996). Aggressive individuals tend to demonstrate low tolerance for emotional arousal, report that their negative affect is extremely unpleasant, and negatively evaluate their own and others' expressions of emotions (e.g., Jakupcak, 2003; Tager, Good, & Brammer, 2010). Third, engaging in partner aggression is also related to deficits in emotional skills commonly implicated in optimal emotional functioning, such as the ability to verbally describe one's emotional state, to engage in goal-directed behavior when experiencing emotions, and to accept emotional states (e.g., Gratz, Paulson, Jakupcak, & Tull, 2009; Gratz & Roemer, 2004). Furthermore, individuals who engage in partner aggression exhibit poor empathic accuracy with regard to their partners' thoughts and feelings, as well as an inability to tolerate the negative emotions of others (e.g., Clements, Holtzworth-Munroe, Schweinle, & Ickes, 2007; Marshall & Holtzworth-Munroe, 2010). Finally, experiential avoidance has been linked to decreased relationship adjustment, greater use of physical aggression, and greater exposure to physical aggression (e.g., Reddy, Meis, Erbes, Polusny, & Compton, 2011; Tull, Jakupcak, Paulson, & Gratz, 2007).

The Current Study

Informed by the growing evidence linking experiential avoidance and related emotional skill deficits to aggressive behavior (e.g., Gratz et al., 2009; Jakupcak, 2003), the model of aggression used to guide the current research posits that experiential avoidance leads to the continuation and escalation of distress and

increases the potential for aggressive behavior (Langer & Lawrence, 2010). Given that aggression tends to provide short-term relief (e.g., Verona & Sullivan, 2008), it is negatively reinforced and thus has an increased likelihood of recurring, until it might eventually become an automatic reaction to feelings of discomfort. Consequently, our experiential avoidance model of aggression proposes that such acts are, in fact, attempts to avoid experiences such as thoughts, feelings, urges, physical sensations, or other internal experiences that are uncomfortable or distressing. For example, anger, shame, fear, and jealousy are common unwanted internal experiences reported as triggers for partner aggression (e.g., Babcock, Costa, Green, & Eckhardt, 2004; Foran & O'Leary, 2008). ACT focuses on reducing experiential avoidance by developing mindful awareness of emotions and thoughts and making behavior changes in line with personal values; therefore, it seems theoretically possible that these components could be important features of reducing aggressive behavior. In sum, ACT may prove useful as a treatment for partner aggression, which has not been conceptualized or treated adequately by traditional approaches.

The overall objective of the current research was to ascertain whether an ACT treatment group could provide beneficial and significant gains for individuals who engage in partner aggression. The central hypothesis was that ACT would lead to significantly greater reductions in psychologically and physically aggressive behaviors in a treatment group than would an attention placebo used in a control group. Participants in the ACT treatment group were expected to show significantly greater reductions in partner aggression at posttreatment than the control group. All treatment gains were expected to be maintained through the 6-month follow-up assessment. We also hypothesized that ACT would lead to significantly greater reductions in experiential avoidance and that these reductions would mediate improvement in aggressive behavior. Additionally, because ACT emphasizes the control of behavior when emotions are present, rather than the control of emotions themselves, we also examined emotion dysregulation as a potential mediator of declines in aggressive behavior.

Method

Participants, Recruitment, and Initial Procedures

This study received institutional review board approval. Participants were male and female adults drawn from a treatment-seeking population, who were referred to the study primarily by mental health professionals at clinics, community mental health centers, and private practices. The study did not require a specific diagnosis, and participants may have been in mental health treatment for any reason. The participants were seeking treatment for problems that may have included anxiety, depression, substance abuse, and life stressors (e.g., unemployment), as well as more pervasive interpersonal difficulties (e.g., borderline personality disorder). There were approximately 50 referring clinicians who provided potentially eligible clients with brochures, which described the group as "an opportunity to get to know other persons and share your own experiences while learning new ways of coping with emotional problems and difficult relationships." In other words, the group was not advertised as a treatment for partner aggression but rather as a group for individuals experiencing challenges regulating emotions and managing relationships.

Interested respondents contacted the research team and were screened for eligibility. To be eligible, individuals were required to endorse engaging at least two physically aggressive behaviors toward a current or former partner in the past 6 months. Individuals under the age of 18 were not included.

To ensure all participants were able to give informed consent and participate actively in the treatment, the study excluded those who reported current psychotic symptoms or who were non-English speaking. Persons who met eligibility requirements and wished to participate were scheduled for an in-person intake appointment, during which individual demographics (e.g., age, race, and education) were collected and the M.I.N.I. International Neuropsychiatric Interview (Sheehan et al., 1998) was administered. Enrolled participants were randomly assigned to either the ACT treatment condition ($n = 50$) or to the attention placebo control condition ($n = 51$) at the individual participant level. Randomization was subject to the restriction that group sizes be approximately equal, and participants were unaware of condition assignments throughout the study. All participants began receiving treatment no more than 4 weeks after participating in the intake appointment. Figure 1 depicts participant flow through the study.

The mean age of participants was 31.45 years ($SD = 7.39$), with ages ranging from 19 to 67 years. Commensurate with the local population, the majority of participants were White (82%). Sixty-eight percent of participants in the study were female, and in general, the sample was educated; most participants (86.3%) had completed some or all of college. Almost all participants (89%) were in a self-identified heterosexual romantic relationship at pretreatment: 42% were engaged or married, 27% were dating, and 20% were cohabiting. Based on the pretreatment diagnostic tools, the participants met criteria for a range of disorders, including any mood disorder (85%), substance use disorder (19%), social phobia (46%), generalized anxiety disorder (64%), borderline personality disorder (71%), and antisocial personality disorder (2%). The modal number of diagnoses was 3 ($M = 3.23$, $SD = 1.76$). There were no differences on demographic variables between men and women, with the exception that, on average, women in the study tended to be older ($M = 34.36$) than men in the study ($M = 30.13$), $t(101) = 5.15$, $p < .05$. All analyses were collapsed across men and women.

Treatment Procedures and Content

Groups in both treatment conditions were equivalent in session length, frequency, and format (12 weekly 2-hr sessions with between eight and 10 members and two facilitators) to ensure parallel therapeutic contact and degree of exposure to other participants. One active treatment group and one attention placebo control group were conducted simultaneously over the course of 1 year for a total of four ACT groups and four control groups. The three group facilitators, including the first author, co-led groups in each treatment condition. Participants were not asked to stop any individual mental health treatment, and it was assumed that they continued their individual mental health treatment as usual, including the use of psychotropic medications, as medication utilization was not a focus of this study. The participants were not compensated for their participation but were offered the treatment at no cost.

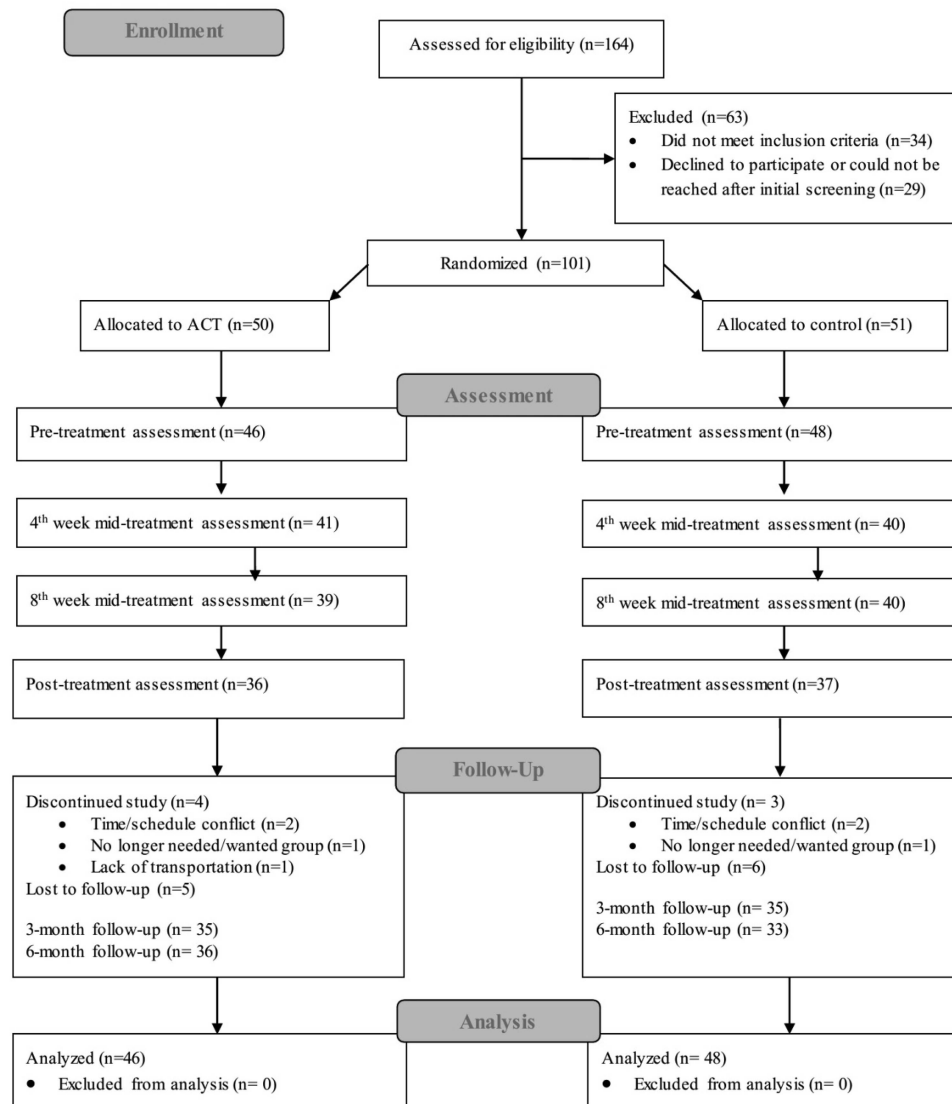


Figure 1. Participant flowchart. ACT = Acceptance and Commitment Therapy.

Group therapists and treatment adherence. Three female master's-level clinical psychology doctoral students, who completed training prior to the beginning of the study, were group therapists for this study. Qualifications for group leaders included more than 2 years of experience conducting therapy under the supervision of psychologists, experience conducting group therapy, training in ACT, and experience conducting ACT in individual treatment. Additionally, facilitators were required to participate in each group as a group member before serving as a co-facilitator.

All group sessions were audio recorded and reviewed for protocol adherence and continued competence in study protocols. Because no absolute criteria exist (on the basis of ratings of recordings) to determine whether group leaders adhere to their respective treatment conditions (i.e., the extent to which they use techniques considered appropriate to the treatment approaches), adherence checklists were developed specifically for this study to

provide guidelines for group leaders and to detail the content that ideally would be covered in each session. The checklist included criteria rated on a scale ranging from 1 (*nonadhering*) to 5 (*excellent adherence*). A team of three raters trained to reliability (mean intraclass correlation coefficients = .73).

The checklists for both groups showed good internal consistency (coefficient α : ACT = .82, control = .85). The average rating for the ACT adherence scale was 3.87, and the average rating for the control group scale was 4.02. Studies vary on cutoff scores used to establish adherence; using 3.0 as a cutoff score, therapists were rated as adherent on 92% of the ACT tapes and 94% of the control tapes. Overall, this pattern of results shows that the ACT and control conditions were distinct and implemented in accord with their respective treatment protocols.

ACT treatment condition. Core ACT exercises were chosen and adapted to fit this population, emphasizing emotional and behavioral skill enhancement techniques to decrease experiential

avoidance (e.g., see web site for the Association of Contextual Behavioral Science at contextualscience.org; Hayes et al., 1999). Group modules included topics such as values, mindfulness, emotional intelligence, acceptance, defusion, and behavioral change or commitment. The modules were didactic and experiential, combining psychoeducation, in-vivo/imaginal exercises, and behavioral practice. The modules focused on the development of each skill in the group context, skill generalization outside the group, and homework assignments. Throughout the treatment, clients completed daily monitoring forms on the emotional precipitants of their use of problematic interpersonal behaviors, which for many participants included aggression, as well as the consequences of their behaviors (e.g., the effects of their actions on their relationships). Additional monitoring included skills use such as identifying emotional avoidance versus emotional acceptance (and the consequences of each) and engaging in actions consistent with chosen personal values. (See Appendix for the ACT group protocol).

Attention placebo condition. To control for the effects of common factors (e.g., therapeutic alliance, client expectations) on outcomes, we included general therapeutic factors in the control group. Specifically, the control treatment was designed to provide elements of group therapy that serve as advantages over individual treatment (i.e., peer support, opportunities for sharing information, role modeling, feedback from peers, altruism, and instilling hope; Yalom, 1995) while omitting the functional components of the active treatment. The control condition used a strictly support and discussion format and provided no instruction on ways to implement behavioral change. The group leaders presented the session topic (e.g., relationships, communication, and health) and the participants discussed, reflected, and expressed feelings related to the topic. The group leaders did not teach any skills directly, have participants practice any skills in session, or assign homework.

Assessment Procedures and Measures

Self-report questionnaires were administered within 1 week of treatment commencement to establish pretreatment/baseline levels of process and outcome variables. The same measures were administered at 4 weeks and 8 weeks (during treatment), at 12 weeks (the end of treatment), and at 3 and 6 months posttreatment. A short questionnaire was administered at each assessment to collect information about the mental health treatment they had been receiving throughout the course of the study. Participants were not paid for completing questionnaires through the end of treatment but were paid \$25 at each of the follow-up assessments.

Outside therapy questionnaire. A short measure was created for the purposes of this study to assess participants' use of outside therapy. On this measure, participants reported the frequency of their participation in therapy and rated the extent to which 17 different therapeutic techniques, activities conducted during their therapy sessions, and therapist behaviors were a part of their outside therapy on a scale of 1 (*not at all*) to 5 (*always*). The measure includes techniques similar to those employed in the present study, as well as techniques used in other therapy models (e.g., CBT and psychodynamic therapy techniques), such as "My

therapist gives me advice" and "My therapist gives me homework or asks me to do things between sessions."

M.I.N.I. International Neuropsychiatric Interview–Version 6.0.0 DSM–IV (MINI). The MINI is a short, structured screening interview that was developed for the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., *DSM–IV*; American Psychiatric Association, 1994) and the International Statistical Classification of Diseases and Related Health Problems, (10th ed., *ICD–10*; World Health Organization, 2010) psychiatric disorders (Sheehan et al., 1998). The MINI assesses diagnostic criteria for major depressive disorder, dysthymia, panic disorder, agoraphobia, social phobia, obsessive–compulsive disorder, posttraumatic stress disorder, psychotic disorder, anorexia nervosa, bulimia nervosa, generalized anxiety disorder, and antisocial personality disorder. It also assesses for suicidal ideation and behavior, mania, and hypomania. The borderline personality disorder (BPD) module of the Structured Interview for *DSM–IV* Personality (SIDP–IV; Pfohl, Zimmerman, & Blum, 1997) was used to assess the presence of BPD.

Multidimensional Measure of Emotional Abuse (MMEA; Murphy & Hoover, 1999). We used the 28 items from the MMEA assessing perpetration of psychological aggression against someone the participant cares about (e.g., "Belittled the other person in front of other people," "Said or implied the other person was stupid"). Participants rated how often they engaged in each behaviors on 7-point scales ranging from 0 (*never*) to 6 (*20 times or more*). Sum scores were calculated by adding the midpoints for each response (e.g., the midpoint 8 for 6–10 times). The psychometric properties of the MMEA have been tested in a sample of female college students and a sample of aggressive men in treatment, with α s ranging from .83 to .94 (Murphy & Hoover, 1999). In a longitudinal study of couples, mean interspousal agreement correlations were .52, and alpha correlations were over .83 (Ro & Lawrence, 2007). At the pretreatment interview, participants answered MMEA items in reference to the previous 3 months. For administrations of the MMEA occurring after treatment commencement, item wording was modified to refer to behaviors occurring since the last assessment (past 4 weeks during treatment, past 3 months at each follow-up assessment). Therefore, scores reflecting the past 3 months were divided by 3 so all scores reflect an average score per month (possible range = 0–233). The alpha coefficients for this measure in the current study ranged from .81 to .92 across assessments.

Conflict Tactics Scales–2–Physical Assault Scale (CTS-2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). The CTS-2 Physical Assault Scale consists of 12 items assessing physical violence perpetration (e.g., "Slapped," "Slammed against wall"). Participants rated how often they engaged in each behavior on 7-point scales ranging from 0 (*never*) to 6 (*20 times or more*). Composite scores were calculated by adding the midpoints for each response (e.g., the midpoint 4 for 3–5 times), as recommended by Straus et al. (1996). As categorized by Straus et al. (1996), the CTS-2 includes both mild or moderate acts (e.g., slapping; grabbing) and severe acts (e.g., kicking, choking). The CTS-2 scales demonstrate adequate reliability and validity (Lucente, Fals-Stewart, Richards, & Goscha, 2001). Straus et al. found the subscales to have good internal consistency in a sample of college students (α s ranged from .86–.95 for the Physical Assault perpetration scale). Participants answered CTS-2 items referencing

the same time frames as the MMEA (see previous section). The possible range of scores was 0–100. The alpha coefficients in the current study ranged from .76 to .88 across assessments.

Acceptance and Action Questionnaire–II (AAQ–II; Bond et al., 2011). The AAQ–II is a 10-item measure of experiential avoidance, or the tendency to avoid unwanted internal experiences (e.g., “I try hard to avoid feeling depressed or anxious,” and “Emotions cause problems in my life”). Participants are asked to rate how true each statement has been for them in the past month on a 7-point Likert scale ranging from 1 (*never*) to 7 (*always*). High scores indicate more experiential avoidance (possible range: 10–70). The AAQ–II has adequate internal consistency ($\alpha = .70$) and adequate convergent, discriminant, and concurrent validity (Bond et al., 2011). The alpha coefficients for this measure in the current study ranged from .86 to .92 across assessments.

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is a 36-item measure that assesses individuals’ typical levels of emotion dysregulation across six domains: nonacceptance of negative emotions, inability to engage in goal-directed behaviors when experiencing negative emotions, difficulties controlling impulsive behaviors when experiencing negative emotions, limited access to emotion regulation strategies perceived as effective, lack of emotional awareness, and lack of emotional clarity. Participants rated how often each item has applied to them in the past month on a 5-point Likert scale ranging from 1 (*almost never*) to 5 (*almost always*), and items were summed to create a total score (possible range: 36–180). The DERS has high internal consistency ($\alpha = .93$), good test–retest reliability, and adequate construct and predictive validity (Gratz & Roemer, 2004). The alpha coefficients for this measure in the current study ranged from .90 to .94 across assessments.

Data Analytic Strategy

All analyses were conducted with growth curve analytic techniques (Raudenbush & Bryk, 2001). In the present study, levels and changes in aggressive behaviors and other outcome variables over time (Level 1) were examined by group membership (Level 2). The outcome variables were composed of six repeated measurements for each individual (Level 1) nested within groups (Level 2). These data were modeled as continuous variables according to a linear polynomial term with values of 0, 1, 2, 3, 6, and 9, corresponding to the six assessments across 9 months: pretreatment (0), during treatment (1, 2, 3) and follow-up (6, 9). For pre- to posttreatment analyses, the assessments were set at (3) so that the intercept represented the last session, or posttreatment. For follow-up analyses, the intercept was shifted to the last follow-up (9) to facilitate group comparisons at those time points. Treatment condition was coded at Level 2 such that ACT = 1 and control = 0.

The first stage of the multilevel analysis entailed computing within-subject associations of all variables and group differences in these associations, using a mixed-model approach. Independent samples *t* tests and chi-square analyses were conducted to examine baseline differences between treatment conditions on all variables. Intercept and measurement time were included as random effects to allow for heteroscedasticity and autocorrelation of within-person measures. Linear, quadratic, and mean-and-variance mod-

els for each variable were estimated and compared to determine the best fitting models for the data.

For the intent-to-treat (ITT) analysis, all data points for participants who were randomized were entered into the model. Completer analyses included participants who completed treatment and at least one subsequent assessment; however, these results did not differ from ITT results, so only ITT results are reported here. To conduct ITT analyses, we assumed a zero slope for each case that did not have at least one assessment beyond the pretreatment baseline. (A detailed discussion of attrition and missing data is presented later in text).

Statistical methods exist for formal tests of mediation in single-level designs (e.g., Baron & Kenny, 1986; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002) and two-level (i.e., nested cross-sectional) designs (e.g., Bauer, Preacher, & Gil, 2006; Kenny, Korchmaros, & Bolger, 2003; Krull & MacKinnon, 2001). In contrast, there is no gold standard for conducting tests of indirect effects for two-level longitudinal models. Thus, the methods for testing multilevel mediation detailed by Krull and MacKinnon (2001) as well as Sobel’s (1982) mediation test, which follow Kenny, Kashy, & Bolger’s (1998) procedures, were extended to this two-level longitudinal case.

Results

Preliminary and Descriptive Analyses

Of the intent-to-treat (ITT) sample (the 101 participants randomized to treatment), 62% completed the full 12 sessions of therapy, including 64% (32/50) in the ACT condition and 59% (30/51) in the control condition. The additional 39 participants received a partial dose of therapy; 32 participants attended between two and 11 therapy sessions, including 16 in each condition (32% of ACT condition and 31% of control condition), and seven participants attended 0 or one session and then discontinued participation in the study, comprising four participants in the ACT condition (8%) and three participants in the control condition (6%). As indicated in Figure 1, reasons for discontinuing included time/schedule conflicts, no longer needing or wanting the group therapy, and a lack of transportation. One-way analyses of variance and chi-square analyses revealed that the portion of participants who did not complete the full 12 sessions did not differ by treatment condition, demographics, or process or outcome measures ($F_s < .64, p_s > .53$). The total number of sessions attended did not differ by treatment condition (ACT $M = 9.72$; control $M = 9.51$). Regarding the seven assessment points, the majority of participants (89%) had two or fewer sessions of missing data. Finally, the presence of missing data did not predict any of the process or outcome variables ($F_s < .83, p_s > .25$).

Data for all variables generated normal distributions. Means and standard deviations of scores on all measures can be found in Table 1. Emotion dysregulation scores on the DERS at pretreatment were higher than those previously reported in a sample of undergraduate students (Shorey, Cornelius, & Idema, 2011) but commensurate with those reported by Gratz and Tull (2011) in a sample of women diagnosed with borderline personality disorder. Levels of experiential avoidance at pretreatment as measured by the AAQ–II were comparable to those previously reported in a

Table 1
Observed Means (and Standard Deviations) for Mediator and Outcome Variables Across Assessment Points

Measures	Condition	Pretreatment (<i>n</i> = 94)	Treatment phase			Follow-up phase	
			4 weeks (<i>n</i> = 81)	8 weeks (<i>n</i> = 79)	12 weeks (<i>n</i> = 73)	3 months (<i>n</i> = 70)	6 months (<i>n</i> = 69)
Psychological Aggression (MMEA)	ACT	45.46 (27.44)	40.30 (26.32)	37.64 (28.92)	30.07 (26.11)	24.99 (21.56)	18.13 (19.45)
Range: 0–233	Control	44.23 (30.01)	42.95 (27.87)	42.53 (25.00)	40.62 (27.73)	38.00 (26.41)	38.24 (22.23)
Physical Aggression (CTS–2)	ACT	6.89 (5.34)	5.04 (6.12)	4.87 (5.83)	3.82 (4.97)	2.76 (5.80)	1.85 (4.61)
Range: 0–100	Control	6.01 (6.22)	5.93 (6.84)	5.55 (6.25)	5.87 (6.44)	5.58 (6.04)	5.79 (5.32)
Experiential Avoidance (AAQ-II)	ACT	46.22 (8.14)	48.58 (7.79)	40.52 (7.43)	38.02 (7.63)	32.89 (7.25)	29.72 (6.54)
Range: 10–70	Control	45.63 (7.02)	44.57 (8.65)	46.78 (8.03)	45.32 (7.99)	43.67 (6.84)	43.26 (7.16)
Emotion Dysregulation (DERS)	ACT	126.99 (18.90)	123.65 (19.78)	110.46 (20.42)	94.39 (21.65)	80.79 (19.54)	82.73 (21.49)
Range: 36–180	Control	128.65 (19.21)	129.43 (18.32)	122.68 (17.91)	120.82 (18.38)	118.93 (20.28)	111.45 (19.88)

Note. ACT = Acceptance and Commitment Therapy; Control = attention placebo control condition; MMEA = Multidimensional Measure of Abuse; CTS–2 = Conflict Tactics Scale–2; AAQ–II = Acceptance and Action Questionnaire–II; DERS = Difficulties in Emotion Regulation Scale.

sample of outpatients seeking psychological treatment for substance misuse (Bond et al., 2011). The developers of the AAQ–II found mean norms for nonclinical populations ranged from 30 to 34 ($SD = 7.38$) and a mean of 44 as an upper-quartile score for clinical populations. In addition, scores on both the AAQ–II and the DERS at pretreatment were similar to those obtained in a clinical sample in a study evaluating a group treatment for self-harm (Gratz & Gunderson, 2006).

Correlations among variables at pretreatment ranged from .42 to .59. One-way analyses of variance and chi-square analyses revealed that demographic variables did not show any significant relations with outcome measures. Furthermore, the ACT and control groups did not significantly differ on any demographic characteristic or diagnoses, and no significant pretreatment differences emerged on the process or outcome measures ($F_s < .77$, $p_s > .46$). Thus, covariates were not included in the primary analyses.

Use of additional psychotherapy. The groups did not differ in frequency of outside therapy use at either posttreatment or at the 3-month follow-up ($p_s < .27$). At the 6-month follow-up, however, participants in the ACT condition reported greater use of psychotherapy than participants in the control group ($B = 1.39$, $p = .05$). Among participants who were utilizing outpatient treatment at the 6-month follow-up (52% in control group and 58% in ACT group), the average number of sessions was 14 ($SD = 10.90$) in the control group and 18 ($SD = 12.87$) in the ACT group. Therefore, psychotherapy use (i.e., number of individual therapy sessions attended) was covaried in all subsequent analyses. Furthermore, the therapy checklist revealed no significant differences between groups on the nature of outside therapy received; participants across groups reported similar types and numbers of therapist behaviors and therapy activities. For example, the most common items endorsed included “My therapist encourages me to express my thoughts and feelings,” and “My therapist focuses on direct ways to reduce symptoms of distress.”

Baseline Models

Linear and quadratic models for each variable were estimated and compared to determine the best fitting models for the data. For psychological aggression, a chi-square comparison test between the deviance fit statistics for the linear and quadratic models indicated that the linear model was a significantly better fit to the

data than the quadratic model, $\chi^2(97) = 238.05$, $p < .001$. The same procedure was then repeated for the physical aggression data. Similarly, a linear model was a significantly better fit to the data than the quadratic model, $\chi^2(97) = 176.61$, $p < .001$. For both linear models (for psychological aggression scores and for physical aggression scores), the significant chi-square tests indicated that there was significant variance in all parameters to support linear models of change in both psychological and physical aggression. Thus, linear models were used as the baseline models for all subsequent analyses with psychological aggression (MMEA) or physical aggression (CTS–2) as the outcome.

Next, linear models examining the slopes of psychological and physical aggression were tested. These models were estimated successfully, providing reliable estimates of all of the model parameters. Reliability is defined as the proportion of variance in each parameter that can be treated as meaningful variance. The reliability coefficients of the intercepts (aggression at posttreatment) were .93 for psychological aggression and .81 for physical aggression. The reliability estimates of the slope parameters (rate of change over time) were .85 for psychological aggression and .79 for physical aggression. Growth curve analyses use only the reliable variance in the parameters for coefficient estimation. The hypotheses that the mean of each parameter differs significantly from zero were tested using t tests, as recommended by Raudenbush and Bryk (2001). The t tests indicated that the slopes significantly differed from zero and were negative, demonstrating there were significant linear declines in psychological aggression, $\beta = -4.56$, standard error (SE) = 1.79, $t(97) = -6.25$, $p < .001$, and physical aggression, $\beta = -5.24$, $SE = 2.51$, $t(97) = -5.90$, $p < .001$, from pretreatment to posttreatment. The same patterns emerged for pretreatment to 6-month follow-up slopes for both psychological aggression, $\beta = -5.63$, $SE = 1.82$, $t(97) = -6.41$, $p < .001$, and physical aggression, $\beta = -5.71$, $SE = 2.34$, $t(97) = -7.35$, $p < .001$. Finally, the chi-square statistics testing whether the residual variances of the parameters were significantly different from zero were significant for psychological and physical aggression, indicating that there is significant variance in all of the parameters to support linear models of change from pretreatment to 6-month follow-up for both psychological and physical aggression (χ^2 s ranged from 3.97 to 8.02, all $p_s < .05$).

Does ACT Reduce Psychological and Physical Aggression?

Two models were used to examine average changes in aggressive behaviors between participants in the ACT and control group over the course of the study: one to examine pre- to posttreatment and a second to examine pretreatment to 6-month follow-up. These Level 1 parameters were predicted by group membership in the Level 2 equations to determine whether significant differences existed between treatment conditions on levels or changes in aggressive behaviors.

Level 1:

$$Y_i + 1_j(\text{Outcome Variable}) = \beta_{0j}(\text{Intercept}) + \beta_{1j}(\text{Time}) + r_{ij}$$

Level 2:

$$\beta_{0j}(\text{Intercept}) = \gamma_{00} + \gamma_{01}(\text{Treatment Condition}) + u_{0j}$$

$$\beta_{1j}(\text{Slope}) = \gamma_{10} + \gamma_{11}(\text{Treatment Condition}) + u_{1j}$$

Results are presented in Table 2. In comparisons of aggression scores among participants in the ACT and control conditions, analyses revealed a significant interaction between time and treatment condition in predicting both psychological and physical aggression on average. Specifically, participants in ACT reported significantly less psychological aggression, $\beta = 1.15$, $SE = 0.68$, $t(97) = 7.43$, $p < .001$, and physical aggression, $\beta = 1.45$, $SE = 0.59$, $t(97) = 7.11$, $p < .001$, at posttreatment than participants in the control group. The ACT participants also reported significantly less psychological aggression, $\beta = 2.05$, $SE = 0.71$, $t(97) = 8.33$, $p < .001$, and physical aggression, $\beta = 2.21$, $SE = 0.65$, $t(97) = 8.19$, $p < .001$, at the 6-month follow-up assessment. Rates of change did not differ between groups from pre- to posttreatment for physical aggression, $\beta = 0.86$, $SE = 0.64$, $t(97) = 1.08$, $p > .05$, or psychological aggression, $\beta = 0.61$, $SE = 0.24$, $t(97) = 1.57$, $p > .05$. However, rates of change differed between groups from pretreatment to the 6-month follow-up. Participants in the

ACT condition reported greater declines in psychological and physical aggression from pretreatment to 6-month follow-up, with steeper slope declines on the MMEA, $\beta = 2.21$, $SE = 0.74$, $t(97) = 3.59$, $p < .01$, and the CTS-2, $\beta = 2.35$, $SE = 0.89$, $t(97) = 6.22$, $p < .01$. (See Table 2 for all group comparisons of intercepts and slopes from posttreatment to 6-month follow-up.) For psychological aggression, the standardized between-group posttreatment effect size (Cohen's d) of 0.40 constitutes a small to medium effect in favor of ACT and the 6-month follow up effect of 0.96 is considered a large effect. For physical aggression, the standardized between-group posttreatment effect size of 0.36 constitutes a small effect in favor of ACT and the 6-month follow-up effect of 0.79 is considered a large effect.

Does ACT Reduce Experiential Avoidance and Emotion Dysregulation?

Two models were used to examine changes in experiential avoidance over the course of the study: one to examine pre- to posttreatment and a second to examine pretreatment to follow-up. The Level 1 process variables were first examined for changes from pre- to posttreatment and from pretreatment to follow-up. Level 1 parameters were then predicted by group membership in the Level 2 equation to determine whether significant differences exist between groups on levels or changes in process variables.

Level 1:

$$Y_i + 1_j(\text{Process Variable}) = \beta_{0j}(\text{Intercept}) + \beta_{1j}(\text{Time}) + r_{ij}$$

Level 2:

$$\beta_{0j}(\text{Intercept}) = \gamma_{00} + \gamma_{01}(\text{Treatment Condition}) + u_{0j}$$

$$\beta_{1j}(\text{Slope}) = \gamma_{10} + \gamma_{11}(\text{Treatment Condition}) + u_{1j}$$

First, these analyses were conducted examining experiential avoidance (AAQ-II). Among ACT participants, on average, AAQ-II scores significantly declined from pre- to posttreatment, $\beta = -1.98$, $SE = 1.82$, $t(46) = -3.22$, $p < .01$, and from pretreatment to 6-month follow-up, $\beta = -2.16$, $SE = 1.23$, $t(46) = -5.16$, $p < .001$. Among control participants, AAQ-II scores did not significantly decline from pre- to posttreatment, $\beta = -0.13$, $SE = 0.25$, $t(48) = -.29$, ns , or from pretreatment to 6-month follow-up, $\beta = -0.08$, $SE = 0.12$, $t(48) = -.48$, ns . In comparing AAQ-II scores of participants in ACT and the control condition, there was a significant interaction between time and treatment condition in predicting experiential avoidance such that participants in ACT reported significantly less experiential avoidance at posttreatment than participants in the control group, $\beta = 3.68$, $SE = 1.62$, $t(97) = 7.46$, $p < .001$. These gains continued through to the 6-month follow-up, with ACT participants reporting significantly less experiential avoidance, $\beta = 4.08$, $SE = 1.96$, $t(97) = 9.52$, $p < .001$. Furthermore, participants in the ACT condition showed significantly steeper declines compared with those in the control condition in experiential avoidance from pre- to posttreatment, $\beta = 3.36$, $SE = 0.54$, $t(97) = 2.80$, $p < .01$, and from pretreatment to the 6-month follow-up, $\beta = 3.85$, $SE = 0.72$, $t(97) = 3.54$, $p < .001$.

These analyses were then repeated with the emotion dysregulation measure (DERS). Among ACT participants, on average,

Table 2

Differences in Aggression Trajectories Between Participants in Acceptance and Commitment Therapy Versus Control Conditions

Outcome	β	SE	$t(97)$
Intercepts			
Intercepts at posttreatment			
Psychological Aggression	1.15	0.68	7.43**
Physical Aggression	1.45	0.59	7.11**
Intercepts at 6-month follow-up			
Psychological Aggression	2.05	0.71	8.33**
Physical Aggression	2.21	0.65	8.19**
Slopes			
Pretreatment through posttreatment			
Psychological Aggression	0.67	0.24	1.57
Physical Aggression	0.86	0.64	1.08
Pretreatment through 6-month follow-up			
Psychological Aggression	2.21	0.74	3.59*
Physical Aggression	2.35	0.89	6.22*

* $p < .01$. ** $p < .001$.

DERS scores significantly declined from pre- to posttreatment, $\beta = -1.77$, $SE = 0.99$, $t(46) = -2.57$, $p < .05$, and from pretreatment to 6-month follow-up among participants in the ACT condition, $\beta = -1.54$, $SE = 0.61$, $t(46) = -3.21$, $p < .01$. Among participants in the control condition, DERS scores did not significantly decline from pre- to posttreatment, $\beta = -0.25$, $SE = 0.16$, $t(48) = -1.02$, *ns*, but declines approached significance from pretreatment to 6-month follow-up, $\beta = -1.32$, $SE = 1.17$, $t(46) = -2.30$, $p = .06$.

In comparing scores of participants in ACT to participants' scores in the control treatment, there was a significant interaction between time and treatment condition in predicting emotion dysregulation, $\beta = 1.01$, $SE = 0.49$, $t(97) = 4.34$, $p < .01$, such that participants in the ACT condition had significantly lower emotion dysregulation scores than participants in the control condition at posttreatment. Similarly, these results were maintained at 6-month follow-up, such that ACT participants continued to report significantly lower emotion dysregulation scores than participants in the control condition, $\beta = 2.14$, $SE = 0.86$, $t(97) = 5.03$, $p < .001$. Furthermore, rates of change did not differ between groups from pre- to posttreatment, $\beta = 1.96$, $SE = 0.23$, $t(97) = 1.67$, *ns*, but participants in the ACT condition showed steeper declines in emotion dysregulation than those in the control condition from pretreatment to the 6-month follow-up, $\beta = 3.53$, $SE = 1.26$, $t(97) = 2.91$, $p < .01$.

Do Experiential Avoidance and Emotion Dysregulation Mediate ACT Outcomes?

As mentioned earlier, to examine mediation within the context of multilevel models, we followed the procedure outlined by Krull and MacKinnon (2001). In order to preserve a temporal connection (Kraemer, Wilson, Fairburn, & Agras, 2002), the mediator introduced in equations was experiential avoidance or emotion dysregulation at a previous time point. According to Baron and Kenny (1986) and Krull and MacKinnon (2001), three criteria must be met to support full mediation. First, the independent variable (treatment condition) needs to be significantly related to the mediator (e.g., experiential avoidance at posttreatment). Second, the independent variable must significantly predict the outcome variable (e.g., aggression at 6-month follow-up). Third, for full mediation, the relation between independent variable and outcome must disappear when the mediator is introduced into the equation. If after introducing the mediator into the equation, the coefficient between the independent variable and outcome remains significant but is reduced, there is evidence for partial mediation.

Because Mediation Criteria 1 and 2 were met, we then examined whether the proposed mediators (AAQ-II and DERS) were associated with aggressive behaviors after controlling for the relation between group membership and aggressive behavior (Condition 3). The tests of indirect effects revealed that lower levels of experiential avoidance (AAQ-II scores) at posttreatment were associated with significantly less psychological aggression $\beta = -1.51$, $SE = 0.65$, $t(97) = -2.57$, $p < .05$, and physical aggression $\beta = -1.78$, $SE = 0.86$, $t(97) = -3.11$, $p < .01$, at the 6-month follow-up. Moreover, the Sobel test revealed an indirect effect for the AAQ-II for both psychological aggression ($z = 2.96$, $p = .02$) and physical aggression ($z = 3.35$, $p = .03$). Post hoc tests were conducted using the PRODCLIN program (MacKinnon,

Fritz, Williams, & Lockwood, 2007), which computes asymmetric confidence limits based on the distribution of products. Results revealed that the confidence intervals (CI) for psychological aggression (CI [.01, .07]) and physical aggression (CI [.02, .08]) do not include zero, consistent with a statistically significant mediation. This indicates the AAQ-II partially mediated reductions in psychological and physical aggression.

An identical model was tested with the DERS as the mediator. Lower levels of emotion dysregulation at posttreatment were associated with less physical aggression, $\beta = -1.97$, $SE = 1.36$, $t(97) = -3.75$, $p < .01$, at 6-month follow-up, and approached significance for psychological aggression, $\beta = -0.91$, $SE = 0.67$, $t(97) = -2.07$, $p = .07$. The Sobel test offered further evidence of a significant indirect effect for physical aggression ($z = 3.79$, $p = .01$) and for psychological aggression ($z = 2.41$, $p = .08$). PRODCLIN results revealed that the confidence intervals for physical aggression (CI [.02, .08]) did not include zero, consistent with a statistically significant mediation. This indicates the DERS partially mediated reductions in physical aggression.

Discussion

The purpose of the current research was to ascertain whether an ACT treatment group, compared with an attention placebo control group, would provide beneficial and significant gains for individuals who engage in partner aggression. Adults ($N = 101$) drawn from a treatment-seeking population were randomized to receive either ACT or an attention placebo control treatment for 12 weeks. Process and outcome data were collected at pretreatment, at 4 weeks of treatment, at 8 weeks of treatment, at posttreatment, at 3 and 6 months posttreatment.

Summary and Interpretation of Results

Overall, the results indicated that ACT led to significant reductions in psychological and physical aggression and that treatment improvements were mediated in part by reductions in experiential avoidance and emotion dysregulation. Furthermore, the gains achieved at posttreatment were retained (or continued to improve) over the 6-month follow-up period. Based on criteria defined by Hollon, Stewart, and Strunk (2006), these findings suggest that ACT did not simply produce palliative effects (i.e., effects that "suppress the expression of the disorder so long as they are applied"; p. 287). Rather, its effects were enduring and curative (i.e., they "reverse(d) processes that would otherwise lead to the continuation of the disorder"; p. 287). From an ACT perspective, one's ability to accept unwanted internal experiences and engage in valued behavior may become more effective as time passes and skills are repeatedly practiced. This is consistent with previous ACT research suggesting that it exerts or maintains treatment effects during a follow-up period (e.g., Gifford et al., 2004; Luoma et al., 2012). Furthermore, this study adds to the limited research on mindfulness and acceptance treatments for relationship conflict and aggression that includes both men and women (e.g., Wupperman et al., 2012).

As hypothesized, ACT reduced experiential avoidance, and changes in this process had a role in the outcomes obtained. Specifically, participants in the study reported clinical levels of experiential avoidance at pretreatment, and for participants in the

ACT group, these levels decreased significantly over the 9 months of the study. Moreover, experiential avoidance at posttreatment partially accounted for reductions in both physical and psychological aggression at 6-month follow-up. These results are consistent with growing evidence linking experiential avoidance and related emotional skill deficits to aggressive behavior (e.g., Gratz et al., 2009; Jakupcak, 2003), as well as other studies that have shown that experiential avoidance tends to improve significantly as a result of an ACT intervention and mediates target outcomes. For example, trials of ACT for test anxiety (Zettle, 2003), worksite stress (Bond & Bunce, 2000), chronic pain (McCracken, Vowles, & Eccleston, 2005), and nicotine addiction (Gifford et al., 2004) have all concluded that decreases in experiential avoidance partially mediated the observed treatment effects of ACT.

Emotion dysregulation—a phenomenon conceptually related to experiential avoidance—was also linked to decreases in aggression. Specifically, the ACT group had a positive effect on emotion dysregulation and decreases in emotion dysregulation partially accounted for reductions in physical (but not psychological) aggression. These results are consistent with research by Gratz and colleagues who have investigated the effects of an acceptance-focused group treatment for individuals with borderline personality disorder and self-harm; they found that the group had positive effects on both experiential avoidance and emotion dysregulation, as measured by the AAQ and the DERS, respectively (Gratz & Gunderson, 2006; Gratz & Tull, 2011).

Limitations of the Present Study

Several limitations of the current study should be noted. First, all measures were self-report questionnaires. Because questionnaires rely on often-limited conscious awareness, future studies would benefit from integrating behavioral, psychophysiological, and brain-based measurements of mediators and outcomes. Similarly, obtaining reports of aggressive behavior from partners or family members is recommended to gather more information about behaviors that may be underreported. Second, the sample for the current study was largely White. However, 18% of participants were minorities, which is a greater proportion than in the state in which the study occurred (7%). Third, we did engage in efforts to obtain information about outside therapy utilization throughout the course of the study, but it is unknown how the participants' involvement in outside treatment may have affected the results. However, outside therapy use was randomized across conditions, and participants were not receiving ACT in their individual therapies. Consistent with previous studies (e.g., Arch et al., 2012), ACT participants used more outside therapy during the follow-up period than participants in the control group. It is possible that the focus on accepting unwanted emotions, connecting to personal values, and engaging in committed action motivated patients to continue engaging in psychotherapy. Finally, it is unknown whether these results are generalizable to all types of aggression, such as "intimate terrorism" (i.e., severe violence and control; M. P. Johnson & Leone, 2005), violence by high-risk offenders in a criminal justice setting, or violence that occurs against individuals other than partners or loved ones. Although we did not assess participants' prior criminal history, overall rates of violence were low to moderate, and the percentage of the sample meeting criteria for antisocial personality disorder was small (2%). Furthermore,

because the participants in the current sample were in individual therapy and successfully followed referral advice to enroll in this study, it is likely that this sample was more motivated to change than a criminal justice sample. In sum, the sample in this study is probably overlapping with, but likely not as severe as, those in typical aggression treatment studies.

Implications of the Present Study

The current study represents the first treatment outcome study comparing ACT with a control group for partner aggression and represents an important first step in developing more effective interventions for partner aggression. This investigation addresses the need for empirically based studies of how behavioral treatments work in general—as called for by leaders in the field of clinical psychology (Kazdin & Nock, 2003)—as well as investigations of how treatments for aggression work specifically. Although identifying mechanisms of change is essential to developing and refining effective behavioral interventions (Lynch, Chapman, Rosenthal, Kuo, & Linehan, 2006), the few studies of traditional programs for aggression that have examined CBT-relevant constructs have revealed that clinically significant changes in aggressive cognitions or personality traits generally do not occur and that any putative changes that occur do not lead to declines in aggressive behavior (i.e., changes in cognitions are not an effective mechanism of treatment; Feder & Forde, 2000; Morrel, Elliott, Murphy, & Taft, 2003). In the current study, putative mediators were assessed frequently throughout treatment and during the follow-up period, and changes in those processes (i.e., experiential avoidance) partially accounted for treatment outcomes. The results of the current study suggest that to the extent that experiential avoidance—and the related construct of emotion dysregulation—contributes to aggressive behavior, an ACT intervention is particularly well suited for individuals who engage in partner aggression. The theory underlying ACT is fairly well elaborated yet can be stated simply: "ACT therapists try to help clients make room for . . . life's difficulties and to move in the direction of their chosen values. Experiential avoidance is a barrier to doing this, which prevents a behavioral commitment to a valued life" (Hayes, Strosahl, & Wilson, 1999, p. 81). ACT thus seeks to increase clients' willingness to be exposed to unpleasant internal experiences if necessary to complete valued activities. In contrast to Duluth and CBT models of treatment (the standard approaches to treating partner aggression in the United States), in which the goal is to change the frequency or content of one's thoughts and feelings, the goal of ACT is to change participants' *relationship* with their thoughts and emotions by helping them become less impulsive and reactive to their internal experiences and more focused on effective, values-based behavior. The overall pattern of results suggests that ACT may be an effective way to address the skill deficits that characterize aggressive individuals. In sum, the current study provides support both for ACT as an intervention that can help ameliorate aggressive behavior and for the model of aggression proposed in the current study.

The findings of this study suggest that ACT can feasibly be delivered in a group format to clients with diverse psychological problems; the present sample was diagnostically diverse and included both men and women reporting a wide range of psychological symptoms in addition to aggressive behavior. Improve-

ments were observed despite the group not being paired with a particular form of individual therapy. That the utility of this group therapy does not depend upon it being matched with a theoretically similar individual therapy provides additional support for its transportability. A strength of this intervention, therefore, is that it is both practical and cost effective.

To our knowledge, this study represents the first randomized clinical trial comparing ACT and a control group for aggressive behavior. As mentioned earlier, existing interventions have only modest empirical support and employ therapeutic techniques that do not bring about clinically significant change in aggressive behavior (e.g., Babcock et al., 2004). The current study provides preliminary evidence that continued efforts toward developing efficacious treatments should include empirical tests of ACT as a treatment for aggressive behavior. The next step should include comparing ACT with traditional treatments such as CBT and the Duluth model and replicating these findings with different samples. For example, it would also be useful to replicate the current methodology with a sample of individuals engaging in severe domestic violence, such as an offender population in a forensic setting. Furthermore, future research should continue to assess how the use of particular ACT skills (e.g., acceptance of emotions) mediates outcomes. For example, does acceptance increase behavioral self-control and lead to improvement in aggressive behavior? Answers to these questions could lead to the refinement of ACT to maximize effectiveness. Researchers may also be interested in evaluating the effectiveness of a stand-alone ACT treatment versus ACT plus treatment as usual. Due to the fundamental differences in the underlying theories and philosophies, it may be contraindicated to incorporate ACT-related elements into existing interventions such as the Duluth model or CBT. If the current findings are replicated, this would suggest an entirely new approach to the treatment of aggression.

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(Appendix follows)

Appendix

ACT Group Protocol

Session(s)	Topic	Description
1	Introduction and values	This session included introductions and an opportunity for clients and facilitators to become acquainted as well as an explanation of the group format and group protocol. Facilitators began to lay the foundation for future sessions by assisting clients in identifying and clarifying valued directions (and values were woven throughout all subsequent sessions). Specifically, identifying the kind of relationships they would like to have, and what behaviors are getting in the way of establishing or maintaining those relationships.
2	Mindfulness	Session 2 introduced mindfulness and the purpose of developing this skill, and included experiential exercises to promote ongoing nonjudgmental contact with psychological and environmental events as they occur. This was accomplished by using language more as a tool to note and describe events, not simply to predict and judge them.
3–4	Emotional intelligence	These sessions focused on increasing emotional awareness and clarity. During these weeks, clients were assisted in improving their ability to identify and differentiate between emotional states and their responses to emotions. An emphasis was placed on the functionality of primary emotional responses, and clients were encouraged to identify both the information being provided by their primary emotions, as well as adaptive ways of acting on this information.
5–6	Acceptance	These sessions focused on the development of emotional acceptance, emphasizing the experiential benefits and emotion regulating consequences of emotional acceptance, as well as the potentially paradoxical long-term consequences of emotional avoidance. In addition to receiving psycho-education on the long-term consequences of these approaches, clients were encouraged to actively monitor and assess the different experiential consequences of emotional willingness (i.e., an active process of being open to emotional experiences as they arise) versus emotional unwillingness.
7–8	Defusion	These sessions focused on understanding the mind and the pros and cons of human language and cognition. Paradox, metaphors, in-session exercises, and a variety of other strategies were used to promote defusion experientially. The goal was to reduce participants' entanglement with verbal processes and to change the way they interact with or relate to their thoughts.
9–10	Behavioral change/commitment	These sessions emphasized behavioral change, focusing on further values clarification and identifying barriers to adaptive behavioral change, integrating previous session material as necessary. Group work involved a focus on commitment and engaging in actions consistent with valued directions, with an emphasis placed on moment-to-moment choices in everyday living and process rather than outcome.
11–12	Practice, review, and closing	These sessions included (a) continued practice of new skills, including interpersonal skills, (b) a review of previous group material, and (c) a debriefing and discussion of the overall group experience.

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Aggression Protects Against the Onset of Major Depressive Episodes in Individuals With Bipolar Spectrum Disorder

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A growing body of research suggests that bipolar spectrum disorders (BSDs) are associated with high aggression. However, little research has prospectively examined how aggression may affect time to onset of hypomanic/manic versus major depressive episodes. In a longitudinal study, we tested the hypothesis that aggression would prospectively predict a shorter time to the onset of hypomanic/manic episodes and a longer time to the onset of major depressive episodes, based on the behavioral approach system theory of BSDs. Young adults ($N = 120$) diagnosed with cyclothymia, bipolar II disorder, or bipolar disorder not otherwise specified were followed every 4 months for an average of 3.55 years. Participants completed measures of depressive

and manic symptoms, family history of mood disorder, impulsivity, and aggression at baseline and were followed prospectively with semistructured diagnostic interview assessments of hypomanic/manic and major depressive episodes and treatment seeking for mood problems. Cox proportional hazard regression analyses indicated that overall, physical, and verbal aggression predicted a longer time to major depressive episode onset, even after controlling for baseline depressive and manic symptoms, family history of mood disorder, treatment seeking for mood problems, and impulsivity. Aggression, however, did not significantly predict time to onset of hypomanic/manic episodes, controlling for the same covariates. The findings suggest that approach-related behaviors may be utilized to delay the onset of major depressive episodes among people with BSDs.

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A WELL-ESTABLISHED FINDING in the literature is that individuals with bipolar spectrum disorders (BSDs) exhibit high levels of aggression and anger. For example, individuals with BSDs score significantly

higher on self-report trait measures of aggression (including aggressive behavior, anger, and hostility) compared to healthy controls and to individuals with non-BSD psychopathology (Ballester et al., 2014; Dervic et al., 2015; Molz et al., 2013). Additionally, individuals with BSDs report more extensive histories of lifetime aggressive behaviors in adolescence and adulthood (Corrigan & Watson, 2005; Perroud, Baud, Mouthon, Courtet, & Malafosse, 2011), and inpatients with BSDs are almost three times more likely to display aggressive behavior while in treatment compared to inpatients with other psychiatric disorders (Barlow, Grenyer, & Ilkiw-Lavalle, 2000). Although aggression may fluctuate in BSDs according to current mood state, this feature seems to persist across contexts, rather than being a more transient, reactive occurrence (Dutra, Reeves, Mauss, & Gruber, 2014).

There is also evidence to suggest that aggression may be a possible risk factor for BSD onset. A review of the research examining prodromal symptoms of BSDs identified irritability and aggressiveness as among the most frequently reported symptoms predating onset of BSD (Skjelstad, Malt, & Holte, 2010). Similarly, in children with BSDs, symptoms of irritability/dyscontrol (including temper tantrums, poor frustration tolerance, impulsivity, increased aggression, decreased attention span, hyperactivity, and irritability) were associated with transition to more classic manic and depressive symptoms (Fergus et al., 2003). High-risk children of parents with BSDs also have been shown to score higher on measures of hostility and irritability compared to children of control parents, even when accounting for the child's own psychopathology and parental non-BSD psychopathology (Farchione et al., 2007). These findings, along with evidence that aggression in individuals with BSDs is associated with poorer functioning (Ballester et al., 2014), as well as greater violence and suicidality (Fazel, Lichtenstein, Grann, Goodwin, & Långström, 2010; Oquendo et al., 2000), underscores the need to better understand the role of aggression in BSD onset and course.

Recent work suggests that, similar to mania/hypomania, aggression might be conceptualized as an "approach emotion" associated with the Behavioral Approach System (BAS; Carver & Harmon-Jones, 2009), the system that regulates approach motivation and goal-directed behavior to attain rewards (Alloy & Abramson, 2010; Alloy, Nusslock, & Boland, 2015; Urosević, Abramson, Harmon-Jones, & Alloy, 2008). In other words, BAS activation may be linked with aggression and anger (Carver, 2004), in addition to being associated with increased energy, positive affect, and excessive goal-directed behavior (Gray, 1994). Specifically, anger provocation and aggressiveness are

hypothesized to occur when goal striving is thwarted (e.g., obstacles or insults are presented; Fowles, 1988; Harmon-Jones & Sigelman, 2001). In support of this, work by Harmon-Jones et al. (2002) showed that left hemisphere activation was associated with both anger and manic/hypomanic symptoms in individuals with BSD. Additionally, Molz et al. (2013) found that aggression was associated with life events that activate the BAS, and the association between BSD status and BAS-activating events was mediated by aggression and impulsivity.

Existing research also suggests that trait aggression may be a predisposition toward experiencing BAS activation, which may put individuals at risk for experiencing hypomania/mania, but protect them against experiencing depression. For example, cognitive-behavioral deactivation strategies, such as dampening high success expectancies and participating in calming activities, have been found to reduce the likelihood of manic relapse (Lam, Wong, & Sham, 2001), whereas behavioral activation strategies protect individuals against full-blown depression (Ekers et al., 2014; Mazzucchelli, Kane, & Rees, 2009). Therefore, given the role of these activation and deactivation strategies in the development and prevention of mood episodes, trait aggression, as an approach-related tendency (Carver & Harmon-Jones, 2009), may be a risk factor for BAS activation. Such evidence implicating aggression in approach motivation suggests that aggression may be highly associated with hypomania/mania. Conversely, given that depression is theorized to be associated with low motivation or excessive BAS deactivation states (Alloy et al., 2015), it may be less compatible with aggression.

Indeed, the BAS theory of BSDs posits that vulnerability to BSDs is the result of an overly sensitive reward system that is hyperreactive to goal- and reward-relevant cues (Alloy et al., 2015). This hypersensitivity leads to excessive reward motivation and approach-related affect in response to BAS-activating events (e.g., goal-striving events), which, in turn, may lead to hypomania/mania. Importantly, this model also proposes that individuals with BSD experience an excessive downregulation or decrease in behavioral approach in response to BAS-deactivating events (e.g., irreconcilable goal-thwarting events), which, in turn, may lead to depression. Thus, the hypothesized vulnerability to BSDs in the BAS model is a propensity toward both excessive reward system activation and deactivation states, which account for mania/hypomania and depression, respectively. Given that trait aggression is linked to approach motivation and BAS activation (Carver & Harmon-Jones, 2009), it may trigger hypomanic/manic symptoms and episodes by increasing the likelihood of excessive BAS activation, but at the same time, protect against

depressive symptoms and episodes by decreasing the likelihood of excessive BAS deactivation among individuals with BSDs. However, no study to date has specifically examined the hypothesized association between aggression and manic/hypomanic versus depressive episodes of BSD.

The current longitudinal study examined the impact of trait aggression on time to onset of manic/hypomanic and major depressive episodes in a sample of young adults with BSDs. Based on the BAS theory of BSDs, we expected, first, that higher scores on trait-level measures of aggression would predict a shorter time to onset of manic/hypomanic episodes. Second, we hypothesized that higher trait aggression would predict a longer time to onset of major depressive episodes.

Method

PARTICIPANTS

Participants in this study were drawn from the Longitudinal Investigation of Bipolar Spectrum Disorders (LIBS) Project, which examined factors that influence the course of BSDs. Based on an expanded Schedule for Affective Disorders and Schizophrenia–Lifetime diagnostic interview (exp-SADS-L; [Endicott & Spitzer, 1978](#)), which was expanded to generate both *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; [American Psychiatric Association, 2000](#)) and research diagnostic criteria (RDC; [Endicott & Spitzer, 1978](#)) diagnoses, participants were eligible if they were diagnosed with a current or lifetime diagnosis of bipolar II disorder, cyclothymia, or bipolar not otherwise specified (BDNOS), per the DSM-IV-TR or RDC. The BDNOS group comprised individuals who had experienced (a) hypomanic episode(s) but no diagnosable depressive episodes, (b) a cyclothymic mood pattern with periods of affective disturbance that did not meet frequency/duration criteria for hypomanic and depressive episodes, or (c) hypomanic and depressive episodes not meeting frequency criteria for a diagnosis of cyclothymia. Participants were excluded if they had experienced a manic episode as defined by the DSM-IV-TR or RDC, as this would suggest a bipolar I diagnosis (and an aim of the overall LIBS Project was to predict conversion to bipolar I). However, individuals who eventually converted to bipolar I disorder over the course of the study were not excluded because a goal of the current study was to examine the prospective effects of trait aggression on time to onset of episodes of both hypomania and mania. All potential participants completed written informed consent procedures. All measures and procedures were approved by the institutional review boards at Temple University and the University of Wisconsin–Madison.

MEASURES

Buss-Perry Aggression Questionnaire (AQ)

The AQ ([Buss & Perry, 1992](#)) is a 29-item self-report questionnaire that assesses trait levels of aggression. Participants completed this measure at the baseline visit by answering each question using a 5-point Likert scale that ranged from 1 (*extremely uncharacteristic of me*) to 2 (*extremely characteristic of me*). The AQ contains four subscales: physical aggression (e.g., “Once in a while I can’t control the urge to strike another person”), verbal aggression (e.g., “I can’t help getting into arguments when people disagree with me”), anger (e.g., “I sometimes feel like a powder keg ready to explode”), and hostility (e.g., “I wonder why sometimes I feel so bitter about things”), and an overall score that is the sum of the subscales (overall aggression). The AQ has demonstrated good retest reliability as well as concurrent validity with other measures of trait aggression ([Buss & Perry, 1992](#)). The original article reported that in a sample of college students, the mean score of overall aggression was 77.8 ($SD = 16.5$) for males and 68.2 ($SD = 17.0$) for females, physical aggression was 24.3 ($SD = 7.7$) for males and 17.9 ($SD = 6.6$) for females, verbal aggression was 15.2 ($SD = 3.9$) for males and 13.5 ($SD = 3.9$) for females, anger was 17.0 ($SD = 5.6$) for males and 16.7 ($SD = 5.8$) for females, and hostility was 21.3 ($SD = 5.5$) for males and 20.2 ($SD = 6.3$) for females ([Buss & Perry, 1992](#)). Possible scores range from 29 to 145.

Impulsive Nonconformity Scale (INS)

The INS ([Chapman et al., 1984](#)) is a self-report scale that evaluates impulsive behavior. It contains 51 true/false items (e.g., “When I want something, delays are unbearable”). Individuals scoring high on the INS in a prior study were more likely to endorse antisocial, psychotic, depressive, and hypomanic/manic symptoms than control participants ([Chapman et al., 1984](#)), and were likely to exhibit high BAS sensitivity ([Alloy et al., 2006, 2009](#)), providing support for the use of the INS as a measure of impulsivity. The INS has good retest reliability ($r = .84$; [Chapman et al., 1984](#)) and good internal consistency ($\alpha s = .79-.84$; [Alloy et al., 2006, 2009; Chapman et al., 1984](#)). The original article reported that the mean scores on the INS were 19.0 for male control participants and 14.5 for female control participants ([Chapman et al., 1984](#)). Possible scores range from 0 to 51.

Beck Depression Inventory (BDI)

The BDI ([Beck, Rush, Shaw, & Emery, 1979](#)) is a 21-item self-report questionnaire that assesses the presence and severity of current symptoms of depression. The BDI has been used successfully to assess symptoms of depression in individuals with,

and at risk for, BSDs (Ng & Johnson, 2013; Stange et al., 2012). It has demonstrated excellent psychometric properties (Beck, Steer, & Garbin, 1988). Beck et al. (1988) reported that the mean scores on the BDI were 10.9 ($SD = 8.1$) for minimal depression, 18.7 ($SD = 10.2$) for mild depression, 25.4 ($SD = 9.6$) for moderate depression, and 30.0 ($SD = 10.94$) for severe depression. Possible scores range from 0 to 63.

Halberstadt Mania Inventory (HMI)

The HMI (Alloy, Reilly-Harrington, Fresco, Whitehouse, & Zechmeister, 1999) is a 28-item self-report questionnaire modeled after the BDI that assesses current cognitive, motivational, affective, and somatic symptoms associated with mania/hypomania. The HMI has exhibited high internal consistency ($\alpha = .82$), adequate convergent validity ($r = .32$) with the mania scale of the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1943), and discriminant validity ($r = -.26$ with the depression scale of the MMPI and $r = -.12$ with the BDI; Halberstadt & Abramson, 2007). The construct validity of the HMI has been supported by Alloy et al. (1999), who reported that the mean score on the HMI for healthy individuals was 17.9 ($SD = 5.6$). Possible scores range from 0 to 84.

Revised General Behavior Inventory (GBI)

The GBI (Depue, Krauss, Spont, & Arbisi, 1989; Depue et al., 1981) is a 73-item self-report questionnaire used to identify and distinguish between potential bipolar spectrum participants and controls. The GBI has been validated among many populations including undergraduates, psychiatric outpatients, and relatives of bipolar I probands (Depue et al., 1989; Klein, Depue, & Slater, 1985). Its psychometric properties are strong, with internal consistencies of $\alpha s = .90-.96$, test-retest reliability of $r s = .71-.74$, good sensitivity, and excellent specificity for BSDs (Depue et al., 1981, 1989). Items were designed to assess various experiences related to depressive, hypomanic/manic, or biphasic symptoms, and how these experiences range in terms of intensity, duration, and frequency. Ratings are made on a 4-point rating scale, ranging from 1 (*not at all*) to 4 (*very often or almost constantly*), and items received a score of 1 point when rated as 3 (*often*) or 4 (*very often or almost constantly*) on the scale (Depue et al., 1989). Points are summed to obtain two subscores: depression (GBI-D score) and hypomania/mania and biphasic (GBI-HB score). The following cutoff scores were used to identify potential bipolar spectrum and control participants: GBI-D score of ≥ 11 and GBI-HB score of ≥ 13 for potential bipolar spectrum participants (Depue et al.,

1989). A pilot study validated this high- and low-GBI group assignment procedure against diagnoses obtained via the exp-SADS-L interviews (Alloy et al., 2008). The mean scores on the GBI reported by the original paper were 10.73 ($SD = 9.69$) for males and 12.59 ($SD = 11.73$) for females (Depue et al., 1981). Possible scores range from 73 to 292.

Expanded Schedule for Affective Disorders and Schizophrenia–Lifetime (Exp-SADS-L)

The exp-SADS-L (Alloy et al., 2008; Alloy, Urošević, et al., 2012) is a semistructured interview assessing symptoms related to mood, anxiety, eating, psychotic, and substance use disorders over the lifetime. All interviews were conducted by trained interviewers who were blind to GBI scores. To obtain consensus diagnoses and monitor interrater reliability, interviews were audiotaped, and expert psychiatric consultants were used as the third diagnostic tier for diagnostic consensus. Interrater reliability was high ($K > .95$ for major depressive disorder diagnoses, $K > .96$ for bipolar spectrum diagnoses; Alloy et al., 2008). Nusslock, Abramson, Harmon-Jones, Alloy, and Hogan (2007) provide further details about exp-SADS-L diagnoses and the extensive interviewer training.

Expanded Schedule for Affective Disorders–Change Version (exp-SADS-C)

The exp-SADS-C (Endicott & Spitzer, 1978) is a semistructured interview that obtains information about the occurrence, duration, and symptom severity of psychiatric disorders. The exp-SADS-C was used to diagnose DSM-IV-TR episodes of major depression and hypomania/mania occurring across the prospective follow-up period (Alloy et al., 2008; Alloy, Bender, et al., 2012; Francis-Raniere, Alloy, & Abramson, 2006; Stange et al., 2015; Weiss et al., 2015). Exp-SADS-C interviewers were blind to participants' GBI scores, exp-SADS-L diagnoses, and baseline aggression, impulsivity, and mood symptom scores. Validity and interrater reliability for the exp-SADS-C were strong ($K > .80$; Alloy et al., 2008; Francis-Raniere et al., 2006). Nusslock et al. (2007) provide further details about exp-SADS-C diagnoses and interviewer training.

PROCEDURE

A two-phase participant selection process was used. In Phase I, 20,500 students from Temple University and the University of Wisconsin–Madison completed the revised GBI (Depue et al., 1989). Based on the GBI cutoffs (see Measures section), 1,730 potentially eligible individuals completed the exp-SADS-L for Phase II screening. At a baseline visit following Phases I and II, participants eligible for the longitudinal study completed self-report measures

of aggression, impulsivity, and symptoms of depression and hypomania. Diagnostic interviews assessing DSM-IV-TR episodes of major depression and hypomania/mania and treatment seeking for mood problems were completed every 4 months after the baseline visit for an average of 3.55 years of follow-up ($M = 1,297.52$ days, $SD = 359.20$ days). The maximum number of prospective assessments participants completed was 12. The minimum number was 1. The average number of prospective assessments completed was 5.85 ($SD = 3.45$). The average number of days between assessments was 153.45 ($SD = 129.99$).

STATISTICAL ANALYSIS

Cox proportional hazard regression (survival) analyses were used to evaluate the hypothesis that aggression predicted a longer time to onset of episodes of major depression and a shorter time to onset of episodes of hypomania/mania. We utilized survival analysis because it allows for different follow-up lengths and varying intervals between assessments, minimizes biases due to attrition, utilizes all available data at each time point, and accommodates right-censored cases, who leave the study before a target event (i.e., mood episode onset) occurs or who do not experience a target event over follow-up (Willett & Singer, 1993). Aggression scores were entered as the independent variables, and time to onset of a hypomanic/manic or major depressive episode were entered as the dependent variables. Baseline depressive and manic symptoms were entered as covariates to control for any effects of baseline mood symptoms on time to onset of mood episodes. Treatment seeking for mood problems during follow-up (yes/no) was included as a covariate to control for the possibility that treatment might alter time to onset of mood episodes. Family history of mood disorder in first-degree relatives was entered as a covariate to control for familial effects. We also included impulsivity as a covariate to ascertain that any prediction of the onset of a mood episode by aggression was above and beyond the effects of impulsivity on the recurrence of mood episodes (Ng, Stange, et al., 2016). We also examined variance inflation factor (VIF) statistics to assess possible multicollinearity problems. None of the VIF statistics for any variable was above 1.5, suggesting multicollinearity was not a problem.

Results

The final sample for this study consisted of 120 participants (47 males, 73 females) ages 17–28 years ($M = 19.71$ years, $SD = 1.76$ years). The ethnic composition of the sample was 75.0% Caucasian, 12.5% African American, 5.0% Hispanic, 2.5%

Asian, 0.8% Native American, and 4.2% other/prefer not to answer. At the initial diagnostic interview (Phase II), there were 31 participants with cyclothymia or BDNOS and 89 participants with bipolar II disorder. Sixty-two (51.70%) of the 120 BSD participants had a positive family history of mood disorder among first-degree relatives; 82 (68.30%) sought treatment for mood symptoms at some time during the 3.55-year follow-up; 91 (75.80%) participants experienced at least one manic or hypomanic episode; and 72 (60.00%) experienced at least one major depressive episode over the follow-up period. Table 1 presents the descriptive statistics and correlations between the variables examined in the current study.

To test the hypothesis that aggression predicted time to onset of depressive or hypomanic/manic episodes, we conducted Cox proportional hazard regression (survival) analyses with days to onset of depressive or hypomanic/manic episode since baseline as the outcome. Baseline depressive and hypomanic symptoms, treatment-seeking status, family history of mood disorder, and INS were entered in Step 1 to account for effects of any of these characteristics on time to onset of episodes of major depression or hypomania/mania, while aggression (overall aggression, anger, hostility, verbal aggression, and physical aggression) score on the AQ was entered in Step 2 in separate models. Controlling for these covariates, higher baseline overall aggression predicted longer time to onset of major depressive episodes (Wald = 4.957, $p = .026$, OR = .983, 95% CI [.968, .998]), but it did not significantly predict time to hypomanic/manic episodes (Wald = 1.148, $p = .248$, OR = .992, 95% CI [.978, 1.007]). Scores on two of the four subscales of the AQ, physical aggression and verbal aggression, also predicted longer time to onset of depressive episodes (physical aggression: Wald = 11.432, $p = .001$, OR = .933, 95% CI [.896, .971]; verbal aggression: Wald = 8.251, $p = .004$, OR = .917, 95% CI [.865, .973]), but they did not significantly predict time to hypomanic/manic episodes (physical aggression: Wald = 1.954, $p = .162$, OR = .978, 95% CI [.948, 1.009]; verbal aggression: Wald = .002, $p = .962$, OR = .999, 95% CI [.948, 1.052]). The other two subscales of the AQ, anger and hostility, did not significantly predict time to onset of episodes of hypomania/mania (Anger: Wald = .095, $p = .758$, OR = .993, 95% CI [.949, 1.039]; hostility: Wald = .585, $p = .445$, OR = .984, 95% CI [.946, 1.025]) or major depression (Anger: Wald = .075, $p = .784$, OR = 1.007, 95% CI [.960, 1.055]; hostility: Wald = .016, $p = .898$, OR = 1.003, 95% CI [.962, 1.045]). The survival curves for high versus low overall aggression,

Table 1
Correlations and Descriptive Statistics of Study Variables

	OA	PA	VA	Anger	Hostility	INS	BDI	HMI	Tx	FamHist	DaysHM	DaysMD
OA	—	.77**	.66**	.80**	.72**	.45**	.16	.04	.04	.03	-.02	.03
PA		—	.40**	.39**	.33**	.38**	.17	.01	.10	-.02	.02	.15
VA			—	.50**	.24**	.38**	.02	.06	-.15	-.10	-.11	.13
Anger				—	.53**	.36**	.12	.03	.05	.06	-.05	-.07
Hostility					—	.24**	.13	.02	.06	.11	.03	-.12
INS						—	.09	.19*	.02	-.06	-.19*	-.12
BDI							—	-.15	.28**	.08	.08	-.25**
HMI								—	-.07	-.09	.07	.29**
Tx									—	.24**	.11	-.17
FamHist										—	.10	.00
DaysHM											—	.33**
DaysMD												—
<i>M</i>	70.25	18.73	15.22	17.12	19.18	17.58	10.29	14.45	—	—	463.06	674.37
<i>SD</i>	17.08	7.25	4.30	5.44	6.03	8.39	10.68	9.68	—	—	536.20	592.47
α	.91	.80	.82	.79	.82	.86	.94	.83	—	—	—	—

Note. OA = Buss-Perry Aggression Questionnaire (AQ) Overall Aggression; PA = AQ Physical Aggression; VA = AQ Verbal Aggression; Anger = AQ Anger; Hostility = AQ Hostility; INS = Impulsive Nonconformity Scale; BDI = Beck Depression Inventory; HMI = Halberstadt Mania Inventory; Tx = treatment seeking for mood problems; FamHist = family history of mood disorders; DaysHM = days without a hypomanic/manic episode; DaysMD = days without a major depressive episode; *M* = mean; *SD* = standard deviation.
* $p < .05$, ** $p < .01$.

physical aggression, and verbal aggression (plotted using a median split) predicting time to onset of major depressive episodes are presented in Figures 1–3, respectively.

Discussion

Given the high rates of mood episode recurrence in BSDs, it is of high priority to identify risk and protective factors for the recurrence of mood

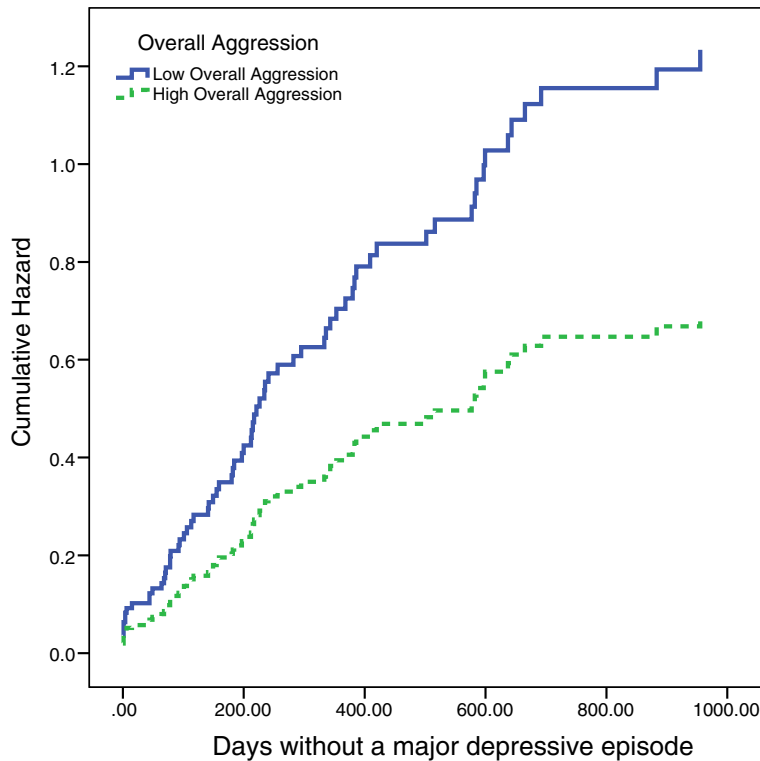


FIGURE 1 Time to major depressive episode as a function of high versus low overall aggression (plotted using a median split).

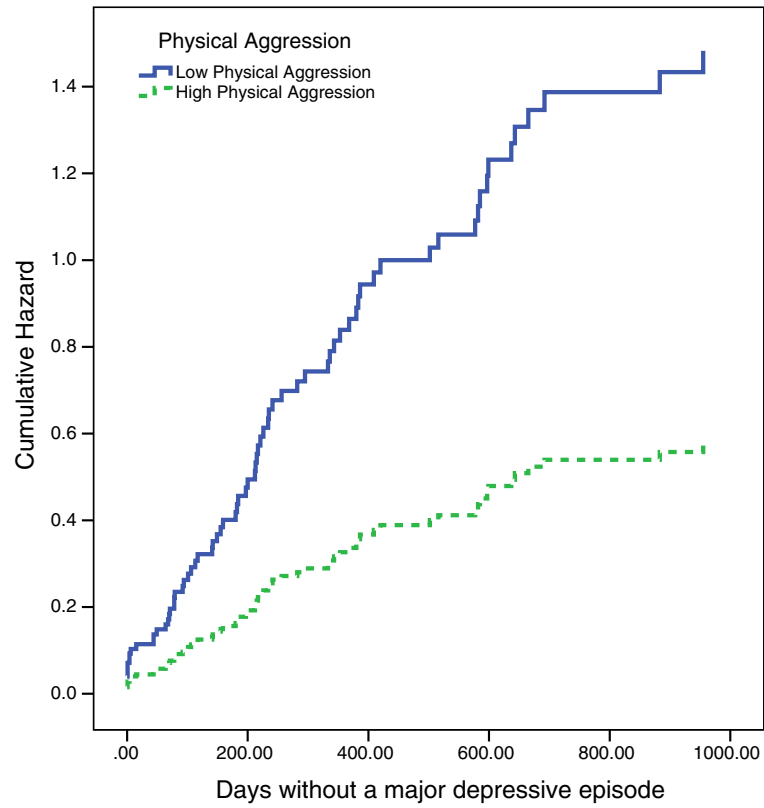


FIGURE 2 Time to major depressive episode as a function of high versus low physical aggression (plotted using a median split).

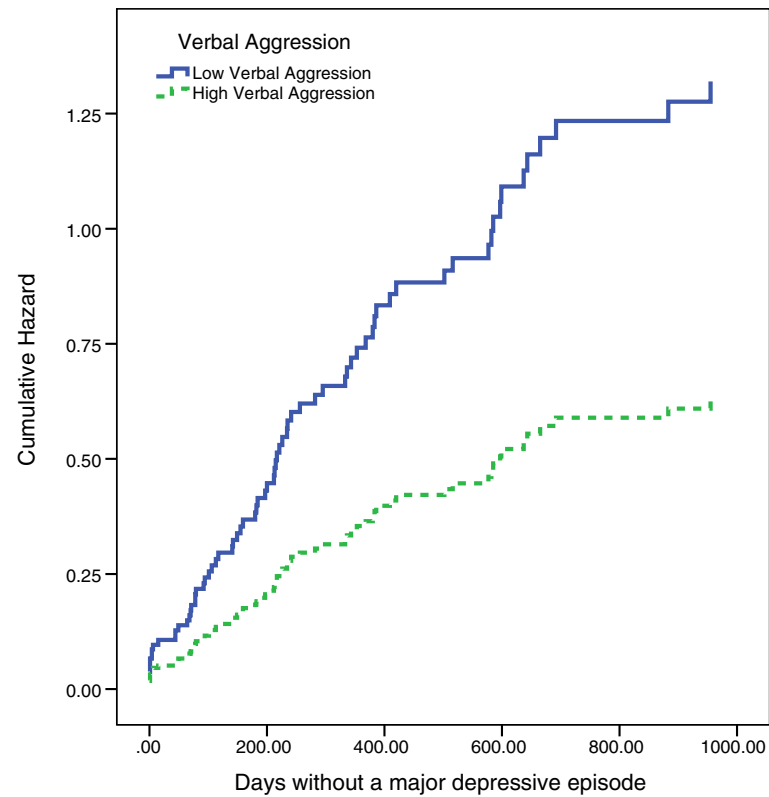


FIGURE 3 Time to major depressive episode as a function of high versus low verbal aggression (plotted using a median split).

episodes. The current study provided a theoretically guided and methodologically rigorous examination of the hypothesis that trait aggression would put people with BSDs at risk for episodes of hypomania/mania, but at the same time, protect them against episodes of major depression, based on the BAS sensitivity theory of BSDs (Alloy et al., 2015). The hypothesis was partially supported. The results of the survival analyses indicate that whereas, overall, physical and verbal aggression predicted a longer time to onset of major depressive episodes, none of the aggression scales predicted time to onset of hypomanic/manic episodes over an average of 3.55 years of follow-up, after taking into account baseline depressive and manic symptoms, impulsivity, family history of mood disorder, and treatment-seeking status over follow-up.

The findings of the current study are congruent with the theory that BAS-activating emotions and behaviors may be protective in delaying the occurrence of depression (Alloy et al., 2015). Aggressive tendencies may decrease withdrawal and low energy and motivation, and thus, prolong the time to onset of major depressive episodes. However, it may be that aggression is only BAS-activating enough to prevent people from experiencing excessive BAS deactivation, which is hypothesized to cause major depression, but not enough to lead to excessive BAS activation, which is hypothesized to cause hypomania/mania. In a similar vein, anger and hostility, which may trigger less BAS activation than physical and verbal aggression, may not activate the BAS enough to protect individuals with BSDs from excessive BAS-deactivation states, which explains the current results that anger and hostility did not predict longer time to major depression onset.

The current study has several methodological strengths. These include the use of a longitudinal sample not recruited from a clinic population, semi-structured diagnostic interviews, standardized diagnostic criteria, diagnosticians blind to the aggression levels of participants, a conservative statistical analysis approach, relatively long overall follow-up period, and relatively short follow-up assessment intervals, which provided high sensitivity for the detection of mood episodes over follow-up.

Notwithstanding these strengths, it is also important to note the limitations of the study. First, we relied on a self-report measure to assess trait aggression. Future studies should examine whether objective measures of aggression also predict a longer time to onset of major depressive episodes. Second, our sample consisted of university students. Therefore, our results may not be generalizable to other populations. However, it is important to note that the participants met DSM-IV-TR and/or RDC

diagnostic criteria for a BSD and exhibited features that characterize individuals with BSDs (e.g., 68% of the participants sought treatment for mood symptoms at some time during the 3.55-year follow-up). In addition, the participants were relatively early in the course of their BSD, which might decrease the confounding effects of years of treatment. However, it is also important to highlight that the current findings may not generalize to healthy controls, given that the study consisted only of participants with BSDs. Third, family history of mood disorder was obtained indirectly by interviewing the participants rather than their relatives. Fourth, we did not measure state aggression, which should be a more proximal predictor of states of BAS activation and deactivation. Future studies might examine the exact role trait and state aggression play in the course of BSDs and whether state aggression mediates the relationship between trait aggression and time to onset of major depressive episodes. Future research also should examine how to more directly measure BAS-activation and -deactivation states because these states are hypothesized to lead to hypomania/mania and depression in the BAS theory of BSDs. Fifth, the current study did not examine how cultural differences in aggression may affect the relationship between trait aggression and time to mood episodes (Archer, 2006; Martin, Manuel, & Fujihara, 2001). This is an important area for future research. Sixth, a few aspects of the BAS theory of BSDs were not examined in the current study. For example, we did not test whether trait aggression interacts with BAS-related events to predict mood symptoms and episodes. In addition, we did not measure BAS-activation and -deactivation states and examine how they may predict hypomania/mania and depression. Finally, we did not examine the mechanisms that may underlie the association between aggression and longer time to onset of depressive episodes in BSDs, such as sleep disturbance (Ng et al., 2015; Ng, Chung, Lee, Yeung, & Ho, 2016). Future studies should address these questions.

The findings of the current study raise the interesting possibility that approach-related or BAS-activating behaviors may be utilized to delay the onset of major depressive episodes among people with BSDs. Specifically, it may be useful for people with BSDs to engage in behaviors that will activate the BAS enough to protect them against major depression, but not so much as to trigger hypomania/mania. The current study does not suggest that aggression should be prescribed as a form of prevention. Rather, there are other activation strategies that may be more adaptive and practical than aggression (Manos, Kanter, & Busch, 2010). For example, there is a large body of literature demonstrating that

behavioral activation strategies protect individuals against full-blown depression (Ekers et al., 2014; Mazzucchelli et al., 2009). Given that people with BSDs spend more days depressed than manic (Kupka et al., 2007), studies examining what behaviors are able to trigger a balanced level of BAS activation may be warranted and may lead to more fine-tuned interventions that help reduce the impact of major depression in BSDs.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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Simultaneous use of alcohol with methamphetamine but not ecstasy linked with aggression among young adult stimulant users



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HIGHLIGHTS

- Alcohol consumption is a ubiquitous feature of amphetamine-type stimulant use.
- Risky simultaneous alcohol and methamphetamine use is linked with aggression.
- No association found between simultaneous use of alcohol and ecstasy and aggression.
- Policy challenges of alcohol and amphetamine-type stimulant use are interlinked.

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ABSTRACT

Introduction: Illicit stimulants are often combined with alcohol in nightlife entertainment districts, an environment where aggressive behaviour commonly occurs. While alcohol and methamphetamine use are each associated with aggressive behaviour, relatively little is known about the impact of the combined use of alcohol and amphetamine-type stimulants (i.e., ecstasy [MDMA] and methamphetamine) on aggression.

Method: Analysis of longitudinal data from a population-based sample of Australian young adult amphetamine-type stimulant users ($n = 248$) to examine: (a) prevalence and timing of simultaneous alcohol and amphetamine-type stimulant use and (b) predictors of ecstasy- and methamphetamine-related aggression and hostility. Prediction models of ecstasy- and methamphetamine-related aggression and hostility were developed using multivariate logistic regression.

Results: Simultaneous alcohol consumption and amphetamine-type stimulant use was prevalent, with drinking generally occurring before consuming amphetamine-type stimulants and while 'high'. Methamphetamine-related aggression and hostility was significantly associated with recurrent risky simultaneous methamphetamine and alcohol use (Adjusted Odds Ratio [AOR] 2.74, 95% CI 1.09–6.89), a high frequency and increasing use methamphetamine trajectory (AOR 7.23, 95% CI 1.27–41.03), and high trait aggression (AOR 5.78, 95% CI 2.53–13.20). In contrast, only trait aggression (moderate: AOR 3.01, 95% CI 1.55–5.84; high: AOR 5.02, 95% CI 2.38–10.61) was associated with ecstasy-related aggression and hostility.

Conclusions: These findings indicate a link between risky patterns of simultaneous alcohol and methamphetamine use and methamphetamine-related aggression and hostility, independent of separate use of alcohol, methamphetamine and cannabis, trait aggression, psychosis, and gender. The policy challenges of amphetamine-type stimulant and alcohol use require a targeted, multidisciplinary approach.

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1. Introduction

Violence among young adults often occurs in and around licensed venues in nightlife entertainment districts (NEDs) (Graham & Homel, 2008; Schnitzer et al., 2010). These settings are inextricably linked with both drinking and illicit substance use, including use of

amphetamine-type stimulants (ATS; i.e., ecstasy [MDMA] and methamphetamine). Illicit stimulants, such as ATS, are often combined with alcohol in NEDs in the context of a 'big night out' (Pennay et al., 2015). In a study of Canadian rave attendees, 45.2% of ecstasy users and 39.3% of amphetamine users had combined alcohol with ecstasy and amphetamines, respectively (Barrett, Gross, Garand, & Pihl, 2005). While alcohol and methamphetamine use are each associated with aggression under certain circumstances (Beck & Heinz, 2013; Darke, Torok, Kaye, Ross, & McKetin, 2010; Ernst, Weiss, Enright-Smith, Hilton, & Byrd, 2008; Exum, 2006; Foran & O'Leary, 2008), relatively little is known about the impact of their combined use on aggression.

1.1. Simultaneous amphetamine-type stimulant and alcohol use

The use of other substances, particularly alcohol and cannabis, is common among ATS users (Darke, Kaye, & Torok, 2012; Herbeck et al., 2013; Scott, Roxburgh, Bruno, Matthews, & Burns, 2012). Substances may be combined for various reasons, including to produce pleasurable effects, to extend, enhance, or intensify effects, and to mitigate negative effects (Hunt, Evans, Moloney, & Bailey, 2009). Specifically, combined alcohol and ATS use may produce longer-lasting euphoria than separate use (Hernández-López et al., 2002) and may mitigate some unwanted ATS use effects (e.g., anxiety, agitation, and restlessness) (Fisk, Murphy, Montgomery, & Hadjiefthymoulou, 2011). ATS use may also facilitate high-volume alcohol consumption, as ATS-intoxicated individuals are potentially able to consume alcohol without experiencing its usual sedative effects (Hernández-López et al., 2002). A recent study observed that ecstasy users who consumed illicit stimulants on a night out drank excessively, consuming a median of 20 standard drinks (McKetin, Chalmers, Sunderland, & Bright, 2014a). While a growing body of research suggests alcohol and drug combinations may result in greater harms than their separate use (Fisk et al., 2011; Hedden et al., 2010; Midanik, Tam, & Weisner, 2007), little is known about potential consequences of simultaneous ATS and alcohol use (Kirkpatrick, Gunderson, Levin, Foltin, & Hart, 2012).

1.2. Drinking, amphetamine-type stimulant use, and aggression

Numerous studies have separately examined the relationship between either alcohol or methamphetamine use and aggression. Both substances affect cognitive functioning, increasing the likelihood that environmental stimuli will be perceived as threatening (Attwood & Munafo, 2014; Homer et al., 2008; Payer et al., 2008), and each affects impulsivity regulation and responses to perceived threats (Clements & Schumacher, 2010; Heinz, Beck, Meyer-Lindenberg, Sterzer, & Heinz, 2011; Kim et al., 2011; Panenka et al., 2013; Scott et al., 2007). A recent Australian study suggests alcohol consumption may account for part of the association between methamphetamine use and violence (McKetin et al., 2014b), raising the possibility that alcohol and methamphetamine may interact to produce a profile of aggressive behaviour that differs from those arising from separate use. This aligns with research examining combined alcohol and cocaine use, which indicates that co-use may have synergistic effects on aggression (Macdonald, Erickson, Wells, Hathaway, & Pakula, 2008; Zhao et al., 2015). However, the relationship between combined alcohol and methamphetamine use and aggression has not been examined.

In contrast, evidence is mixed regarding ecstasy use and aggression. While there is evidence of subacute effects, with ecstasy linked with increased aggression 3–4 days post-consumption (Curran, Rees, Hoare, Hoshi, & Bond, 2004; Hoshi, Pratt, Mehta, Bond, & Curran, 2006), this association may be confounded by sleep factors (e.g., hours and quality of sleep) (Pirona & Morgan, 2010; Scott, Hides, Allen, & Lubman, 2013). Further, there is little evidence supporting an association between ecstasy use and long-term increases in aggression (Hoshi et al., 2007).

1.3. Current study

This study adds to the scarce research examining the relationship between simultaneous alcohol and ATS use and aggression, using a population-based sample of Australian young adult ATS users to address the following questions:

1. How prevalent is simultaneous alcohol and ATS use among young adult ATS users?
2. Are patterns of simultaneous alcohol and ATS use associated with ATS-attributed aggression and hostility, adjusting for ATS use trajectories, cannabis use, alcohol use, trait aggression, psychosis, and gender?

2. Methods

2.1. Participants

The Natural History Study of Drug Use (NHSU) is a prospective study of a population-based sample of young adult ATS users in South-East Queensland, Australia, which commenced in 2009. A one-page drug use screening questionnaire was mailed to 12,079 young adults (aged 19–23 years) randomly selected from the Brisbane and Gold Coast electoral roll (response rate: 49.9%). Using these screening data, a sampling frame was developed from which an ATS-user group (used ecstasy or methamphetamine ≥ 3 times within the last 12 months; $n = 352$) was recruited. This method is described in detail elsewhere (Smirnov, Kemp, Wells, Legosz, & Najman, 2014). All participants provided informed consent and the study protocol was approved by the University of Queensland's Behavioural and Social Sciences Ethical Review Committee (approval number: 2007-001-367).

Data are drawn from the baseline face-to-face interview ($n = 352$), 6-month online survey ($n = 335$), 12-month face-to-face interview ($n = 315$), 30-month online survey ($n = 319$), and 4.5-year face-to-face interview ($n = 274$; 77.8% of baseline sample). In the current study, 104 cases (29.5%) were excluded due to missing data, including 92 participants who did not complete follow-up waves and 12 participants who were missing relevant data, resulting in the present sample ($n = 248$).

Excluded participants were more likely, compared with the present sample, to be male (59.6% cf. 45.6%; $\chi^2 = 5.79, p < 0.05$) but did not differ significantly by age ($t = 1.12, ns$), baseline employment ($\chi^2 = 0.23, ns$), last month ecstasy (43.0% cf. 46.8%, $\chi^2 = 0.41, ns$) or methamphetamine use (12.0% cf. 14.6%, $\chi^2 = 0.40, ns$) at baseline, or mean total lifetime consumption of ecstasy pills at baseline (180.1 pills cf. 194.3 pills; $z = -0.98, ns$). They were less likely to have consumed alcohol in the last month at baseline (92.0% cf. 98.0%; $\chi^2 = 7.10, p < 0.01$), but among those who had consumed alcohol, there was no difference in the mean number of standard drinks (defined as any portion containing 10 g of alcohol (National Health and Medical Research Council, 2009)) consumed (8.80 cf. 7.71 standard drinks; $z = -1.04, ns$).

2.2. Measures

2.2.1. Aggression and hostility during ecstasy and methamphetamine use (outcome)

As part of a set of questions assessing subjective effects, participants reported whether they experienced feelings of aggression or hostility from using (a) ecstasy and (b) methamphetamine at three waves – baseline (timeframe: ever), 12 months (timeframe: last 12 months), and 4.5 years (timeframe: last 12 months). Dichotomous variables were created for ecstasy- and methamphetamine-related aggression and hostility (experienced feelings of aggression or hostility at any wave vs. never experienced).

2.2.2. Timing of alcohol consumption during ecstasy and methamphetamine use

Timing of alcohol consumption was measured at three waves. At baseline (timeframe: ever) and 12 months (timeframe: last 12 months), participants who had used ecstasy or methamphetamine reported if they usually consumed alcohol during their episodes of use of that drug (i.e., did not usually drink, usually drank while 'up' on ecstasy/methamphetamine, usually drank while 'coming-down'). At 30 months, participants reported if they consumed alcohol on their most recent ecstasy and methamphetamine use episodes in the last 12 months (i.e., did not drink, drank before taking, drank while up, drank while coming-down).

From these data, two variables were created to capture recurrent 'risky' patterns of simultaneous alcohol use during ecstasy and methamphetamine use (categories: 1. no risky simultaneous use, 2. risky simultaneous use at 1 wave, and 3. risky simultaneous use at 2–3 waves). Risky simultaneous use was defined as consuming alcohol both while up and while coming-down as this likely involves extended drinking episodes.

2.2.3. Ecstasy and methamphetamine use trajectories

The number of days of ecstasy and methamphetamine use in the last 31 days was measured at baseline, 6 months, 12 months, and 30 months, and recoded as 'no recent use', 'occasional use (1–2 times a month)', 'frequent use (3–4 times a month)', and 'very frequent use (≥ 5 times a month)'. K-means cluster analysis with Euclidean distance as the measure of similarity was used to identify ecstasy and methamphetamine trajectory groups based on these ordinal variables. This method was chosen as there is a lack of etiological evidence to inform the selection of covariates or criteria for group allocation, as required by other analytic methods (Jain, 2010). For ecstasy and methamphetamine, four cluster groups were specified, based on previous research (Jain, 2010; Kertesz et al., 2012). For both variables, two contiguous clusters were combined to form an intermediate cluster, resulting in three trajectory groups (see Appendix A):

- Ecstasy: 1. 'very infrequent use' ($n = 84$), 2. 'regular and declining use' ($n = 138$), and 3. 'high frequency and declining use' ($n = 20$);
- Methamphetamine: 1. 'very infrequent use' ($n = 159$), 2. 'low regular use' ($n = 54$), and 3. 'high frequency and increasing use' ($n = 10$).

Despite small numbers in the high frequency and increasing use methamphetamine trajectory, all groups were retained as they appear to reflect population patterns of use (Australian Institute of Health and Welfare, 2014). The ecstasy use trajectories effectively discriminate between usage levels, as corroborated by measures of lifetime quantity of use and ecstasy dependence (Smirnov et al., 2013).

2.2.4. Cannabis use

The number of days of cannabis use in the last 31 days was measured at baseline, 12 months, and 30 months. Binary variables were created for each time point (\geq weekly use [4 or more days of use] vs. $<$ weekly use), from which a measure of recurrent weekly use was derived (categories: 1. no weekly use at any wave, 2. weekly use at 1 wave, and 3. weekly use at 2–3 waves).

2.2.5. Binge alcohol consumption

At baseline, 12 months, 30 months, and 4.5 years, participants reported the number of standard drinks they usually consumed on days of drinking in the last 31 days, with reference to a chart displaying the number of standard drinks in different alcoholic beverage servings. Dichotomous variables were created for binge alcohol consumption at each wave based on recognised thresholds (i.e., ≥ 5 standard drinks on a single occasion (National Health and Medical Research Council, 2009)). A measure was created to capture recurrent binge consumption

(categories: 1. no binge alcohol consumption, 2. binge consumption at 1–2 waves, and 3. binge consumption at 3–4 waves).

2.2.6. Trait aggression

Trait aggression was measured at 4.5 years using the Buss Perry Aggression Questionnaire's physical aggression subscale (Buss & Perry, 1992), which asks respondents to rate how characteristic a number of statements are of them. This questionnaire has been used widely in research examining aggression and substance use (Giancola, 2002; Skara et al., 2008; Tremblay, Graham, & Wells, 2008). The physical aggression subscale has high internal consistency (Cronbach's alpha 0.82 to 0.85 (Buss & Perry, 1992; Archer & Webb, 2006; Gerevich, Bacskai, & Czobor, 2007)) and test-retest reliability (0.80 (Buss & Perry, 1992)), and is strongly related to direct measures of physical aggression (Archer & Webb, 2006).

2.2.7. Psychosis

Past 12-month psychosis was measured at baseline using a brief psychosis screening instrument based on core elements of the Composite International Diagnostic Interview Schizophrenia module, including symptom domains of thought interference, ideas of reference or persecution, and grandiose beliefs (Degenhardt, Hall, Korten, Morgan, & Jablensky, 2005). A score of ≥ 3 across 7 items was used to identify potential cases of psychosis (Degenhardt et al., 2005).

2.3. Analysis

We conducted longitudinal analyses, comprising variables measured across multiple time points (i.e., ecstasy- and methamphetamine-related aggression and hostility, risky simultaneous alcohol and ATS use, ATS-use trajectories, cannabis use, and risky alcohol use). Separate prediction models of ecstasy- and methamphetamine-related aggression and hostility were developed using multivariate logistic regression, reporting unadjusted and adjusted estimated odds ratios. These models examine a number of potential predictors, including risky simultaneous alcohol and ATS use. Data were analysed using Stata/SE Version 13.1.

3. Results

3.1. Sample characteristics

Socio-demographic characteristics of the sample are presented in Table 1. A majority had completed tertiary education, after 30 months of follow-up, and were employed either part- or full-time.

Table 1
Socio-demographic characteristics of young adult amphetamine-type stimulant user sample ($n = 248$).

Age at baseline	
Mean (Standard Deviation)	20.86 years (1.21)
Range	19–23 years
Gender	
Female	54.44%
Male	45.56%
Education at baseline	
Completed high school	71.37%
Tertiary education ^a	
Completed tertiary education	72.58%
Employment at baseline	
Unemployed	13.71%
Part-time employment	40.32%
Full-time employment	45.97%
Employment at 4 1/2 years	
Unemployed	14.52%
Part-time employment	22.18%
Full-time employment	63.31%

^a Measured at baseline and 30-month follow-up; tertiary education refers to university, Technical and Further Education (TAFE), or trade qualification.

With regard to subjective effects of aggression or hostility, 45.5% of ecstasy users ($n = 242$) and 41.7% of methamphetamine users ($n = 223$) reported experiencing these effects from their ecstasy and methamphetamine use, respectively, at least once during the study period.

3.2. Prevalence of simultaneous alcohol and amphetamine-type stimulant use

At baseline, 92.9% of ecstasy users ($n = 241$) and 80.7% of methamphetamine users ($n = 197$) usually consumed alcohol while using ecstasy and methamphetamine, respectively. These high rates continued; at 12 months, 96.3% of recent ecstasy users (used in last 12 months; $n = 187$) and 84.4% of recent methamphetamine users ($n = 101$) had usually consumed alcohol during their episodes of use. At 30 months, 97.9% and 89.7% of recent ecstasy ($n = 145$) and methamphetamine users ($n = 87$) had consumed alcohol on their most recent episode of use.

3.3. Timing of alcohol consumption during amphetamine-type stimulant use

Among ecstasy users ($n = 242$), 31.4% engaged in risky simultaneous alcohol and ecstasy use (i.e. used alcohol while 'up' on ecstasy and while coming-down) at one study wave and 28.5% did so at multiple waves. Among methamphetamine users ($n = 223$), 30.9% engaged in risky simultaneous alcohol and methamphetamine use at one wave and 19.7% did so at multiple waves. Overall, alcohol was more commonly used while up than it was while coming-down from ATS. At multiple study waves, 76.0% of ecstasy users had used alcohol while up on ecstasy and 41.3% of methamphetamine users had used alcohol while up on methamphetamine, compared with 29.8% while coming down from ecstasy and 19.7% while coming down from methamphetamine. Additional data collected at the 30-month follow-up, relating to occasions of ecstasy ($n = 145$) and methamphetamine use ($n = 87$) in the last 12 months, indicate that drinking alcohol before consuming ecstasy (75.2%) and methamphetamine (64.4%) was also common. Those who drank before ATS use (ecstasy: $n = 109$; methamphetamine: $n = 56$) also tended to drink while up (ecstasy: 71.6%; methamphetamine: 75.0%), but less commonly drank while coming down (ecstasy: 24.8%; methamphetamine: 39.3%).

3.4. Predictors of ecstasy- and methamphetamine-related aggression and hostility

Tables 2 and 3 present results for prediction models of ecstasy- and methamphetamine-related aggression and hostility, developed using multivariate logistic regression and reporting unadjusted and adjusted odds ratios and 95% confidence intervals. Both moderate and high trait aggression were associated with ecstasy-related aggression and hostility in unadjusted and adjusted analyses. A marginally non-significant association ($p = 0.065$) for the high frequency and declining ecstasy trajectory was fully attenuated in the adjusted model. No significant associations were found between ecstasy-related aggression and hostility and risky simultaneous ecstasy and alcohol use, cannabis use, risky alcohol use, psychosis, or gender.

In contrast, risky simultaneous methamphetamine and alcohol use was significantly associated with methamphetamine-related aggression and hostility in unadjusted and adjusted analyses (Table 3). Methamphetamine users who engaged in risky simultaneous use (i.e., consumed alcohol while up and while coming-down) at 2–3 study waves had almost three times the relative odds of methamphetamine-related aggression and hostility (AOR 2.74, 95% CI 1.09–6.89, $p < 0.05$), compared to users who did not engage in risky simultaneous use. The high frequency and increasing use methamphetamine trajectory and high trait aggression were also significantly associated with feelings of aggression and hostility.

Table 2
Prediction model of ecstasy-related aggression and hostility^a ($n = 242$).

	n	Unadjusted ORs (95% CI)	Adjusted ^b ORs (95% CI)
Risky simultaneous ecstasy and alcohol use ^c			
Risky simultaneous use at 1 wave	76	1.47 (0.80–2.70)	1.37 (0.69–2.66)
Risky simultaneous use at 2–3 waves	69	1.60 (0.86–2.98)	1.38 (0.68–2.79)
Ecstasy use trajectory ^d			
Regular and declining use	138	1.14 (0.66–1.98)	1.03 (0.56–1.91)
High frequency and declining use	20	2.60 (0.94–7.18) [†]	2.16 (0.72–6.47)
Cannabis use ^e			
Weekly use at 1 wave	33	0.64 (0.29–1.43)	0.56 (0.23–1.33)
Weekly use at 2–3 waves	72	1.52 (0.85–2.69)	1.22 (0.64–2.32)
Risky alcohol use ^f			
Risky use at 1–2 waves	94	1.77 (0.67–4.70)	1.27 (0.44–3.71)
Risky use at 3–4 waves	125	2.25 (0.86–5.84)	1.34 (0.46–3.93)
Trait aggression ^g			
Moderate	65	2.83 (1.51–5.30)**	3.01 (1.55–5.84)**
High	57	5.71 (2.86–11.40)***	5.02 (2.38–10.61)***
Psychosis ^h	12	2.51 (0.73–8.57)	1.63 (0.44–6.13)
Gender (male)	111	1.55 (0.93–2.59)	0.91 (0.50–1.67)

^a Experienced feelings of aggression or hostility attributed to ecstasy use at baseline, 12 months, or 4.5 years ($n = 110$).

^b Prediction model using multivariate logistic regression, reporting odds ratios adjusted for all other variables in the model.

^c Risky simultaneous ecstasy and alcohol use defined as consuming alcohol while up on ecstasy and while coming-down from ecstasy; measured at baseline, 12 months, and 30 months; reference category is no risky simultaneous ecstasy and alcohol use at any of the three time points.

^d Trajectory groups developed using k-means cluster analysis; reference category is 'very infrequent use'.

^e Days of cannabis use in the last month measured at baseline, 12 months, and 30 months; weekly cannabis use defined as four or more days of use in the last month; reference category is no weekly cannabis use at any of the three waves.

^f Risky alcohol use defined as usually consuming ≥ 5 standard drinks on days of drinking in the last month; measured at baseline, 12 months, 30 months, and 4.5 years; reference category is no risky alcohol use at any of the four time points.

^g Trait aggression measured using the Buss Perry Aggressive Questionnaire for physical aggression; categories are low (scores range from 6.4–13.6), moderate (scores range from 14.3–20.0), and high (scores range from 27.06–37.9).

^h Past 12-month psychosis measured using a 7-item brief psychosis screener, with scores of ≥ 3 categorised as potential cases of psychosis.

[†] $p = 0.065$.

** $p < 0.01$.

*** $p < 0.001$.

Associations for the regular low use methamphetamine trajectory, recurrent weekly cannabis use, and gender were attenuated in the adjusted analyses. Risky alcohol use and psychosis were not associated with methamphetamine-related aggression and hostility.

4. Discussion

Alcohol consumption was a ubiquitous feature of ATS use in this population-based sample. Recurrent risky simultaneous alcohol and methamphetamine use (i.e., drinking alcohol while intoxicated on methamphetamine and while coming-down at 2–3 waves of the study) was associated with methamphetamine-related aggression and hostility, indicating that risky simultaneous alcohol and methamphetamine use increases the likelihood of aggression among young adults. This association was independent of patterns of alcohol, methamphetamine, and cannabis use, trait aggression, psychosis, and gender. In contrast, there was no association between risky simultaneous alcohol and ecstasy use and ecstasy-related aggression and hostility.

Alcohol was predominantly consumed before and during ATS use episodes, rather than while coming-down, which aligns with US research (Barrett et al., 2005; Barrett, Darredeau, & Pihl, 2006; Hopper et

Table 3
Prediction model of methamphetamine-related aggression and hostility^a (*n* = 223).

	<i>n</i>	Unadjusted ORs (95% CI)	Adjusted ^b ORs (95% CI)
Risky simultaneous methamphetamine and alcohol use ^c			
Risky simultaneous use at 1 wave	69	1.46 (0.78–2.74)	1.45 (0.70–3.01)
Risky simultaneous use at 2–3 waves	44	4.59 (2.17–9.73)***	2.74 (1.09–6.89)*
Methamphetamine use trajectory ^d			
Regular low use	54	2.62 (1.39–4.93)**	2.02 (0.92–4.42)
High frequency and increasing use	10	7.78 (1.60–37.91)*	7.23 (1.27–41.03)*
Cannabis use ^e			
Weekly use at 1 wave	33	0.95 (0.42–2.15)	0.70 (0.28–1.80)
Weekly use at 2–3 waves	71	2.60 (1.42–4.76)**	1.64 (0.80–3.40)
Risky alcohol use ^f			
Risky use at 1–2 waves	87	1.00 (0.36–2.75)	0.53 (0.17–1.68)
Risky use at 3–4 waves	115	1.97 (0.74–5.23)	0.94 (0.30–2.92)
Trait aggression ^g			
Moderate	63	1.93 (1.00–3.75) [†]	1.57 (0.74–3.32)
High	55	6.70 (3.25–13.83)***	5.78 (2.53–13.20)***
Psychosis ^h	12	1.00 (0.31–3.25)	0.64 (0.16–2.66)
Gender (male)	103	2.47 (1.43–4.27)**	1.38 (0.70–2.74)

^a Experienced feelings of aggression or hostility attributed to methamphetamine use at baseline, 12 months, or 4.5 years (*n* = 93).

^b Prediction model using multivariate logistic regression, reporting odds ratios adjusted for all other variables in the model.

^c Risky simultaneous methamphetamine and alcohol use defined as consuming alcohol while up on methamphetamine and while coming-down from methamphetamine; measured at baseline, 12 months, and 30 months; reference category is no risky simultaneous methamphetamine and alcohol use at any of the three time points.

^d Trajectory groups developed using k-means cluster analysis; reference category is 'very infrequent use'.

^e Days of cannabis use in the last month measured at baseline, 12 months, and 30 months; weekly cannabis use defined as four or more days of use in the last month; reference category is no weekly cannabis use at any of the three waves.

^f Risky alcohol use defined as usually consuming ≥ 5 standard drinks on days of drinking in the last month; measured at baseline, 12 months, 30 months, and 4.5 years; reference category is no risky alcohol use at any of the four time points.

^g Trait aggression measured using the Buss Perry Aggressive Questionnaire for physical aggression; categories are low (scores range from 6.4–13.6), moderate (scores range from 14.3–20.0), and high (scores range from 27.06–37.9).

^h Past 12-month psychosis measured using a 7-item brief psychosis screener, with scores of ≥ 3 categorised as potential cases of psychosis.

[†] $p = 0.051$.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

al., 2006). However, a significant minority did drink while coming-down from ATS. The timing of alcohol consumption is important as it may reflect motives for combined use. Young adults who consume alcohol while coming-down may have different motives (e.g., drinking to cope with depressive symptoms of coming-down) than those who only drink prior to and during ATS use. They may also use alcohol as a coping mechanism in other scenarios. Further investigation of the timing of alcohol consumption during ATS use, including the associated motives, is warranted.

A likely explanatory mechanism for the association between risky simultaneous alcohol and methamphetamine use and methamphetamine-related aggression and hostility relates to the physiology of use. Our findings are consistent with evidence concerning physiological effects of both methamphetamine and alcohol use on aggression, including an observed dose-response relationship (Heinz et al., 2011; McKetin et al., 2014b). There may be an additive effect of alcohol and methamphetamine use on aggression; however, more research examining the rate and severity of aggression is required to confirm this.

The high frequency and increasing methamphetamine use trajectory was also associated with methamphetamine-related aggression and hostility. This finding adds to previous research linking frequent

methamphetamine use and violent behaviour (McKetin et al., 2014b), by pointing to the possible contribution of persistent patterns of use. Further, our findings indicate that trait aggression plays an important role. For males, the occurrence of this trait, and more intensive substance use patterns, appears to explain their higher rates of methamphetamine-related aggression and hostility. No association was found between psychosis and methamphetamine-related aggression and hostility, which is consistent with research involving dependent methamphetamine users (McKetin et al., 2014b). Lastly, the association with recurrent weekly cannabis use was attenuated in the full model, which may reflect overlap in methamphetamine and cannabis use patterns.

Research should also consider the potential impact of the social-environmental context and substance use outcome expectancies. Alcohol and illicit stimulants are commonly combined in licensed venues (Pennay et al., 2015) and both environmental characteristics of these settings (Graham, Bernards, Osgood, & Wells, 2012; McFadden, Young, & Markham, 2015) and outcome expectancies regarding alcohol consumption in these settings (Zinkiewicz et al., 2016) can increase the risk of violence. However, the social context of use is unlikely to be a sufficient explanatory factor, given that ecstasy and methamphetamine use overwhelmingly occurs in similar settings for this young adult population.

The lack of association between ecstasy-related aggression and hostility and simultaneous ecstasy and alcohol use, risky drinking, and ecstasy use trajectories is consistent with previous evidence (Pirona & Morgan, 2010; Scott et al., 2013; Hoshi et al., 2007). The marginal association between ecstasy use and aggression, which was attenuated in the full model, could be accounted for by the polydrug use profile of higher-risk ecstasy users. Only trait aggression was associated with ecstasy-related aggression and hostility, which is perhaps not surprising, as expressions of aggression run counter to commonly reported subjective effects of ecstasy use (e.g., feelings of empathy and social bonding (Baylen & Rosenberg, 2006; Sumnall, Cole, & Jerome, 2006)).

4.1. Implications

Our study contributes to understandings of the relationship between alcohol use, methamphetamine use, and aggression, which have predominantly focused on separate relationships for these substances. While high-volume alcohol consumption has previously been shown to increase the likelihood of aggressive behaviour among dependent methamphetamine users (McKetin et al., 2014b), co-use of alcohol and methamphetamine has not been explicitly examined. Our findings show a link between simultaneous alcohol and methamphetamine use and methamphetamine-related aggression and hostility, independent of a number of potential predictors including separate patterns of alcohol and methamphetamine use, trait aggression, psychosis, and gender. Further, our findings build on previous research indicating that ecstasy does not appear to be linked with aggression, showing this is still the case when combined with alcohol.

The link between alcohol, methamphetamine, and aggression is a concern for both public health and law enforcement, particularly given the high prevalence of drinking during ATS use in this population-based sample. The interlinking of these issues indicates that the policy challenges of ATS and alcohol use by young adults should be approached in an integrated manner. Engagement in risky behaviours in public settings, such as NEDs, likely increases the risk of police contact, which may present an important opportunity for engaging with this group. Australian police have taken an active role in areas of public health related to substance use – such as police diversion for cannabis users (Payne, Kwiatkowski, & Wundersitz, 2008) – and there may be greater scope for police involvement in provision of harm reduction resources, including drug and alcohol

service referrals. However, harm reduction resources should reflect normative patterns of use. While our findings show that simultaneous alcohol and ATS use is prevalent among young adult ATS users, there is currently a lack of harm reduction resources specifically targeting this issue.

4.2. Limitations

Study limitations should be acknowledged. Firstly, the accuracy of self-report can be impacted by concerns around stigma and illegality of behaviour. However, this is likely mitigated in a longitudinal study with high participant retention. Secondly, our measures of ATS-related feelings of aggression and hostility do not necessarily correspond to incidents of aggressive behaviour. Forthcoming analyses from this study will examine such incidents. Thirdly, the cluster analytic method used may potentially have resulted in higher rates of trajectory misclassification compared with other analytic methods. Fourthly, ATS users in this study were drawn from a population sample of predominantly recreational users. Consequently, our findings may differ from samples of more problematic ATS users. Lastly, while we adjusted for trait aggression, psychosis, and gender, our results could potentially be explained by confounding factors not examined in this study, including factors relating to the social-environmental setting and substance use outcome expectancies. Further, we had limited capacity to examine use of other substances (e.g., cocaine) due to the low frequency of use in this sample.

5. Conclusion

Drinking is a ubiquitous feature of ecstasy and methamphetamine use in this population of Australian young adult amphetamine-type stimulant users. Combined alcohol and amphetamine-

type stimulant use is an emerging area of concern for public health and law enforcement and has been linked with increased harms compared to the separate use of these substances. This study adds to the growing literature, with our findings indicating a link between risky simultaneous alcohol and methamphetamine use and methamphetamine-related aggression and hostility, independent of patterns of alcohol, methamphetamine, and cannabis use, trait aggression, psychosis, and gender. The interlinking of issues of drinking, methamphetamine use, and aggression highlights that the policy challenges of amphetamine-type stimulant and alcohol use by young adults may need to be approached collaboratively by both public health and law enforcement.

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Contributors

All authors contributed to the development of this research. AS and JMN conceived of the present study. HW, RK, and ML contributed to the development of the study. EML reviewed the literature. EML conducted the statistical analysis with assistance from AS. EML wrote the first draft of the manuscript and all authors contributed to and approved the final manuscript.

Conflict of interest

All authors declare that they have no conflicts of interest.

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Appendix A

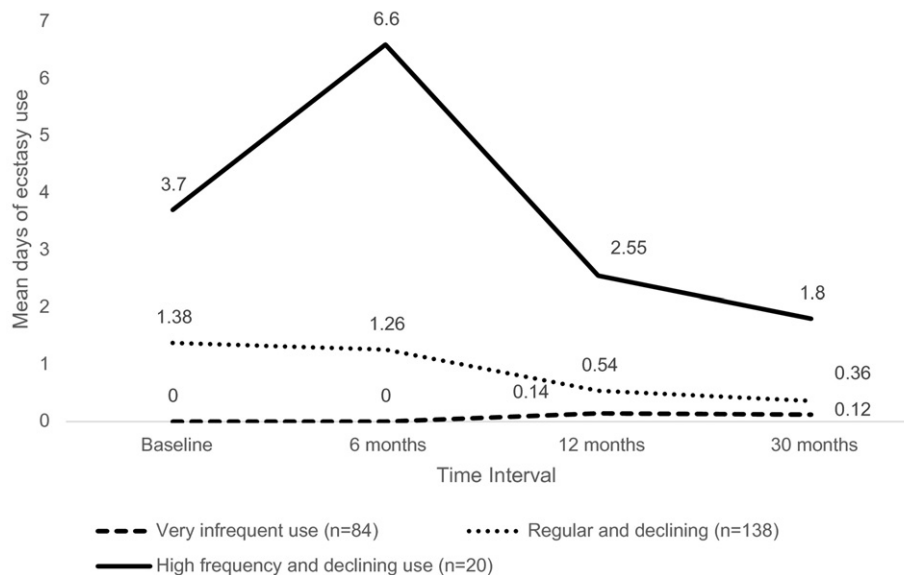


Fig. A1. Ecstasy use trajectories over a 30-month period. Note: Mean days of ecstasy use refers to the number of days that ecstasy was used during the last month at each time interval. Trajectory groups were developed using k-means cluster analysis.

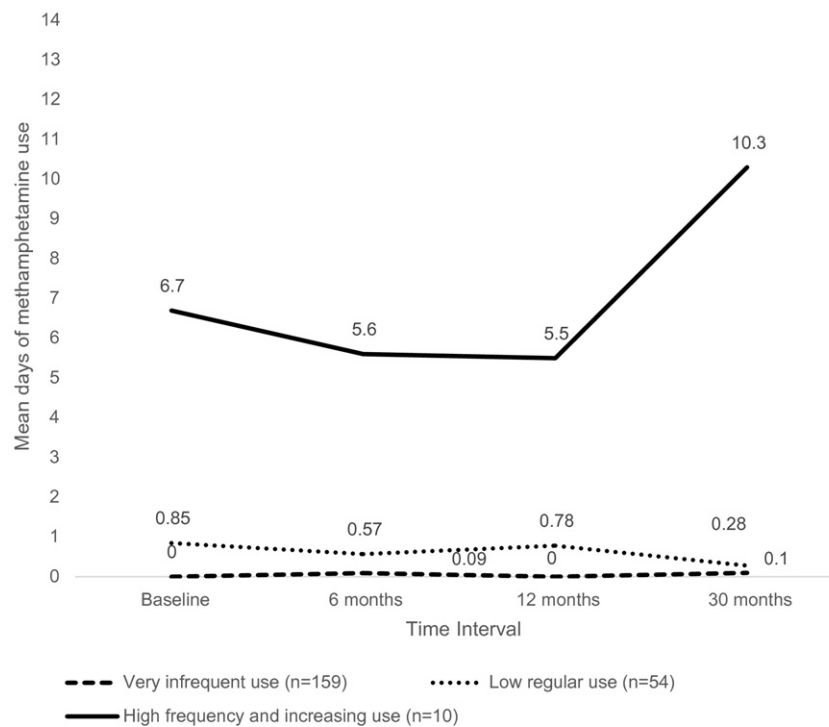


Fig. A2. Methamphetamine use trajectories over a 30-month period. Note: Mean days of methamphetamine use refers to the number of days that ecstasy was used during the last month at each time interval. Trajectory groups were developed using k-means cluster analysis.

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Anger, Aggression, and Self-Harm in PTSD and Complex PTSD



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This study examined the contribution of complex posttraumatic stress disorder (PTSD) diagnosis and symptomatology to the difficulties of anger, aggression, and self-harm in a Northern Ireland clinical community sample. A "current complex PTSD" (CCPTSD) group ($n = 11$) was compared with a "current PTSD" group ($n = 31$) on self-report measures of these variables. The CCPTSD group demonstrated significantly higher levels of physical aggression and self-harm than the PTSD group. The complex PTSD symptom of 'alterations in self-perception' was a significant predictor of aggression and history of self-harm, suggesting the potential role of posttraumatic shame and self-loathing in PTSD theoretical models

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of these destructive behaviors. Social desirability was a notable confounding influence in the assessment of anger, aggression, and self-harm in traumatised individuals. © 2009 Wiley Periodicals, Inc. *J Clin Psychol* 65: 1099–1114, 2009.

Keywords: PTSD; Complex PTSD; DESNOS; anger; aggression; self-harm; social desirability

Clinicians working with individuals exposed to multiple and chronic trauma in child and adulthood, especially in interpersonal contexts, have noted that their difficulties go well beyond the symptom clusters of posttraumatic stress disorder (PTSD). DSM-IV (American Psychiatric Association [APA], 1994) criteria for PTSD operates around three symptom clusters: (a) reexperiencing (e.g., intrusive memories, nightmares); (b) avoidance (e.g., efforts to avoid thoughts, feelings, and reminders of trauma); and (c) arousal (hypervigilance, irritability). These symptom clusters seem effective at explaining the central difficulties of those exposed to singularly occurring, acute traumatic events. However, in isolation they are less well-suited for the spectrum of symptoms and personality disturbance often exhibited by individuals who have experienced prolonged trauma (Herman, 1992). “Complex PTSD” or “disorders of extreme stress not otherwise specified” (DESNOS) emerged to account for the organized and complicated array of problems described by those who experience early onset, protracted, and repeated traumatic events usually involving interpersonal victimization. Examples of these complex traumata include torture, childhood abuse, domestic violence, chronic combat exposure, and severe social deprivation (Briere & Spinazzola, 2005; Dorahy, 2006; Herman; see Courtois & Ford, 2009).

Complex posttraumatic stress reactions appear particularly common in regions of the world experiencing terrorism and sectarian violence (de Jong, Komproe, Spinazzola, van der Kolk, & Van Ommeren, 2005). For over 40 years, Northern Ireland has been caught in the grip of a sectarian conflict known as the “Troubles.” A recent prevalence study revealed that the incidence of PTSD in Northern Ireland (12%) was twice as high as in neighbouring counties in the Republic of Ireland (6%; Muldoon, Schmid, Downes, Kremer, & Trew, 2005). Moreover, as a result of the Troubles, many people in Northern Ireland have been exposed to traumatic events that would typically engender complex PTSD symptoms (Dorahy, 2006). A recent study of Northern Irish treatment receivers found that childhood exposure to the Troubles was related to lifetime DESNOS, and perceived impact of Troubles exposure was associated with DESNOS symptom severity (Dorahy et al., 2009). The following DESNOS symptoms extend beyond those of PTSD: (a) alterations in regulation of affect and impulses (e.g., excessive risk-taking); (b) alterations in consciousness or attention (e.g., pathological dissociation); (c) ‘alterations in self-perception’ (e.g., shame); (d) ‘alterations in relations with others’ (e.g., distrust, victimizing others); (e) somatization (e.g., unexplained physical complaints); and (f) ‘alterations in systems of meaning’ (e.g., distorted beliefs; Ford & Kidd, 1998; Pelcovitz et al., 1997).

Often one of the most clinically pressing aspects of a complex PTSD presentation is “self-destructive thoughts and behaviours,” including anger, aggression, and self-harm (Steele, Van der Hart, & Nijenhuis, 2004). Although some studies have found elevated levels of these difficulties in PTSD populations (e.g., Freeman & Roca, 2001; Orth & Wieland, 2006), individuals with complex trauma histories have been

found to present with more severe anger, aggression, and self-harm. For example, aggression and self-harm are more prominent in PTSD samples reporting a history of severe child sexual abuse (Begic & Jokic-Begic, 2002; Weaver, Chard, Mechanic, & Etzel, 2004). Yates (2006) reported that childhood trauma and the complex PTSD symptoms of dissociation (i.e., 'alterations in attention or consciousness') and somatization were important predictors of severe self-harm in adulthood. Furthermore, individuals with a complex PTSD-type presentation (i.e., PTSD with comorbid borderline personality disorder) had the highest levels of anger in a sample of psychiatric outpatients (Franklin, Posternak, & Zimmerman, 2002).

Several theories have been proposed to explain posttraumatic anger in individuals with PTSD and these may be useful for complex PTSD. For example, *fear avoidance theory* postulates that anger is an emotional avoidance strategy comparable to cognitive avoidance strategies such as distraction (Foa, Riggs, Massie, & Yarczower, 1995). *Survival mode theory* proposes that individuals with PTSD experience heightened anger because they enter a biologically predisposed "survival mode" when they encounter stimuli associated with the trauma or have reexperiencing PTSD symptoms. This mode is comparable to the "fight or flight" response and engages a number of cognitive biases (e.g., threat-confirmation bias) that make anger and aggressive responding more probable (Chemtob, Novaco, Hamada, Gross, & Smith, 1997).

When heightened anger, aggression, and self-harm are exhibited by individuals with complex PTSD, they may arise, in part, from fear avoidance and survival mode adaptation. Nonetheless, individuals with complex PTSD may also have quite marked personality disturbance. More profound emotional/behavioural difficulties may originate from ingrained, characterological changes elicited by adaptation to prolonged trauma. This is a view expressed in Yates' (2004) developmental model of childhood trauma and self-harm. The author describes how early trauma can negatively influence normal personality development in five areas of competence (i.e., motivational, attitudinal, instrumental, emotional, and relational). Traumatic disruption in achieving any of these competencies can ultimately lead to developmental deviations in personality formation and the development of unhelpful patterns of cognition, emotion, and behavior. For example, attitudinal competence refers to the establishment of a foundation for self-esteem and self-worth, where the individual perceives him/herself as deserving of the care or responsiveness of others. Failure to achieve this competency may lead to perceptions of worthlessness, shame, and self-loathing (Yates, 2004). Over time, these attitudes, and the adaptive mechanisms the individual employs to cope with them, become ingrained elements of their personality. The adaptive mechanisms may involve the individual turning their shame and self-loathing outward via aggression or inward via self-harm.

Despite the theoretical and empirical basis for increased anger, aggression, and self-harm in individuals with PTSD, previous work has used varying operational definitions of self-harm and self-report measures with either unknown or weak psychometric properties (e.g., Weaver et al., 2004; Zlotnick, Mattia, & Zimmerman, 1999). Also, the vast majority of studies exploring PTSD anger and aggression have been based exclusively on male war veterans (e.g., Freeman & Roca, 2001), leaving only a modest amount of empirical research on PTSD anger and aggression in community populations (e.g., Feeny, Zoellner, & Foa, 2000).

Additional research questions also need consideration. Anger, aggression, and self-harm have not been investigated in terms of their specific relationship to

complex PTSD and its symptomatology, despite these difficulties being regarded as prominent in this diagnosis (Herman, 1992). Authors have also highlighted the importance of further examination of PTSD symptoms, anger, aggression, and self-harm to evaluate possible causal mechanisms (e.g., Orth & Wieland, 2006). Finally, a largely unexplored avenue of research is the role of social desirability in self-reports of PTSD anger, aggression, and self-harm. Social desirability has been found to influence self-reports of anger and aggression in clinical samples and healthy volunteers, leading participants to under-report potentially negative information about themselves (Dyer, Bell, McCann, & Rauch, 2006). Consequently, this bias could represent a serious obstacle to the valid assessment of such socially sensitive variables in PTSD populations.

The present investigation examined anger, aggression, and self-harm in a Northern Ireland clinical community sample. The primary aim of the study was to ascertain if the complex PTSD and PTSD diagnoses can be differentiated on the basis of anger, aggression, and self-harm. It was hypothesised that individuals with a current diagnosis of complex PTSD would score significantly higher on measures of anger, aggression, and self-harm than individuals with a current diagnosis of PTSD.

To inform theoretical models, exploration of the relationships among complex PTSD symptoms and anger, aggression, and self-harm was also an objective of the current study. This aim was to identify the symptoms of complex PTSD and/or PTSD that increase the likelihood of posttraumatic anger, aggression, and self-harm. The association among social desirability and other dependent measures was also to be examined via correlational analysis and then controlled statistically if, as previously documented, it presented as a confounding influence on the assessment of socially sensitive variables (e.g., self-harm, aggression).

Method

Participants

Forty-six clients attending an urban community therapy service in Belfast volunteered to take part in the study over a 3-month data collection period. Two participants ultimately declined participation because they came to feel that discussing their trauma would be too distressing. The remaining 44 individuals (35 male, 9 female) consented to participate and were aged 24–63 years old. All had experienced a Troubles-related incident, as documented in their case notes and acknowledged on the Posttraumatic Diagnostic Scale (PDS; Foa, 1995), for which they were receiving treatment. Recruitment was via convenience sampling and participants were categorised into one of two trauma groups: (a) current PTSD (PTSD) group and (b) current complex PTSD (CCPTSD) group.

PTSD group inclusion criteria were 18–64 years old and diagnosis of PTSD, as assessed using the Posttraumatic Diagnostic Scale (PDS; Foa, 1995). Exclusion criteria were as follows: current presence of all six complex PTSD symptoms, as assessed using the Structured Interview for Disorders of Extreme Stress (SIDES; Pelcovitz et al., 1997); a diagnosis of learning disability; and a diagnosis of a degenerative neurological disorder. For the CCPTSD group, inclusion criteria were 18–64 years old and current presence of all six complex PTSD symptoms. Exclusion criteria were a diagnosis of learning disability and a diagnosis of a degenerative neurological disorder.

Materials/Apparatus

Posttraumatic Diagnostic Scale (PDS; Foa, 1995). The PDS is a 49-item self-report diagnostic instrument for PTSD, which also provides additional scales measuring the severity of PTSD symptoms and level of impairment in functioning (see Table 1). Foa et al. (1997) reported PDS test-retest reliability as 0.83 with 87.3% agreement in PTSD diagnosis between the two administrations. Internal consistency was quoted as 0.92. Diagnostic performance and convergent validity have been confirmed in several investigations (Foa, 1995; Sheeran & Zimmerman, 2002).

Structured Interview for Disorders of Extreme Stress (SIDES; Pelcovitz et al., 1997). This 45-item interview schedule assesses the six symptom domains of complex PTSD/DESNOS: (a) 'alterations in regulation of affect and impulses' (19 items; e.g., "When I feel upset, I have trouble finding ways to calm myself down"); (b) 'alterations in consciousness or attention' (5 items; e.g., "I 'space' out when I feel frightened or under duress"); (c) 'alterations in self-perception' (6 items; e.g., "I am too ashamed of myself to let people get to know me"); (d) 'alteration in relations with others' (5 items; e.g., "I have trouble trusting people"); (e) somatization (5 items; e.g., "I have trouble with abdominal pain, yet doctors have not found a clear cause for it"); and (f) 'alterations in systems of meaning' (5 items; e.g., "I believe that life has lost its meaning"). The SIDES measures the presence and severity of each symptom, as well as providing diagnoses of current and lifetime complex PTSD. Pelcovitz et al. (1997) reported kappa values of 0.81 for inter-rater reliability and an internal consistency of 0.96 for complex PTSD diagnosis.

Aggression Questionnaire–Short-Form (Buss & Warren, 2000). The Aggression Questionnaire–short-form is a 15-item measure comprising five subscales assessing the cognitive (i.e., hostility), affective (i.e., anger), and behavioral (i.e. physical

Table 1
Demographic Characteristics of the Trauma Groups

	CCPTSD [n = 11]	PTSD [n = 31]	Statistic (df)	Sig. (p)
<i>Gender</i>				
Male	91%	77%	$\chi^2(1) = 0.958$	0.328
Female	9%	23%		
Mean age (standard deviation)	46 (8)	43 (11)	$t(40) = 0.862$	0.394
<i>Marital/relationship status</i>				
Current relationship	36%	55%	$\chi^2(1) = 1.109$	0.292
No current relationship	64%	45%		
<i>Highest educational qualification</i>				
GCSE and above ^a	45%	55%	$\chi^2(1) = 0.287$	0.592
None	55%	45%		
<i>Employment status</i>				
Employed	0%	16%	$\chi^2(1) = 2.014$	0.303
Unemployed	100%	84%		
<i>Level of impairment of function (PDS)</i>				
Moderate	9%	29%	$\chi^2(1) = 1.78$	0.182
Severe	91%	71%		

CCPTSD indicates current complex PTSD; PTSD, posttraumatic stress disorder; PDS, Posttraumatic Diagnostic Scale.

^aGCSE refers to the British assessment undertaken by school student at approximately the age of 16.

aggression, verbal aggression, and indirect aggression) components of aggression. It also contains an overall index of aggression calculated by totaling the subscale scores. Scores can be classified in terms of severity based on their percentile rank according to standardized norms. The seven established classifications are very low (<2nd percentile), low (2nd–14th percentile), low average (15th–27th percentile), average (28th–71st percentile), high average (72nd–81st percentile), high (82nd–97th percentile), and very high (>97th percentile). Test-retest reliability of the subscales ranges from 0.72–0.80, whereas internal consistency ranges from 0.63–0.90 (Buss & Warren)

Self-Harm Behavior Questionnaire–self-harm subscale (Gutierrez, Osman, Barrios, & Kopper, 2001). The seven-item self-harm subscale of the Self-Harm Behavior Questionnaire classifies respondents as positive or negative for a history of self-harm, as well as providing an overall index of self-harm severity. Participants were classified as having a history of self-harm if they ever engaged in "... self-inflicted, direct, socially unacceptable destruction or alteration of body tissue that occurs in the absence of conscious suicidal intent ..." (Yates, 2004, p. 39). The Self-Harm Behavior Scale has a robust four-factor structure and satisfactory concurrent, discriminant, and predictive validity. Internal consistency of the self-harm subscale was reported as 0.95 (Gutierrez et al., 2001). Test-retest reliability of the scale was found to be 0.96 (Fliege et al., 2006).

Marlowe-Crowne Social Desirability Scale–Short-Form C (Reynolds, 1982). This 13-item questionnaire is a short-form of the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960). The measure has a single factor structure and assesses socially desirable responding (Reynolds). Fischer and Fick (1993) reported an internal consistency for the scale of 0.89. Test-retest reliability was also quoted as 0.89 (Crowne & Marlowe).

Procedure

Individuals attending for treatment were provided with a study information sheet by their therapist. Those who consented to take part were invited to attend two assessment sessions. In one session, demographic information was obtained from participants and the PDS and SIDES were administered. In the other session, participants were given the Aggression Questionnaire–short form, the self-harm subscale of the Self-Harm Behavior Questionnaire, and the Marlowe-Crowne Social Desirability Scale–short-form C. The order of appointments and sequence of questionnaire administration were randomized to prevent order effects. With the exception of a small number of participants who completed the forms themselves during the assessment sessions ($n = 3$), the questionnaires were administered as structured interviews read to participants by the researcher.

Results

Post-Trauma Diagnosis

In the overall sample, 42 participants (95%) met diagnostic criteria for PTSD, 34 participants (77%) met symptom criteria for lifetime complex PTSD, and 11 participants (25%) qualified for CCPTSD. All CCPTSD participants also met diagnostic criteria for PTSD. The primary statistical analyses were conducted on the 11 CCPTSD participants and the remaining 31 PTSD participants. The 2 participants not positive for PTSD or CCPTSD were included only in the regression analyses. The demographic characteristics of these two trauma groups are listed in

Table 1. There were no significant differences between the CCPTSD and PTSD groups on any of these variables ($p > 0.05$).

Anger and Aggression

Post-trauma diagnosis, anger, and aggression. Table 2 contains the aggression severity classifications for the CCPTSD group, PTSD group, and overall sample for each of the aggression questionnaire subscales. Buss and Warren (2000) created seven qualitative labels of aggression severity. To simplify analyses, the classifications were collapsed into three categories. The new categories (i.e. very low–high average, high, very high) were weighted towards the higher classifications of severity because the aggression levels of the sample were skewed in this direction.

Using an exact significance test for Pearson's chi-square to compensate for $> 25\%$ of cells with an expected frequency of less than 5, it was found that there was a significant difference between the CCPTSD group and the PTSD group on physical aggression ($\chi^2 = 6.851$; $df = 2$; $p = 0.032$; $\phi = 0.404$; Power = 58%). This was most notable in the very high classification, with the CCPTSD group showing much greater physical aggression at this level than the PTSD group. There were no significant differences between the trauma groups on verbal aggression, indirect aggression, anger, or hostility. However, the CCPTSD group had somewhat more participants in the very high range for anger compared with the PTSD sample, while a higher frequency of PTSD participants engaged in very high levels of verbal aggression than CCPTSD participants.

Table 2

Aggression Severity Classifications for the Trauma Groups and Overall Sample for Each of the Aggression Questionnaire Subscales

	Severity classification	CCPTSD [$n = 11$]	PTSD [$n = 31$]	Sample [$n = 42$]	Chi-square (df)	Sig. (p)
Physical aggression	Very low–high average	36%	32%	33%	$\chi^2(2) = 6.851$	0.032
	High	9%	48%	38%		
	Very high	55%	19%	29%		
Verbal aggression	Very low–high average	45.5%	38.7%	40.5%	$\chi^2(2) = 0.958$	0.733
	High	45.5%	38.7%	40.5%		
	Very high	9%	22.6%	19%		
Indirect aggression	Very low–high average	55%	48%	50%	$\chi^2(2) = 0.266$	0.906
	High	18%	26%	24%		
	Very high	27%	26%	27%		
Anger	Very low–high average	18%	29%	26%	$\chi^2(2) = 0.905$	0.675
	High	27%	32%	31%		
	Very high	55%	39%	43%		
Hostility	Very low–high average	9%	19%	17%	$\chi^2(2) = 0.63$	0.798
	High	27%	26%	26%		
	Very high	64%	55%	57%		

CCPTSD indicates current complex PTSD; PTSD, posttraumatic stress disorder.

Social Desirability, Post-Trauma Symptomatology, Anger, and Aggression

Data from all 44 participants were included in the correlational/regression analyses of anger and overall aggression. The correlation matrix for social desirability, anger, total aggression, PTSD symptoms, and complex PTSD symptoms is shown in Table 3. Variable intercorrelations were examined to identify potential response bias (i.e., social desirability) and to aid the selection of appropriate predictors for the regression, providing the most parsimonious model. Anger had a significant positive correlation with 'alterations in self-perception' and a significant negative correlation with social desirability. Total aggression correlated positively with arousal, 'alterations in self-perception,' and 'alterations in systems of meaning.' It also correlated negatively with social desirability.

Social desirability also had significant negative correlations with arousal, somatization, and 'alterations in relationships with others.' Consequently, to select variables to be inputted as predictors in multiple regressions of anger and total aggression, partial correlations among the variables controlling for social desirability were examined. Although a medium-effect size correlation between anger and 'alterations in self-perception' was still present after controlling for this variable, it was marginally non-significant ($r_p = 0.3$; $df = 41$; $p = 0.052$). Hence, no further regression analysis was conducted on anger. Similarly, the relationships between total aggression and arousal ($r_p = 0.28$; $df = 41$; $p = 0.073$) and 'alterations in systems of meaning' ($r_p = 0.17$; $df = 41$; $p = 0.289$) became non-significant after partialling out social desirability, leaving 'alterations in self-perception' as the only remaining correlate of total aggression ($r_p = 0.36$; $df = 41$; $p = 0.018$).

A hierarchical multiple regression was performed with total aggression as the dependent variable and social desirability and 'alterations in self-perception' as independent variables (see Table 4). Social desirability was entered into the first block to control for possible response bias, and 'alterations in self-perception' was entered in the second block. This model was significant ($F_{(2,41)} = 14.234$; $p < 0.0005$; $f^2 = 0.695$; Power = 61%) and accounted for 41% of the variance in total aggression. Social desirability and severity of 'alterations in self-perception' were significant predictors of total aggression, with social desirability accounting for 32% of the variance in total aggression and severity of 'alterations in self-perception' accounting for a further 9% of the variance.

Self-Harm

Post-Trauma Diagnosis and Self-Harm. The overall frequency of participants with a history of self-harm was 66% (29 participants). Thirty-nine percent had a history of self-harm only and 27% had a history of both self-harm and attempted suicide. The most common method of self-harm among participants was self-cutting (58%). Other behaviors reported were punching a wall or other object (35%), self-burning (14%), banging head against a wall or other object (10%), hitting oneself (10%), scratching/biting or picking wounds (10%), self-choking (7%), and hair-pulling (3%). Ninety-one percent of participants in the CCPTSD group (10 participants) had a history of self-harm compared to 58% of the PTSD group (19 participants). This difference was statistically significant ($\chi^2 = 4.08$; $df = 1$; $p = 0.043$; $\phi = 0.305$; Power = 46%).

Table 3
Intercorrelations Between Anger, Aggression, Social Desirability, PTSD Symptoms, and CCPTSD Symptoms

	2	3	4	5	6	7	8	9	10	11	12
<i>Dependent variables</i>											
1. Anger											
2. Total aggression	0.85**										
<i>Independent variables</i>											
3. Social desirability		-0.37*	0.16	0.02	0.28	0.16	0.12	0.35*	0.12	0.18	0.09
4. Re-experiencing		-0.57**	0.15	0.07	0.40**	0.20	0.23	0.41**	0.21	0.23	0.26*
5. Avoidance			-0.21	-0.15	-0.32*	-0.23	-0.25	-0.21	-0.25*	-0.29*	-0.22
6. Arousal				0.4**	0.52**	0.54**	0.22	0.28*	0.36*	0.10	0.36*
7. Alterations in regulation of affect & impulses					0.56**	0.51**	0.41**	0.51**	0.46**	0.40**	0.56**
8. Alterations in attention or consciousness						0.41**	0.29*	0.53**	0.39**	0.22	0.44**
9. Alterations in self-perception							0.50**	0.58**	0.48**	0.49**	0.59**
10. Alterations in relationships with others								0.39**	0.51**	0.28*	0.57**
11. Somatization									0.61**	0.20	0.58**
12. Alterations in systems of meaning										0.36*	0.44**

CCPTSD indicates current complex PTSD; PTSD, posttraumatic stress disorder.
 * $p < 0.05$, ** $p < 0.01$.

Table 4
Summary of Hierarchical Multiple Regression for Variables Predicting Total Aggression

	B	SE B	β	R^2	Sig. (p)
<i>Block 1</i>					
Social desirability	-2.75	0.616	-0.567	0.32	<0.0005
<i>Block 2</i>					
Social desirability	-2.436	0.595	0.502	0.41	<0.0005
Alterations in self-perception	5.532	2.233	0.304		0.018

B indicates unstandardized beta coefficient; SE B, standard error of B; β , standardized beta coefficient; R^2 , coefficient of determination.

Table 5
Summary of Logistic Regression for Variables Predicting History of Self-Harm

	Odds ratio (95% CI)	Chi-square (df)	Nagelkerke R^2	Sig. (p)
<i>Block 1</i>				
Social desirability	0.737 (0.557–0.976)	$\chi^2(1) = 5.43$	0.16	0.02 0.033
<i>Block 2</i>				
Social desirability	0.898 (0.647–1.247)	$\chi^2(4) = 22.375$	0.55	<0.0005 0.522
Alterations in self-perception	6.69 (1.24–36.098)			
Alterations in attention or consciousness	3.551 (0.824–15.307)			
Somatization	3.258 (0.63–16.842)			

CI indicates confidence interval.

Social Desirability, Post-Trauma Symptomatology, and Self-Harm

A logistic regression was to be conducted with history of self-harm as the dependent variable and social desirability, PTSD symptoms, and complex PTSD symptoms as covariates. However, the PTSD symptoms of reexperiencing, avoidance, and arousal, and the CCPTSD symptoms of 'alterations in regulation of affect and impulses,' 'alterations in relations with others,' and 'alterations in systems of meaning' engendered multivariate outliers. Consequently, these variables were necessarily omitted from the analysis. In the eventual model, social desirability was entered in the first block to control for possible response bias, and 'alterations in attention or consciousness,' 'alterations in self-perception,' and somatization were entered into the second block (see Table 5). On its own, social desirability accounted for 16% of the variance in history of self-harm. The full model significantly predicted history of self-harm and accounted for 55% of the variance.

In the full model, 'alterations in self-perception' significantly predicted history of self-harm. Social desirability, 'alterations in attention or consciousness,' and somatization were not significant predictors of history of self-harm, despite 'alterations in attention or consciousness' and somatization exhibiting substantial effect sizes in the analysis. Overall, the odds of having a history self-harm increased by (a) 3.55 for every unit increase in 'alterations in attention or consciousness,'

(b) 3.26 for every unit increase in somatization, and (c) 6.69 for every unit increase in 'alterations in self-perception.' The odds of not reporting a history of self-harm increase by 1.1 for every unit increase in social desirability.

To assess the degree to which social desirability, PTSD symptoms, complex PTSD symptoms, and aggression subscales related to severity of self-harm, the intercorrelations between these variables were examined. The only significant correlate of severity of self-harm was physical aggression. This relationship was negative ($r = -0.42$; $n = 29$; $p = 0.024$), suggesting that reductions in physical aggression are linked with increases in self-harm. Linear regression revealed that physical aggression was a significant predictor of severity of self-harm ($\beta = -0.42$; $p = 0.024$) and accounted for 18% of the variance ($F_{(1,27)} = 5.75$; $p = 0.024$; $R^2 = 0.18$; $f^2 = 0.22$; Power = 56%).

Discussion

There was partial support for the hypothesis that those with CCPTSD would have higher aggression, anger, and self-harm scores than those with PTSD. The most distinctive form of aggression typifying participants with CCPTSD was physical aggression, with 55% of the CCPTSD group and 19% of the PTSD group scoring in the very high range. The severity of CCPTSD physical aggression is all the more significant given the very high classification represents scores greater than the 97th percentile in the standardized norms (Buss & Warren, 2000).

Although physical aggression may be the most successful subtype of aggression to discriminate individuals with CCPTSD from individuals with PTSD, it was not the most prevalent aggressive difficulty among CCPTSD and PTSD participants. The majority of those in both the CCPTSD group and the PTSD group were classified as high or very high on hostility. Hostility assesses the cognitive component of trait aggression and reflects attitudes of bitterness, resentment, and ill-will (Buss & Warren, 2000). The results clearly show that such cognitions are very common in people with PTSD, regardless of its complexity. Anger, the emotional component of aggression, also figured prominently, with just under half of the overall sample having very high levels of this emotion. The high levels of hostility and anger within the overall sample is concordant with previous research (e.g., Orth & Wieland, 2006).

The intercorrelations between post-trauma symptoms and anger/aggression in this sample provide some challenges for theoretical models. Avoidance symptoms had extremely weak non-significant relationships with anger and aggression, undermining theoretical assertions that anger and aggression are coping strategies for avoiding the more negative, aversive emotion of fear (Foa et al., 1995). Also, arousal and reexperiencing symptoms had no significant relationships with anger and aggression after controlling for social desirability. These findings are inconsistent with *survival mode theory* (e.g., Chemtob et al., 1997), which suggests that PTSD anger emerges from a biologically predisposed, hypervigilant survival mode triggered by reexperiencing symptoms and stimuli associated with the trauma. In contrast, 'alterations in self-perception' was a substantial correlate of anger, aggression, reexperiencing, avoidance, arousal, and many CCPTSD symptoms, including 'alterations in regulation of affect and impulses.' Moreover, it emerged as the only significant predictor of aggression after controlling for social desirability.

The content of 'alterations in self-perception' includes feelings and appraisals of shame, ineffectiveness, guilt, responsibility, isolation, and being permanently damaged (Pelcovitz et al., 1997). The current findings suggest that theories of

posttraumatic shame may offer useful contributions to the understanding of anger and aggression in PTSD and CCPTSD (see Nathanson, 1992; Kluft, 2007, for behavioral responses to shame-script activation). In the model of Wilson, Drozdek, and Turkovic, (2006), posttraumatic shame is comprised of a number of dimensions including (a) suicidality and desire for self-obliteration and (b) devalued self-appraisal. The latter refers to a perceived loss of moral goodness as a result of trauma and engenders powerful negative cognitions of the self. The authors propose that such negative attributional processes form the foundation of numerous affect and impulse difficulties, including sadness, anger, humiliation, anxiety, and destructive behavior (e.g., suicide, self-harm, aggression). It may be that 'alterations in self-perception' underlies emotional and physiological precursors to anger and aggression such as arousal and alterations in regulation of affect and impulses.

The overall sample demonstrated levels of self-harm (66%) comparable to other studies of PTSD (e.g., 60%; Zlotnick et al., 1999). However, this investigation differentiated CCPTSD and PTSD with regard to this variable. All participants who qualified for the CCPTSD diagnosis, bar one, reported a history of self-harm, with a significant difference emerging between the CCPTSD group (91%) and the PTSD group (58%) in the frequency of this behavior. A substantial history of self-harm among individuals with CCPTSD empirically supports a priori assertions that self-harm is a central feature of complex PTSD (e.g., Herman, 1992). However, self-harm was also evident in the overall sample and is, therefore, not unique to CCPTSD. The logistic regression analysis suggested that in addition to social desirability, the CCPTSD symptoms of 'alterations in self-perception,' 'alterations in attention or consciousness,' and somatization explained 55% of the variance in history of self-harm.

The prominence of 'alterations in self-perception' with regard to self-harm again illustrates the importance of cognitions associated with shame, guilt, and feeling permanently damaged in the engagement of destructive behaviors. Self-harm might represent a physical manifestation of these negative self-perceptions or a coping strategy for the subsequent aversive affect associated with the cognitions. The negative relationship between physical aggression and severity of self-harm suggests that physical aggression might be an externalized (other-directed) method of coping with aversive affect, possibly as an alternative to self-directed harm.

'Alterations in attention or consciousness' and somatization were also important predictors of history of self-harm, corroborating previous findings that dissociation and somatization are significant risk factors for this behavior (Yates, 2006; Zlotnick et al., 1999). A common explanation for the relationship between dissociation and self-harm is that engaging in this behavior helps individuals with complex PTSD feel "more alive" and "real again" after the unsettling numbness and depersonalisation associated with dissociation (Zlotnick et al., 1996). In comparison, the role of somatization in self-harm is less clear. Somatization involves the transformation of psychological pain into physical experiences. Research has shown that unmet physical needs as a result of childhood neglect can lead to a preoccupation with bodily functioning as an adult (Waldinger, Schulz, Barsky, & Ahern, 2006). Self-harm could, therefore, represent a deliberate bodily attack on the trauma. However, this interpretation remains largely speculative in the absence of any further evidence for such a mechanism.

Social desirability presented as a significant bias affecting self-reports of aggression and self-harm. It accounted for 32% of the variance in aggression and 16% of the variance in history of self-harm. Social desirability also correlated significantly with arousal symptoms and mediated the relationship between arousal and aggression.

These results suggest a possible tendency in individuals with PTSD to respond in a socially desirable manner and downplay levels of reported arousal, anger, aggression and self-harm. To our knowledge no investigation involving individuals with PTSD has examined this issue and the current study highlights that social desirability is an important concern when assessing arousal, anger, aggression, and self-harm.

The present study had a number of limitations. Sample size and representativeness presented the biggest shortcomings, prompting the need for further validation of these findings in large-scale research. The sample was skewed towards the male gender, which reflected the referral demographic of the service from which participants were drawn but contrasts with a general population study that found no gender differences in the prevalence of PTSD in Northern Ireland (Muldoon et al., 2005). Moreover, a substantial portion of the PTSD group qualified for a lifetime diagnosis of complex PTSD and many had several CCPTSD symptoms. This possibly reflects the complicated nature of Troubles-related traumatic experiences, which are often multiple and varying in kind (Dorahy et al., 2009). Consequently, the sample represented a more chronic and complex group than what might present in other community treatment clinics.

The sample composition was also uneven, with the CCPTSD group having low numbers because of the stringent criteria required to meet this diagnosis. In fact, it is likely that the difficulty in meeting the current diagnosis, perhaps, in part, due to the way this is determined with the SIDES, has led many researchers to only use the lifetime diagnosis of complex PTSD in empirical studies (e.g., Ford, 1999). This raises important questions about the construct of complex PTSD and how it is currently assessed psychometrically. If lifetime diagnosis is used, then complex PTSD represents a historical classification, comparable to assessments of trauma typology. However, if the current diagnosis is used, complex PTSD becomes a contemporaneous disorder reflecting active or “live” symptomatology in the same way as standard PTSD. Such issues need to be resolved and may, in part, be aided by the development of the next generation of tools for complex PTSD (see Ford, Hawke, Alessi, Ledgerwood, & Petry, 2007) and the psychometric refinement of existing measures (e.g., SIDES). The need for the latter was highlighted in the current investigation when the symptom cluster of ‘alterations in regulation of affect and impulses’ exhibited some of the weakest correlations with anger, aggression, and self-harm, despite these concepts being prominent components of this cluster.

A primary implication of this study is that physical aggression is the main form of aggressive behavior that typifies CCPTSD and distinguishes individuals with this condition from those with less complicated forms of PTSD. Moreover, the prominent role that ‘alterations in self-perception’ had in predicting aggression and self-harm means that elements of this symptom cluster (e.g., shame) could figure in theories of anger, aggression, and self-harm in complex PTSD. This extends to the development of treatment models. As the recommended treatment framework for complex PTSD, the *phase-oriented* approach advocates the resolution of self-destructive behaviors, such as aggression and self-harm, as the first priority of any complex PTSD intervention (e.g., Follette, Iverson, & Ford, 2009; Ford, Courtois, Van der Hart, Nijenhuis, & Steele, 2005; Steele et al., 2004). The success of this work may be heightened by the initial phase of treatment addressing issues of shame, self-loathing, and ‘alterations in self-perception’ to effectively reduce aggression and self-harm (Kluft, 2007). The inverse relationship between physical aggression and severity of self-harm highlights the importance of exploring the link between these two behaviors and their respective functions in the assessment stages of treatment.

Clinicians should also be aware of the role socially desirable responding may play in assessment and early treatment when dealing with sensitive topics such as anger, aggression, and self-harm.

Future studies should aim to expand on the current findings, 'alterations in self-perception,' 'alterations in attention or consciousness,' somatization and physical aggression all had important relationships with self-harm; however, further research should examine the links between these variables and the explicit motives for self-harm provided by participants. Self-report measures such as the Self-Injury Motivation Scale (Osuch, Noll, & Putnam, 1999) may be useful in this regard. Although not the focus of the current study, future work should consider the role of depression, alcohol abuse, and borderline personality symptoms on the dependent variables (e.g., Ford, 1999). These symptom clusters are common in complex PTSD (Ford, 1999; Herman, 1992) and may provide a greater empirical understanding of affect regulation and impulse difficulties in chronic and complex posttrauma presentations. It would also be informative to ascertain whether specific types of traumatic experiences are linked to physical aggression, self-harm, and the different complex PTSD symptom clusters.

In conclusion, high levels of physical aggression and self-harm emerged as characteristic sequelae of complex PTSD. The symptom of 'alterations in self-perception' was an important predictor of aggression and history of self-harm, suggesting the potential role of posttraumatic shame and self-loathing in PTSD theoretical models of these destructive behaviors. Somatization and 'alterations in attention or consciousness' are also important contributors to self-harm behavior, whereas social desirability was a notable confounding influence in the assessment of PTSD arousal, anger, aggression, and self-harm.

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Original Article

Prospective longitudinal course of aggression among adults with bipolar disorder

Ballester J, Goldstein B, Goldstein TR, Yu H, Axelson D, Monk K, Hickey MB, Diler RS, Sakolsky DJ, Sparks G, Iyengar S, Kupfer DJ, Brent DA, Birmaher B. Prospective longitudinal course of aggression among adults with bipolar disorder.

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Objectives: Bipolar disorder (BP) has been associated with increased aggressive behaviors. However, all existing studies are cross-sectional and include forensic or inpatient populations and many do not take into account the effects of comorbid conditions. The goal of this study was to evaluate the longitudinal course of aggression among adult outpatients with BP compared with non-BP patients and healthy controls.

Methods: Subjects with bipolar I disorder (BP-I)/bipolar II disorder (BP-II) (n = 255), those with non-BP psychopathology (n = 85), and healthy controls (n = 84) (average 38.9 years, 78.7% female, and 84.9% Caucasian) were evaluated at intake and after two and four years of follow-up. Aggression was self-rated using the Aggression Questionnaire (AQ). Comparisons were adjusted for any significant demographic and clinical differences and for multiple comparisons. For subjects with BP, associations of AQ with subtype of BP, current versus past mood episodes, polarity and severity of the current episode, psychosis, and current pharmacological treatment were evaluated.

Results: In comparison with subjects with non-BP psychiatric disorders and healthy controls, subjects with BP showed persistently higher total and subscale AQ scores (raw and T-scores) during the four-year follow-up. There were no effects of BP subtype, severity or polarity of the current episode, psychosis, and current pharmacological treatments. Subjects in an acute mood episode showed significantly higher AQ scores than euthymic subjects.

Conclusions: BP, particularly during acute episodes, is associated with increased self-reported verbal and physical aggression, anger, and hostility. These results provide further evidence of the need for treatments to prevent mood recurrences and prompt treatment of acute mood episodes in subjects with BP.

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Bipolar disorder (BP) is a severe psychiatric disorder associated with serious psychosocial consequences and increased risk for suicidality, cardiovascular illnesses, substance abuse, and legal problems (1–3). The World Health Organization ranked BP among the top 10 most disabling disorders in the world (4).

BP has also been associated with increased risk for aggressive behaviors (5). However, all current studies are cross-sectional and the results have

been confounded by the presence of other psychiatric conditions. Also, most of the studies have included forensic or inpatient populations, limiting the generalizability of their findings. For example, Barlow et al. (6) found that inpatients with BP had significantly more aggressive behaviors than inpatients with other Axis-I disorders. In contrast, Bincosino et al. (7) reported that physical assault was equally prevalent in inpatients with BP, schizophrenia, substance/alcohol abuse, and

'organic' disorders. Fazel et al. (8, 9) reported significantly more violent behaviors in a large sample of adults with BP after discharge from the hospital compared with their siblings with non-BP psychopathology and the general population. However, these results were, in large part, accounted for by the presence of comorbid substance abuse. In a previous cross-sectional study, we compared aggression in adult outpatients with BP-I and BP-II with that in subjects with non-BP disorders and healthy controls, using the self-report Aggression Questionnaire (AQ) (10). After adjusting for confounding factors (e.g., demographic factors, treatment, and presence of non-BP psychopathology), subjects with BP reported significantly higher levels of anger and aggressive behaviors, especially during acute and psychotic episodes, compared to subjects with non-BP psychopathology and healthy controls (10). These results suggested that aggression, measured with the AQ, was specifically higher in adults with BP.

Since there are no longitudinal studies prospectively assessing aggressive behaviors of adults with BP, we sought to extend our prior findings (10) by evaluating whether the increased aggression found at intake in subjects with BP was stable over time. To do this, subjects with BP, non-BP subjects, and healthy controls were followed at least one time over a period of approximately four years. We hypothesized that, after adjusting for confounding factors, subjects with BP would continue to report higher levels of aggression compared to the other two control groups.

Methods

Subjects

Subjects were recruited as part of the National Institute of Mental Health (NIMH) Pittsburgh Bipolar Offspring Study (BIOS) (11). Details of the methods of this study are described elsewhere (11). Briefly, adults with BP ($n = 255$) were recruited through advertisement (53%), adult BP studies (31%), and outpatient clinics (16%). Subjects were required to fulfill DSM-IV criteria for BP-I or BP-II (12) and were excluded if they were diagnosed with schizophrenia, mental retardation, mood disorders secondary to substance abuse, or medical conditions that impeded participation in the study, or lived more than 200 miles away from Pittsburgh (PA, USA). Community control subjects ($n = 169$; 84 healthy and 85 with non-BP disorders) were recruited through the University of Pittsburgh Center for Social and Urban Research at a ratio of one control adult to two subjects with BP. Control

subjects were group matched by age, sex, and neighborhood using the area code and the first three digits of the telephone number of the subjects with BP. The exclusion criteria were the same as for subjects with BP, with an additional exclusion criterion of BP and/or history of BP in first-degree relatives.

Only subjects with at least one follow-up assessment were included in this study (BP = 227, non-BP = 75, healthy controls = 81). No clinical or demographic differences were found between subjects with and without follow-up assessments.

Assessment

After Institutional Review Board approval and informed consent had been obtained, subjects were assessed at intake and every other year for psychopathology, family history of psychiatric disorders, and other variables such as psychosocial functioning, family environment and exposure to negative life events. Only instruments relevant to the present study are included in this article.

Axis-I disorders and severity of current mood episode were evaluated using the DSM-IV Structured Clinical Interview (SCID) (13) as well as the attention-deficit hyperactivity disorder (ADHD), disruptive behavior disorder (DBD), and separation anxiety disorder sections from the Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present and Lifetime Version (K-SADS-PL) (14). Overall functioning was evaluated using the DSM-IV Global Assessment of Functioning (GAF) (12). Current pharmacological treatments (mood stabilizers, antipsychotics, stimulants, and antidepressants) were ascertained using the Adult Health Medical Screening Interview developed for BIOS. Socioeconomic status (SES) was evaluated using the Four-factor Hollingshead Scale (15). The Family History-Research Diagnostic Criteria method plus ADHD and DBD items from the K-SADS-PL were used to ascertain the psychiatric history of second-degree relatives and biological co-parents not seen for direct interview. All assessments were completed by bachelors- or masters-level interviewers with at least two years of experience and were carried out in the subjects' homes. All assessments were presented to a psychiatrist who was blind to the psychiatric status of the subjects. Inter-rater reliability for the SCID and KSADS was acceptable ($\kappa \geq 0.8$).

Lifetime aggression was evaluated through the AQ (16). During the follow-up, subjects were instructed to report only those changes noted since the last evaluation. The AQ is an updated version of the classic Buss-Durkee Hostility Inventory

(17), a widely known instrument for assessing lifetime anger and aggression. The internal consistency estimate of the AQ is 0.94 and the AQ has strong construct and discriminant validity (17). The AQ includes 34 items scored on five subscales: Physical Aggression (PHY), Verbal Aggression (VER), Anger (ANG), Hostility (HOS), and Indirect Aggression (IND). The PHY subscale includes items focused on the use of physical force when expressing anger: *'I may hit someone if he or she provokes me'*. The VER subscale is formed by items that make reference to hostile speech: *'When people annoy me, I may tell them what I think of them'*. The items of the ANG subscale describe aspects of anger related to arousal and sense of control: *'At times I feel like a bomb ready to explode'*. The HOS subscale refers to attitudes of social alienation and paranoia: *'I wonder what people want when they are nice to me'*. Finally, the IND subscale measures the tendency to express anger in actions that avoid direct confrontation: *'When someone really irritates me, I might give him/her the silent treatment'*.

Each of the items describes a characteristic related to aggression, and the individual rates the description on a Likert scale from 1 (*Not at all like me*) to 5 (*Completely like me*) to form an AQ total score along with an Inconsistent Responding (INC) index score as a validity indicator. The INC is based on several pairs of items for which responses tend to be similar among individuals; for example: *'If somebody hits me, I hit back'*, and *'If I have to resort to violence to protect my rights, I will'*. If the difference score between these pairs is bigger than one point, then the INC score increases one point. The developers of the AQ suggest questioning the accuracy of the individual's response when the INC is ≥ 5 .

Total and subscale AQ scores can be reported as raw or T-scores. The T-norms were standardized in a sample of more than 2,000 individuals, aged 9–88 years, considered as representative of the US population (18).

Statistics

Between-group demographic and clinical comparisons were done using standard parametric and non-parametric statistics as appropriate. Longitudinal total and subscale AQ scores among BP, non-BP, and healthy control groups were compared using mixed models, both with and without adjustment for significant covariates.

Within the BP group, the BP type (BP-I/BP-II), the presence of a current mood episode (defined as within the month preceding the assessment), the polarity of the current episode (manic/mixed,

hypomanic, depressed, and not otherwise specified), the severity of the current episode (mild, moderate and severe), and current exposure to pharmacological treatments were evaluated using mixed models.

Log transformation of total and subscale raw AQ scores was performed to achieve normal distributions. T-scores were also evaluated; with very few exceptions, the two analyses yielded similar results. Therefore, for simplicity, only results using raw AQ scores are presented. All pair-wise comparisons were conducted with Bonferroni corrections. All p-values were based on two-tailed tests with $\alpha = 0.05$. All statistical analyses were conducted using SAS 9.2 (SAS Institute, Cary, NC, USA) or SPSS 19 (IBM Corporation, Armonk, NY, USA).

Results

As shown in Table 1, 227 subjects with BP, 75 subjects with non-BP psychopathology, and 81 healthy controls were included in the analyses. Subjects were followed for an average of 3.9 years (median = 4.04 years, standard deviation = 1.04) and were assessed approximately at two years (Time 2) (BP = 220, non-BP = 74, healthy controls = 80) and at four years (Time 3) (BP = 186, non-BP = 66, healthy controls = 79).

At intake (Time 1), subjects with BP and non-BP psychopathology were less likely to be married than the healthy controls. Also, subjects with BP and non-BP psychopathology had lower SES than the healthy controls (for all above-noted comparisons, $p < 0.05$). Subjects with BP had significantly higher lifetime prevalences of ADHD, DBD, panic disorder, generalized anxiety disorder, posttraumatic stress disorder, obsessive compulsive disorder, social phobia, and eating disorder when compared to the non-BP group (all p-values < 0.05). There were no differences in demographics and clinical characteristics between subjects with and without follow-up assessments.

At Time 2, nine subjects (BP = 7, non-BP = 1, healthy controls = 1) and at Time 3, 12 subjects (BP = 9, non-BP = 2, healthy controls = 1) dropped out of the study. In addition, 31 subjects had not been followed up (BP = 25, non-BP = 6). There were no differences in demographics and clinical characteristics between subjects included in this analysis and those who dropped out or had not been interviewed.

AQ raw scores

As shown in Table 2, after adjusting for between-group significant demographic and clinical

Table 1. Demographic and clinical characteristics of the sample at Time 1

	Bipolar disorder (n = 227)	Non-BP (n = 75)	Healthy controls (n = 81)	Statistics	p-value
Demographic characteristics					
Age, mean (SD)	38.99 (7.8)	39.51 (9.0)	39.21 (7.5)	$F = 0.12$	0.9
Sex, % female, mean (SD)	179 (78.9)	59 (78.7)	61 (75.3)	$F = 0.46$	0.8
Race, % white, mean (SD)	204 (89.9)	60 (80.0)	66 (81.5)	$F = 6.50$	0.04
Marital status, % living together, mean (SD)	120 (52.9) ^a	44 (58.7) ^a	66 (81.5) ^b	$F = 20.46$	<0.0001
SES, mean (SD)	35.10 (14.7) ^a	36.35 (13.1) ^{a,b}	40.86 (13.6) ^b	$F = 4.95$	0.008
Lifetime Axis-I psychiatric disorders, n (%)					
Bipolar I disorder	154 (67.8)	–	–	–	–
Bipolar II disorder	73 (32.2)	–	–	–	–
MDD	–	33 (44.0)	–	–	–
Dysthymic disorder	–	9 (12.0)	–	–	–
Psychosis	24 (10.6)	2 (2.7)	–	$\chi^2 = 4.5$	0.03
ADHD	57 (25.1)	6 (8.0)	–	$\chi^2 = 10.0$	0.002
Disruptive behavior disorder	79 (34.8)	9 (12.0)	–	$\chi^2 = 14.2$	0.0002
ODD	61 (26.9)	5 (6.7)	–	$\chi^2 = 13.5$	0.0002
Conduct disorder	46 (20.3)	5 (6.7)	–	$\chi^2 = 7.4$	0.006
Substance use disorder	143 (63.0)	38 (50.7)	–	$\chi^2 = 3.6$	0.06
Alcohol	117 (51.5)	30 (40.0)	–	$\chi^2 = 3.0$	0.08
Drugs	96 (42.3)	22 (29.3)	–	$\chi^2 = 4.0$	0.05
Any anxiety	167 (73.6)	26 (34.7)	–	$\chi^2 = 37.0$	<0.0001
Panic disorder	90 (39.7)	6 (8.0)	–	$\chi^2 = 26.0$	<0.0001
SAD	22 (9.7)	7 (9.3)	–	$\chi^2 = 0.008$	0.9
GAD	63 (27.8)	4 (5.3)	–	$\chi^2 = 16.4$	<0.0001
PTSD	83 (36.6)	12 (16.0)	–	$\chi^2 = 11.1$	0.0009
OCD	31 (13.7)	2 (2.7)	–	$\chi^2 = 7.0$	0.008
Social phobia	56 (24.7)	5 (6.7)	–	$\chi^2 = 11.3$	0.0008
Eating disorders	21 (9.3)	2 (2.7)	–	$\chi^2 = 3.5$	0.06

Different superscripts indicate significant differences among groups with p-values ≤ 0.05 after Bonferroni's correction.

ADHD = attention-deficit hyperactivity disorder; GAD = generalized anxiety disorder; MDD = major depressive disorder; OCD = obsessive compulsive disorder; ODD = oppositional defiant disorder; PTSD = posttraumatic stress disorder; SAD = separation anxiety disorder; SD = standard deviation; SES = socioeconomic status.

differences, there were significant time, group, and time \times group interactions for the three groups in total scores and every AQ subscale (all p-values < 0.05) with the exception of the time \times group interaction for the physical and the indirect subscales.

Pair-wise comparisons adjusting for between-group clinical and demographic differences and multiple comparisons showed that subjects with BP had significantly higher overall total and individual subscale AQ scores than subjects with non-BP psychopathology (all p-values < 0.05). Also, BP subjects showed significantly higher total AQ scores and significantly higher scores in each one of the AQ subscales than the healthy controls. There were no differences in the overall total AQ score and scores in each of the subscales between the non-BP group and the healthy controls.

After adjusting for between-group demographic and clinical differences and multiple comparisons, pair-wise comparisons of the time by group interactions showed a significant decrease in the AQ total and anger scores in the subjects with BP when

compared to non-BP subjects. Subjects with BP also had lower PHY and VER scores when compared to healthy controls (all p-values < 0.05 ; results available upon request). Also, non-BP subjects showed a significant decrease in anger when compared to the healthy controls ($p < 0.05$).

After excluding from the above-mentioned analyses subjects with an AQ 'inconsistency index' ≥ 5 (BP = 127, non-BP = 24, healthy controls = 13), similar results were obtained. It is also important to highlight that subjects who participated in this study had worse punctuation in the AQ scores than those subjects who did not, although results were not statistically significant (results available upon request).

Within the BP group, subjects experiencing a mood episode at intake and during the follow-up (Time 1 = 149, Time 2 = 105, Time 3 = 77) showed significantly higher total AQ scores and significantly higher scores in all the subscales of the AQ, in comparison with subjects who were not in a current mood episode (all p-values < 0.05). Adjusting for between-group demo-

Table 2. Comparison of the Aggression Questionnaire (AQ) raw total and each subscale scores among subjects with bipolar disorder (BP), subjects with non-BP psychopathology (non-BP), and healthy controls (HC)

	Time 1	Time 2	Time 3	Statistics ^a					
				Group		Time		Time × group	
				F	p-value	F	p-value	F	p-value
AQ total									
BP	87.06 ± 27.56	78.61 ± 26.69	77.52 ± 28.69	67.75	<0.0001	25.10	0.0001	4.88	0.009
Non-BP	64.12 ± 20.39	63.28 ± 23.54	59.76 ± 16.81						
HC	53.80 ± 12.55	50.66 ± 11.20	49.59 ± 10.10						
Physical total									
BP	16.74 ± 8.12	14.90 ± 7.17	15.05 ± 8.09	31.50	<0.0001	18.12	<0.0001	2.89	0.06
Non-BP	13.01 ± 5.30	12.57 ± 5.58	11.83 ± 3.69						
HC	10.43 ± 3.15	10.16 ± 3.03	10.17 ± 3.13						
Verbal total									
BP	13.76 ± 5.20	12.46 ± 4.96	12.33 ± 5.23	33.18	0.0001	4.83	0.03	4.98	0.007
Non-BP	10.63 ± 3.34	10.39 ± 4.19	10.03 ± 3.39						
HC	8.96 ± 2.57	8.76 ± 2.44	8.99 ± 2.62						
Anger total									
BP	19.99 ± 6.98	17.72 ± 6.97	17.65 ± 6.80	60.24	<0.0001	15.65	0.0001	5.62	0.005
Non-BP	13.75 ± 5.19	14.12 ± 5.75	13.53 ± 5.60						
HC	11.78 ± 3.43	10.58 ± 2.89	10.49 ± 2.74						
Hostility total									
BP	22.18 ± 8.32	20.17 ± 8.26	19.42 ± 8.36	62.38	<0.0001	15.29	0.0002	3.63	0.03
Non-BP	14.69 ± 5.96	14.86 ± 7.10	13.62 ± 5.25						
HC	12.57 ± 4.53	11.83 ± 4.67	11.01 ± 3.74						
Indirect total									
BP	14.44 ± 4.70	13.36 ± 4.68	13.10 ± 4.97	27.13	<0.0001	24.98	<0.0001	0.38	0.70
Non-BP	12.03 ± 4.33	11.32 ± 4.19	10.78 ± 3.31						
HC	10.04 ± 2.90	9.36 ± 2.52	8.93 ± 2.05						

For all group comparisons: BP > non-BP; BP > healthy controls and non-BP > healthy controls with p-values ≤ 0.05 after Bonferroni's correction.

^aAdjusted for race, marital status, and socioeconomic status.

graphic and clinical differences, and current use of psychotropic medications (any medication, antipsychotics, antidepressants, stimulants, and mood stabilizers) yielded similar results. In addition, there were no effects of BP subtype (BP-I or BP-II), the polarity of the current episode (e.g., hypomanic, manic/mixed, depressed, or not otherwise specified), the severity of the current episode (mild, moderate, or severe), the presence of psychosis (delusions and/or hallucinations), and familial history of BP.

To evaluate whether the high AQ scores in the subjects with BP were accounted for by the recruitment of patients attending clinical settings, and as a consequence having more severe disorders than those recruited by other means, an analysis comparing the intake AQ scores between those subjects with BP who were recruited through advertisement and those who were recruited through clinics was done. Subjects recruited through advertisement showed higher physical, anger, and total AQ scores (all p-values < 0.02). There were no differences on the verbal, hostility, and indirect subscales.

Overall functioning

After adjusting for between-group demographic and clinical differences at intake and during the follow-up, there were significant group ($F = 53.4$, $p < 0.001$), and time × group ($F = 9.1$, $p < 0.001$) differences in the overall functioning of all the subjects. Pair-wise comparisons adjusting for multiple comparisons and confounding variables showed that subjects with BP had lower functioning when compared to subjects with non-BP psychopathology (p-values < 0.001) and the healthy controls (p-value < 0.001). Finally, subjects with non-BP psychopathology showed lower functioning when compared to healthy controls (p-value < 0.05). For the overall sample, there was a significant negative correlation between AQ total score and overall functioning (Pearson's correlation coefficient = -0.55, $p \leq 0.001$).

Discussion

To our knowledge, this is the first longitudinal study of adult BP in the literature that has evalu-

ated aggression in subjects with BP in comparison to subjects with non-BP psychopathology and healthy controls. After adjusting for between-group demographic and clinical differences, during the four-year follow-up, subjects with BP showed persistently higher total AQ scores and higher scores on each of the AQ subscales than the other two groups (Fig. 1). As expected, subjects with non-BP psychopathology also showed higher AQ scores than the healthy controls. In contrast to the subjects with BP, subjects with non-BP psychopathology did not show any difference in AQ total or any subscale score when compared to healthy controls after adjusting for confounding clinical factors. Within the BP group, the total and subscale AQ scores were significantly higher during an acute mood episode. The severity and polarity of the current episode, the presence of psychosis, and current pharmacological treatments did not affect the AQ scores. The higher AQ scores in the subjects with BP were not due to the recruitment from clinical settings, since subjects recruited through advertisement showed higher AQ scores. Finally, for all groups there was a significant correlation between the aggression scores and overall functioning. After adjusting for confounding factors, subjects with BP had significantly lower functioning when compared to subjects with non-BP psychopathology and healthy controls. Also, subjects with non-BP psychopathology showed lower overall functioning than healthy controls.

Before discussing the above-mentioned results in more detail, the limitations of this study need to be highlighted. First, the results may not be generalizable to other populations because the sample was recruited through a high-risk study (BIOS) (11).

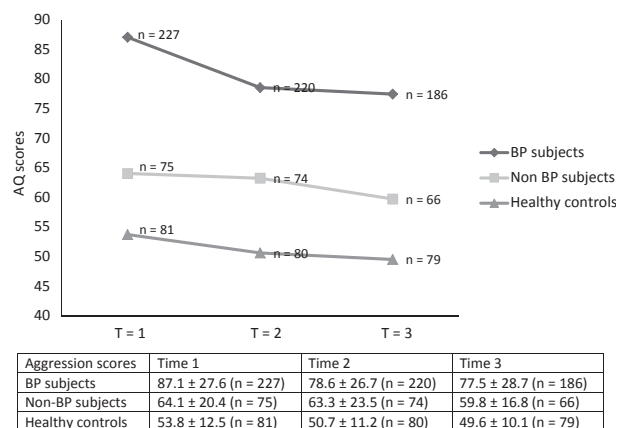


Fig. 1. Comparison of aggression raw scores between subjects with bipolar disorder (BP), subjects with non-BP psychopathology, and healthy controls. T = time. Group $F = 67.75$, $p < 0.001$; time $F = 25.1$, $p < 0.001$; interaction time \times group $F = 4.88$, $p < 0.05$.

However, the lifetime prevalence of psychiatric disorders in the sample was similar to that reported in the National Comorbidity Survey Replication study (19). Also, the rates of comorbid psychiatric disorders in subjects with BP in our sample were similar to those reported in the adult BP literature (19, 20). Secondly, although we excluded subjects with mental retardation, cognitive function was not formally evaluated. In addition, we did not evaluate the effects of personality disorders. Thirdly, the prevalence of psychosis in our sample was low (2%). Fourthly, the information collected in this study was obtained only from subjects' self-evaluations and not from their relatives or criminal reports. Consequently, subjects could have under- or over-reported their aggressive behaviors. However, this potential bias might affect not only subjects with psychiatric disorders, but also healthy controls. In fact, in a large community study of adults with psychiatric disorders and healthy controls, the tendency to over-report aggression was present not only in adults with psychopathology, but also in the controls (21). Finally, only the effects of psychopharmacological, and not the psychosocial treatments during the current episode were analyzed. However, given that this study is naturalistic, these results need to be treated with caution.

The results of this study corroborate our prior cross-sectional findings (10) and suggest that BP is associated with high levels of self-reported aggression over time, especially during an acute mood episode. The fact that the aggression scores continued to be significantly higher after taking into account the presence of non-BP illnesses suggests that BP specifically is associated with aggression. Existing studies have also reported increased aggression and anger associated with BP in comparison with patients with non-BP psychopathology [(22); see review by Lavatolav (5)]. For example, Perlis et al. (23) found that the presence of anger attacks during pure depressive episodes was twice as common among BP (62%) when compared to unipolar depressed patients (26%). However, most of these studies have only focused on the presence of aggression in patients with BP who were in an acute episode and all of them were cross-sectional.

Comparable with our prior study (10) and Fazel et al. (8), there were no effects of the subtype of BP or the polarity of the current episode on the aggression scores. In contrast, perhaps due to methodological differences (e.g., definition of aggression and inpatient status), Graz et al. (24) reported a significantly higher rate of criminal behaviors in patients while in mania when

compared with patients with bipolar or unipolar depression. Finally, in agreement with our last study (10), we also found that there were no effects of the severity of the current episode of BP on aggression. The reason for these counterintuitive findings is not entirely clear, but it is possible that aggression as measured through the AQ is specifically related to BP independently of the severity of the episode.

In general, psychosis has been found to be associated with increased risk for aggression. In contrast with the general literature (25) and our prior report (10), perhaps due to a lack of statistical power, in this analysis the presence of psychosis in subjects with BP was not specifically associated with aggression.

The finding that subjects with BP reported more aggressiveness may be a potential source of stigma and discrimination against people with BP (26). However, it is important to emphasize that the above results do not mean that subjects with BP are more prone to severe violent behaviors such as homicide, rape, or the use of weapons. In fact, the AQ does not measure severe violent behaviors; it measures hostility, verbal and physical aggression, irritability, and indirect aggression. Moreover, a recent large study by Fazel et al. (8, 9) showed that patients with BP had more violent behaviors (e.g., homicide, assault, robbery, and sexual offenses), but the results were in large part accounted for by the use of substances and not BP *per se*.

In conclusion, independent of the BP subtype, polarity, comorbidity, severity of mood episodes, and the use of medications, subjects with BP, particularly when acutely ill, reported more verbal and physical aggression, anger, and hostility than subjects with non-BP psychopathology and healthy controls, and these differences were stable over time. The results of this study provide further evidence for the importance of preventing mood recurrences and implementing psychosocial and pharmacological treatments to help subjects with BP manage their aggressiveness. Successful acute treatment and prevention of recurrences will improve well-being, minimize interpersonal and family conflicts, and hopefully prevent the development of more severe violent behaviors in subjects with BP.

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Bipolar Disorder and Violent Crime

New Evidence From Population-Based Longitudinal Studies and Systematic Review

Seena Fazel, MD; Paul Lichtenstein, PhD; Martin Grann, PhD; Guy M. Goodwin, DPhil; Niklas Långström, MD, PhD

Context: Although bipolar disorder is associated with various adverse health outcomes, the relationship with violent crime is uncertain.

Objectives: To determine the risk of violent crime in bipolar disorder and to contextualize the findings with a systematic review.

Design: Longitudinal investigations using general population and unaffected sibling control individuals.

Setting: Population-based registers of hospital discharge diagnoses, sociodemographic information, and violent crime in Sweden from January 1, 1973, through December 31, 2004.

Participants: Individuals with 2 or more discharge diagnoses of bipolar disorder (n=3743), general population controls (n=37 429), and unaffected full siblings of individuals with bipolar disorder (n=4059).

Main Outcome Measure: Violent crime (actions resulting in convictions for homicide, assault, robbery, arson, any sexual offense, illegal threats, or intimidation).

Results: During follow-up, 314 individuals with bipolar disorder (8.4%) committed violent crime compared with 1312 general population controls (3.5%) (adjusted odds ratio, 2.3; 95% confidence interval, 2.0-2.6). The risk was mostly confined to patients with substance abuse comorbidity (adjusted odds ratio, 6.4; 95% confidence interval, 5.1-8.1). The risk increase was minimal in patients without substance abuse comorbidity (adjusted odds ratio, 1.3; 95% confidence interval, 1.0-1.5), which was further attenuated when unaffected full siblings of individuals with bipolar disorder were used as controls (1.1; 0.7-1.6). We found no differences in rates of violent crime by clinical subgroups (manic vs depressive or psychotic vs nonpsychotic). The systematic review identified 8 previous studies (n=6383), with high heterogeneity between studies. Odds ratio for violence risk ranged from 2 to 9.

Conclusion: Although current guidelines for the management of individuals with bipolar disorder do not recommend routine risk assessment for violence, this assertion may need review in patients with comorbid substance abuse.

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VARIOUS ADVERSE HEALTH outcomes have been reported in bipolar disorder, including increased risk of premature death from suicide and other causes,¹ victimization,² homelessness,³ and repeat offending.⁴ However, the evidence for interpersonal violence and violent crime is less clear. The few reported population studies have used different diagnostic criteria, including any manic episode⁵ or all affective psychoses,^{6,7} as well as selected samples such as homicide offenders.⁸⁻¹⁰

To clarify the association of bipolar disorder with violent crime, we conducted new population-based longitudinal investigations and included these findings in a systematic review and meta-analysis. We aimed to quantify the risk of violent crime in in-

dividuals with bipolar disorder after adjustment for sociodemographic and familial (early environment and genetic) confounders and to examine the mediating role of substance abuse. The results of this work advance the evidence base in 4 ways. First, to reduce the risk of chance effects, we matched 3743 individuals having bipolar disorder with 37 429 individuals in the general population (which includes more bipolar disorder cases than in all previous studies combined, to our knowledge). Second, to reduce misclassification by incorrect inclusion of nonpsychotic diagnostic groups such as personality disorder and substance abuse (which are associated with violence^{11,12}), we only included as case individuals those with bipolar disorder diagnosed on at least 2 separate occasions. Third, to test for potential

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familial confounding, we studied rates of violent crime in individuals with bipolar disorder compared with their unaffected siblings. Fourth, to contextualize our findings, we conducted a systematic review and meta-analysis of research on bipolar disorder and violence, which to our knowledge is the first quantitative synthesis of the available evidence.

METHODS

NEW EMPIRICAL INVESTIGATION AND STUDY SETTING

We linked the following nationwide population-based registries in Sweden: the Hospital Discharge Registry (HDR [National Board of Health and Welfare]), the National Crime Register (National Council for Crime Prevention), the national censuses from 1970 and 1990 (Statistics Sweden), and the Multi-Generation Register (Statistics Sweden). In Sweden, all residents (including immigrants) have a unique 10-digit personal identification number that is used in all national registers, enabling the linking of data in these registers.

PATIENTS WITH BIPOLAR DISORDER

Using the HDR, which includes all individuals admitted to and discharged from any hospital for assessment or treatment (including forensic psychiatric hospitals and the few private providers of inpatient health care), we identified as case individuals those who fulfilled 2 criteria. First, they had to have been discharged from hospitals between January 1, 1973, and December 31, 2004, and to have had discharge diagnoses of bipolar disorder on at least 2 separate occasions according to the *International Classification of Diseases, Eighth Revision (ICD-8)* (1973-1986 [diagnostic codes 296.1, 296.3, and 296.88]), *ICD-9* (1987-1996 [codes 296A, 296C-296E, and 296W]), or *ICD-10* (1997 onward [codes F30 and F31]). All hospitalized individuals receive ICD diagnoses on discharge. Second, cases were born between January 1, 1958, and January 1, 1989, so that they were at least aged 15 years (the age of criminal responsibility) at the start of the study on January 1, 1973. We required that bipolar disorder had been diagnosed on at least 2 separate occasions to increase diagnostic precision; this stipulation should minimize false-positive diagnoses by excluding individuals with only 1 diagnostic opinion.

Data were also extracted for every individual with regard to discharges between January 1, 1973, and December 31, 2004, with principal or comorbid diagnoses of alcohol abuse or dependence (*ICD-8* code 303, *ICD-9* codes 303 and 305.1, and *ICD-10* code F10 except x.5) and drug abuse or dependence (*ICD-8* code 304, *ICD-9* codes 304 and 305.9, and *ICD-10* codes F11-F19 except x.5). This information was used as a marker for comorbid alcohol or drug abuse disorders.

DIAGNOSTIC VALIDITY AND RELIABILITY

In the HDR, there is good evidence for distinguishing between diagnoses of schizophrenia and those of nonschizophrenia psychoses based on record review and interview using the OPCRIT computerized diagnostic system to generate *DSM-IV* diagnoses.¹³ Only approximately 1% of individuals discharged from the hospital have missing personal identification numbers.¹⁴ More than 90% of individuals with severe mental illness are thought to be admitted over any given 10-year period in Sweden.¹⁵ Since January 1, 1973, the HDR has recorded national coverage for psychiatric disorders. Consequently, the register has been widely

used in psychiatric epidemiologic investigations.¹⁶ In 2008, 2 board-certified psychiatrists (including N.L.) conducted a review of the medical records of 135 randomly chosen patients with 2 separate HDR diagnoses of bipolar disorder in 1 Swedish county. This analysis yielded an agreement rate of 91.5%; most false-positive diagnoses were severe chronic unipolar depressive disorders (usually with comorbid substance abuse or nonbipolar psychosis) but without the distinct hypomanic or manic episodes needed to diagnose bipolar disorder (data available from the authors). A prior validity study¹⁷ found fair agreement between substance abuse diagnoses in the HDR and a comprehensive 4-week inpatient assessment used as the criterion standard. Results of a more recent larger comparison study¹⁸ suggested fair to moderate agreement specifically for comorbid substance abuse in schizophrenia (κ statistic [SE], 0.37 [0.23]; $P < .001$; corresponding to 68% full agreement).

We investigated 2 overlapping samples of individuals with bipolar disorder. The first was a national sample of those with 2 or more hospital diagnoses of bipolar disorder ($n = 3743$). The second, a subgroup of the first sample, comprised all individuals with 2 or more hospital diagnoses of bipolar disorder who also had full siblings unaffected by bipolar disorder ($n = 2570$). We identified 2 comparison groups who had never been hospitalized for bipolar disorder at any time during the study period. The first was a random selection of approximately 10 individuals in the general population matched on birth year and sex for each individual with bipolar disorder (37 429 general population control individuals matched to 3743 patients with bipolar disorder). The second comprised unaffected full siblings of individuals with bipolar disorder (4059 full-sibling controls and 2570 individuals with bipolar disorder), unmatched by age or sex and identified using the Multi-Generation Register.¹⁹ The Multi-Generation Register records each person born in Sweden from 1933 onward and ever registered as living in Sweden from 1960 onward, matched to their parents.²⁰ For immigrants, similar information exists for those who moved to Sweden before age 18 years together with 1 or both parents. Both comparison groups included individuals who may have had a substance abuse history; individuals with only 1 hospitalization for bipolar disorder were not included in the comparison groups.

OUTCOME MEASURES

Data on all convictions for violent crime from January 1, 1973, until December 31, 2004, were retrieved for all individuals aged 15 years (the age of criminal responsibility in Sweden) and older. In keeping with other studies,^{14,18} violent crime was defined as homicide, assault, robbery, arson, any sexual offense (rape, sexual coercion, child molestation, indecent exposure, or sexual harassment), illegal threats, or intimidation. Attempted and aggravated forms of offenses, where applicable, were also included.

Convictions were used because the Swedish Criminal Code²¹ determines that individuals are convicted regardless of mental illness. These included verdicts of not guilty by reason of insanity, noncustodial sentences, fines and cautions, and transfers to forensic hospitals. No plea bargaining is permitted. The crime register has excellent coverage; only 0.05% violent crimes had missing associated personal identification numbers between 1988 and 2000.¹⁴

SOCIODEMOGRAPHIC COVARIATES

Data on civil status and income were gathered from the 1970 and 1990 national censuses. For income, if there were no 1990 census data, we used 1970 data and converted these to the 1990 monetary value. Income was then divided into tertiles (low, medium, and high) for the purpose of further analysis. When data

on individual income were missing, we used the household income (also divided into tertiles) of the family of origin at the time of the 1970 or 1990 census. Single marital status was defined as being unmarried, divorced, or widowed (but included those who were cohabiting). Immigrant status was defined as being born outside of Sweden or having at least 1 parent born outside of Sweden. In the main analyses, missing data were not replaced by imputation or other methods.

MAIN ANALYSES

We estimated the association between bipolar disorder and violent crime with conditional logistic regression analysis, as per related work using matched or sibling controls^{16,22} via the clogit command in STATA software version 10 (StataCorp LP, College Station, Texas). The clogit command fits conditional (fixed effects) logistic regression models to matched case-control groups. Only violent crime after the second inpatient diagnosis of bipolar disorder was included in the analyses. Approximately 10 controls from the general population were selected for each case. In the sibling control study, all unaffected siblings were compared with each individual having bipolar disorder. Age and sex were matched or adjusted for in all analyses. In the general population study, controls were matched by birth year and sex. In the sibling control investigation, we adjusted for sex and age in analyses involving full-sibling comparisons by calculating the age difference (in years) between patient and sibling. We tested possible confounders (income, marital status, and immigrant status) by examining whether they were each independently associated with case status and violent crime at $P < .05$ using χ^2 tests in univariate analyses.²³ Income and marital status (being single vs nonsingle) met these criteria and were included as covariates in adjusted models. Immigrant status was a confounder in the general population comparison. Because substance abuse may be on the causal pathway between bipolar disorder and violent crime, we did not include it as a confounder¹⁸; instead, stratum-specific estimates are provided. In building the regression model, all significant confounders were entered simultaneously with bipolar disorder status as exposure and with violent crime as outcome.

SUBGROUP ANALYSES

We performed several within-group comparisons of individuals with ICD-9 or ICD-10 diagnoses of bipolar disorder (which was not possible using ICD-8 because of poorer subtype classification) based on their last diagnosis. First, we compared individuals diagnosed as having a manic episode ($n=925$) (ICD-9 codes 296A-296C and ICD-10 codes F301, F308, F309, and F311) with those diagnosed as having a depressive episode ($n=461$) (ICD-9 code 296D and ICD-10 codes F313 and F314). Second, we compared individuals having any manic, mixed, or hypomanic episode ($n=1224$) (ICD-9 codes 296A, 296C, and 296E and ICD-10 codes F300, F301, F308, F309, F311, and F316) with those having a depressive episode ($n=461$). Third, using ICD-10 diagnoses only (which was not possible using ICD-8 and ICD-9 because of poorer subtype classification), we compared individuals diagnosed as having a psychotic episode ($n=403$) (ICD-10 codes F302, F312, and F315) with those having a nonpsychotic episode ($n=923$) (ICD-10 codes F300, F301, and F308-F311 and codes 313, 314, 316, and 317). For the subgroup analyses, binary logistic regression was used, and adjustments were made for age, sex, income, and immigrant and marital status. A further subgroup analysis was performed in which we recalculated risk estimates by assigning an extra category to missing income and marital status information so that the model included all cases and controls.

SYSTEMATIC REVIEW AND META-ANALYSIS

Computerized MEDLINE, EMBASE, and PsycINFO searches were performed for studies published from January 1, 1970, to February 1, 2009, using a combination of the terms *viol**, *crim**, *bipolar*, *psychos**, and *psychot**. References were retrieved and hand searched for other citations, including gray literature (unpublished or semiofficially published); non-English-language publications were translated. To supplement the search, US National Criminal Justice Reference Abstracts²⁴ and an extensive bibliography on crime and mental disorder prepared for the Health Agency of Canada²⁵ were searched. When required, we contacted authors of studies for additional information. For the National Survey on Drug Use and Health,²⁶ we extracted bipolar data directly from the authors' Web site for 2002 because the published data have pooled diagnoses. Our inclusion criteria comprised case-control studies (including cross-sectional surveys) and cohort studies, which allowed an estimation of the risk of violence in patients with bipolar disorder compared with a general population comparison group.

A standardized form was used to extract data, including information on study design, geographic location of the study, last year of follow-up for violence ("study period"), diagnostic criteria, definition of violence, method of violence ascertainment, sample size, mean age, and any adjustment for sociodemographic factors. Suitability for inclusion was assessed, and data extraction was conducted independently by 2 of us (S.F. and N.L.); any differences were resolved by discussion among coauthors. Meta-analysis of violent outcomes risk was performed, generating pooled odds ratios (ORs) with 95% confidence intervals (CIs) for random-effects models. Such an approach weights studies more equally and is considered more appropriate for meta-analyses with substantial heterogeneity.²⁷ Heterogeneity among studies was estimated using Cochran Q (reported with a χ^2 value and P value) and the I^2 statistic, with the latter describing the percentage of variation across studies that is owing to heterogeneity rather than chance.^{28,29} The I^2 statistic, unlike Cochran Q , does not inherently depend on the number of studies considered, with values of 25%, 50%, and 75% taken to indicate low, moderate, and high levels of heterogeneity, respectively. Analyses were performed with STATA software, version 10.

The Regional Ethics Committee at the Karolinska Institutet approved the study. The protocol was recorded as 2005/174-31/4.

RESULTS

NEW LONGITUDINAL STUDIES

Basic sociodemographic information and substance abuse comorbidity among individuals with bipolar disorder and among general population and full-sibling controls are given in **Table 1**. The age at diagnosis is older than the age at violent crime because it applies to the whole sample with bipolar disorder and not just the subgroup convicted of offenses (violent crime will usually be skewed to younger groups).

The prevalence of convictions for violent crime among individuals with bipolar disorder was 8.4%, while the rate was 3.5% in general population controls and 6.2% in unaffected full siblings ($P < .05$ for comparison of rates for the whole group having bipolar disorder with general population controls and for the subgroup having bipolar disorder and their siblings unaffected by bipolar dis-

Table 1. Sociodemographic Information and Substance Abuse Comorbidity Among Individuals in 2 Longitudinal Studies of Bipolar Disorder and Violent Crime in Sweden

Variable	Study 1		Study 2	
	Individuals With Bipolar Disorder (n=3743)	Unaffected General Population Control Individuals (n=37 429)	Individuals With Bipolar Disorder Who Have Full Siblings Unaffected by Bipolar Disorder (n=2570)	Unaffected Full Siblings of Individuals With Bipolar Disorder (n=4059)
Age at diagnosis, mean (SD), y	28.5 (7.1)	NA	27.2 (6.9)	NA
Age at first violent crime, mean (SD), y	26.8 (7.5)	24.0 (7.2)	26.1 (7.4)	23.2 (6.6)
Male sex, No. (%)	2108 (56.3)	21 080 (56.3)	1408 (54.8)	1976 (48.7)
Individual annual income, 1000 SEK, mean (SD) ^a	80.4 (60.5) (n=3149)	102.3 (66.4) (n=29 700)	77.9 (60.7) (n=2252)	96.3 (67.3) (n=3427)
Single status, No. (%) ^b	2672 (84.1) (n=3178)	22 281 (74.8) (n=29 777)	1982 (86.9) (n=2282)	2758 (80.2) (n=3437)
Substance abuse comorbidity, No. (%) ^c	795 (21.2)	694 (1.9)	523 (20.4)	164 (4.0)

Abbreviations: NA, not applicable; SEK, Swedish krona.

^aDetermined at the time of the 1990 census.

^bDivorced, widowed, not married, cohabiting.

^cProportion with any inpatient discharge for drug or alcohol abuse or dependence between January 1, 1973, and December 31, 2004.

Table 2. Risk of Violent Crime in Individuals Having Bipolar Disorder Followed Up Longitudinally Compared With Unaffected General Population Control Individuals and Unaffected Full-Sibling Controls^a

Control Group	Individuals With a History of Violent Crime, No. Violent/Total No. (%)		Adjusted Odds Ratio (95% Confidence Interval)	
	Controls	Individuals With Bipolar Disorder		
Unaffected general population controls	1312/37 429 (3.5)	314/3743 (8.4)	2.6 (2.3-3.0) ^b	2.3 (2.0-2.6) ^c
Unaffected full-sibling controls	253/4059 (6.2)	202/2570 (7.9)	1.6 (1.2-2.0) ^b	1.6 (1.2-2.1) ^c

^aViolent crime was defined as actions resulting in convictions for homicide, assault, robbery, arson, any sexual offense, illegal threats, or intimidation.

^bGeneral population controls were matched by age (birth year) and sex. Unaffected full-sibling controls were not matched, but the comparison was adjusted for sex and age.

^cGeneral population controls were matched by age and sex, and the association was adjusted by income (lowest vs middle and highest tertiles), marital status (single vs nonsingle), and immigrant status (individual or at least 1 parent born outside of Sweden). Unaffected full-sibling controls were not matched, but the comparison was adjusted for age, sex, income, and marital status.

order [Table 2]). Therefore, there was an increased risk of violent crime among the individuals with bipolar disorder: the adjusted OR (aOR) was 2.3 (95% CI, 2.0-2.6) for their risk of violent crime compared with that of general population controls. The risk increase was reduced to an aOR of 1.6 (95% CI, 1.2-2.1) when individuals with bipolar disorder were compared with their siblings unaffected by bipolar disorder.

The risk of violent crime among patients having bipolar disorder and substance abuse comorbidity was more than 21.3% and was significantly higher than the risk among patients without such comorbidity (Table 3). Therefore, compared with general population controls, the odds of violent crime among those having bipolar disorder and substance abuse comorbidity was 6.4 (95% CI, 5.1-8.1); compared with unaffected siblings, the risk was also high but was attenuated (aOR, 2.8; 95% CI, 1.8-4.3). In contrast, for patients having bipolar disorder without substance abuse comorbidity, the risk of violent crime was minimally elevated (aOR, 1.3; 95% CI, 1.0-1.5) compared with that in the general population and was not significantly elevated compared with that in unaffected siblings (aOR, 1.1; 95% CI, 0.7-1.6). Although in the latter comparison the rate of violent crime was slightly higher

among the unaffected siblings, the relative risk was not higher because the risk estimate accounted for matching and adjustments.

The rate of violent crime was also calculated among the general population and unaffected siblings with hospital discharge diagnoses of substance abuse. Among the general population, the rate was 33.0% (95% CI, 31.2%-34.8%), and among the unaffected siblings it was 41.5% (95% CI, 35.5%-47.5%).

SUBGROUP ANALYSES

We found no evidence of manic episodes being specifically associated with increased risk of violence compared with depressive episodes (aOR, 1.2; 95% CI, 0.8-1.9) nor for manic, mixed, or hypomanic episodes vs depressive episodes (1.1; 0.7-1.7) nor for psychotic vs nonpsychotic bipolar disorder episodes (0.8; 0.4-1.4). When stratified by substance abuse comorbidity, these risk estimates were unchanged (data not shown); for example, there was no increased risk when individuals having manic episodes and comorbidity were compared with individuals having depressive episodes and comorbidity. When individuals with missing information on in-

Table 3. Risk of Violent Crime in Individuals Having Bipolar Disorder With and Without Substance Abuse Comorbidity Followed Up Longitudinally Compared With Unaffected General Population Control Individuals and Unaffected Full-Sibling Controls^a

Control Group	Individuals With a History of Violent Crime, No. Violent/Total No. (%)				Adjusted Odds Ratio (95% Confidence Interval) ^b	
	Bipolar Disorder Without Substance Abuse Comorbidity	Matched Unaffected Controls	Bipolar Disorder With Substance Abuse Comorbidity	Matched Unaffected Controls	Bipolar Disorder Without Substance Abuse Comorbidity	Bipolar Disorder With Substance Abuse Comorbidity
Unaffected general population controls	145/2948 (4.9)	997/29 479 (3.4)	169/795 (21.3)	315/7950 (4.0)	1.3 (1.0-1.5)	6.4 (5.1-8.1)
Unaffected full-sibling controls	85/2047 (4.2)	164/3235 (5.1)	117/523 (22.4)	90/824 (10.9)	1.1 (0.7-1.6)	2.8 (1.8-4.3)

^aViolent crime was defined as actions resulting in convictions for homicide, assault, robbery, arson, any sexual offense, illegal threats, or intimidation.

^bGeneral population controls were matched by age (birth year) and sex, and the association was adjusted by income (lowest vs middle and highest tertiles), marital status (single vs nonsingle), and immigrant status (individual or at least 1 parent born outside of Sweden). Unaffected full-sibling controls were not matched, but the comparison was adjusted for age, sex, income, and marital status.

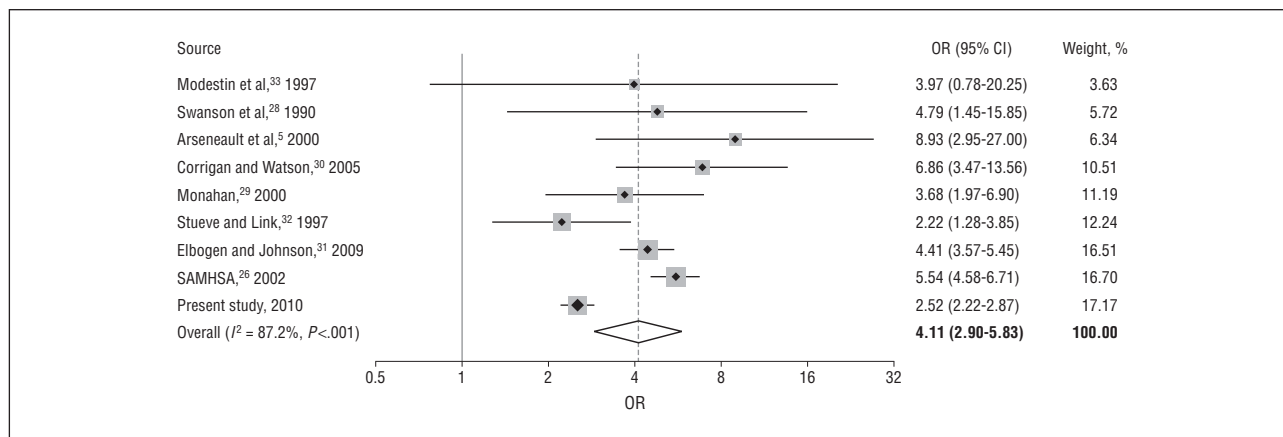


Figure. Meta-analysis reporting risk of violence in individuals with bipolar disorder compared with general population control individuals across 9 studies (including the present study). Weights are from random-effects analysis. The open diamond at the bottom of the plot denotes the pooled odds ratio (OR) with 95% confidence interval (CI; represented by horizontal lines). The gray box surrounding each study plot point is proportional to study size.

come and marital status were included in the overall model, the aOR was 2.4 (95% CI, 2.1-2.7) for violent crime among individuals with bipolar disorder compared with general population controls.

We also investigated differences by sex. The rate of violent crime was higher among men; of individuals with bipolar disorder, 226 of 1635 men (13.8%) and 88 of 2108 women (4.2%) had been convicted of a violent offense. However, compared with rates of violent crime among general population controls of the same sex, women with bipolar disorder had a higher risk of violent crime (aOR, 4.1; 95% CI, 3.0-5.5) than men with bipolar disorder (1.9; 1.6-2.3).

SYSTEMATIC REVIEW

We identified 8 previous studies that reported on risk of violence in individuals with bipolar disorder compared with general population controls. Five were conducted in the United States (2458 cases with bipolar disorder)^{26,30-33} and 1 each in New Zealand (n=19),⁵ Israel (n=81),³⁴ and Switzerland (n=82).³⁵ Different outcome measures were used, including a combination of crime registers,³⁵ combined register-based and self-report instruments,^{5,31} and self-report methods.^{26,32-34}

We included the first of the new Swedish studies reported herein (individuals with bipolar disorder compared with general population controls, who were matched by age and sex but not adjusted for other confounders, to be consistent with the other studies) with these 8 previous investigations to conduct a meta-analysis (**Figure**). When synthesizing the data, in individuals with bipolar disorder, 625 of 6383 (9.8%) had violent outcomes compared with 3346 of 112 944 (3.0%) in the general population comparisons. The ORs ranged from 2.2 to 8.9, and the pooled random-effects crude OR was 4.1 (95% CI, 2.9-5.8), with high heterogeneity between studies ($I^2=87.2\%$).

COMMENT

This longitudinal study of 3743 individuals with bipolar disorder has 2 main findings. First, there was an increased risk for violent crime among individuals with bipolar disorder. Most of the excess violent crime was associated with substance abuse comorbidity. Second, there was an increased risk for violent crime among the unaffected siblings of individuals with bipolar disorder. This finding further weakens the relationship between

bipolar disorder per se and violent crime and highlights the contribution of genetic or early environmental factors in families with bipolar disorder.

The systematic review and meta-analysis herein provide some context for these findings. The increased risk estimates varied from 2 to 9, with a pooled OR of 4.1 (95% CI, 2.9-5.8) using a random-effects model. This pooled OR is higher than that in the present study for 2 principal reasons. First, the pooled estimate is mostly based on crude estimates rather than adjusted estimates, as many previous studies have not fully or even partially adjusted for socioeconomic confounders. Second, unlike most previous studies, we only examined violent crime after diagnosis of bipolar disorder, which is a likely explanation for the lower risk estimate in our study. In a meta-regression analysis¹² of schizophrenia and violence investigations, this study characteristic also explained lower risk estimates. The high heterogeneity reported herein is not surprising considering the different study methods, various outcome measures, and 5 different countries where the studies were conducted.

Bipolar disease severity (measured by the presence of psychotic symptoms) or diagnostic subgroups (manic vs depressive episode) were not associated with a violent crime risk increase in our study. Instead, the association between bipolar disorder and violent crime seemed to be largely mediated by substance abuse comorbidity. The risk increase in patients with bipolar disorder and substance abuse comorbidity was more than that found in a related study¹⁸ of schizophrenia. In the present study, the OR for violent crime in patients with substance abuse comorbidity was 6.4 (95% CI, 5.1-8.1). In schizophrenia, the risk increase in patients having comorbidity was 4.2 (95% CI, 3.9-5.0). Other work³³ has found mediation of substance abuse in patients with bipolar disorder. Although we found that the rate of violent crime was 4.2% in women with bipolar disorder and 13.8% in men with bipolar disorder, the relative risk in women compared with that in female general population controls was higher than the corresponding estimate in men. Sex differences in violence have also been reported for severe mental illness.^{14,36}

Available data suggest a common familial etiology for bipolar disorder, violent criminality, and substance abuse. First, we found that the risk of violent crime in individuals with bipolar disorder was confined to those with comorbid substance use, and among those with substance abuse comorbidity, the risk was reduced from 6.4 relative to that of general population controls to 2.8 in comparison to sibling controls, indicating that familial effects are important for the association between violent crime and bipolar disorder among individuals with substance abuse. Second, comorbidity between bipolar I disorder and substance misuse is high (60% in the National Comorbidity Survey Replication³⁷), and in our data familial effects confounded the association between bipolar disorder and substance abuse (unaffected siblings had twice the rate of substance abuse [4.0%] compared with that of general population controls [1.9%]). Third, related work from Sweden³⁸ demonstrated a 5-fold increased risk of violent crime in individuals with substance abuse; hence, substance abuse seems to be a likely explanation for increased violence in the unaffected siblings. The finding of

shared familial etiology for bipolar disorder, violent criminality, and substance abuse is consistent with at least 2 likely explanations for the increased risk of violence among some patients with bipolar disorder. Bipolar disorder (with a predominantly genetic cause) may lead to substance abuse, which in turn increases the risk for violent crime. Alternatively, there may be a shared genetic susceptibility to substance abuse, bipolar disorder, and violent crime. However, with the available data, it is not possible to disentangle these 2 explanations, nor the relative genetic and environmental causes for the familiarity. Further work is required to better understand the mechanisms (eg, by obtaining information on individuals who commenced violent crime before the onset of bipolar disorder).

Two implications follow from the role of comorbidity in mediating violence among individuals with bipolar disorder. First, detection is important, and current practice guidelines highlight the fact that comorbidity may be overlooked.³⁹ Second, substance abuse treatment for individuals with bipolar disorder is likely to reduce the risk for violence and other adverse outcomes (including suicide⁴⁰). However, more trial evidence is required. A recent expert consensus statement identified a single trial, that of psychoeducation, for the treatment of comorbidity in patients with bipolar disorder.⁴¹ Other recommendations include the involvement of an addiction psychiatrist and the potential value of dual-diagnosis treatment programs.³⁹

Although the overall risk estimate is similar to that found in schizophrenia investigations, we found no increased violence risk in patients having bipolar disorder without substance abuse comorbidity, whereas in schizophrenia a small risk increase remained.¹⁸ Current UK guidelines⁴² for bipolar disorder discuss the importance of assessing substance abuse but do not discuss the risk of violence. According to US guidelines,³⁹ clinical experience suggests that violence may be present in some patients with bipolar disorder, but guidelines do not recommend routine risk assessment or quantification of the risk. Furthermore, they state that comorbid psychosis may contribute to this risk, which is not confirmed by the present data, although it is possible that different mechanisms (including psychotic motives) are relevant for more severe crimes such as murder. What evidence-based recommendations for assessment of risk for violent crime should be made for patients with bipolar disorder, given our findings? Since the risk estimate for bipolar disorder with substance abuse comorbidity is similar to that for substance abuse alone (reported to increase the risk of violence between 6- and 7-fold in a recent review),¹² we suggest that detailed assessment is appropriate for all individuals with substance abuse, irrespective of bipolar diagnosis.

The strengths of the present empirical work include the large number of violent offenders with bipolar disorder compared with other studies included in the meta-analysis, more than all previous studies combined. In addition, we only included violent crime after diagnosis of bipolar disorder, reducing the possibility that the reported association is confounded by conviction precipitating hospital admission among those with bipolar disorder. We also made careful adjustment for possible sociodemographic confounders. We accounted for cohort effects by matching for year of birth, and we ad-

justed for residual confounding using unaffected siblings as controls.

Study limitations include our reliance on hospital data for case ascertainment and comorbidity. By relying on hospitalization data, the mean age at onset of illness in our sample was 27 years, which is older than is usually found in prospective⁴³ and retrospective⁴⁴ reviews of patient data. The actual age at onset of illness will have been earlier because of our reliance on hospitalization data. The rates of violence that we reported might have been higher if we had included a younger sample of patients before hospital diagnosis. However, this would not affect relative risk estimates because cases and controls were matched on age.

Over a 30-year period, the vast majority of individuals (>90%) in Sweden with severe mental illness were likely to have been hospitalized at some point.¹⁵ This means that some individuals with mental illness were missed by these registers, and this weighted our findings to those with more severe bipolar disorder presentations, some of whom were admitted because of violence risk or actual violent incidents. Such biases would have tended to overestimate the risk, although charges may have been dropped by the police in some cases.⁴⁵

We used 2 diagnoses of bipolar disorder for study inclusion; hence, some individuals with bipolar disease were missed. Whether these individuals differ in their rates of violent crime is uncertain. No difference was found in a study¹⁸ of schizophrenia that compared rates of violent crime in cohorts of patients having 2 diagnoses vs those having 1 diagnosis, and this pattern may be similar in bipolar disorder. A further limitation is that information on comorbidity is likely specific, as it is based on hospital diagnoses, but is not particularly sensitive, so it is possible that the effects of substance abuse have been underestimated. Furthermore, the sensitivity of register-based data for the controls is likely to be worse than that for the patients,⁴⁶ among whom inpatient admissions allow for the assessment of substance abuse comorbidity; hence, any comparison between individuals with substance abuse in the general population and patients must be made with caution. Information on other potentially important comorbidities, such as childhood conduct problems, was not available. Although we relied on conviction data, other work has shown that the degree of underestimation of violence is similar in psychiatric patients and controls compared with self-report measures; hence, the risk estimates were not affected.⁵ A recent systematic review examining the relationship between schizophrenia and violence also found no difference in risk estimates between self-report and register-based studies.¹²

Rates of violent crime and their resolution are similar across western Europe,⁴⁷ and assault rates are comparable between Sweden and the United States,⁴⁸ suggesting the potential generalizability of our findings. In addition, alcohol sales per capita in Sweden are similar to those in the United States,⁴⁹ although comparative information on illegal drug use is limited. Furthermore, Sweden is similar to the United States in terms of an internationally recognized proxy for psychiatric morbidity, namely, age-adjusted disability-adjusted life-years.⁵⁰ Prevalences of mental disorders differ minimally across European countries, with a median prevalence of 0.9% for bipolar disorder,⁵¹

which compares with 1.0% in a recent US epidemiologic survey.³⁷ A final limitation is that our results do not clarify whether any particular clinical phase of bipolar disorder (such as mania) may increase risk of violent crime or whether there are potential roles of treatment and medication nonadherence in mediating this risk. Interview-based prospective studies, perhaps as part of a large simple trial, will be necessary to clarify these issues.

In summary, we used complementary designs to investigate the risk of violent crime in patients with bipolar disorder and included a meta-analysis of all available studies. Our empirical work substantially increases the evidence base by including more individuals with bipolar disorder than the previous studies combined and more precise methods to handle confounding. We demonstrated a clear association of bipolar disorder with violent crime in individuals with substance abuse comorbidity. The risk associated with a bipolar diagnosis per se appears low; it was minimal compared with that in general population controls when there was no comorbid substance abuse, and there was no association when violence risk in patients was compared with that in unaffected siblings. Our findings suggest the need for violence risk assessment and management in patients with bipolar disorder who have substance abuse comorbidity.

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Domestic Violence Perpetrator Programs:
A Proposal for Evidence-Based Standards in the United States

(Summary of Recommendations; pre-publication draft, June 15, 2016)

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Abstract

In the United States, the judicial system response to violence between intimate partners, or IPV, typically mandates that adjudicated perpetrators complete a batterer intervention program (BIP). The social science data has found that these programs, on the whole, are only minimally effective in reducing rates of IPV. The authors examined the social science literature on the characteristics and efficacy of BIPs. Over 400 studies were considered, including a sweeping, recently-conducted survey of BIP directors across the United States and Canada. Results of this review indicate that the limitations of BIPs are due, in large part, to the limitations of current state standards regulating these programs; and furthermore, that these standards are not grounded in the body of empirical research evidence, or best practices. The authors, all of whom have considerable expertise in the area of domestic violence perpetrator treatment, conducted an exhaustive investigation of the following key intervention areas: overall effectiveness of BIPs, length of treatment/length of group sessions, number of group participants and number of facilitators, group format and curriculum, assessment protocol and instruments, victim contact, modality of treatment, differential treatment, working with female perpetrators, working with perpetrators in racial and ethnic minority groups, working with LGBT perpetrators, perpetrator treatment and practitioner-client relationships, and required practitioner education and training. Recommendations for evidence-based national BIP standards were made based on findings from this review.

Keywords: batterer intervention, IPV, domestic violence, perpetrator treatment, BIP standards

III – Conclusions and Implications for Treatment Standards

General Recommendations

1. Partner abuse (PA) can take the form of discrete physical and non-physical assaults or a pattern of such assaults, and often includes a pattern of coercive control of the relationship partner.
2. Perpetrators can be either male or female and vary in personality, social demographics, violence history and level of threat to the physical and emotional well-being of victims
3. Victims include child witnesses and the entire family system
4. Physical PA, sexual abuse, and some forms of emotional abuse, are criminal offenses
5. Holding offenders accountable requires a multi-system response, including effective policing, prosecution, incarceration, judicial monitoring, and/or treatment
6. Perpetrator treatment is one part of a coordinated community response that includes law enforcement, victim advocates, mental health professionals and other social service agencies
7. Regardless of a perpetrator's legal status, treatment should be based on the needs of that individual and the extent to which he or she presents a threat to current and future victims
8. Treatment should be delivered by providers with substantial and accurate knowledge of partner abuse, including prevalence rates, abuser characteristics, causes and contributing factors, dynamics, and the negative impact on victims and families
9. Perpetrator treatment plans should be determined through a thorough psychosocial assessment that includes, but is not limited to, known PA risk factors
10. Treatment should be based on current best practices informed by empirical research on treatment outcome, treatment engagement, and risk factors for PA recidivism.

The next section highlights our recommendations, based on the best available evidence.

Overall effectiveness of BIPs

With respect to treatment effectiveness neither previous (Babcock, Green & Robie.,2004 and Feder & Wilson., 2005), nor more recent meta analyses/reviews (Eckhardt et al.,2013; Arias et al, 2014)), produce convincing evidence that treatment programs for IPV work, especially when considering the more traditional, more widespread and legally sanctioned Duluth type program approach emphasizing power and control issues. Quasi experimental groups are more likely to show change but as the methodological rigor of a study increases, the likelihood of obtaining significant effects decreases. However, given that the consensus appears to be that there are positive but non-significant effects (Arias et al 2014), it is argued that the question becomes one of not whether the programs work but under what conditions do they work and for whom.

Recommendations:

- Given the enormity of the problem and its impact on families and society, as well as strong empirical evidence for the effectiveness of some interventions, it would be premature for policy-makers to exclude treatment as an important part of the community response to domestic violence
- There is a strong need for more research on specific moderators of treatment outcome.
- The question becomes one of not whether the programs work but under what conditions do they work and for whom.

Length of Treatment and Length of Group Sessions

A recent survey of BIPs in the United States and Canada, Buttell et al. (2015) found that the average number of sessions in these programs was 30 (SD=12.12), with a range from 8 to 78 weeks and the modal number of sessions being 26 (N=178) and that the average length of sessions across programs was 103 minutes (SD=19.1) with the modal session duration reported as 120 minutes (N=184). A couple of research reports provide evidence of reduced recidivism in treatments of longer duration, however, a meta-analysis concludes there were greater treatment effects for programs under 16 weeks for both police and partner reports.

Recommendations

- There is not enough evidence to make any recommendations with respect to optimum length of treatment
- It is important to carry out empirical studies to assess differential outcomes associated with varying treatment length
- Optimal treatment length may be influenced by a variety of factors, including the duration and intensity of treatment sessions and degree of active engagement in treatment, as well as the needs of particular client populations and the extent to which they are at risk of recidivism

Number of Participants and Facilitators

To date, there are no experimental studies that have examined the specific effects of different facilitator arrangements (e.g., one male, one female, or a male-female co-facilitator team), facilitator demographics, or group size on recidivism among clients. Surveys of perpetrator program characteristics in the United States and Canada reveal that the average number of clients per intervention was 8 (N=166), that in most cases, two co-facilitators are responsible for leading these groups with the most common arrangement (approximately one-third of programs) a male-female co-leader team. In the absence of empirical data, clinical experience suggests that group cohesion and a strong client-facilitator alliance, so important for group retention and lower levels of post-treatment violence, may not be possible with large groups that impede active engagement of every client and supportive group interactions. There is

no clear number to recommend, but certainly groups with more than 8 or 10 participants make it very challenging to promote full and active participation by all group members.

Recommendations

- There is not sufficient evidence to make any conclusive recommendations
- However, in the absence of empirical data, clinical experience suggests that group cohesion and a strong client-facilitator alliance, so important for group retention and lower levels of post-treatment violence, may not be possible with large groups.

Group Format and Curriculum

A major survey on BIPs revealed that the majority were delivered via group therapy and that they incorporate a wide array of educational components, skills and techniques into their curricula. Most commonly, curriculum topics include: Effects of violence on children, Identifying power/control tactics, Identifying/managing emotions, Conflict resolution skills, Changing pro-violent/irrational thoughts, Consciousness raising about gender roles, General coping skills, General self-awareness, Socialization factors, Anger/impulse control skills, Understanding of childhood experiences, Identifying the three-phase battering cycle, Assertiveness training, Life skills, and Meditation and relaxation training. A minority offered grief work, helped clients to identify mutual abuse cycles, or provide them with skills to heal past trauma.

Outcome studies find CBT programs, which incorporate into their curriculum emotion management, communication and conflict resolutions skills, have been found to be marginally more effective than feminist/power and control models such as Duluth (Miller, Drake & Nafziger, 2013). In addition, specific curriculum topics have been identified that address known risk factors, and interventions that address them have some support in the research literature (Stewart, Flight & Slavin-Stewart, 2013).

Recommendations:

- Known risk factors should provide a basis upon which to identify and assess potential educational components.
- The following risk factors were identified along with interventions with demonstrated efficacy. 1) Stress, especially from low income and unemployment; 2) Having an aggressive personality characterized by a desire to dominate, hostility toward the opposite sex or attitudes that support violence; 3) Poor impulse control; 4) Depression; 5) Emotional insecurity; 6) Alcohol and drug abuse; 7) Having witnessed violence between one's parents as a child, or having been abused or neglected by them; and 8) Being in an unhappy or high conflict relationship.

Assessment Protocol and Instruments

The need for a thorough and sound assessment protocol, given the heterogeneity of this population, to identify individuals at risk for repeat violence, as well as any relevant targets for treatment, and then to match treatment strategies to individuals or similar groups (Andrews, Bonta, & Wormith, 2009) is noted. There exist a variety of useful instruments to assess specific areas such as physical violence, emotional abuse, motivation and readiness to change, attachment style, and motivation for violence. However, both early reviews noting the psychometric properties of IPV screening tools were insufficiently studied (Preventative Services Task Force USPSTF, 2004) and a more recent systematic evaluation of the state of violence assessment approaches used by a range of assessors (e.g. police, nurses, social workers, and psychologists)¹ concluded that there is limited evidence for the superiority of IPV-specific risk assessment over general violence risk assessment measures (Nicholls et al, 2013). These reviews suggest that there is much more work needed in this area.

Overall, the evidence from previous reviews and meta-analyses (Dutton & Kropp, 2000; Bowen et al, 2011; Hanson, Helmus, & Bourgon, 2007; Nicholls et al., 2013) is insufficient to recommend a single IPV risk assessment tool with well-established psychometric properties towards BIPs. Future studies of risk assessment should assess both the feasibility of extending assessment duties to individuals within the BIP system (e.g. parole officers, social workers, program facilitators) to investigate changes in predictive accuracy, as well as focus on the validation of novel risk assessment measures and the comparison of multiple instruments in BIP settings.

Recommendations:

- Perpetrator programs should base treatment on the results of a thorough and sound assessment protocol that:
 - (1) Identifies individuals at risk for repeat violence who pose a continuing threat to victim safety, using a reliable and validated instrument such as the ODARA, SARA or Propensity for Abusiveness Scale and, when victim contact is possible, the Danger Assessment or other validated victim questionnaire
 - (2) Identifies relevant targets for treatment, based on an understanding of known risk factors, a thorough psychosocial history and use of validated questionnaires to determine type, frequency and severity of abuse perpetrated, impact on the victim and family, motivation to change, and all personality, relationship and social factors relevant to a client's treatment progress
- Future studies should:
 - (1) Explore how predictive accuracy may vary depending on who is conducting the assessment (e.g., perpetrator program or Probation)
 - (2) Focus on the validation of novel risk assessment measures and the comparison of multiple instruments in BIP settings.

(3) Determine the validity and reliability of instruments that measure the quality of therapist-client relationships as well as group dynamics and cohesion, given the importance of these factors in predicting positive treatment outcomes.

Victim Contact

Victim contact has been considered in order to assess treatment effectiveness, to develop and revise a safety plan with the victim that accounts for the perpetrator's progress in treatment, and to connecting victims to the broader aspects of BIP programs in an effort to provide greater linkage of victims to resources and increased feelings of safety among victims by enhancing coordinated community responses. In spite of the fact that 93% of state standards require victim contact from the treatment provider during the intake assessment (Maiuro & Eberle, 2008) and that there is some evidence that victim reports provide higher rates of recidivism following BIP treatment compared to police records (Babcock, Green, & Robie, 2004), some states allow contact and some do not due to victim safety concerns. However, no studies to date have explored the impact of contact policies on victim safety. Additionally, most states (85%) with standards permitting victim contact enforce "duty to warn" guidelines for treatment providers that necessitate the contact of both victims and police when there is a threat of danger to the victim (Maiuro & Eberle, 2008), with the intention of enhancing safety compared to no-contact policies. Researchers have called for the standardization of risk assessment procedures to better assist in safety planning for victims but there is insufficient evidence at present to recommend a single assessment tool for risk assessment purposes. Given the safety concerns, programs have adopted a victim advocate approach, in which the advocate is the sole individual that may contact the victim, and agrees only to provide information to the program when it is safe for the victim to do so. Given the lack of empirical evidence, we must continue to work to find the best policies for victims in BIPs to promote safety and prevent violence.

Recommendations:

- Whenever possible, it is important to obtain information on perpetrator recidivism from the victims
- BIP programs must thoroughly ensure victim safety before seeking a victim's report on their partner's behavior
- There is a need for studies that explore the impact of contact policies on victim safety
- There is a need for outcome studies that explore the ways BIPs can best work within a coordinated community response to protect victims and lower rates of perpetration

Modality of Treatment

In spite of the tenuous empirical evidence in its support, the most commonly prescribed interventions for domestic violence occur in a group format, implemented by 97% of BIPs in the United States and Canada (Buttell et al., 2016). While the need for individual treatment is recognized to address those with special circumstances, such as serious mental health issues, some state standards go as far as prohibiting individual treatment, although 45% of BIPs offer

this modality to domestic violence perpetrators (Buttelle et al., 2016). In spite of positive evidence forthcoming from numerous quasi-experimental and experimental investigations that examined different types of conjoint interventions, including interventions based on cognitive-behavioral principles (Brannen & Rubin, 1996; O’Leary, Pan, & Neidig, 1999; Dunford, 2000), Domestic Violence Focused Couples Treatment (DVFCT; Stith, Rosen, McCollum, & Thomsen, 2004), non-aggression-focused behavioral couple therapy (Simpson, Atkins, Gattis, & Christensen, 2008), brief motivation-focused interventions (Woodin & O’Leary, 2010), and interventions based on Gottman principles such as communication, conflict management, intimacy/friendship, and creating a shared meaning (Bradley, Friend, & Gottman, 2011; Bradley & Gottman, 2012; Wray, Hoyt, & Gerstle, 2013; Adler-Baeder, Robertson, & Schramm, 2010), 68% of states prohibit the use of couples treatment of any kind either before or concurrent with a primary domestic violence intervention. In the select states that do not explicitly ban couples therapy for domestic violence, standards prohibit any couples-based intervention that advocates for an equal distribution of responsibility for violence or abuse (Maiuro & Eberle, 2008) for fear of potential negative impact on the victim.

However, there is no empirical evidence to support this assertion. To the contrary, research has yielded preliminary evidence that while recidivism is significantly reduced when couples participate in either a single-couple or multi-couple formats, the effects are greater for the latter (Stith et al., 2004). The evidence does not support one approach over another but there is empirical evidence supporting the use of couple formats especially when used judiciously and monitoring possible negative impact on the victims.

Recommendations:

- There is no empirical support for the wholesale prohibition of any particular modality
- The consensus seems to be that there are advantages to group format, such as helping the perpetrator feel understood among peers and overcome not only denial but also feelings of shame, and thus motivating him or her to stay in treatment.
- The need for individual treatment is recognized to address those with special circumstances, such as serious mental health issues, as well as for individuals who, for other reasons, would not benefit as much from group.
- There is empirical evidence supporting the use of couple formats especially when used judiciously and with monitoring of possible negative impact on the victims.

Differential Treatment

Studies have consistently shown that intimate partner violence is not a unitary phenomenon and that instead it varies with respect to the type and severity of violence as well as the characteristic of the perpetrators. Given this heterogeneity, and that not all perpetrators can be classified as batterers, it is proposed that it seems prudent, humane, and honest to have intervention programs for intimate partner aggression, with different options including type of intervention, length of the program and level of judicial monitoring. It is further argued that

given that there is no clear evidence that traditional BIPs with a Duluth based model are effective, continuing to mandate men to attend such programs presents as a questionable practice and that it is time to explore different alternatives. There is evidence to support placement of men in different intervention groups based on the severity and generality of the violence, the presence or absence of substance abuse, mental illness or personality type. Although most states have a mandate with respect to the one size fits all treatment approach, there have been some positive attempts providing interventions responsive to the aforementioned heterogeneity which have produced differential outcomes as hypothesized (Cantos & O’Leary, 2014; Cavanaugh, Solomon, & Gelles, 2011; Fruzzetti & Levensky, 2000; Kliem, Kröger, & Kosfelder, 2010; Tollefson, Webb, Shumway, Block, & Nakamura, 2009

There is need for openness to varied theoretical orientations, and some that seem worthy of more extensive evaluation include individualized treatment and motivational interviewing approaches ([Murphy, Meis & Eckhardt, 2009](#)), couple approaches (Hamel & Nichols, 2006; Salis & O’Leary, in press; Stith, McCollum & Rosen, 2011), individual approaches followed by couple approaches (Geller, 1992; Salis & O’Leary, in press; Stith, McCollum & Rosen, 2011), cultural context and family systems approaches (Almeida & Hudak, 2002), and acceptance and commitment based approaches (Zarling, Lawrence & Marchman, 2015). What follows are recommendations, some of which are quite tentative but based on the review of the literature and what we know about characteristics of perpetrators and responses to treatment. Additional research will be needed to determine what specific approach might work with what population. Citations have been included referring the reader to articles providing empirical evidence for the recommended intervention. These treatment recommendations are discussed further in Cantos & O’Leary (2014).

Recommendations:

Step 1. Determine the Type of Violence: (Kelly & Johnson, 2008)

- Male perpetrated vs female perpetrated
- Self-defense
- Mutual combat
- Controlling/Coercive Violent (Intimate terrorism)

Step 2. Determine Characteristics of Perpetrators

- Generally-violent versus family-only (Cantos, Goldstein, Brenner, O’Leary & Verborg, 2015).
- Borderline personality characteristics (generalized affect regulation problems) (Holtzworth-Munroe & Stuart (1994).
- Attachment difficulties (relationship specific affect regulation problems) (Dutton & Corvo, 2006)
- Impulse/anger control difficulties (Gondolf, 2000)
- Power and control motivation
- History of substantial head injury (Farrer, Frost, & Hedges, 2012; Howard (2012)

Step 3: Determine presence of alcohol or substance abuse, and if present refer to treatment prior to proceeding with intimate partner violence treatment

Step 4. Make Treatment Decision Based on Above

- If abuse is unilateral, refer to intimate partner perpetrator group for further evaluation
- If Controlling/Coercive Violence (Intimate Terrorism) refer to power and control group plus close monitoring by probation
- If Mutual Combat refer to couples treatment of intimate partner violence (McCullum & Stith, 2008; Simpson, Atkins, Gattis, & Christensen, 2008)
- If Substantial Head Injury, refer to head injury coping skills group
- If Unilateral Generally-Violent:
 - ✓ Casework
 - ✓ Help With Employment And Income, Basic Needs
 - ✓ Impulse Control/Anger Control Skills
 - ✓ Intensive Probation Monitoring
 - ✓ Motivational Interviewing (Scott et al. (2011)
- If Family-Only:
 - ✓ Traditional Social Learning Approach
 - ✓ Discussions on the Deleterious Consequences of the Use of Violence in Intimate Relationships
 - ✓ Anger Control Skills
 - ✓ Effective Communication Skills
 - ✓ Use of Egalitarian Conflict Resolution Skills
 - ✓ Effective Assertion Skills
 - ✓ Appropriate Expression Of Feelings
- If Unilateral Family Only with Insecure Attachment
 - ✓ Address history of affective relationships
 - ✓ Address family history i.e., relationship with parents
 - ✓ Address history of loss within intimate relationships
 - ✓ Address insecure attachment or avoidant attachment issues
- If Family-Only With Borderline Tendencies (Cavanaugh, Solomon, & Gelles, 2011; Fruzzetti & Levensky, 2000; Kliem, Kröger, & Kosfelder, 2010; Tollefson et al., 2009; Tollefson & Phillips, 2015):
 - ✓ Dialectical behavior therapy
 - ✓ Mindfulness
 - ✓ Affect regulation skills

Working with Female Perpetrators

The appropriateness of referring women arrested for perpetrating partner aggression to attend perpetrator intervention programs that in many cases were designed for male offenders (Carney

& Buttell, 2004a) has been questioned, as well as whether they should be seen in same gender or mixed gender groups. Existing evidence does not provide evidence for any contraindication for mixed gender groups. Only a few studies have quantitatively examined treatment outcomes for women in BIPs (Buttell, 2002; Carney & Buttell, 2004b, 2006; Tutty, Babins-Wagner, & Rothery, 2006, 2009; Wray, Hoyt, & Gerstle, 2013) and there have been no randomized controlled trials evaluating court-mandated treatments for female perpetrators of IPV. Across studies there are some promising effects of BIP's for women in terms of psychological variables and reductions in non-physical forms of abuse. However, we have no evidence that BIP's for court-mandated women effectively reduce their own use of physical violence toward partners. The only evidence for reduction of physical perpetration of intimate partner violence comes from interventions addressing at risk parenting with women referred for parenting issues. Acceptance and Commitment Therapy has been shown to effectively reduce aggression perpetrated by women referred from mental health clinicians.

Available studies support the similarity of aggression by women to that of men with respect to the frequency and severity as well as the reasons for aggressing. Research examining the characteristics of partner-aggressive women who have been court-mandated to attend treatment has found that psychopathology, in the form of depression, PTSD and borderline personality, among such women is common (Dowd, Leisring, & Rosenbaum, 2005; Henning, Jones, and Holdford, 2003; Stuart, Moore, Gordon, Ramsey, & Kahler, 2006). Like men, most partner-aggressive women are in bi-directionally abusive relationships (Leisring et al., 2005; Straus & Gelles, 1990; Swan & Snow, 2002, 2006). Women and men initiate both verbal and physical abuse at similar rates (Hamel et al. 2015). However, women incur more severe physical injuries from IPV compared to men (Lawrence et al., 2012). Many partner-aggressive women have also been physically or sexually abused in childhood (Dowd et al., 2005; Hamberger, 1997; Swan & Snow, 2006) or have witnessed domestic violence as children (Hamberger, 1997). It is thus recommended that services for partner aggressive women need to attend to women's victimization experiences.

In sum, while there are some indications that the treatment needs of female domestic violence offenders differ in some respects from those of their male counterparts, the similarities outweigh the differences, and the preponderance of the research evidence therefore does not support a need for entirely different standards for these two populations.

Recommendations

- Need to develop empirically-determined interventions.
- Important to address:
 - ✓ Contextual variables such as parenting issues.
 - ✓ Victimization experiences, including child abuse and victimization by adult partners.
 - ✓ Psychopathology, in the form of depression, PTSD, substance abuse disorders, and borderline personality.

- Given the similarities across gender with respect to risk factors, physical and psychological PA rates of perpetration, and motives, as well as preliminary evidence for the viability of mixed-gender groups, the use of mixed-gender or same-gender formats should be decided by an assessment of each client's needs and preferences.

Working with Perpetrators in Racial and Ethnic Minority Groups

Very little research has been carried out addressing effectiveness of either standard BIP interventions or culturally focused BIPs with African Americans, Hispanics or Asians. With respect to African American perpetrators, the conclusion from the limited research that is available seems to be that traditional BIPS are just as ineffective for all races and that culturally focused interventions may be important for those perpetrators with higher racial identification. Given that the variables alcohol abuse, use of illegal drugs, unemployment, exposure to community violence, exposure to IPV within family of origin, impoverished neighborhoods and economic distress (most significant) all appear to be risk factors for African American perpetrators of IPV (Williams, Oliver, & Pope, 2008, Schafer et al., 2004, Caetano et al., 2000; Cunradi et al., 2002), the consensus seems to be that in culturally-focused interventions, social conditions and stressors particular to the African American community should be considered and integrated into program curricula as well as religion and spirituality. Increased participation and satisfaction of Latino offenders in a culturally-focused program suggests reason for further investigation into the benefits of culturally-based curricula for Latinos. Several studies have addressed risk factors and cultural indicators of IPV in the Latino/a community. however, results should be considered inconclusive at best as the available literature presents varying and often conflicting findings (Caetano, Cunradi, Clark, & Schafer, 2000; Cunradi, Caetano, Clark, & Schafer, 1999; Hancock & Siu, 2009; Field, Caetano, 2005; Caetano, Field, Ramisetty-Mikler, & Lipsky, 2009; Cunradi, Caetano, & Schafer, 2002; Caetano, Schafer, Field, & Nelson, 2002; Cunradi, Caetano, Clark, & Schafer, 2000; Ferguson, 2011; Sugihara & Warner, 2002; Kim-Goodwin & Fox, 2009; Duke & Cunradi, 2011). It has been argued that culturally based interventions are important for Latinos because Latino male perpetrators were not accepting of the conventional model's association between patriarchy and male oppression and that enforcement of traditional gender roles is magnified as a coping mechanism during the immigration process, Much less is known about Asians and Native Americans.

Recommendations

- Culturally-focused interventions may be important for African Americans with higher racial identification.
- There is a consensus that in culturally-focused interventions, social conditions and stressors particular to ethnic minority communities should be considered and integrated into program curricula, as well as religion and spirituality.
- Culturally focused interventions appear important for Latinos especially for those who have experienced immigration.

- There is a need to understand more about IPV in Asian and Native American communities to support recommendations about culturally-focused interventions.

Working with LGBT Perpetrators

There is very limited information available on IPV in LGBT offenders. It is argued that conceptualization of IPV in state standards as an expression of patriarchy through men's use of violence to dominate and control their female intimate partners has preempted the study of IPV in LGBT populations. To date, no empirical studies have been conducted on treatment outcomes for LGBT offenders. IPV in LGBT relationships has not been thoroughly studied or analyzed, which reveals its actual status as marginalized in research, policy, and treatment of IPV in spite of recent research estimates stating IPV is experienced by same-sex partners at similar or slightly higher rates as heterosexual couples. This lack of attention is even more acute in "trans" identified people's relationships since the latest NIPSV survey does not even ask about this population. The lack of empirical studies of LGBT offenders means a fundamental lack of understanding about this problem, its triggers and possible ameliorating factors. The very limited available literature suggests that treatment providers must be knowledgeable about sexual minority subgroup issues in order to treat LGBT clients effectively (Coleman, 2002; Istar, 1996) such as being knowledgeable of the unique identities, forms of abuse specific to LGBT people (e.g., threatening to reveal a partner's sexual orientation), and impacts of homophobia and heteronormativity.

Recommendations

- Substantially more data should be collected on the characteristics and needs of LGBT populations (especially trans).
- Empirical research on treatment approaches for LGBT offenders also needs to be carried out
- Alternative theoretical models in addition to the feminist paradigm should be created in order to better understand and frame the problem of IPV in LGBT communities
- BIPs ought to develop and utilize culturally relevant curricula in their treatment of LGBT offenders such as addressing forms of abuses specific to LGBT people and impacts of homophobia and heteronormativity.

Perpetrator Treatment and Practitioner-Client Relationships

A small number of studies in the probation criminal justice field (e.g. Keneally, Skeem, Manchak, & Eno Lauden, 2012; Paparozzi, & Gendreau, 2005; Polaschek, & Ross, 2010) support the notion that the dual role of support person and control agent can be balanced; firm and authoritative but still fair and respectful. The intimate partner violence literature indicates that the facilitator and offender relationship is a key component required for reduced recidivism, and when facilitators take a more active role through continuous assessment, they can readily identify clients who are not progressing in treatment and can intervene and assess why the client

is not improving before the client terminates prematurely (Reese, Norsworthy, & Rowlands, 2009). Facilitative and supportive relationship roles, goal specificity and goal agreement between the facilitator and client focused on strengths and solutions have been shown to facilitate change, to impact the client's experience in feeling cared about, seeing a way forward, valuing themselves, and building up trust, willingness to continue in the program and demonstrated recidivism reduction.

Among the more promising findings have been for psychoeducational programs that incorporate a Motivational Interviewing (MI) component. MI significantly predicts increased motivation and responsibility-taking among partner-violent men, as well as a stronger client-facilitator alliance and lower recidivism rates (Mbilinyi et al., 2011; Musser et al., 2008; Woodin & O'Leary, 2010). MI techniques also have been significantly correlated with group cohesion, which in turn is correlated with increased motivation as well as reduced rates of recidivism (Alexander, Morris, Tracy & Frye, 2010; Taft et al., 2003).

Recommendations

- It is important for facilitators to develop a client-centered approach
- Facilitators should take an active role in providing effective treatment, based on client needs, through continuous assessment
- Facilitators should adopt facilitative and supportive relationship roles
- Facilitators should help clients develop specific change goals that are agreeable to both the facilitator and client; change goals should focus on strengths and solutions.

Motivational interviewing is likely to be very helpful in these efforts

Required Group Facilitator Education and Training

A recent survey national survey of BIPs provided evidence that a large majority of facilitators (about 90%) have at least a Bachelor's degree, that on average, they have 8 years of experience conducting perpetrator groups, obtain 30 hours of training annually and that in some respects are ill-informed about domestic violence. There are still no national standards for providers at any level from domestic violence advocates to those working in BIPs, to clinicians with the required hours of training in most states being at an alarmingly low level. Training programs are often defined as 'education' and not 'treatment' thereby not requiring a clinical or professional degree. It is proposed that If BIPs are to become more effective, then perpetrator interventions must be based on good evidence and accurate information. Recent studies call into question Gondolf's (2012) assumption that BIPs should be guided in their work by battered women's advocates since a review of the fact sheets available on 338 websites of the National Coalition Against Domestic Violence (NCADV), state affiliates and associated advocacy organizations revealed that much of the data reported was inaccurate (Hines, 2014), and a study measuring basic knowledge on IPV, administered online and face-to-face at a major family violence conference to 410 family court professionals, victim advocates and college students revealed that respondents answered less than a third of the items correctly (Hamel et al., 2009). Obtaining

accurate facts on domestic violence, or finding good evidence-based trainings, is certainly a challenge for practitioners.

There is also a lack of information on supervision and consultation for BIP treatment. A focus on specific education and training with respect to supervision and consultation is all but absent in the literature in spite of the fact that supervision and consultation are critical pieces in the management of batterer programming and central to responsible and ethical practice. The growth in the field of cross training, the notion of turning to other disciplines in the field in collaboration with the idea of learning how each other integrates and develop concepts, and create knowledge environments, as well as the use of on-line training are proposed as possible partial solutions to address the knowledge gaps and lack of educational resources in the field.

Recommendations

- Facilitators should be licensed mental health professionals, or have at a minimum a bachelor's degree in psychology or related field and be under the direct supervision of a mental health professional.
- Before working with perpetrators, facilitators should first obtain a minimum 40 hours of classroom training, including:
 - ✓ 16 hours on basic IPV knowledge, including empirical information on types and prevalence rates of IPV, contextual factors, motivation, relational dynamics, risk factors and impact on victims and families
 - ✓ 4 hours on the characteristics and efficacy of perpetrator intervention, including BIPs
 - ✓ 4 hours on the role of BIPs in the community-coordinated response to domestic violence
 - ✓ 8 hours on assessment and treatment planning
 - ✓ 8 hours on conducting treatment in the psychoeducational group format
- Facilitators should be familiar with the heterogeneity of both intimate partner violence and characteristics of perpetrators, and have exposure to different models accounting for the development and maintenance of intimate partner violence.
- Facilitators should be trained in all relevant evidence-based assessment and treatment models and approaches
- Practitioners who work with perpetrators within the modalities of individual, couples and family therapy should obtain a minimum of 16 additional classroom training hours in those modalities, and be licensed mental health professional or registered interns under supervision by a mental health professional.
- Others with a minimum bachelor's degree in psychology or related field and under the direct supervision of a mental health professional may work within a group format, provided that it is a psychoeducational rather than a therapeutic or process group.
- Training materials/information should be based on the most reliable and current scholarly research, such as the Partner Abuse State of Knowledge literature reviews

(www.domesticviolencerearch.org), or other resources that may become available in the future.

- Trainees should be expected to demonstrate mastery of relevant training material – for example, as demonstrated through completion of a test of this knowledge.
- Following classroom training, practitioners should complete hands-on training as they provide therapy or conduct groups with IPV perpetrators for a time period that is sufficient to develop skills for independent practice, typically a minimum of 1 year, or the time period required to do 52 client sessions, under the supervision of a Certified IPV Practitioner:
 - ✓ 1 hour weekly supervision, or 2 hours if practitioner is working with 3 or more therapy clients or groups
 - ✓ Supervision of non-therapists to take place during group sessions/or observed through one-way mirror, for 24 weeks
 - ✓ Supervision of therapist interns must take place in group sessions/or observed through one-way mirror for 12 weeks
 - ✓ Supervision of licensed therapists can be done outside the therapy office/group room
- Requirements for Trainers:
 - ✓ Be a licensed mental health professional with at least an MA level degree in the social sciences
 - ✓ Have worked in the field of IPV for a minimum of 10 years, with at least 4 years of direct experience working with IPV perpetrators.
 - ✓ Be a Certified IPV Practitioner, having successfully completed the 40-hour minimum classroom training and the hands-on 52-week supervised training.

Limitations and Suggestions for Future Research

This integrative review highlights numerous areas in need of experimental studies to examine the potential impact of variations in program structure and approach. Examples of structural program considerations include variations in the length of treatment, duration of sessions, format (e.g., group versus individual), facilitator education and training, and facilitator arrangements (e.g., single versus dual facilitators; same versus opposite gender pairs). There is an even longer list of variations in program philosophies and practices in need of further research. Examples include the use of supportive versus confrontational approaches, skills-oriented versus process-oriented groups, and many potential variations in the focus and content of change, such as mindfulness, emotion regulation, attachment anxiety, anger management, assertiveness, communication skills, etc. Additional considerations include the hypothesis that different subgroups of IPV offenders will respond more favorably to different intervention approaches. Finally, pressing questions remain about the nature, timing, and need for treatment to address a myriad of comorbid difficulties that include alcohol abuse, other drug abuse, depression, unemployment, personality dysfunction, and post-traumatic reactions.

In addition to the need for a greater evidence base examining the impact of different program structures and approaches, the review identifies significant gaps in research on diverse samples and populations. Taking gender as one example, none of the 30 controlled studies of IPV perpetrator interventions identified in a recent state of knowledge review had any female perpetrators in their samples. LGBTQ populations are likewise seriously under-represented in existing IPV intervention research. The review also reveals a substantial need for research on program adaptations and culturally-focused interventions within the U.S. for Native Americans, African Americans, and Hispanic Americans, as well as a variety of immigrant populations. Context will be crucially important in these efforts, including variations in socioeconomic conditions and in the challenges faced by urban, suburban, and rural populations. Unfortunately, funding for IPV intervention research appears to be shrinking, and enthusiasm for this area of research among policy makers and other key stakeholders may be waning. In light of these considerations, it is crucially important to prioritize specific research questions and approaches from among the myriad of possible research questions highlighted in this review. Toward that end, the following suggestions highlight several key areas for empirical research that may guide the further development of best practices and practice guidelines for IPV intervention.

Models that integrate risk assessment and risk management with IPV intervention. As noted earlier in the review, virtually all efficacy research on IPV interventions has relied on “one-size-fits-all” models that pay little or no attention to individual risk patterns and needs (Eckhardt et al., 2013). In contrast, Andrews and Bonta’s (2010) Risk-Need-Responsivity (RNR) model is both a highly influential and empirically-sound approach to psychosocial intervention with criminal offenders. This model maintains that successful interventions must be responsive to the specific risk profile and criminogenic needs of the individual offender. An extensive body of research supports the efficacy of intervention approaches that rely on RNR principles for other populations of criminal offenders (e.g., Andrews & Bonta 2010). Nevertheless, no studies to date have examined the efficacy of IPV interventions that are responsive to the specific risk profiles of IPV offenders, despite the availability of forensic tools, such as the SARA (Kropp et al., 2008), which was developed to help guide risk management and intervention planning for this population.

One notable example is the Colorado standards for IPV intervention, which require IPV intervention staff to work together on a multi-disciplinary team with victim advocates and legal system representatives. The multi-disciplinary team assesses the presence of 14 IPV risk factors, uses the risk data to place each offender into low, medium, or high risk categories, and develops an individualized service plan for each case. Differential intervention is provided, with low risk cases receiving standard weekly group intervention and high risk cases receiving a minimum of two clinical contacts per week (Gover, Richards & Tomsich, 2015). An initial process evaluation identified some implementation challenges, including the fact that very few cases (about 10%) were categorized as low risk, and the fact that high risk cases were very unlikely to successfully complete IPV intervention (Gover et al., 2015). Despite these challenges, the Colorado approach

represents a unique effort to coordinate IPV intervention using an RNR framework designed to provide monitoring and intervention services that are matched to client risk profiles.

In light of the extensive body of research on other populations of criminal offenders, and the extensive literature (much of which is reviewed above) on risk factors for IPV recidivism, it should be a high priority to determine whether approaches that tailor the intensity and focus of IPV intervention to the specific risk profiles of individual offenders can enhance safety and violence reduction relative to standard approaches currently in widespread use.

Does one size fit most? Interventions for low-risk offenders. As noted previously in the section on differential treatment, there is some research evidence suggesting that some treatment approaches may be more effective than others, depending on the characteristics of the perpetrator and type of violence. However, it was also acknowledged that the treatment guidelines are tentative, and that much more research is needed. Furthermore, this review has found that the majority of participants in IPV treatment (typically 60-70%) do not generate victim-partner reports of recidivist violence within a 1-2 year follow-up period. The experience of being detected as an IPV perpetrator, subject to legal sanctions, monitored, and exposed to counseling appears to be a sufficient intervention to bring about violence cessation for the majority of IPV offenders. These findings suggest that a “one-size-fits-most” approach involving a coordinated community response has significant merit. Further, correlational evidence indicates that exposure to more elements of the coordinated community response system (including arrest, effective prosecution, probation monitoring, and IPV counseling) is associated with lower IPV recidivism (Murphy et al., 1997). These findings may be useful for public policy even if the effects of IPV treatment within the coordinated community response have not been precisely isolated and may vary across populations and contexts.

Given: a) the tendency to isolate specific risk variables for IPV recidivism using quantitative prediction models (such as linear regression); b) the relative absence of empirically-based cutoffs for risk prediction with this population; and c) the limited amount of research on patterns of correlated risk variables, it is not surprising that we know very little about the risk profiles of the majority of offenders who do not engage in recidivist IPV. For example, do such individuals possess some, few, or none of the common risk factors for IPV recidivism? Also, assuming that specific variables are predictive of IPV recidivism across populations and contexts, do the same levels or scores on these variables convey similar risk, or are different cutoffs needed to detect low and high risk cases in different contexts?

Many recidivism risk factors are linked to poor general impulse control, reflected in problems such as anger dysregulation (Birkley & Eckhardt, 2015; Murphy, Eckhardt & Taft, 2007) and head injury (Akerele, Williams, & Murphy, under review), or to poor situational impulse control, reflected in factors such as acute alcohol intoxication (Jones & Gondolf, 2001). Under the assumption that low risk individuals tend not to possess as many of these characteristics, we can speculate that they have more intact self-regulation mechanisms, and are therefore likely to end their use of physical IPV in response to a various elements of the standard community intervention system. While group is currently the more commonly prescribed format, couples

counseling is allowed in some states, and has been proven effective with this low-risk offender population.

Existing interventions may also be well-matched to the needs of these low-risk offenders, provided that they incorporate some of the basic, empirically-supported research findings discussed in this review. For example, weekly group psychoeducation to enhance relationship skills and reduce coercive and controlling behavior may be a good fit for individuals who do not have significant complicating problems such as substance dependence or intense emotion dysregulation – particularly if those groups are facilitated by clinicians who are capable of fostering a strong therapist-client alliance and can maintain a cohesive and productive group experience. Establishing a strong facilitator-client alliance requires that facilitators employ a flexible treatment approach in order to address, as much as possible, the individual treatment needs of their clients. This can be achieved even when working with a set curriculum, provided that a thorough assessment is conducted, personal goals are established for each client, and provisions are made for referring clients to adjunct therapeutic services (see: Hamel, 2016). When conducted in this way, “one-size-fits-most” is, in effect, much closer to the differential treatment suggestions previously discussed. For example, batterer intervention clients at one Northern California program (Hamel, 2014) are required to complete an initial assessment consisting of validated instruments that include the Conflict Tactics Scales, the Controlling and Abusive Tactics Questionnaire, the Safe at Home Questionnaire, and the Experiences in Close Relationships Questionnaire, to measure, respectively, each client’s history of physical aggression, emotional abuse and controlling behaviors, readiness to change, and attachment style (Hamel, 2014):

The group facilitator reviews these following the initial session and gives the client feedback about the results in the second session, either in front of the whole group, or in a private meeting after group, depending on client preference. Clients are asked to enter their scores in the “My Profile” section of their workbooks (see Appendix C), and urged to use those scores to set their own goals for treatment. They are told that they will be re-administered some of these instruments prior to their final exit interview at program Completion. We believe that this process is in keeping with research-based MI principles and good evidence-based practice (Shlonsky & Gibbs, 2004), in providing each client special attention and enhancing the facilitator-client alliance. An internal review of BIP clients enrolled in our various San Francisco Bay area locations between 2009 and 2013 found an overall increase in client functioning, based on a comparison of pre- and post-program scores, in self-perceived higher levels of motivation to accept responsibility for their behaviors, ability to better manage anger and resolve interpersonal conflicts peacefully, and lessened use of emotional abuse and control tactics (p. 122)

It is also quite probable that subtle variations in program structure or approach will have limited impact on individuals who have intact self-control and are motivated to avoid further legal sanctions or negative personal consequences from continued violence. The idea that “one-size-fits-most” leads to several important research priorities. One is to develop procedures that can

accurately detect individuals who are at low risk for IPV recidivism. Ideally, such assessments should be user-friendly to support adoption by program practitioners with the levels of training and experience recommended earlier in this review. Second, it will be important to identify the duration and intensity of intervention that is sufficient to promote and maintain violence cessation for low-risk cases. There may be ways to accomplish this goal without the need for a lengthy series of experimental trials to compare different program lengths, for example through analyzing outcome data from existing programs that vary in length or intensity to look for the point(s) of diminishing returns for continued intervention. The tendency in the field to date, as reflected for example in the 52 week requirement in California IPV program standards, has been to assume that if a reasonable amount of intervention is not effective for everyone, then everyone should receive more of the same. This assumption is problematic on many levels, including the idea that everyone needs more intervention and the idea that something that is not working in a lower dose will be effective in a higher dose.

Finally, it will be important to formulate a reasonable set of intervention strategies that are sufficient to promote violence cessation for low risk offenders. This may be accomplished in a number of ways, including the use of qualitative and client-satisfaction studies to elicit subjective appraisals of helpful and unhelpful intervention methods among successful outcome cases and by looking for empirical examples suggesting unfavorable outcomes or potentially dangerous intervention practices within existing intervention and evaluation studies.

New approaches to high risk offenders. The prognosis for high-risk offenders contrasts starkly with that of low risk offenders. Available evidence, reviewed above, indicates that a small proportion of IPV treatment cases accounts for a great majority of recidivist violence incidents. It is not clear that any intervention approach has had a significant benefit in reducing violence for this subpopulation of offenders. This latter point relies on some assumptions about treatment for non-responders. Studies using a variety of treatment approaches and formats have produced similar findings in which a modest proportion of cases have very poor outcomes involving frequent and/or severe IPV recidivism. It remains possible that these poor outcome cases reflect different subgroups of offenders in different studies or different intervention conditions. However, this seems unlikely given that there are a number of risk factors that consistently predict poor treatment outcome across different interventions.

Therefore, the most likely conclusion is that existing IPV treatments are not having their intended effects on these high risk cases. Existing interventions may be insufficiently intense to promote violence cessation for these individuals, insufficiently responsive to their specific risk profiles and needs, or somehow misguided in their approach to high risk cases. There is a pressing need for research to develop straightforward and practical assessment strategies that can accurately detect individuals at high risk for IPV recidivism, to examine monitoring and case management strategies that can reduce acute or imminent risk for repeat violence, and to test intervention strategies that are sensitive to the specific needs of high risk cases. Obviously, no intervention will be successful with everyone, and it is important to have realistic expectations, particularly for individuals with long histories of criminal involvement and antisocial behavior.

However, the literature to date contains very few examples of efforts to develop and test interventions specifically targeting the subpopulations of IPV offenders who present the highest risk for recidivist violence.

Two encouraging recent trends suggest that the field is moving in the direction of targeting key risk factors for IPV recidivism. One trend involves the use of intervention approaches focused on enhancement of emotional and behavioral self-regulation. A recent study demonstrating the efficacy of Acceptance and Commitment Therapy for intimate partner violence relative to an attention placebo control condition is an excellent example of this trend (Zarling et al., 2015). Notably, their study showed that reductions in abusive behavior associated with ACT were, in part, explained by reductions in emotional dysregulation and experiential avoidance. As noted earlier, however, their study had a somewhat unusual sample for IPV intervention research, being majority female, voluntarily referred, and help-seeking within a mental health context. Thus, the extent to which their sample represented cases at high risk for recidivism remains unclear.

A second trend involves efforts to target substance use problems, most notably alcohol dependence, in the context of IPV intervention. Longitudinal studies have isolated alcohol abuse as a very strong risk marker for recidivism (e.g., Jones & Gondolf, 2001). A recent study by Stuart and colleagues (2013) provides a nice example of this trend. They identified IPV offenders in community treatments with problematic drinking patterns and randomized them to receive either treatment-as-usual or a brief (90-minute) intervention consisting of structured assessment feedback about their drinking and motivational interviewing to stimulate change. Despite the very brief (and relatively low-cost) nature of the intervention, those who received the alcohol treatment displayed lower rates of drinking and partner violence over the subsequent 6 months. However, significant benefits were not sustained through a 12 month follow-up. These findings are encouraging for identifying and addressing problem drinking as a key risk factor for IPV recidivism, but also suggest a need for more extensive and intensive approaches in concert with IPV intervention.

Trauma-informed treatment. Many of the individuals in the severe subtypes of IPV offenders (e.g., dysphoric / borderline and generally violent / antisocial groups) have significant histories of trauma. Adverse childhood experiences, most notably experiencing child abuse or witnessing inter-adult aggression in the home, have been linked to IPV perpetration through an extensive body of research. Traditional explanations emphasize social learning of violence through childhood exposure. However, an emerging literature re-casts these childhood experiences as traumatic stress exposures. Using broader assessments of traumatic stress, clinical studies indicate that 75-90% of male IPV perpetrators report exposure to one or more event that would meet DSM definition of trauma exposure (Criterion A for the diagnosis of PTSD) (Hoyt, Wray, Wiggins, Gerstle & Maclean, 2012; Maguire et al., 2015; Semiatin, Torres, LaMotte, Portnoy & Murphy, in press). In addition, military veterans with PTSD have rates of partner violence that are about 3 times higher than the rates observed among veterans without PTSD (Taft, Watkins, Stafford, Street & Monson, 2011). PTSD symptoms in IPV offenders are

associated with greater extent and severity of abuse perpetration, greater relationship dysfunction, more generalized violence, and greater problems with alcohol and other drugs (Semiatin et al., in press).

These findings highlight the need for intervention approaches that are sensitive to the potential effects of traumatic stress among IPV perpetrators (Taft, Creech & Murphy, in press). Toward this end, a recent trial conducted within two VA hospitals randomized 135 U.S. military veterans to receive either enhanced VA care as usual in a wait-list control group or a 12-session, trauma-informed group CBT intervention called Strength at Home (Taft, MacDonald, Creech, Monson & Murphy, in press). About half of the sample had diagnosable levels of PTSD, and all reported some form of trauma exposure. The results demonstrated significantly greater reductions in physical and emotional abuse for veterans who received the Strength at Home program. These encouraging initial findings highlight the need for more research to examine the impact of trauma-informed and trauma-focused treatments for IPV within community settings.

Qualitative analyses of treatment non-responders and recidivist violent incidents. In order to develop more effective IPV interventions, we may need a fuller and richer understanding of the missing and misguided elements of existing approaches. Large-scale quantitative prediction studies have been very useful in understanding risk factors for violence recidivism. However, we know relatively little from an “insider’s” perspective about this process. For example, it would be helpful to know how recidivist offenders experienced the IPV intervention program, and whether some elements or aspects of these programs are alienating to these individuals. Likewise, it would be interesting to determine what goes wrong for offenders who are engaged and active participants in IPV services yet have significant repeat violence. It is possible that in-depth analysis of recidivism and specific instances of recidivism may provide additional guidance for program enhancements.

Strategies to increase voluntary referrals and forms of help-seeking that do not rely exclusively on the criminal justice system. It is a great thing that police, prosecutors, and probation agents take intimate partner violence much more seriously than they did 40 years ago and that IPV is widely treated as criminal behavior rather than a private matter between lovers. Despite the significant social changes were hard fought by activists in the shelter and battered women’s movement, the struggle for social justice for survivors of partner violence is far from over. The use of court-mandated intervention services for perpetrators of IPV will likely remain an important alternative for many reasons, including the desire to minimize the negative effects of incarceration on families.

Nevertheless, there is a tremendous need to develop sustainable systems of care for both survivors and perpetrators of intimate violence that are not fully reliant on the criminal justice system. . Currently, many states with mandatory arrest and no-drop prosecution policies (such as California), do not allow for a diversion option, by which first-time, lower-level offenders can be persuaded to enter treatment in lieu of a criminal conviction. Results of a large survey of U.S. IPV intervention programs found that the average program receives 89% of their referrals from the court, and about half of all programs receive more than 95% of referrals that way (Price &

Rosenbaum, 2009). There is simply no socially acceptable process for individuals who have engaged in partner violence to ask for help. The development of a system of care for IPV perpetrators who are not yet court-involved might require important innovations, and significant research. There is a need for extensive social messaging, not merely to show that violence is wrong, but to raise public awareness that it is OK to ask for help. Similarly, although there have been dozens (perhaps hundreds) of studies examining IPV screening for victims within health care settings, there is virtually no research on IPV screening for perpetration. One possible reason is that doctors and nurses prefer a clear process by which to refer individuals who screen positive for perpetrating violence. Another may be that health professionals need proper training to be comfortable with this type of conversation. In addition to general medicine, extensive data highlight the need for better service referrals or service provision within specialty care for individuals with conditions that are linked to increased risk for IPV, including substance dependence, PTSD, and mood disorders.

Although these points may seem only tangentially relevant to the development of model standards for IPV intervention with court-mandated populations, one potentially important topic for further research involves the value of having both voluntary and court-referred participants receiving services together. Self-referred cases tend to report higher motivation to change at the outset of treatment, and tend to be more forthcoming on initial assessments (Rosenbaum et al., 2001). It is possible that a better balance of self- and court-referred cases may produce a more constructive atmosphere in treatment groups. As noted earlier, the use of clinical strategies designed to motivate change and resolve ambivalence about the need for change appear to increase the efficacy of standard IPV interventions by enhancing engagement into the active elements of treatment. We also need concerted and sustained research efforts to devise effective strategies to establish referrals from individuals who have not yet become involved with the court system.

Characteristics of Domestic Violence Offenders: Associations with Childhood Exposure to Violence

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Abstract Many women are abused by intimate partners, millions of children witness such acts, and many of these children are physically abused. Children who are exposed to violence often evidence difficulties, including violent behavior, as adults. One hypothesized mode of intergenerational transmission is modeling. There is evidence that witnessing and/or experiencing violence are related to different patterns of abusive behavior and, perhaps, psychopathology, but the extent of the relationship is unclear. This study examined differences in generality, frequency, and severity of violent offenses, nonviolent criminal behavior, and psychopathology within a battering population of 1,099 adult males with varying levels of exposure to violence as children. Generality, frequency, and severity of violence and psychopathology all increased as level of childhood exposure to violence increased. Modeling theory was supported by the findings that men who witnessed domestic violence as children committed the most frequent domestic violence, and men who were abused as children were more likely to abuse children. Men who were abused also committed more general violence.

Keywords Domestic violence · Offenders · Modeling

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Prevalence of Family Violence in the United States

Fortunately, there has been a recent steep decline in intimate partner violence. Even so, there are approximately 700,000 violent crimes, including about 1,700 murders, committed by intimate partners in the United States each year (U.S. Department of Justice 1996, 2000a). Domestic violence is the leading cause of injury to women aged 15 to 44 (U.S. Department of Justice 1996), and it accounts for about one-third of the total number of murders of women in this country (U.S. Department of Justice 2000a). Approximately half of all victimized women live in a home with children under the age of 12 (U.S. Department of Justice 2000a), and an estimated 3.3 million children are exposed to violence against their mothers or female caretakers each year (American Psychological Association [APA] 1996; Jaffe et al. 1990).

About half of all men who abuse women also abuse their children or other children who live in their homes (APA 1996; Appel and Holden 1998; Straus and Gelles 1990). Children who live in homes where domestic violence occurs are 1,500 times more likely to be abused than those who live in homes without violence (U.S. Department of Justice 1993). The physical abuse of children is a component of family violence that is all too common in the United States: It is estimated that somewhere between a little less than 1% (U.S. Department of Justice 1998) and just over 5% of all children in this country experience physical abuse (Gallup 1995).

Outcomes Associated with Family Violence

A variety of short- and long-term negative outcomes have been associated with experiencing physical abuse as a child. In general, abused children seem to have behavioral, emotional, and social problems (see review by Malinosky-Rummell and Hansen 1993). Researchers commonly find

that, as adults, abused children mature and display violence toward nonfamilial others (e.g., McCord 1983; Rosenbaum and Bennett 1986) as well as toward their children and intimate partners (e.g., Kempe et al. 1962; Straus et al. 1980; Widom 1989).

Like direct experiencing of physical abuse as a child, witnessing of interparental (or a parent and his/her intimate partner) abuse as a child or adolescent has been linked to a number of negative outcomes, including aggressive and delinquent behaviors (Fantuzzo et al. 1991; Graham-Bermann and Levendosky 1998; Hershorn and Rosenbaum 1985), developmental and academic deficits (Pfouts et al. 1982), depression, anxiety, lower self-esteem, and somatic symptoms (Fantuzzo et al. 1991; Graham-Bermann and Levendosky 1998; Spaccarelli et al. 1994). The consequences of witnessing also appear to continue into adulthood, and long-term effects include depression, trauma, antisocial behaviors, substance use, general violence, and partner violence (Downs et al. 1996; Ehrensaft et al. 2003; Henning et al. 1997; Widom 1989).

Theory of Intergenerational Transmission of Violence

Many researchers have reported a link between violent childhood experiences (including witnessing domestic violence and/or being physically abused) and violent adult offenses, and this phenomenon is frequently called the intergenerational transmission of violence or aggression (e.g., Dutton et al. 1995; Jankowski et al. 1999; Sugarman and Hotaling 1989). One often-hypothesized mechanism of such transmission is observational learning (e.g., Grych and Fincham 1990; Holtzworth-Munroe and Stuart 1994; Jaffe et al. 1990), most commonly described as learning from modeling with a social learning perspective (Bandura 1973, 1977). Social learning theory suggests that a child learns not only how to commit violence but also learns positive attitudes about violence when he (or she) sees it rewarded (Dutton and Holtzworth-Munroe 1997; Kalmuss 1984). This suggests that children who have witnessed violence, or have been abused, learn destructive conflict resolution and communication patterns. Sternberg et al. (1997) suggest that Bandura's social learning theory would predict that both observers and victims can be affected, with children from more violent environments being more likely to acquire aggressive modes of behavior.

There is a large body of evidence suggesting that social learning theory can account for violent behavior in general (e.g., Bandura et al. 1963; Ellis and Sekyra 1972; Plomin et al. 1981). Further, a few more recent tests of the social learning model have found evidence that family violence is learned, particularly through modeling (Kwong et al. 2003; Gwartney-Gibbs et al. 1987; Lystad 1986; Mihalic and

Elliot 1997). Kalmuss (1984) proposed that the intergenerational transmission of family aggression involves both generalized and specific modeling: Generalized modeling refers to the acceptance of aggression within families, while specific modeling refers to the perpetration of particular types of aggression the individual was exposed to within the family of origin. In theory, families with high levels of aggression produce both generalized and specific forms of modeling. Children from homes where multiple forms of violence or severe violence occur are exposed to more modeling, which increases the probability that violence is learned and perpetrated (Kalmuss 1984). However, evidence of the future effects associated with specific modeling is mixed (Kwong et al. 2003; Stith et al. 2000).

There is some evidence that different types of childhood traumas are related to different patterns of abusive behavior in violent men. Dutton and Hart (1992) found that offenders who had been physically abused as children were more likely to commit crimes of physical aggression than sexual crimes. These researchers also found that men who commit family violence are more likely to report violence in their family of origin than men who commit nonviolent crimes and men who commit violent crimes against strangers (Dutton and Hart 1992). Numerous studies have found that adults who abuse their children are more likely to have been abused than the general population (e.g., Silver et al. 1969; Straus et al. 1980). It may be the case that individuals who were abused are more likely to abuse their children than individuals who witnessed violence, but were not themselves victims (Kalmuss 1984). There is some evidence that adults who witnessed violence, but were not themselves abused, are more likely to perpetrate domestic violence than those who were abused but did not witness violence as children. However, there is also evidence that adults are most likely to perpetrate domestic violence if they were both physically abused and witnessed domestic violence as children (Downs et al. 1996; Holtzworth-Munroe et al. 1997; Kalmuss 1984; Widom 1989), and some researchers have found no role-specific patterns of violence (Kwong et al. 2003). Family violence appears to be learned, although the roles of generalized and specific modeling are unclear. Given that most perpetrators are male, it is important to study how learned violence affects men.

Differences in Forms of Violence and Perpetrators

Previous studies looking at male perpetrators of domestic violence have found they are not alike with respect to severity and frequency of violence or levels of psychopathology (e.g., Hamberger and Hastings 1986; Holtzworth-Munroe and Stuart 1994). The most violent perpetrators are most likely to have been physically abused and witnessed

domestic violence as children and also be violent outside of the home. These men report moderate levels of anger and often have antisocial personality traits. Less violent batterers are less likely to have experienced violence (either as a witness or victim) as a child and do not tend to show evidence of high levels of general violence or psychopathology (Holtzworth-Munroe and Stuart 1994; Waltz et al. 2000).

Domestic violence offenders do not often evidence severe mental disorders (Saunders 1999). However, they do often meet criteria for personality disorders, most commonly Antisocial, Borderline, Dependent, Depressed, and Narcissistic (Hamberger and Hastings 1986; Hamberger et al. 1996; Waltz et al. 2000). Generally, domestic violence perpetrators evidence more mood and psychotic disorders than nonviolent men (Hamberger and Hastings 1988), but there are differing degrees and patterns of psychopathology and offenses committed within the battering population.

Many previous studies (e.g., Hamberger and Hastings 1986; Holtzworth-Munroe and Stuart 1994; Tweed and Dutton 1998) have examined differences among domestic violence offenders. Yet, to date there is no research that clearly distinguishes offenders who were witnesses of violence from those who were abused as children. It appears from the social learning literature and previous work on family violence that differences between the groups exist, but the extent to which exposure relates to offense and psychopathology is still unclear. This study examined whether there are differences between perpetrators of domestic violence who, during childhood, witnessed domestic violence, were physically abused, neither witnessed nor were abused, or both witnessed and were abused.

Method

Participants

A sample of 1,099 male batterers (85% African-American, 14% Caucasian, and 1% another race or unreported), who ranged in age from 18 to 65 (with a mean age of 32), participated in this study. The sample represented the population of males arrested for battering in the area and is comparable in terms of age (national mean age is 31) but not race (national racial mix is more evenly balanced) of the perpetrator to national statistics. All participants had been court ordered between 1998 and 2002 for assessment at a domestic violence center in a Southern metropolitan city (see Table 1 for a summary of participant characteristics).

Measures

Measures used in this study were selected to assess three areas of theoretical interest: (a) generality of violence and

Table 1 Demographic characteristics of groups

	Sample size			
	Neither	Witnessed	Abused	Both
Race				
African-American	433	76	262	166
Caucasian	80	7	33	30
Other	3	1	5	2
Age				
18–25	150	29	73	52
26–40	274	43	165	106
41–60	90	12	58	40
60 or older	1	–	3	–

There were three missing cases

nonviolent criminal behavior, (b) frequency and severity of domestic violence, and (c) psychopathology as evidenced by personality attributes. Specific items from the assessment protocol that were relevant to each of these areas were included as variables for analyses.

Generality of Violence and Nonviolent Criminal Behavior

The extent to which violent behavior generalized from intimate partner violence to other forms of criminal violence and nonviolent criminal behavior was assessed in two ways: (a) via two ratings based on police reports and (b) via the abuse scale score of the Child Abuse Potential Inventory (CAP; Milner 1986). Ratings were assigned by the domestic violence center interviewer on a three-point scale, with 0 indicating no prior arrest, 1 indicating one minor prior arrest, and 2 indicating one severe or two or more prior arrests, for non-intimate partner violence and for nonviolent charges, respectively.

The CAP score was used to assess generalization of intimate partner violence to the tendency to physically abuse children.

Frequency and Severity of Domestic Violence

Frequency and severity of domestic violence were assessed via selected items from a questionnaire designed for use at the domestic violence center. It is composed of items from the physical abuse (violence) section of the Conflict Tactics Scales (Straus 1979).

To measure physical spouse abuse, the following items' ratings were summed: 1) threw something, 2) pushed, grabbed, or shoved, 3) slapped, 4) kicked, bit, or hit, 5) hit or tried to hit with something, 6) beat up, 7) choked, 8) threatened with a gun or knife, and 9) used a gun or knife. To assess severity, as previously done in the CTS literature (Straus and Gelles 1990), the ratings for items 5 through 9 were summed.

Psychopathology of the Offender

Five personality scales of the Millon (MCMI-III; Millon 1994) were used to assess psychopathology/personality attributes of theoretical interest. The individual scales were chosen for two reasons: (a) the MCMI-III, which is the most commonly used measure of psychopathology in the domestic violence literature, has no measure of overall distress, and (b) previous research has shown batterers differ with respect to the personality attributes measured by these scales (e.g., Holtzworth-Munroe and Stuart 1994). The five subscales are: Antisocial, Borderline, Dependent, Depressive, and Narcissistic.

Procedures

Each participant completed an assessment battery, which contained several questionnaires designed specifically for the center in order to assess information about the offender, the victim, and the recent offense. All forms were completed in a group format and were supplemented by an individual interview. The interviews typically lasted about 45 min and were conducted by advanced graduate students or Masters- or Doctoral-level professionals.

Participants were assigned to one of four groups (neither, witnessed only, abused only, both) on the independent variable, which represents status of exposure to violence as a child. This placement was determined by the participant's answers to items about his exposure prior to the age of sixteen. Specifically, assignment of status was based on yes–no responses to items about having witnessed either or both parents being aggressive towards the other and yes–no items about having been abused as a child.

If a participant answered yes to any of the relevant items, he met criteria for inclusion in the category of reference. If he did not answer yes to any of these items, the participant was placed in the “neither” group ($n=517$; 47%). If he answered yes to witnessed items, but endorsed no abused items, he was placed in the “witnessed only” group ($n=84$; 8%). If he answered yes to abused items, but did not endorse any witnessed items, then he was placed in the “abused only” group ($n=300$; 27%). If he answered yes to both witnessed and abused items, he was placed in the “both” group ($n=198$; 18%).

Analyses

Bivariate correlational (Pearson product-moment) analyses were conducted to assess relationships among the offender characteristics. This was done in order to examine differences in demographic characteristics of offenders in each

group, to determine whether any covariates were necessary in further analyses.

Analyses of variance were conducted to assess the three areas of interest. Childhood trauma status served as the independent variable; the four levels of the variable were: neither, witnessed only, abused only, and both. One-way Analyses of Variances (ANOVAs) were performed to assess differences in generality of violence, nonviolent criminal behavior, and frequency and severity of domestic violence. A Multivariate Analysis of Variance (MANOVA) was performed to assess differences in psychopathology, defined in terms of personality disorder.

For each ANOVA and the MANOVA performed, the assumptions of independence, homogeneity of variance, and normality of distribution were examined. Analyses of variances were deemed appropriate for each assessment. Due to concerns about unequal sample sizes and distributions increasing Type I error risk, alpha levels were set at .01 or less. Post-hoc comparison tests, specifically Dunnett's T3 tests that do not assume normal distribution, were done as necessary to look for specific differences between groups.

Generality of Violence and Nonviolent Criminal Behavior

The dependent variables were: assigned 0 to 2 rating of number of prior assaults and violent offenses against a non-intimate partner, assigned 0 to 2 rating of number of non-violent offenses, and total CAP abuse scale score.

Frequency and Severity of Domestic Violence

The dependent variables were: the frequency (total sum of physical abuse items) score from the modified CTS items and the severity score (sum of items 5 through 9) from the modified CTS items.

Psychopathology of the Offender

The dependent variables were the Millon scores on the scales measuring Antisocial, Borderline, Dependent, Depressed, and Narcissistic personality disorders.

Results

Correlational Analyses

No significant relationships between childhood trauma status and the participant demographic variables of age, race, and level of education were found, and it was deemed unnecessary to use any covariates in further analyses.

Generality of Violence and Nonviolent Criminal Behavior

A one-way ANOVA was used to assess the impact of childhood trauma status on ratings of violent offenses against someone other than an intimate partner. There was a significant difference in non-intimate violence between groups, $F(3, 1095)=5.83, p=.001$, with non-intimate violence increasing with level of exposure to violence as a child. The eta-squared was .016, which means that a little less than 2% of the variance in violence could be accounted for by group membership.

Post-hoc comparison of means tests (Dunnett T3s) revealed significant differences between those who had neither witnessed domestic violence nor were abused as children (“neither” group) and those who had both witnessed domestic violence and been abused as children (“both” group). Significant differences were also found between those who witnessed domestic violence only (“witnessed only” group) and those who had both witnessed and been abused (“both” group), with the participants in the “both” group having committed more non-intimate violence than any other group (see Fig. 1).

A one-way ANOVA was also used to assess the impact of childhood trauma status on ratings of non-violent criminal offenses. It was expected that results would significantly mirror non-intimate violent behavior. This notion was not confirmed.

The differences between groups with respect to the potential for physically abusing children as measured by the CAP were also assessed with an ANOVA. There was a significant difference in potential for child abuse between the

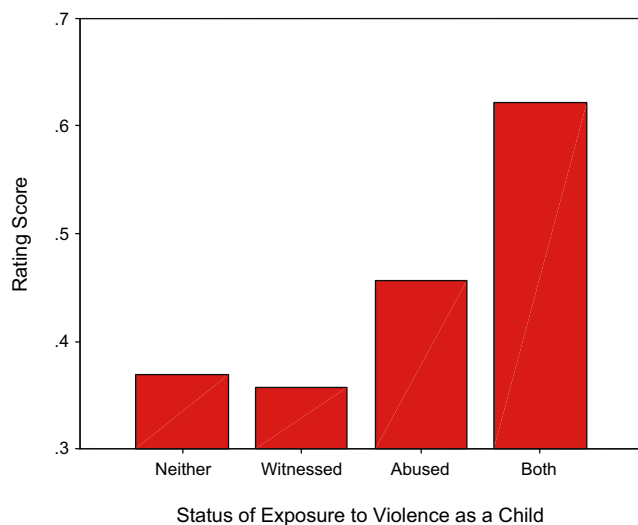


Fig. 1 Mean ratings (0 to 2 scale) per group of violent offenses committed against someone other than an intimate partner

groups, as measured by this scale; $F(3, 278)=8.72, p<.001$. The eta-squared was .071. Significant differences between the “neither” group and “abused only” group were revealed by post-hoc comparisons using Dunnett T3s. Significant differences were also found between the “neither” group and the “both” group. Participants in the group that experienced neither form of violence had lower CAP scores than any of the other groups.

Frequency and Severity of Domestic Violence

Differences in frequency of domestic violence offenses between groups were assessed using an ANOVA with the frequency score (sum of the modified physical CTS items) as the dependent variable. Significant differences were found in frequency scores between groups, $F(3, 1094)=26.90, p<.001$; eta-squared was .069. Post-hoc analyses using Dunnett T3s revealed significant differences between those in the “neither” group and all of the others. Significant differences were also found between those in the “abused only” group and those in the “both” group. Comparison of means revealed that those who had neither witnessed domestic violence nor been abused as children committed less domestic violence, and witnessing domestic violence as a child added to the likelihood of committing domestic violence as an adult.

Differences in severity of domestic violence offenses between groups were assessed using an ANOVA with the severity score (derived from the subtotal of modified CTS items) as the dependent variable. There was a significant difference between groups, $F(3, 1095)=14.95, p<.001$, with those with more violence exposure committing more severe violence. Eta-squared was .039. Post-hoc analyses revealed significant differences in severity of domestic violence offenses between those in the “neither” group and all other groups, with the “neither” group exhibiting the lowest severity scores. (For a summary of frequency and severity of domestic violence offenses, see Fig. 2.)

Psychopathology

Psychopathology and personality characteristics were assessed via five personality scales of the MCMI (Antisocial, Borderline, Dependent, Depressive, and Narcissistic). A MANOVA using the five aforementioned scales of the MCMI as dependent variables was conducted. There was a significant effect for status, $F(3, 851)=18.89, p<.001$. Psychopathology increased as level of exposure to violence increased. One-way ANOVAs were then conducted with each MCMI scale as the dependent variable to specify differences (See Fig. 3).

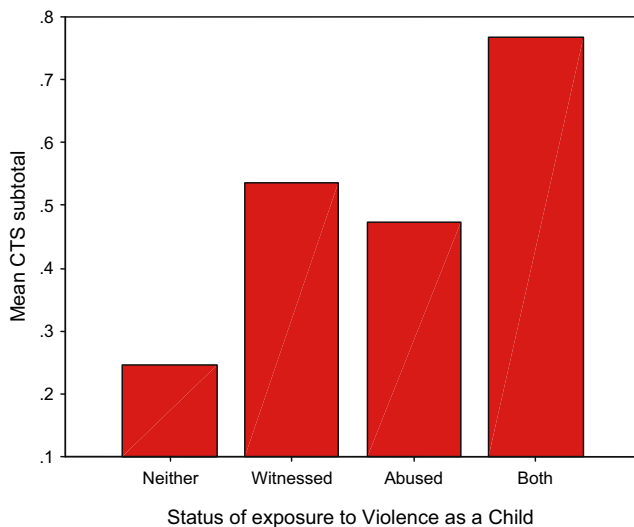


Fig. 2 Mean severity of domestic violence score per group—sum of five CTS items rated on a 0–4 scale

Analysis of the Narcissistic scale analysis revealed no significant differences, but all other univariate analyses showed significant or near significant* differences in level of psychopathology between groups. The Depressive scale results were $F(3, 852)=11.84, p<.001$ (eta-squared was .053). The Antisocial scale results were $F(3, 852)=21.00, p<.001$ (eta-squared was .079). The Borderline scale results were $F(3, 852)=17.60, p<.001$ (eta-squared was .070). The Dependent* scale results were $F(3, 852)=3.14, p<.05^*$ (eta-squared was .019).

Post-hoc tests for the Depressive scale revealed significant differences between the “neither” and “witnessed only” groups. Significant differences were also found between the “neither” and “both” groups, and between those in the “abused” and “both” groups. Comparison of means indicated that the most depressed were those with the most exposure to violence as children and the least depressed were those with the least exposure to violence. It seems to be the case that witnessing added to the likelihood of being depressed, as it does for the likelihood of frequent and severe domestic violence.

Post-hoc tests for the Antisocial scale revealed significant differences between the “neither” and “witnessed” groups, the “neither” and “abused” groups, the “neither” and “both” groups, and the “abused” and “both” groups. This followed the same pattern as the other MCMI scales, with means being ordered from highest to lowest for “both”, “witnessed”, “abused”, and “neither”.

Post-hoc tests for the Borderline scale revealed significant differences between the “neither” and “witnessed” groups, the “neither” and “abused” groups, and the “neither” and “both” groups. Again, the same pattern was evidenced in the means, and the hypothesis about psychopathology was confirmed.

Post-hoc tests for the Dependent scale revealed significant differences between the “neither” and “both” groups. Interestingly, there was a non-significant difference between those in the “witnessed only” group and those in the “both” group, with the participants who witnessed only being more dependent than those who were exposed to both forms of violence.

Discussion

The purpose of this study was to investigate the relationship between childhood exposure to violence and characteristics of adult male domestic violence offenders, who were placed in groups according to their reports of whether or not they witnessed domestic violence or were physically abused as children. Participants completed measures to assess generality, frequency, and severity of their violent offenses, occurrence of other criminal behavior, and level of psychopathology. Although there is a plethora of research on batterers, no prior study had directly examined differences in men who had witnessed, been abused, neither had witnessed nor been abused, or both had witnessed and been abused.

The likelihood of committing violence against someone other than an intimate partner (general violence) increased as the participants’ exposure to violence as a child increased. Batterers who were abused as children were more likely to abuse children than those who were not abused. These results are consistent with previous findings that children who witness violence (e.g., Downs et al. 1996; Henning et al. 1997) or are physically abused (e.g., McCord 1983; Rosenbaum and Bennett 1986) often become aggressive adults. With respect to previous findings about male batterers, these results are in

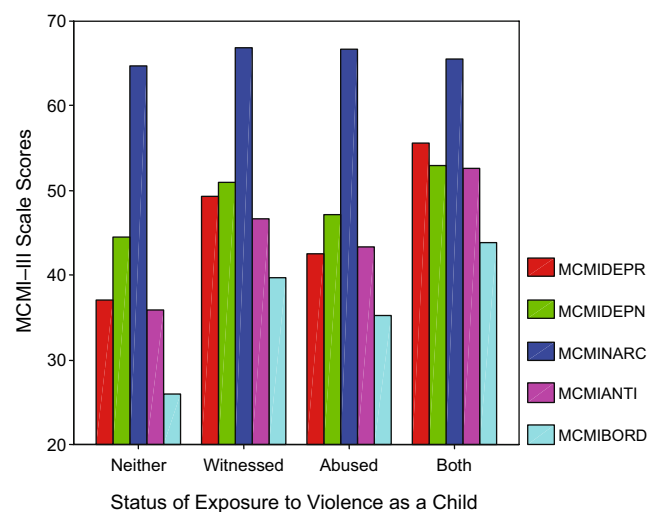


Fig. 3 Mean scores for each status group on the depressive, dependent, narcissistic, antisocial, and borderline scales of the Millon clinical multiaxial inventory, third edition

harmony with the research that states that the most generally violent men often report being exposed to violence as a child (Holtzworth-Munroe et al. 2000; Waltz et al. 2000). Results are also consistent with the previous finding that abused children are likely to become child abusers (e.g., Kempe et al. 1962; Widom 1989). And it adds support to the notion that adults who were abused as children may be more likely to abuse children than those who witnessed violence but were not themselves abused (Kalmuss 1984).

Nonviolent criminal behavior did not increase with exposure to violence as a child. This result seems contradictory to the research on the consequences of witnessing domestic violence and being physically abused as a child, which repeatedly reports that witnessing and being abused are associated with a greater number of legal problems and arrests (e.g., Graham-Bermann and Levendosky 1998; Widom and White 1997).

This non-significant difference between groups may be accounted for by the fact that any childhood exposure to violence is associated with criminal activity. It is the case that domestic violence witnesses and abused children are similar with respect to negative outcome (Jaffe et al. 1986). Perhaps, the men in the “neither” group experienced some other form of violence (e.g., neighborhood, media) and are affected in the same manner as men who experienced familial violence. Another potential reason for the lack of findings is that the arrest rate, which is what ratings were based upon, may have been inflated due to the racial mix of the population. This sample was largely (85%) African-American, and African-American males have a higher likelihood than the general population of being imprisoned or jailed. Approximately 5% of the general population will be in jail or prison during their lifetimes; this number jumps to 28% for African-American males (U.S. Department of Justice 2000b). This unfortunate statistic may have masked differences between groups given the high likelihood of arrest for nonviolent crime in the entire sample.

It may also be the case that battering men commit more nonviolent crime than the general population, making it a behavior that is prevalent for all the groups but not distinguishing between them. Base rates specifically for nonviolent crime are not readily available, but statistics on criminal corrections may help understand the lack of significance. Approximately .01% of the general population was on probation or parole in 1997 (U.S. Department of Justice 1996), but 40% of men arrested for domestic violence had criminal justice status (probation, parole, or restraining order) prior to arrest (U.S. Department of Justice 2000b). The failure to separate types of crime is not uncommon. In fact, most prior studies looking at criminal and legal activity with respect to childhood history and adult offense have not separated violent from nonviolent crimes, so it is unclear whether witnesses and abused children actually commit more

nonviolent offenses as adults. This finding and explanation are consistent with a review by Malinosky-Rummell and Hansen (1993) that found no relationship between physical abuse and criminal behavior.

Another possibility for non-significant findings is that the ratings of nonviolent crime were open-ended. Police and legal records were obtained by the domestic violence center and the number of offenses was coded exactly for zero and one offense, but a rating of 2 was assigned for two or more offenses. More precision of the variable may have revealed differences between groups.

Frequency of domestic violence offenses committed increased as exposure to violence as a child increased. This finding is consistent with previous reports of the most frequent offenses being committed by men with the highest level of exposure to violence in childhood (Holtzworth-Munroe et al. 2000; Waltz et al. 2000). The finding that men who had witnessed domestic violence committed more frequent domestic violence than men who had not is consistent with previous research about the likelihood of perpetration of domestic violence (Downs et al. 1996; Kalmuss 1984). This adds support to the modeling theory, given that men who witnessed domestic violence committed that offense, which they had seen as children, more frequently than men who were abused only or had no exposure to either form of violence.

Severity of domestic violence offenses committed also increased as exposure to violence as a child increased. This is consistent with the finding that men who were exposed to the most violence as children commit the most severe domestic violence (for a review see Holtzworth-Munroe et al. 1997). Men who had both witnessed domestic violence and been abused committed the most severe offenses, which is also consistent with previous findings (Downs et al. 1996; Kalmuss 1984). There was a trend toward witnesses having committed more severe offenses than those who were abused only, but this difference was not significant.

Level of psychopathology increased as exposure to violence as a child increased. This is consistent with psychological difficulties reported by adults who were witnesses of domestic violence (e.g., Jaffe et al. 1986) or were abused as children (e.g., Kinard 1980). Previous research has shown childhood exposure to violence is related to personality disorders in adult male batterers (Hamberger and Hastings 1986; Waltz et al. 2000). However, most studies have not found significant differences between batterers that differed with respect to childhood history or other characteristics (Holtzworth-Munroe et al. 2000; Waltz et al. 2000). In contrast, this study found significant differences for three (Antisocial, Borderline, and Depressive) of the five personality disorders assessed.

Significant results may have been found due to the fact that this study, which categorized batterers according to

their childhood exposure to violence, allowed for more detail to be uncovered than most prior research. One explanation for the lack of significant findings on the MCMI scale measuring narcissistic characteristics is that narcissism is a likely characteristic of all batterers. In fact, the mean score of 67, which is just below the threshold for clinical concern, on the Narcissistic scale was considerably higher than any other mean score.

Limitations

One limitation of this study was that there was no nonviolent comparison group. It would have been informative to have men who were exposed to violence as children but did not become violent adults. This would have been a more stringent test of modeling and could have revealed specific differences in characteristics between those who became violent and those who did not.

Another, somewhat related, limitation is that all of the participants had been arrested and court-ordered for assessment. It may be the case that the subset of battering men who “get caught” are different on important dimensions from those whose violence goes without punishment. Generalizability may also be questioned due to the uneven racial mix of the sample.

A third limitation of this study was that the independent variable, childhood exposure to violence, was assessed solely through retrospective self-report. It may have been difficult for adult men to accurately remember their levels of exposure to violence as children, and whether or not they answered questions truthfully could be questioned. It may be that some men, eager to blame their histories rather than accept responsibility for their violent behavior, over-reported childhood exposure to violence. Witnessing and being abused may also have been under-reported due to social stigma. This issue of self-report also affects the dependent measures. Victim report of frequency and severity of domestic violence offenses was available only for about one-third of the sample.

Some of the measures had weaknesses. For example, the ratings of prior nonviolent offenses were open-ended. Ratings of violence against someone other than an intimate partner might have been slightly contaminated as well as being open-ended and involving some subjectivity. Although the measure intended to exclude domestic violence offenses, data collected from the police for the first few months did not provide victim information, and therefore intimate partners may not have been removed from the database. This is unlikely, given that prior to DVAC involvement, very few arrests were made for domestic violence charges, but nonetheless it should be taken into consideration. Ratings were basically assigned based on number of offenses, but a 2 was assigned for two or more offenses or for one severe offense, and although DVAC staff

members were trained and reliability was checked, there may have been some unintended variability in this measure. The CAP is not a very good assessment tool. It is the only instrument that is widely accepted as a measure of child abuse potential, but it is often not interpretable due to participants’ lying in response to its face valid items. Furthermore, the psychometric properties have been rarely studied by any one other than the test creator.

Recommendations for Future Research

Improvements can be made with respect to study population. A sample accurately reflecting national racial mix would increase generalizability. This could be done by sampling from a variety of areas or by using a stratified sample. Two comparison groups, one of nonviolent men who had exposure to violence as children and one of non-court-ordered domestic violence offenders, should be included in future tests of the relationship between childhood exposure to violence and characteristics of domestic violence offenders. A retrospective study following children who had exposure to violence would be ideal. If this is not possible, and adults are assessed, a solution would be to obtain medical or legal records, or parental reports, that confirm reported childhood exposure to violence or lack thereof.

More consistent measures from sources other than the participant to assess generality, frequency, and severity of violence and psychopathology would be beneficial. Generality of violence, particularly child abuse, should be assessed objectively. This could be done by using medical records or police records where the child is clearly stated as the victim. This study did not include victim reports and ratings made by the center staff based on police and court records, and those and other external sources should be used more extensively. Careful separation of nonviolent and violent offenses and separation of intimate versus non-intimate offenses are recommended.

To date, few studies have examined all of the dimensions on which batterers differ. Continued assessment of frequency, severity, and psychopathology is important, as more data are needed. This was the first study that looked at specific differences based on offender’s childhood exposure to violence, and significant findings both replicated and added to previous work. This distinction may be the first step toward identifying how batterers develop differentially, which has been identified as missing from the literature (Holtzworth-Munroe and Stuart 1994), and is clearly important for prevention and intervention efforts. Therefore, it is recommended that this distinction be made in future projects.

Results from this and future studies may clarify the sequelae of exposure to violence as a child, and this clarification should be used to work with children in order to stop the intergenerational transmission of violence. When the unfortunate need arises to develop intervention,

treatment should be tailored to the history of the batterer. Perhaps the identification of the importance of childhood exposure to violence is key in the successful treatment of batterers, and thereby would slow the cycle of violence.

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Towards Evidence-Based Practice with Domestic Violence Perpetrators

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Towards Evidence-Based Practice with Domestic Violence Perpetrators

Abstract

This review examines the policy and practice of interventions with perpetrators of domestic violence in light of the widely accepted principles of evidence-based practice. Thus far these policies and practices have enjoyed a sort of immunity from external, empirical accountability available through implementing the findings from evaluations research and other empirical practice analyses. This immunity is supported by a policy framework where, for example, the state certifying agencies may presumptively forbid methods of intervention that contradict the approved model with no obligation to empirically assess their efficacy or safety. Based on the review of findings from both explanatory research and interventions research, evidence-based recommendations for policy and program change are proposed.

*The preponderance of evidence now accumulated in the field calls into question the efficacy of batterer programs based on the most prevalent national models. Indeed, the main findings from our randomized trial are consistent with other recent trials, of which **none** found that mandating offenders to a batterer program for groups for men produced lower rates of re-abuse. (p. viii)*

Labriola, Rempel, and Davis (2005) Testing the Effectiveness of Batterer Programs and Judicial Monitoring: Final Report Submitted to the National Institute of Justice (http://www.courtinnovation.org/_uploads/documents/battererprogramseffectiveness.pdf) retrieved 6/29/06

Introduction

Numerous empirical studies, literature reviews, and meta-analyses of standard model interventions with perpetrators of domestic violence have found little or no positive effect on violent behavior (Dutton and Corvo, 2006). In spite of these consistent findings, the standard model of intervention with “batterers” has not been subjected to the same kind of critical appraisal and reformulation that other behavioral change programs receive. Rather, program content and strategies are shaped and controlled by fixed standards or guidelines developed and disseminated by governmental or quasi-governmental domestic violence “certifying” agencies (usually state-level), thus determining which approaches are permitted for local programs (National Institute of Justice, 1998). The typical program for these offenders is same-sex, group psychoeducational or cognitive behavioral treatment, of six to thirty-six weeks in length, with content emphasizing “accountability”, rational emotive principles, and feminist gender relations (Corvo & Johnson, 2003; Edleson, 1996; Eisikovits & Edleson, 1989; Feder & Wilson, 2005) .

These programs enjoy a sort of immunity from external, empirical accountability that confounds the dynamic program development strategies available through implementing the findings from evaluations research and other empirical practice

analyses. This immunity is supported by a policy framework where, for example, the state certifying agencies may presumptively forbid methods of intervention that contradict the approved model with no obligation to empirically assess their efficacy or safety. (Corvo and Johnson, 2003). For example, the New York Office for the Prevention of Domestic Violence on its website (www.opdv.state.ny.us) under the heading “Best Practices in Domestic Violence Cases” asserts without substantiation or citation: “*Joint counseling in any form – couple counseling, family therapy, mediation – is contraindicated in DV cases, even when the victim insists on it...because it is dangerous...unfair.... ineffective*”. However, Stith, Rosen, McCollum, and Thomsen (2004) found in their review and study that couples treatment was at least as effective as the standard model and more effective in some circumstances.

Although the roots of the larger policy framework can be traced back to the feminist-inspired Duluth Domestic Abuse Intervention Project, increasingly it has come to resemble the more conservative social control, “law and order” policies which favor the criminalizing of deviance (Dutton and Corvo, 2006). It is this “law and order” custodianship rationalized by a vestigial, rote, feminist ideology that maintains an inflexible, hermetic policy framework.

Although there is abundant scientific information available about the etiology, enactment, and treatment of violence to better inform domestic violence policies, little of it is used for program development or practice. For example, extensive evidence exists describing a variety of individual patterns of intimate abusiveness (e.g. Dutton & Corvo 2006), including: 1) differential patterns of violence (unilateral: male predominant, female predominant and bilateral) and 2) differential profiles of offenders within either

gender, including personality disorders and impulse control problems including substance abuse. Yet, most certified perpetrator interventions ignore this variability in favor of a “one-size-fits all” approach.

One of the major custodians of domestic violence policy, the National Institute of Justice (NIJ) has funded a number of “batterer” intervention evaluations (e.g. NIJ, 2003 *Do Batterer Intervention Programs Work?*). However, an ideological and political firewall exists between this kind of information and substantial changes in policy and practice. For example, the links between alcohol abuse and domestic violence, well-established through epidemiological, clinical and laboratory studies, are often minimized in domestic violence policy and practice with the rationale that not all perpetrators abuse alcohol and not all alcohol abusers are violent (Corvo, Halpern, and Ferraro, 2006). Some states actually prohibit providing counseling for addiction to “batterers” as part of their approved programs. (National Institute of Justice, 1998).

What distinguishes domestic violence policy and interventions from other problem areas is not only a poor showing in effectiveness and outcomes. Babcock, Green, and Robie (2004) found comparably small effect sizes for some interventions in other problems with similar populations. What *does* distinguish domestic violence policy and interventions are the systematic and institutional proscriptions against using evaluation findings and other pertinent data to develop program innovations. The proximal impediments to program development are the domestic violence certifying agencies that oversee interventions with abuse perpetrators involved in the criminal justice system. These agencies formulate and implement policies that regulate what structure, duration and form of intervention is required as a condition of probation for

persons found guilty of domestic assault and thereby which form of intervention is deemed acceptable by the courts. Hence, program funding is only available to those programs that conform to these policies (Dutton and Corvo, 2006).

Evidence-based practice (EBP) has emerged as an important treatment model in many fields including medicine, psychiatry, psychology, social work, marriage and family therapy (Thyer, 2004) and criminology (Petrosino, Boruch, , Soydan, Duggan, & Sanchez-Meca, 2001). The core principle of EBP is the commitment to understanding and using the best available scientific research findings to inform practice (Fraser, 2003; APA, online). Some have even suggested that approaching practice without considering the most rigorous research available is unethical and may violate professional norms (Casey Family Services, online).

How does one make progress in a field of practice, interventions with domestic violence perpetrators, where the core principle of EBP may be rejected in favor of maintaining an inordinately political and ideological service delivery system? The task, then, of moving toward evidence-based practice with domestic violence perpetrators must proceed against the inertia of a policy framework that has often suppressed program development efforts and may presumptively exclude important research findings.

Overview of Evidence-Based Practice

An antecedent of EBP in psychology can be traced back to the Bolder Conference in 1949, where clinicians meeting to discuss training and practice in psychology advanced the idea that practice should be founded on research and social science methods – the “scientist-practitioner” model (Fraser, 2003). The roots of EBP in medicine are often attributed to the work of Archibald Cochrane, whose 1971 monograph

"Effectiveness and Efficiency. Random Reflections on Health Services" proposed that a medical intervention be considered effective only if it has been demonstrated, preferably by a randomized controlled trial, that it does more good than harm (Hill, 2000).

Patterson, Miller, Carnes, and Wilson (2004) identify the further development of the principles of EBP in the 1980's in the work of Gordon Guyatt and colleagues at McMaster University in Canada:

"[they] wanted to create systematic ways of finding, critically appraising, and using available clinical research... Instead of depending on expert opinion, these early leaders wanted to develop systematic principles based on scientific methods that would help individual clinicians make their own research-based clinical decisions." (p.184)

Howard, McMillen and Pollio (2003) see EBP as a departure from an historical paradigm where theory, supervision, "experience", common sense, and other authority-based perspectives determined practice methods.

Sackett, Straus, Richardson, Rosenberg, and Haynes (2000) define EBP as the "the integration of best research evidence with clinical expertise and patient values" (p. 1).

Further, Sackett, et al describe EBP as involving five steps:

1. Convert a need for information into an answerable question.
2. Find the best clinical evidence to answer that question.
3. Critically appraise the evidence in terms of its validity, clinical significance, and utility.
4. Integrate the critical appraisal of research evidence with one's clinical expertise and the client's characteristics.
5. After implementing the EBP, evaluate one's effectiveness.

Grounded in science and empiricism, EBP requires the ability and willingness to give up preconceived, untested notions of effective practice. Shlonsky and Gibbs (2004)

state, “ EBP assumes a predisposition to inquiry as well as the impetus to pose specific questions. It assumes a fair-minded approach that eschews selling a particular position.” (p.151). The general epistemology of EBP, then, can be seen as one of applied scientific research, where certain kinds of systemic inquiry are seen as more valid and more useful. When possible, the referred methodology is the multi-site randomized controlled clinical trial (Thyer, 2004) with descending value applied to less rigorous forms of experimentation, quasi-experimentation, and non-experimentation. Currently there are several organizations dedicated to designing and conducting systematic reviews of the scientific literature to support practitioners and organizations in identifying best practices. Two of the better known of these organizations are the Cochrane Collaboration (www.cochrane.org) in the field of medicine and the Campbell Collaboration (www.campbellcollaboration.org) in the fields of education and social and behavioral practice.

Especially pertinent to domestic violence perpetration, not all areas of practice are equally advanced in the amount, accessibility, or methodological sophistication of relevant research findings. Fraser (2003) identifies two types of research-based knowledge as building blocks of EBP: explanatory research and intervention research. Explanatory research seeks to identify causes and describe causal mechanisms; intervention research focuses on the effectiveness and efficacy of interventions.

Explanatory Research and Domestic Violence Perpetration

Three separate, though occasionally overlapping, theoretical perspectives guide explanatory or causal research in domestic violence perpetration. These current major explanatory theoretical views of domestic violence can be broadly categorized as

feminist/socio-cultural, social learning theory-based intergenerational transmission, and psychological. (Corvo and Johnson, in press).

Feminist/socio-cultural View

Although the “batterer” treatment standards of most states are premised upon domestic violence being the product of patriarchy, the central causal construct in the feminist/socio-cultural theory, there is little consistent empirical evidence in support of this view. Briefly, the patriarchy-as-cause view asserts that domestic violence is solely a product of the socially sanctioned domination and control of women by men (Corvo and Johnson, 2003). Empirical studies examining the influence of patriarchal gender role socialization or gender-based power inequities on domestic violence behavior have demonstrated neither strong, nor linear correlations between those factors (Yick, 2000; Sugarman & Frankel, 1996; Dutton, 1994). The effect size of variables generated by feminist/socio-cultural theory is often weak when compared to those generated by other theoretical perspectives (e.g. Corvo and Johnson, in press))

In fact numerous studies contradict this perspective: less than 10% of all couples are male dominant (Coleman & Straus, 1985); women are more likely to use severe violence against non-violent men than the reverse (Stets & Straus, 1992); men in North America do not endorse violence against their wives as acceptable (Dutton, 1994; Simon et al., 2001) and abusiveness is higher in lesbian relationships than in heterosexual relationships (Lie, Schilit, Bush, Montague, & Reyes, 1991). Finally, Archer’s (2000) meta-analysis, with a combined n of 60,000, found women to be more domestically violent than men, especially among younger women.

Intergenerational Transmission

The intergenerational transmission of domestic violence has been one of the most commonly reported influences in domestic violence in adulthood. Research conducted on the intergenerational transmission of domestic violence has framed much of its inquiry in social learning theory. The social learning theory-based intergenerational transmission model of domestic violence posits that observing violence in one's family of origin creates ideas and norms about how, when, and towards whom aggression is appropriate. Early studies found a high frequency of violence in the families of origin of domestically violent men (Gayford, 1975; Rosenbaum and O'Leary, 1981; Roy, 1977; Straus, Gelles, and Steinmetz, 1980). Other studies (Gelles, 1974; Carrol, 1980) found associations between child abuse in the family of origin and current domestic violence for both men and women (as victims). Kalmus (1984), reanalyzing the Straus, et al. (1980) national sample, found that both exposure to child abuse and observation of inter-parental spousal violence contributed to the probability of marital aggression for men and women. Although consistently significant across studies, the effect size of social learning-derived intergenerational transmission variables in predicting domestic violence in adulthood is often small. In their review of the research, Holtzworth-Munroe, Bates, Smutzler, and Sandin (1997) observed, that the correlations found between family of origin violence and current partner violence were not strong and may be mediated by other variables. In spite of its many contributions, the social learning focus has restricted inquiry into a broader range of possibly predictive psychosocial variables. The companion literature on the intergenerational transmission of child abuse and youth violence, for example, has explored a much wider range of family of origin variables (e.g. Sheridan, 1995; Corvo,

1997). Intergenerational transmission studies of domestic violence using broader psychosocial variables are less common (Corvo and Carpenter, 2000).

Psychological Theories

Psychological theories of domestic violence perpetration examine individual psychological, psychiatric, behavioral and neurological factors. Dutton (2006) summarizes these as personality disorders, neurobiological factors, neuroanatomical factors, disordered or insecure attachment, developmental psychopathology, cognitive distortions, and post-traumatic symptoms.

Holtzworth-Munroe, et al (1997) state, “Violent husbands evidence more psychological distress, more tendencies to personality disorders, more attachment/dependency problems, more anger/hostility, and more alcohol problems than nonviolent men.” (p.94)

Not only do domestically violent men differ from non-violent men on important psychological variables, they differ substantially from each other. With the recognition that domestic violence perpetrators differed greatly on a number of important characteristics, efforts have been made to identify subtypes of perpetrators. Although a number of different instruments, sorting criteria, methods, and samples have been used, there has been substantial consistency in the identification of three sub-types (Lohr, Bonge, Witte, Hamberger, & Langhinrichsen-Rohling, 2005; Holtzworth- Munroe and Stuart 1994). A number of authors have used different labels for these three subtypes typically identified through a variety of analytic strategies, primarily cluster analysis. These subtypes have been shown to differ on measures of personality styles and disorder, psychopathology, hostility, attachment styles, drug and alcohol use, and type and severity of violence (Lohr, et al., 2005).

In addition to the research examining the relationship between psychological factors and domestic violence, there is a much larger body of basic research that looks at the relationship between psychological factors and violence in general. Much of that basic research on causes of violence and aggression is neuropsychological. The consensus statement issued by the Aspen Neurobehavioral Conference (Filley, et al., 2001) summarizes the considerable literature on the neuroscience of violence, identifying genetic, neuroanatomical, neurochemical, developmental, neuropsychological, and psychiatric factors. One area of particular promise is the study of the association between frontal lobe deficits and violence. Frontal lobe deficits refer, in general, to compromised abilities to inhibit impulsivity or aggression, or to redirect attention from repetitive behavior (Westby & Ferraro, 1999).

Not all research on domestic violence perpetration is conducted with formally identified offender samples. Samples drawn from other treatment populations (e.g. alcohol treatment) or “normal” populations, may exhibit a greater range of variability in factors associated with perpetration. For example, the Dunedin Multidisciplinary Health and Development Study (National Institute of Justice, 1999) found that the factors most closely correlated with partner violence, in a representative birth cohort, were factors often associated with criminal offending in general included mental health problems, academic failure, resource deficits, and early anti-social behavior.

Early trauma, borderline personality, and attachment disorders

Particularly useful in understanding psychological issues specific to domestic violence perpetration is the overlapping risk and influence of early trauma, attachment disruption, and borderline personality traits.

There is a strong relationship between borderline traits in male perpetrators and intimate abusiveness (Dutton, 1998, 2002a, 2002b). In a series of studies, Dutton and his colleagues (for a review see: Dutton, 1995a, 1995b, 1998, 2002b) have examined personality profiles of assaultive males. Men's borderline characteristics were significantly related to chronic anger, jealousy, wives' reports of clients' use of violence, and experiences of adult trauma symptoms. In effect, a constellation of personality features (borderline personality organization, high anger, fearful attachment, chronic trauma symptoms and recollections of paternal rejection) accounted for reports of abusiveness by one's intimate partner.

Bowlby (1969) viewed interpersonal anger as arising from frustrated attachment needs and functioning as a form of "protest behavior" directed at regaining contact with an attachment figure. Thus, attachment theory suggests that an assaultive male's violent outbursts may be a form of protest behavior directed at his attachment figure (in this case, an intimate partner) and precipitated by perceived threats of separation or abandonment. A "fearful" attachment pattern may be most strongly associated with intimacy-anger. Fearful individuals desire social contact and intimacy but experience pervasive interpersonal distrust and fear of rejection. This style manifests itself in hypersensitivity to rejection (rejection-sensitivity), and active avoidance of close relationships where vulnerability to rejection exists. While the fearful share anxiety over abandonment with another insecurely attached group (called "preoccupied"), their avoidance orientation may lead to more chronic frustration of attachment needs.

Dutton and colleagues assessed attachment styles in abusive men. Fearfully attached men experience high degrees of both chronic anxiety and anger (Dutton,

Saunders et al., 1994). Fearful attachment alone accounted for significant proportions of variance in both emotional abuse criterion factors completed by female partners. Fearful attachment was also strongly correlated with borderline personality organization. Since anxiety (+.42) and anger (+.48) were both strongly associated with fearful attachment, one could argue that an emotional template of intimacy-anxiety/anger is the central affective feature of the fearful attachment pattern. Babcock et al. also found insecure attachment styles to be related to abusiveness (Babcock, Jacobson, Gottman, & Yerington, 2000). Mikulincer (1998) found that attachment style related to dysregulation of negative emotions in intimate relationships. Corvo (in press) found that early life separation and loss events were more strongly associated with adult domestic violence perpetration than was exposure to child abuse or parental spousal violence.

In abused boys, a prominent sequela of abuse victimization is hyper-aggression. Carmen, Reiker, and Mills (1984) suggested that abused boys are more likely than abused girls to identify with the original aggressor and to eventually perpetuate the abuse on their spouse and children. In their view, an effect of physical maltreatment by a parent is to exaggerate sex role characteristics, possibly as a means of attempting to strengthen the damaged self. Other studies, however, have suggested that male reactivity to maltreatment may be mediated by genetic variability in some neurotransmitters (Caspi, et. al, 2002). Van der Kolk (1987) noted that traumatized children (including physical abuse) had trouble modulating aggression and included being physically abused as a child as a trauma source. Further, van der Kolk (1987) noted how Posttraumatic Stress Disorder (PTSD) included poor affect tolerance, heightened aggression, irritability, chronic dysphoric mood, emptiness, and recurrent depression and was "described in

patients who have been subjected to repeated trauma over a considerable period of time" (p. 114). PTSD may be another link or mediating variable between childhood abuse victimization and adult perpetration of intimate abuse.

In order to test this notion, wife assaulters were compared to two groups of diagnosed PTSD men from independent studies (Dutton, 1995c). In the wife assault sample, 45% of all men met research criteria for PTSD and, assaultive men exhibited elevated levels of chronic trauma symptoms.

The source of trauma, as revealed in this work was physical abuse combined with shaming by the father and with a lack of secure attachment to the mother. Consequently, the latter could not provide buffering against the former (Dutton, 1998, 2002b). Tangney, Wagner, Fletcher, and Gramzow (1992) have presented a more focused analysis of the potential role of shame as a mediator between the early experiences of assaultive men and their adult experience of anger and abusiveness. They describe shame-proneness as a moral affective style that has to do with "global, painful, and devastating experience in which the self, not just behavior, is painfully scrutinized and negatively evaluated" (*op. cit.*, p. 599). In this sense, shame-inducing experiences, which generate a shame-prone style, may be viewed as attacks on the global self and should produce disturbances in self-identity. Shame-prone individuals have been found to demonstrate a limited empathic ability, a high propensity for anger and self-reports of aggression (Wallace & Nosko, 2003). Dutton and colleagues found recollections of shame-inducing experiences by parents of assaultive men to be significantly related to the men's self reports of both anger and physical abuse (Dutton, van Ginkel, & Starzomski, 1995).

Dutton, van Ginkel, and Starzomski (1995) found that the experience of being shamed seemed to interact with exposure to violence to produce assaultiveness.

These features of an abusive personality: insecure attachment, borderline traits, and trauma reactions have not been an explicit focus of treatment for spouse assault.

Drug and alcohol abuse

Of particular importance in understanding risk for domestic violence perpetration is drug and alcohol abuse. With a much longer anecdotal history, empirical studies supporting the concomitance of substance abuse and domestic violence can be traced at least to the late 1970's (e.g. Hilberman and Munson, 1978). Bennet, Reed, and Williams (1998) reported rates of concomitance of substance abuse and domestic violence ranging from 23% to as high as 100%. The National Institute of Alcohol Abuse and Alcoholism (NIAAA), (1997) summarizes several models describing the relationship between alcohol consumption and violence: disinhibition; overreaction to perceived threat due to impaired information processing; inaccurate assessments of consequences of violence; alcohol-violence expectancies; deviance disavowal; and amplified effects due to neuroendocrinological and hormonal factors. Perry (1997) has proposed that the effects of alcohol on violence can be exaggerated, in part, by compromises in neuroanatomy, with alcohol's disinhibiting properties being multiplied where there are frontal lobe deficits. Westby and Ferraro (1999) using multiple indicators of frontal lobe impairment found that heavier alcohol use, poorer vocabulary, and frontal lobe deficits differentiated domestic violence offenders from non-offenders. A secondary analysis of the Westby and Ferraro data (Corvo, Halpern and Ferraro, 2006) found a cluster of offenders who exhibited higher levels of violence, greater alcohol use and more frontal lobe deficits,

suggesting differential effects at higher levels of pathology. Moeller & Dougherty (2001) identify antisocial personality disorder (ASPD) as mediating the effects of alcohol consumption on aggression, with persons diagnosed with ASPD exhibiting increased aggression due to alcohol consumption as compared to controls. They suggest that the association between ASPD and alcohol-related aggression may stem, in part, from ASPD-related impairments in regions of the brain performing executive functions.

Sonkin and Liebert (2003) describe a comprehensive assessment protocol for perpetrators that encompasses many of the behavioral and psychological factors described above with recommendations for individualized treatment plans.

What we see in psychological views of domestic violence perpetration, then, is a number of general risk factors shared with violence and criminality in general as well as a set of more specific risk factors for violence with intimate partners. The latter stemming from particular family of origin influences (e.g. erratic caregiving, parental shaming) and enacted in a particular relational context, cued by real, exaggerated, or feared rejection or threat. The complexity of psychological risk reveals domestic violence perpetration as a disorder primarily of poor impulse control, neuropsychological vulnerability, chemical dependency and intimacy dysfunction.

Interventions Research and Domestic Violence Perpetration

Because of the ever present risk of confounds among quasi-experimental studies, results from randomized experiments are the "gold standard" for evaluation. In a treatment outcome study done on the standard Duluth model, Shepard (1987, 1992) found a 40% recidivism rate in a six month follow up of Duluth clients, higher than most

control recidivism levels (Shepard, 1987, 1992). Babcock et al.(2004) put recidivism rates at 35% for a 6-12 month follow up according to wives, and 21% for the same time period using criminal justice data (i.e., arrests) (Babcock et al., 2004).

Feder and Forde (1999) randomly assigned batterers on probation to either a feminist-psychoeducational program or no treatment in Broward County, Florida. In general, there were no statistically significant differences between the two groups on recidivism as measured by police records ($d = 0.04$) or by victim report ($d = -0.02$). There was a small but significant effect on recidivism among the subset of men randomly assigned to group treatment who attended all 26 sessions. In this study, random assignment apparently failed, with an uneven number of men being assigned to the treatment and control condition (Feder & Forde, 1999). Moreover, this study suffered from a particularly high attrition rate of men from treatment (60%) and low response rate from victims at follow-up (22%).

Davis, Taylor, and Maxwell (1998) compared a long (26-week) psychoeducational group to a brief (8-week) psychoeducational group, and to a community service control (70 hours of clearing vacant lots, painting senior citizen centers, etc.) in Brooklyn, New York. They found a statistically significant reduction in recidivism and a small but respectable effect size of $d = 0.41$ based on criminal records among the long treatment group only; the 8-week group was indistinguishable from the community service control ($d = 0.02$). When based on victim report of recent offenses, neither the long nor the brief intervention had a statistically significant effect on reassault when compared to no treatment. Correspondingly, the effect size due to treatment based on partner report of subsequent violence was small ($d = 0.21$). It is important to note that,

like in the Broward County experiment (Feder & Forde, 1999), random assignment may have been compromised. In the Brooklyn experiment (Davis, Taylor, & Maxwell, 2000), nearly 30% of initial assignments were subjected to "judicial overrides" (Gondolph, 2001); that is, judges reassigned defendants to different interventions.

Ford and Regoli (1993) designed a study that randomly assigned batterers into treatment as a pretrial diversion (i.e., defendants' criminal records would be cleared pending treatment completion), treatment as a condition of probation post-conviction, versus alternative sentencing strategies (e.g., paying a fine or going to jail). Even though this study was designed to test different sentencing options rather than effects due to treatment, one can compare batterers sentenced to treatment versus batterers not sentenced to treatment (although the type of treatment and actual attendance rates were not specified). Again, there were no significant differences or effect sizes comparing recidivism rates based on victim report between men sentenced to treatment versus those who were not. Neither treatment as pretrial diversion ($d = 0.00$) nor as a condition of probation post-conviction ($d = -0.22$) was found to be superior to purely legal interventions.

Conducting an experiment in which judicial discretion is sacrificed and criminals are randomly assigned to treatment or no treatment can be problematic on ethical as well as practical grounds (Dutton, Bodnarchuk, Kropp, Hart, & Ogloff, 1997).

Babcock, Green and Robie (2004) conducted a meta-analytic examination of 22 studies of treatment outcome. The d' for Duluth treatment was .19. (about 1/5 of a standard deviation difference between treated and untreated). Comparisons between CBT and Duluth were not significant but 'pure' Duluth models were hard to find. As the

authors stated, “modern batterer groups tend to mix different theoretical approaches to treatment, combining feminist theory of power and control as well as specific interventions that deal with anger control, stress management and improved communication skill” (Babcock et al., 2004, p. 1045).

Stith, Rosen, McCollum, and Thomsen (2004) using an eclectic model of group therapy for couples, where the men were violent but mutual violence was the predominant pattern, reduced violence at least as much as the most effective standard model and more in some circumstances.

In a meta-analysis, undertaken under the auspices of the Campbell Collaboration, Feder, Wilson, and Austin (2005) reported:

While additional research is needed, results from this meta-analysis leave questions about the effectiveness of court-mandated treatment in reducing recidivism among misdemeanor domestic violence offenders. Unfortunately, additional experimental research testing the effectiveness of these programs is not possible in many jurisdictions in that their statutes require individuals to be mandated into a BIP upon conviction. This has led to a pattern whereby judges, prosecutors and probation officers continue to send batterers to these programs even as they have grave doubts about their effectiveness. The end result is that alternate programs cannot be implemented and tested even as evidence builds indicating that [batterer intervention programs], at least as designed and implemented today, may not be effective. (online)

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In addition to the standard, approved interventions that are directly targeted at perpetrators, there are a number of other interventions and programs that have significance for developing an evidence-based approach to working with domestic violence. For example studies by Stuart, Ramsey, Moore, Kahler, Farrell, Recupero, and Brown (2003) and O’Farrell, Fals-Stewart, Murphy, and Murphy (2003) found that the

successful treatment of alcohol dependence, alone, reduced partner violence to a much greater degree than is typically found with domestic violence interventions *per se*.

In the more general fields of offender rehabilitation and forensic psychiatry there is now a broad recognition of the importance of evidence-based treatment. Ward, Day, Howells, and Birgden (2004) report how targeting treatment towards specific areas of need that are functionally related to the offending and adhering to solid principles of program design and delivery has achieved significant reductions in recidivism across offender types. Howells, Day, and Thomas-Peter (2004) suggest that violent behavior can be best changed by integrating evidence-based principles from both offender rehabilitation and forensic mental health.

Restorative justice is another promising approach. In brief, restorative justice views crime primarily as a conflict between individuals that results in harm to victims rather than to the state; its goal is reconciliation and repair rather than retribution (Bevin, Hall, Froyland, Steels, and Goulding, 2005).

Bevin, et al. (2005) found that in a sample of community offenders and victims, a restorative justice process, when compared to a conventional court process, produced greater feelings of safety, security and control among victims and a reduction in factors associated with recidivism among offenders.

Currently a randomized comparison study, by Linda Mills and colleagues, between batterer's treatment and a restorative justice intervention, is underway in Arizona (personal communication, Linda Mills, 2005)

Multisystemic Therapy is one of the "Blueprints Model Programs" identified by the Center for the Study and Prevention of Violence at the University of Colorado

(online). It is one of the most effective models of reducing re-offending behavior among violent, substance abusing adolescents. Although not currently tested with domestically violent adults, it's impressive outcomes with similar problem areas and theoretical orientation of ecological and systemic interventions suggests it may have substantial potential.

Given the regulatory and legal restrictions on interventions with domestic violence perpetrators, there are fewer variations in treatment models than one might hope and meta-analyses, evaluations, and reviews take on a repetitive note: it is clear that the current standard model has little or no evidence for effectiveness. Looking at more innovative approaches and those from related issues and other populations, some encouraging findings suggest that viewing domestic violence as a complex issue with multiple influences can substantially improve outcomes.

Conclusion

If EBP practice begins with the framing of an answerable question, domestic violence policy has limited the number of questions that are possible to ask. For example, if one wished simply to ask, "What form of domestic violence treatment was most effective in reducing violence?" it would have to be answered within a framework where the range of possible treatments options is overly constrained.

Our review suggests that a thorough, individualized assessment and treatment approach holds promise for more effective program outcomes. Within the existing context of same-sex, group, court-mandated therapy, there are several ways to increase treatment success. Many rely on established CBT techniques used for other problem

areas and simply recognize the relevance of these techniques for perpetrator treatment when focused on issues empirically linked to violence perpetration. A rich psychology of intimate violence perpetrators has developed since the first wave of treatment was developed. Essentially this research has unearthed what emotions, cognitions and situational interactions intermingle to generate and support abusive behavior.

The robust findings on perpetrator typologies points toward the need to carefully assess and direct perpetrators into the types of treatment appropriate to their particular constellation of issues.

In addition to promising better outcomes, more individualized treatment may reduce attrition, the *bete noire* of domestic violence programs. Chang and Saunders (2002) suggest, also, that culturally-competent practice with better matching of client types and needs to treatment can improve program retention.

Clearly, the relationship between substance (primarily alcohol) abuse and domestic violence must be directly addressed in treatment in some integrated form, and not relegated to a marginal epiphenomenon.

The success of some forms of couples treatment and the predominance of the mutuality (if not symmetry) of domestic violence suggest that, where appropriate, the interactional and relational issues pertinent to violence be integrated into treatment.

The salience of the emotional and behavioral sequelae of early, disturbed attachment in domestic violence indicates treatment, whether group, couple, or individual, that promotes a sense of secure membership, connection, or bonding.

The current best evidence clearly does not support investing substantial public funds in the continuation, let alone the mandating, of the standard domestic violence program model.

In the face of overwhelming countervailing evidence, why does this model persist? There is no scientific reason why causal explanations of domestic violence and the principles of perpetrator treatment should exist outside the biopsychosocial framework used to understand and address contemporary mental health and social problems. In some sense, then, the political issues in the policy framework “trump” the science to a greater degree than perhaps in most other social problems. Perpetrators are consistently demonized and vilified in such a fashion so as to make them appear unworthy of a broader range of services (e.g. as in comparison to parents who physically assault their children) (Corvo and Johnson, 2003). There are few advocacy groups to put pressure on legislatures for legal or regulatory change. In short, within the existing policy framework of mandated interventions, there is a lack of political support to reframe the issue so that implementing an evidence-based approach becomes feasible.

Whatever benefits to violent families that may result from improved, evidence-based practice, await a more rational iteration of the policy framework.

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Does batterers' treatment work? A meta-analytic review of domestic violence treatment

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Abstract

This meta-analytic review examines the findings of 22 studies evaluating treatment efficacy for domestically violent males. The outcome literature of controlled quasi-experimental and experimental studies was reviewed to test the relative impact of Duluth model, cognitive–behavioral therapy (CBT), and other types of treatment on subsequent recidivism of violence. Study design and type of treatment were tested as moderators. Treatment design tended to have a small influence on effect size. There were no differences in effect sizes in comparing Duluth model vs. CBT-type interventions. Overall, effects due to treatment were in the small range, meaning that the current interventions have a minimal impact on reducing recidivism beyond the effect of being arrested. Analogies to treatment for other populations are presented for comparison. Implications for policy decisions and future research are discussed.

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Keywords: Duluth model; Cognitive–behavioral therapy; Recidivism; Violence

1. Introduction

As an estimated 840,000 women reported assaults at the hands of an intimate in 1996 (Bureau of Justice Statistics, 1998), interventions designed to address this growing public

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health concern have focused on the perpetrators of domestic violence in hopes of deterring further assault. Prior to the 1980s, little attention was paid to domestic violence intervention (Fagan, 1989). Issues of family privacy vs. societal best interest were paramount (Zimring, 1989); domestic violence was sometimes thought best “left behind drawn curtains” (*State v. Oliver*, 1874, cited in Rosenfeld, 1992). Subsequent criminalization of domestic violence dictated whether the crime of domestic violence should entail rehabilitation or incarceration. Since then, spouse abusers have “traditionally fallen under the rehabilitative, rather than the punitive arm of the criminal justice system” (Rosenfeld, 1992, p. 207). In actuality, with the implementation of mandatory arrest policies and court-mandated counseling, batterers’ interventions became a fusion between punishment and rehabilitation.

1.1. Current standards of care

While interventions for batterers are far from standardized, standards of care of battering interventions have been evolving in the United States since the 1990s (see Austin & Dankwort, 1999, for a review). Most states target the perpetrator as solely responsible for the crime and, as such, he shall be held accountable. Most guidelines also require training of group facilitators and experience in domestic violence work, although professional degrees and licensure are generally not required. The recommended duration of intervention ranges from 12 to 52 weeks. Finally, the group intervention model is the format of choice in 90% of mandates, and individual and couples’ therapy is deemed as inappropriate in the majority of the current standards (Austin & Dankwort, 1999). For the most part, state standards have been developed independently of empirical research.

Despite declarations that arrest followed by court-ordered treatment offers “great hope and potential for breaking the destructive cycle of violence” (U.S. Attorney General’s Task Force on Family Violence, 1984, p. 48), there is little empirical evidence that treatment is effective in reducing recidivism of family violence to any meaningful degree. In his review of the earlier studies on marital violence treatment programs, Rosenfeld (1992) concluded that men who are arrested and complete treatment have only slightly lower recidivism rates than men who are arrested but refuse treatment, dropout of treatment, or remain untreated. Some have even argued that treatment programs may put women at increased risk for domestic violence, by contributing to a false sense of security among battered women whose husbands have sought treatment (Holtzworth-Munroe, Beatty, & Anglin, 1995).

Fortunately, in the past decade, several researchers have conducted well-designed studies capable of shedding some light on questions and concerns regarding the efficacy of batterers’ treatment. A small but growing body of methodologically rigorous investigations into the effectiveness of current programs now exists. The purpose of this article is to critically review the treatment outcome research on batterers’ interventions and to conduct a meta-analysis to examine the impact of (1) the treatment type and (2) the study design on the effect size attributable to treatment. Since the current community response to battering is a combination of legal sanctions plus rehabilitation, the goal of this meta-analysis is to examine the effect of the therapeutic intervention, over and above the effect of legal interventions.

A number of studies have summarized the effects of batterers' treatment (Babcock & LaTaillade, 2000; Davis & Taylor, 1999; Hamberger & Hastings, 1993; Levesque & Gelles, 1998; Rosenfeld, 1992; Tolman & Bennett, 1990). After their review of the research literature, Hamberger and Hastings (1993, p. 220) asked the question, "What do we know about the short- and long-term effects of treatment on wife assault?" They conclude "Not much," due to methodological problems of the existing research. In his quantitative review, Rosenfeld (1992) concluded that there are minimal decreases in recidivism rates between treatment completers (36%) and men only receiving legal-system interventions (39%). Rosenfeld stopped short of conducting a meta-analysis, due to the limited number of studies using consistent methodologies available at that time. Davis and Taylor (1999) recently reviewed the empirical batterers' treatment outcome literature and came to quite different conclusions. Although they did not conduct a meta-analysis, they calculated the average effect sizes from five studies. Based on these averages, they estimated the treatment effect size to be approximately $h=0.41$ (less than 0.50 is considered "small") but nonetheless concluded that "there is fairly consistent evidence that treatment works and that the effect of treatment is substantial" (Davis & Taylor, 1999, p. 69). Levesque and Gelles (1998) were the first to present a meta-analysis of 17 batterers' treatment outcome studies. Based on the small effect sizes (h s ranging from 0.18 to 0.27), they concluded that batterers' interventions "work a little, probably."

To help to clarify some of these discrepant conclusions, we conducted a formal meta-analysis, including the more methodologically rigorous studies, and new findings on recently completed experiments. The current study is the first formal meta-analysis on batterers' treatment outcome studies to be published to date. We attempted to improve on previous research in two ways. First, Hamberger and Hastings (1993) included studies that utilized uncontrolled, pre–post designs in their review. The level of confidence that any change in batterers' behavior was, indeed, due to treatment was undermined because extraneous causes were not ruled out by the presence of a control group. Pre–post studies preclude the estimate of an effect size due to treatment, as they are confounded with the effects of the legal system, i.e., the effects of "getting caught." As such, the present study utilized only studies that possessed some type of control group (e.g., treatment dropouts, another type of nonequivalent control group, or those randomly assigned to a no-treatment condition). Second, previous studies (Davis & Taylor, 1999; Levesque & Gelles, 1998;) have reported the effect size of batterers' treatment in terms of Cohen's h (Cohen, 1988). However, this statistic does not adjust for sample size and is more commonly used in power analysis than meta-analysis. To account for sample size, Cohen's d was selected as the measure of effect size in the present study.

1.2. Batterers' interventions

Only a few intervention modalities have been subjected to rigorous empirical test. These include feminist psychoeducational men's groups, cognitive–behavioral men's groups, anger management (a form of cognitive–behavioral group treatment), and couples' therapy.

1.2.1. Psychoeducational model

The most prominent type of clinical intervention with batterers is a feminist psychoeducational approach (Pence & Paymar, 1993). This intervention, originated by the Duluth Domestic Abuse Intervention Project program in Minnesota, is frequently referred to as the Duluth model. According to this model, the primary cause of domestic violence is patriarchal ideology and the implicit or explicit societal sanctioning of men's use of power and control over women. This program, developed from a social work perspective, typically eschews DSM-type diagnoses and does not consider the intervention to be therapy. Rather, group facilitators lead consciousness-raising exercises to challenge the man's perceived right to control or dominate his partner. A fundamental tool of the Duluth model is the "Power and Control Wheel," which illustrates that violence is part of a pattern of behavior including intimidation, male privilege, isolation, emotional, and economic abuse, rather than isolated incidents of abuse or cyclical explosions of pent-up anger or painful feelings (Pence & Paymar, 1993). The treatment goals of the Duluth model are to help men change from using the behaviors on the Power and Control Wheel, which result in authoritarian and destructive relationships, to using the behaviors on the "Equality Wheel," which form the basis for egalitarian relationships (Pence & Paymar, 1993). The feminist Duluth-type model remains the unchallenged treatment of choice for most communities. In fact, the states of Iowa and Florida mandate that battering intervention programs adhere to the general tenets of the Duluth model to be state certified (Abel, *in press*; Healey, Smith, & O'Sullivan, 1998).

1.2.2. Cognitive behavioral groups

An alternative to the feminist psychoeducational group is the cognitive-behavioral therapy (CBT) model. Cognitive behavioral batterers interventions, developed primarily by psychologists, tend to make violence the primary focus of treatment. Since violence is a learned behavior, nonviolence can similarly be learned according to the cognitive-behavioral model (Adams, 1988). Violence continues because it is functional for the user, reducing bodily tension, achieving victim compliance, putting a temporary end to an uncomfortable situation, and giving the abuser a sense of power and control (Sonkin, Martin, & Walker, 1985). Recognizing the functional aspects of violence, the cognitive-behavioral therapist points out the pros and cons of violence. In addition, they use skills training (e.g., communication, assertiveness, and social skills training) and anger management techniques (e.g., timeouts, relaxation training, and changing negative attributions) to promote awareness of alternatives to violence.

The intervention labels are often misleading. Some CBT groups are not strictly "cognitive" or "behavioral," as they address emotional components of violence, such as empathy and jealousy (Dunford, 2000). Most modern cognitive-behavior groups also usually address perpetrator attitudes and values regarding women and the use of violence toward women. To the extent that CBT groups address patriarchal attitudes, and Duluth model groups address the learned and reinforced aspects of violence, any distinction between CBT and Duluth model groups becomes increasingly unclear.

1.2.3. *Other modes of therapy*

The rationale for the use of group therapy is that men learn to confront one another's denial and victim blaming (Murphy & Baxter, 1997). As such, there have been no controlled, empirical studies to date testing individual therapy approaches for abusers. Due to concerns about the effectiveness of male-only group interventions, some in the domestic violence field are exploring alternatives to the psychoeducational group approach by testing conjoint groups (Dunford, 2000; O'Leary, Heyman, & Neidig, 1999). Advocates of couples groups state that including the wife in the group intervention may change the tenor of the men's group by rendering role-play more realistic and by reducing "women bashing" (Dunford, 2000). It may also empower the wife by allowing her to "witness authority figures confronting the offensive and oppressive nature of spouse abuse," as well as model for her constructive ways to deal with conflict (Dunford, 2000, p. 469). However, most states set standards, guidelines, or mandates that discourage or prohibit the funding of any program that offers couples or family counseling as a primary mode of intervention (Healy et al., 1998; Lipchick, Sirles, & Kubicki, 1997), as the woman's disclosures in the presence of her partner may lead to later retribution (Lipchick et al., 1997) or imply that she is at least partially to blame for her victimization (Jacobson, 1993).

2. Method

2.1. *Overview of methods of prior studies*

The primary purpose of this article is to quantitatively summarize the findings to date on the effect of batterers' treatment on violence recidivism. A review of the batterers' treatment literature was conducted using PsycInfo, entering the keywords "batterers" and "domestic violence." These were cross-referenced with terms including "treatment" and "intervention." Studies identified in this way were retrieved and their reference sections reviewed for additional treatment outcome studies. Additionally, the reference sections of five reviews of the batterer treatment literature were examined (Bargarozzi & Giddings, 1983; Davis & Taylor, 1999; Gelles, 1980; Rosenfeld, 1992; Tolman & Bennett, 1990). Prior to results of our quantitative meta-analysis, we will briefly summarize the methods and findings of available studies to the present, casting a broad net to include published materials, manuscripts in press, and data presented at national conferences. For three recent studies (Feder & Forde, 1999; Gondolf, 2000; Taft, Murphy, Elliott, & Morrel, 2001), additional information needed to calculate effect size was obtained directly from the authors.

2.1.1. *Quasi-experimental studies*

Table 1 presents the quasi-experimental studies, most of which used the nonequivalent control group design (Campbell & Stanley, 1963) to compare either treatment completers to treatment dropouts or treated offenders to a matched group of nontreated batterers (not using true random assignment). It should be noted that the nonequivalent control group design employed by most studies on battering interventions does not meet the American Psycho-

Table 1
Quasi-experimental designs

Study author	Group design and initial sample size	Treatment type	Treatment length	Attrition rates	Follow-up recidivism measure and response rates	% Re-offended	Effect size (<i>d</i>)
Taft et al. (2001), Morrel, Elliott, Murphy, and Taft (2003), and Murphy (personal communication)	Tx1 completers (<i>n</i> = 33); Tx2 completers (<i>n</i> = 41), dropouts (<i>n</i> = 12)	Tx1 = supportive + treatment retention; Tx2 = CBT + treatment retention	16 sessions	18% completed < 12 weeks	Police records at 22–36 months (73% of sample) and partner report (61% of the sample) at 6 months follow-up	Police report: Tx1 = 9.5%; Tx2 = 9.7%, dropouts = 54% Partner report: Tx1 = 10%; Tx2 = 18.5%, dropouts = 33%	Police report: Tx1 = 1.15; Tx2 = 1.22 Partner report: Tx1 = 0.69; Tx2 = 0.36
Gondolf (1997, 1998, 2000, personal communication)	Tx1 completers (<i>n</i> = 158); Tx1 dropouts (<i>n</i> = 55); Tx2 completers (<i>n</i> = 145); Tx2 dropouts (<i>n</i> = 64); Tx3 completers (<i>n</i> = 140); Tx3 dropouts(<i>n</i> = 75); Tx4 completers (<i>n</i> = 135); Tx4 dropouts(<i>n</i> = 72)	Four Duluth model programs of different lengths	Tx1 (Pittsburgh): 12 weeks with few additional services; Tx2 (Denver): 26 weeks; Tx3 (Houston): 24 weeks; Tx4 (Dallas): 12 weeks with several additional services	32% across all sites attended less than 2 months	Police reports (57%) at 15 months follow-up and cumulative partner, perpetrator, police report (48% of sample) at 30 months	Police report: Tx1 = 17%; Tx1 dropouts = 41%; Tx2 = 26%; Tx2 dropouts = 51%; Tx3 = NA; Tx3 dropouts = NA; Tx4 = 12%; Tx4 dropouts = 19% Partner report: Tx1 = 40%; Tx1 dropouts = 50%; Tx2 = 35%; Tx2 dropouts = 55%; Tx3 = 35%; Tx3 dropouts = 59%; Tx4 = 33%; Tx4 dropouts = 58%	Police report: Tx1 = 0.58 ^a ; Tx2 = 0.54; Tx3 = NA; Tx4 = 0.20 Partner report: Tx1: 0.20; Tx2: 0.41; Tx3: 0.50; Tx4: 0.52
Babcock and Steiner (1999)	Tx completers (<i>n</i> = 106); Tx dropouts (<i>n</i> = 178); incarcerated (<i>n</i> = 55)	Multisite, majority Duluth model, psychoeducational + probation	36 weeks	68% completed < 28 sessions	Police report at 2 years postprosecution	Completers = 8%; dropouts = 23%; incarcerated = 62%	Tx vs. dropouts = .40

Murphy et al. (1998)	Tx completers ($n = 10$); noncompleters ($n = 225$)	Duluth model psychoeducational	22 sessions	84% (of 62 men ordered to treatment) completed < full 22 weeks	Police records 12–18 months postprosecution	Completers = 0%; noncompleters = 16%	0.44
Dutton et al. (1997)	Tx completers ($n = 156$); Tx dropouts and rejected ($n = 290$)	Clinical anger management vs. dropouts and rejected (for noncooperation, psychosis, etc.)	16 weeks	52%	Police reports ranging up to 11 years (mean 5.2 years)	Completers = 18%; dropouts = 21%	0.07
Dobash et al. (1996)	Tx completers ($n = 40$); Tx dropouts ($n = 80$)	Psychoeducational group vs. dropouts	unknown	66%	Police and partner report (25% of sample) at 1 year follow-up	Police report: completers = 7%; dropouts = 10% Partner report: dropouts = 75%	Police report = 0.11 Partner report = 0.92
Newell (1994)	Tx1 = DV group completers ($n = 155$); Tx1 dropouts ($n = 118$); Tx2 = other Tx ($n = 83$); no Tx ($n = 135$)	Feminist psychoeducational group vs. other Tx (AA, couples, individual) vs. group dropouts vs. no Tx control	12 weeks	57%	Police reports (re-arrest) at 2 year follow-up	Tx1 completers = 23%; Tx1 dropouts = 36%; Tx2 = 16%; no Tx = 22%	Tx1 completers vs. dropouts = 0.29; Tx1 completers vs. no Tx = -0.02 Tx2 vs. no Tx = 0.15
Flournoy (1993)	Tx1 ($n = 16$); Tx2 ($n = 13$); waitlist control ($n = 14$)	Tx1 = CBT; Tx2 = psychoeducational; control = waitlist	8 weeks	CBT 19%; psychoeducational 38%	Police reports 2–3 months follow-up (81% of sample)	Tx1 = 8%; Tx2 = 0%; control = 7%	Tx1 = -0.03; Tx2 = 0.33
Harrell (1991)	Tx1 ($n = 81$); no-treatment control ($n = 112$)	Mandated CBT group (8–12 weeks) vs. no treatment mandated	8–12 weeks	20%	Police reports at 15–29 months; partner report on 90% of sample at 6 months	Police report: Tx = 50%; no Tx = 30% Partner report: Tx = 43%; no Tx = 12%	Police report = -0.42 Partner report = -0.76
Chen, Bersani, Myers, and Denton (1989)	Mandated to Tx ($n = 120$); not mandated ($n = 101$)	Anger management	8 weeks	37% completed less than 7 sessions	Police reports	Completers = 5%; dropouts = 10%	0.19
Edleson and Grusznski (1988) Study 3	Tx completers ($n = 84$); Tx dropouts ($n = 37$)	Psychoeducation followed by process oriented	8 weeks psychoeducation + 16 weeks	31%	Partner report at 6 months follow-up	Completers = 42%; dropouts = 49%	0.14

(continued on next page)

Table 1 (continued)

Study author	Group design and initial sample size	Treatment type	Treatment length	Attrition rates	Follow-up recidivism measure and response rates	% Re-offended	Effect size (<i>d</i>)
Edleson and Grusznski (1988) Study 1	Tx completers (<i>n</i> = 27); Tx dropouts (<i>n</i> = 30)	Psychoeducation followed by process oriented	8 weeks psychoeducation + 16 weeks	47%	Partner report at 6 months follow-up	Completers = 33%; dropouts = 46%	0.26
Hamberger and Hastings (1988)	Tx completers (<i>n</i> = 32); Tx dropouts (<i>n</i> = 36)	CBT group	15 weeks	53%	Combination of self + partner + police report at 1 year follow-up	Completers = 9%; dropouts = 17%	0.23
Waldo (1988)	Tx completers (<i>n</i> = 30); Tx dropouts (<i>n</i> = 30); control (<i>n</i> = 30)	Relationship enhancement men's group	12 weeks	50%	Police reports at 1 year follow-up	Completers = 0%; dropouts = 20%; controls = 20%	Completers vs. dropouts = 0.70; completers vs. control = 0.70
Leong, Coates, and Hoskins (1987)	Tx completers (<i>n</i> ≈ 33); Tx dropouts (<i>n</i> ≈ 34)	CBT group	unknown	≈ 50%	Police report at 6 months follow-up	Completers = 13%; dropouts = 29%	
Hawkins and Beauvais (1985)	Tx completers (<i>n</i> = 52); Tx dropouts (<i>n</i> = 43)	CBT	1–6 group + 6 couple and individual	45%	Police report at 6 months follow-up	Completers = 18%; dropouts = 18%	0.00
Stacey and Shupe (1984)	Initial <i>N</i> = 193; Tx1 (<i>n</i> at follow-up = 77); dropouts (<i>n</i> at follow-up = 30)	Multisite: 2 sites CBT, 1 site psychodynamic/Rogerian	10–18 weeks	Unknown	Partner report at 0–24 month follow-up (55% of sample)	Completers = 34%; dropouts = 50%	0.33

Tx = treatment.

^a Effect sizes from the Pittsburgh site (Gondolf, 2000) were excluded from the meta-analysis due to treatment dropouts receiving additional legal sanctions.

logical Association's standards for establishing empirical support (Chambless et al., 1996). All of the quasi-experimental studies share the methodological problem of potentially "stacking the deck" in favor of treatment. Men who choose to complete treatment are known to be different from those who drop out (e.g., more educated, more likely to be employed, married, and Caucasian, and less likely to have a criminal record) (Babcock & Steiner, 1999; Hamberger & Hastings, 1988). Two studies did attempt to control for these preexisting group differences (Babcock & Steiner, 1999; Gondolf, 1997), and found that the effect attributable to treatment remained statistically significant. However, the percentages and effect sizes presented in Table 1 are not corrected for confounds due to group differences between treatment dropouts and completers. It is difficult to estimate the effect size controlling for demographic variables because most studies do not present the data in a manner such that a reanalysis, controlling for confounds, would be possible; we predict that doing so would dramatically decrease the effect size.

A second methodological difficulty with quasi-experimental designs is the degree to which the "dropout" condition is contaminated by the effects of alternative sanctions against batterers. Gondolf (2000) found that the effect size of treatment at one of his study's site (Pittsburgh) was negligible. He later learned that alternative sanctions were issued upon treatment dropouts, rendering the dropouts invalid as a comparison group. Thus, that site was excluded from our meta-analysis. Other studies that were included in the meta-analysis may have similar confounds that are undisclosed in their reports. In some cases, quasi-experimental designs and randomized experiments can yield comparable effect sizes (Heinsman & Shadish, 1996). However, whether this is true for the body of studies on batterers' intervention remains an empirical question.

2.1.2. *True experiments*

Because of the ever-present risk of confounds among quasi-experimental studies, results from randomized experiments are the "gold standard" for meta-analyses (Shadish & Ragsdale, 1996, p. 1290). Therefore, results of the five, recent experimental studies should be considered a more accurate estimate of the actual effect size due to batterers' treatment. Table 2 presents the five studies to date that have employed random assignment. These five experiments deserve special attention.

Feder and Forde (1999) randomly assigned batterers on probation to either a feminist-psychoeducational program or no treatment in Broward County, FL. In general, there were no statistically significant differences between the two groups on recidivism as measured by police records ($d=0.04$) or by victim report ($d=-0.02$). There was a small but significant effect on recidivism among the subset of men randomly assigned to group treatment who attended all 26 sessions. In this study, random assignment apparently failed, with an uneven number of men being assigned to the treatment and control condition (Feder & Forde, 1999). Moreover, this study suffered from a particularly high attrition rate of men from treatment (60%) and low response rate from victims at follow-up (22%).

In a large evaluation of U.S. Navy personnel stationed in San Diego, Dunford (1998, 2000) compared a 36-week cognitive-behavioral group and a 26-week couples therapy format to a rigorous monitoring condition and a no-treatment control (victims safety planning). Neither

Table 2
Experimental designs

Study authors	Group design and initial sample size	Treatment type	Treatment length	Attrition rates	Follow-up recidivism measure and response rates	% Re-offended	Effect size (<i>d</i>)
Feder and Forde (1999, personal communication)	Tx = Duluth (<i>n</i> = 174); control (<i>n</i> = 230)	Duluth + probation vs. probation only	26 weeks	60%	Police at 1 year and partner report (22% of sample) at 6 month follow-up	Police report: Tx = 4.8%; control = 5.7% Partner report: Tx = 32.7%; control = 31.6%	Police report: Tx = 0.04 Partner report: Tx = -0.02
Dunford (2000)	Tx1 = CBT (<i>n</i> = 168); Tx2 = couples (<i>n</i> = 153); monitoring (<i>n</i> = 173); control (<i>n</i> = 150)	CBT men's group, conjoint Tx, and rigorous monitoring vs. victim safety planning control	Tx1 = 36 weeks + 6 monthly meetings; Tx2 = 26 weeks + 6 monthly meetings; monitoring = monthly meetings for 12 months	29%	Police and partner report (72% of initial sample of 861) on at 1 year follow-up	Police report: Tx1 = 4%; Tx2 = 3%; monitoring = 6%; control = 4% Partner report: Tx1 = 29%; Tx2 = 30%; monitoring = 27%; control = 35%	Police report: Tx1 = 0.00; Tx2 = 0.05; monitoring = -0.09 ^a Partner report: Tx1 = 0.13; Tx2 = 0.10; monitoring = 0.17 ^a

Davis et al. (2001)	Tx1 = long (<i>n</i> = 129); Tx2 = brief (<i>n</i> = 61); control (<i>n</i> = 186)	Duluth model treatments vs. community service control	Tx1 = 26 weeks; Tx2 = 8 weeks	33%	Police and partner report of new incident in past 2 months (50% of sample) at 1 year follow-up	Police report: Tx1 = 10%; Tx2 = 25%; control = 26% Partner report: Tx1 = 14%; Tx2 = 18%; control = 22%	Police report: Tx1 = 0.41; Tx2 = 0.02 Partner report: Tx1 = 0.21; Tx2 = 0.10
Ford and Regoli (1993)	Tx1 = pretrial diversion into counseling (<i>n</i> = 127); Tx2 = counseling as condition of probation (<i>n</i> = 114); control = sentence without counseling (<i>n</i> = 106)	Counseling (unknown type) as pretrial diversion vs. condition of probation vs. other sentencing (e.g., fine, jail) control	Unknown	Unknown	Partner report at 6 month follow-up (31% of sample)	Tx1 = 34%; Tx2 = 45%; control = 34%	Tx1 = 0.00; Tx2 = - 0.22
Palmer et al. (1992)	Tx (<i>n</i> = 30); control (<i>n</i> = 26)	Psychoeducational vs. probation only	10 weeks	30% attended < 7 sessions	Police at 1–2 year follow-up	Tx = 10%; control = 31%	Tx = 0.54

Tx = treatment.

^a Effect sizes generated from the rigorous monitoring conditioning (Dunford, 2000) were excluded from this meta-analysis, as it does not represent a therapeutic intervention. Weighted percentage of nontreated who re-offended based on police report = 21%; based on partner report = 35%.

CBT men's groups ($d=0.13$) nor couples therapy ($d=0.10$) had a significant impact on recidivism at 1-year follow-up based on victims' report. This study represents the most methodologically rigorous study conducted to date in terms of sample size, length of follow-up, attrition rates, follow-up reporting rates, and assessment of treatment adherence. However, it is important to note that this sample of batterers, those employed through the Navy in San Diego, are not representative of the population of batterers court-mandated to domestic violence programs around the country. All of the research participants were employed, had a high stake in social conformity, and thus, were more "socially bonded" (Sherman, Smith, Schmidt, & Rogan, 1992). Any intervention, including arrest and being identified by authorities, may work to deter socially bonded individuals from repeat offenses. This may be reflected in the unusually low official recidivism rates of the nontreated batterers (4%).

Davis, Taylor, and Maxwell (2001) compared a long (26-week) psychoeducational group to a brief (8-week), psychoeducational group, and to a community service control (70 hours of clearing vacant lots, painting senior citizen centers, etc.) in Brooklyn, NY. They found a statistically significant reduction in recidivism and a small but respectable effect size of $d=0.41$ based on criminal records among the long treatment group only; the 8-week group was indistinguishable from the community service control ($d=0.02$). As for partner report, this study employed a rather unusual method of calculating re-offenses. Only new incidents of violence in the 2 months prior to the follow-up contact point were included rather than a cumulative count. When based on victim report of these recent offenses, neither the long nor the brief intervention had a statistically significant effect on re-assault when compared to no treatment. Correspondingly, the effect size due to treatment based on partner report of subsequent violence was small ($d=0.21$). It is important to note that, like in the Broward County experiment (Feder & Forde, 1999), random assignment may have been compromised. In the Brooklyn experiment (Davis et al., 1998), nearly 30% of initial assignments were subjected to "judicial overrides" (Gondolf, 2001); that is, judges reassigned defendants to different interventions.

Ford and Regoli (1993) designed a study that randomly assigned batterers into treatment as a pretrial diversion (i.e., defendants' criminal records would be cleared pending treatment completion), treatment as a condition of probation postconviction, vs. alternative sentencing strategies (e.g., paying a fine or going to jail). Although this study was designed to test different sentencing options rather the effects due to treatment, one can compare batterers sentenced to treatment vs. batterers not sentenced to treatment (although the type of treatment and actual attendance rates were not specified). Again, there were no significant differences or effect sizes comparing recidivism rates based on victim report between men sentenced to treatment vs. those who were not. Neither treatment as pretrial diversion ($d=0.00$) nor as a condition of probation postconviction ($d=-0.22$) was found to be superior to purely legal interventions.

Finally, Palmer, Brown, and Barrera (1992) conducted a small scale study in Canada of men using block random procedure: men were assigned to 10-week psychoeducational treatment if a new group was to commence within 3 weeks or, if not, to a "probation only" control group. The relatively unstructured, client-centered treatment addressed beliefs about

violence, responsibility for violent behavior, coping with conflict and anger, self-esteem, and relationships with women (Peluch, 1987). Based on police reports, men assigned to the treatment condition re-offended at a significantly lower rate than men assigned to probation only, yielding a medium effect size ($d=0.54$). However, this study is limited by its small sample size, and the results may not be generalizable to other samples.

Conducting an experiment in which judicial discretion is sacrificed and criminals are randomly assigned to treatment or no treatment can be problematic on ethical as well as practical grounds (Dutton, Bodnarchuk, Kropp, & Hart, 1997). Adopting an experimental design does not guarantee a more rigorous evaluation than quasi-experimental designs afford (Gondolf, 2001). While it is true that experimental designs permit greater confidence in conclusions regarding causal relations, it is also the case that problems with differential attrition and failure of random assignment reduce internal validity of this design. Additionally, researchers must grapple with the “intention-to-treat” problem: should effect sizes be calculated from the initial sample size or from the completers only? What if the majority of “treated” offenders attended no-treatment groups whatsoever? It is recommended that researchers report both recidivism rates for all batterers who were assigned to treatment as well as those who actually completed treatment (although few of studies have done so).

2.2. Study inclusion criteria

Originally, 68 empirical studies of the efficacy of batterers’ treatment programs were located. These studies were classified according to the design: experimental ($k=5$), quasi-experimental ($k=17$) and pre–post ($k=48$). The criterion for inclusion in this meta-analysis was the (1) the presence of some form of comparison group of batterers and (2) reliance on victim report or police record as the index of recidivism. The uncontrolled, pre–post test studies have been reviewed previously (Davis & Taylor, 1999; Hamberger & Hastings, 1993; Rosenfeld, 1992). These are the weakest methodological designs and generally tend to overestimate effect size (Lipsey & Wilson, 1993). On this basis, 48 of the 70 studies were not included. The stronger quantitative evaluations of domestic violence interventions generally fall into two categories: (1) quasi-experimental, where treatment completers are compared to treatment dropouts or to a matched comparison group that did not receive treatment and (2) true experimental designs, where clients are randomly assigned to treatment(s) vs. no treatment. Studies ($k=22$) consisting of experimental and quasi-experimental designs formed the data for this quantitative review. These studies yielded a total of 44 effect sizes (effect sizes formed the unit of analysis for the present study), in which a treatment group was compared to either a randomized control or treatment dropouts.

Several recent studies have compared two active treatments for domestic violence without the inclusion of a control group and without the comparing of completers to a no-treatment or dropout comparison group. For example, two studies (Brannen & Rubin, 1996; O’Leary et al., 1999) compared a couples format to a gender-specific group format. Saunders (1996) compared the response of batterers with different personality profiles to both more standard structured groups vs. more process-oriented therapies. Although one could calculate an effect size from these treatment comparison studies, the resultant statistic would reflect the

magnitude of the difference between two active treatments. This would grossly underestimate the effect size due to treatment and potentially bias the results against treatment. Other studies (e.g., Edleson & Syers, 1991) report recidivism rates for the treatment completers only. Sullivan and Bybee (1999) conducted a well-designed randomized clinical trial of victims' advocacy intervention that yielded an effect size (d) of 0.35 based on victim report of recidivism; however, interventions with victims are beyond the scope of the current meta-analysis. While these studies are important contributions to the clinical literature, they do not render effect sizes estimating the effect due to batterers' treatment. As such, they are not included in this meta-analysis.

2.3. Coding

Effect sizes were coded along a number of dimensions that were theoretically promising for investigation as moderators. Each effect size was classified according to the type of report upon which recidivism rates were based, treatment type, treatment duration, follow-up time, and attrition rates. Report of batterer recidivism took two forms: police report and partner report. Many of the earlier effect sizes relied exclusively on batterers' self-report as an outcome measure. Such effects cannot differentiate between treatment success and batterers' tendency to vastly underreport the true incidence of abuse (Davis & Taylor, 1999; Rosenfeld, 1992). Moffit et al. (1997) found that the reliabilities between male and female report in a community sample on the presence/absence of violence was poor (average kappa=.36). They concluded that in a therapeutic or correctional setting, "where the pressures (for batterers) to bias their reports may outweigh researchers' promises of confidentiality," collateral reports may be essential (Moffit et al., 1997, p. 54). In light of this potential reporting bias, only effect sizes that use at least one independent report of recidivism, either victim report or criminal record, were included in this review. In many cases, both police and partner reports were examined. As such, our analyses of the data examined separate effect sizes for all comparisons presented in each study; moderator analysis was performed twice, separately for partner and police report, to avoid artificial inflation of the number of studies.

2.3.1. Recidivism

Considering practical significance, most clinicians working with batterers agree that cessation of intimate partner violence is an important success criterion (Edleson, 1996), rather than, for example, showing a decrease in the frequency or severity of violent acts. For the purposes of this review, "recidivism" is considered any report of physical violence reported by the victims and/or any domestic violence incidents reported to the police during a follow-up period (i.e., recidivism is a dichotomous variable and the effect sizes are calculated from the proportion of men who re-offended). Most studies utilized the Conflict Tactics Scale (CTS/CTS-2) (Straus, 1979; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) as an outcome measure of partner report of recidivism. Our dependent measure of partner report of recidivism was the percentage that stopped further physical aggression, rather than change in CTS score. While a cessation of men's emotional abuse and increased accountability are

also goals of many treatment programs, few program evaluations or experiments have examined any outcome variable other than physical abuse frequency or criminal recidivism. Therefore, only police report and partner reports of physical assault were included in this meta-analytic review.

2.3.2. *Treatment types*

Treatment types included Duluth/feminist psychoeducational ($k=19$), CBT ($k=11$), and other ($k=7$). Since the meta-analytic method requires examination of the heterogeneity/homogeneity of variance due to each putative moderator, a cell size greater than one was required for each level of the moderator. As a consequence, any type of treatment that occurred only once in the database was aggregated into the “other” category. The seven effect sizes in the “other” category came from studies testing the effectiveness of couples therapy (Dunford, 2000), supportive therapy (Taft et al., 2001), relationship enhancement (Waldo, 1988), a mixture of different interventions (Newell, 1994), and therapies of an unspecified type (Ford & Regoli, 1993).

2.3.3. *Treatment length*

Treatment length was dichotomized: short (mean treatment length <16 weeks), and long (mean treatment length 16 weeks). If any treatment did not maintain a uniform duration, the average length of treatment was utilized.

2.3.4. *Follow-up length*

Effect sizes were classified into one of two categories based on follow-up length: short (mean follow-up time <12 months) and long (mean follow-up time >12 months). For studies with variable follow-up times, the mean follow-up time was calculated.

2.3.5. *Attrition*

Attrition from treatment was calculated as the percentage of individuals who were classified as “dropouts” from the quasi-experimental studies by the authors. It should be noted that different authors have distinct criteria for what constitutes treatment completion. For some effect sizes, completers must attend 100% of the sessions; other authors report “completers” as those attending 80% or more of the required sessions. Due to the inconsistencies in calculating and reporting attrition, this variable was not entered into the meta-analysis. However, attrition rates are reported in [Tables 1 and 2](#). They may be viewed as an index of quality of treatment or quality of the coordinated community response and may influence the effect size.

2.4. *Reliability*

For reliability purposes, both the first and second authors reviewed and coded each study. There were no disagreements on study design, type of report, length of treatment, or follow-up length (reliability = 100% agreement). However, there was one study in which the coders disagreed on the treatment type (reliability = 95% agreement). In this case, the study author

was contacted (Jeffrey Edelson, personal communication, September 13, 2000) to assist in assigning a label to the treatment.

2.5. Estimates of effect size

Table 1 presents the general design, type of treatment, and recidivism or re-offense rates of all identifiable quasi-experimental designs, and Table 2 the existing true experimental studies conducted in the past decade. The re-offense rates (that is, the percentage in the treated and control conditions who re-offended) as reported in the studies were then recalculated into an effect size, using the g statistic on proportions (Hedges & Olkin, 1985). The g statistic on proportions was then transformed into the d statistic, adjusting for sample size (Johnson, 1995). It is important to note that the size of the final samples with complete recidivism data at follow-up, especially those based on partner/victim report, is usually significantly smaller than the initial n . In many cases, the specific n s of treated and comparison groups with complete follow-up data were not explicit, although the follow-up response rate usually was. In those cases, we estimated the final n by “discounting” the initial n in each condition by the proportion with complete follow-up data.

An “effect size” is an attempt to quantify the magnitude of the effect due to treatment using a shared metric that is not influenced by the size of the sample. When based on the d statistic, effect sizes of 0.20 are considered “small,” 0.50 are considered “medium,” and effect sizes 0.80 and above are considered large (Cohen, 1988). The d effect size is in units of standard deviations; therefore, an effect size of 0.25 translates to an improvement of one-fourth of a standard deviation compared to no treatment. In true experimental designs, the effect size allows us to evaluate the magnitude of the impact that treatment has on recidivism; in quasi-experimental designs, the effect size approximates the strength of relationship between treatment and recidivism, uncontrolled for external confounds (Campbell & Stanley, 1963).

Effect sizes and variances were calculated in terms of d using Hedges and Olkin’s (1985) meta-analytic method. This enabled differential weighting of effects for sample size. Calculation of the d was accomplished utilizing D-Stat version 1.11 (Johnson, 1995). This software program calculates d based on proportions by treating each proportion as the mean of a distribution of successes vs. failures. Effect sizes were computed for each comparison for each dependent measure (i.e., report type), resulting in a total of 37 effect sizes. Moderator analysis was then conducted using MetaWin 1.0 (Rosenberg, Adams, & Gurevitch, 1997). This computer program follows Hedges and Olkin’s hierarchical approach to meta-analysis that employs the Q statistic to determine the degree of heterogeneity that exists between and within groups. As mentioned previously, other studies (Davis & Taylor, 1999; Levesque & Gelles, 1998) have reported the effect size of batterers’ treatment in terms of Cohen’s h (Cohen, 1988). Recalculating the effect sizes in terms of Cohen’s h does not substantially change the conclusions of this article. The d effect sizes can easily be converted to r effect sizes (Wolf, 1986, p. 35)¹ to calculate a

¹ Formula for r -to- d transformation: $r = \frac{d}{\sqrt{d^2 + 4}}$.

binomial effect size display (BESD), using the formula (Rosenthal, 1995; Rosnow & Rosenthal, 1988):

$$\text{BESD} = 0.50 + (r/2)$$

The BESD allows for translation of the effect size in terms of differential outcome rates to assist in interpreting the practical importance of the effect size.

Previous works (Babcock & LaTaillade, 2000; Davis & Taylor, 1999) have informally examined the effect of batterers' treatment by taking the average effect size across study. In contrast, formal meta-analyses weight effect sizes by sample size. Therefore, the results of this article may differ substantially from simply averaging or “eyeballing” of the effect sizes presented in the tables.

3. Results

Based on the data summarized in Table 1, the weighted percentage of nontreated offenders who recidivated was 21% based on police reports and 35% based on partner reports. These recidivism rates for nontreated offenders are consistent with those previously reported (O'Leary et al., 1989; Rosenfeld, 1992).

3.1. Publication bias

Analysis for publication bias and the “file drawer” phenomenon was conducted using a normal-quantile plot (Wang & Bushman, 1998). If null findings were selectively ignored, the normal-quantile plot would reveal absence of effect sizes around zero. Examination of the plots revealed no evidence for a publication bias (see Fig. 1).

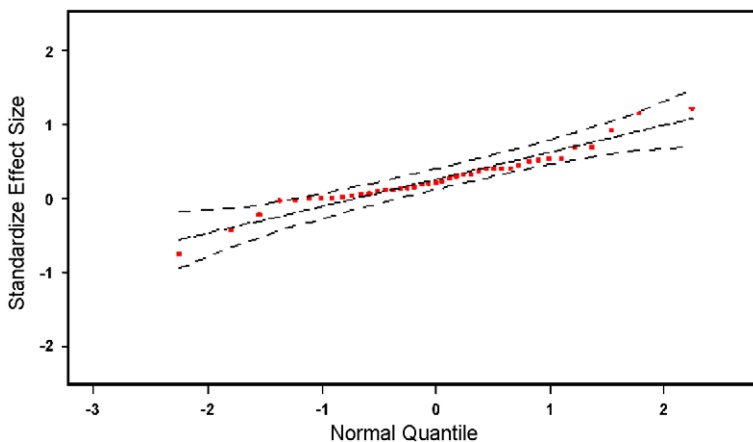


Fig. 1. Normal quantile plot to assess for the “file-drawer” problem.

3.2. Outlier analysis

Outlier analysis was conducted using the sample adjusted meta-analytic deviancy statistic (SAMD) developed by Huffcutt and Arthur (1995). The SAMD statistics were calculated separately for police and partner report. Examination of the scree plot of SAMD statistics when recidivism was assessed by police report suggested four possible outliers: both CBT (SAMD=8.73) and supportive interventions (SAMD=6.99) with retention techniques reported by Taft et al. (2001) and CBT in Harrell (1991) (SAMD=-11.08). Taft et al. and Harrell were thus excluded from subsequent analyses.

The scree plot of SAMD statistics based on partner report indicated that there were two outliers. These data points represented Dobash, Dobash, Cavanagh, and Lewis (1996) and Harrell (1991) with SAMDs of 11.01 and -15.02, respectively. Both effect sizes were excluded from the subsequent analysis based on outlier analysis.

3.3. Moderators of effect size

The remaining 36 effect sizes were entered into the hierarchical fixed effects analysis described by Hedges and Olkin (1985). A model was tested that reflected a combination of methodological and treatment moderators (Fig. 2); these included: report type, experimental vs. quasi-experimental design, and treatment type.

3.4. Effects due to method of assessing recidivism

The first moderator variable entered into the analysis was report type. The resulting analysis of two sets of effect sizes based on police and partner reports (i.e., a hierarchical moderator approach) permitted optimal use of the existing data without redundant use of samples in each group. We report 95% confidence intervals (CIs) for all effect size estimates. CIs that do not contain zero can be considered statistically significant from zero at the $P < .05$ level. Effects based on police report ($k=20$) yielded an overall effect size of $d=0.18$ (95% CI=0.11–0.25) and the effects based on partner report ($k=16$) yielded an equivalent effect size of $d=0.18$ (95% CI=0.08–0.28). Examination of the Q -within statistic was not significant heterogeneity for police report ($Q_w=26.96$, $df=19$, ns) or partner report ($Q_w=10.96$, $df=16$, ns). A significant Q_w statistic indicates heterogeneity among the effect sizes that suggested the existence of further moderators. While the Q_w was not statistically significant for either police or partner report, indicating a lack of heterogeneity, the presence of the hypothesized model (Fig. 2) warranted continued examination of the remaining moderators (Rosenthal, 1995).

3.5. Effect due to study design

The second moderator variable entered into the model was research design (i.e., experimental or quasi-experimental). This variable was examined for effects based on police and partner report. Analysis of research design as a moderator for effect size within police report revealed that experimental designs ($k=6$) had an overall $d=0.12$ (95% CI=0.02–0.22). The

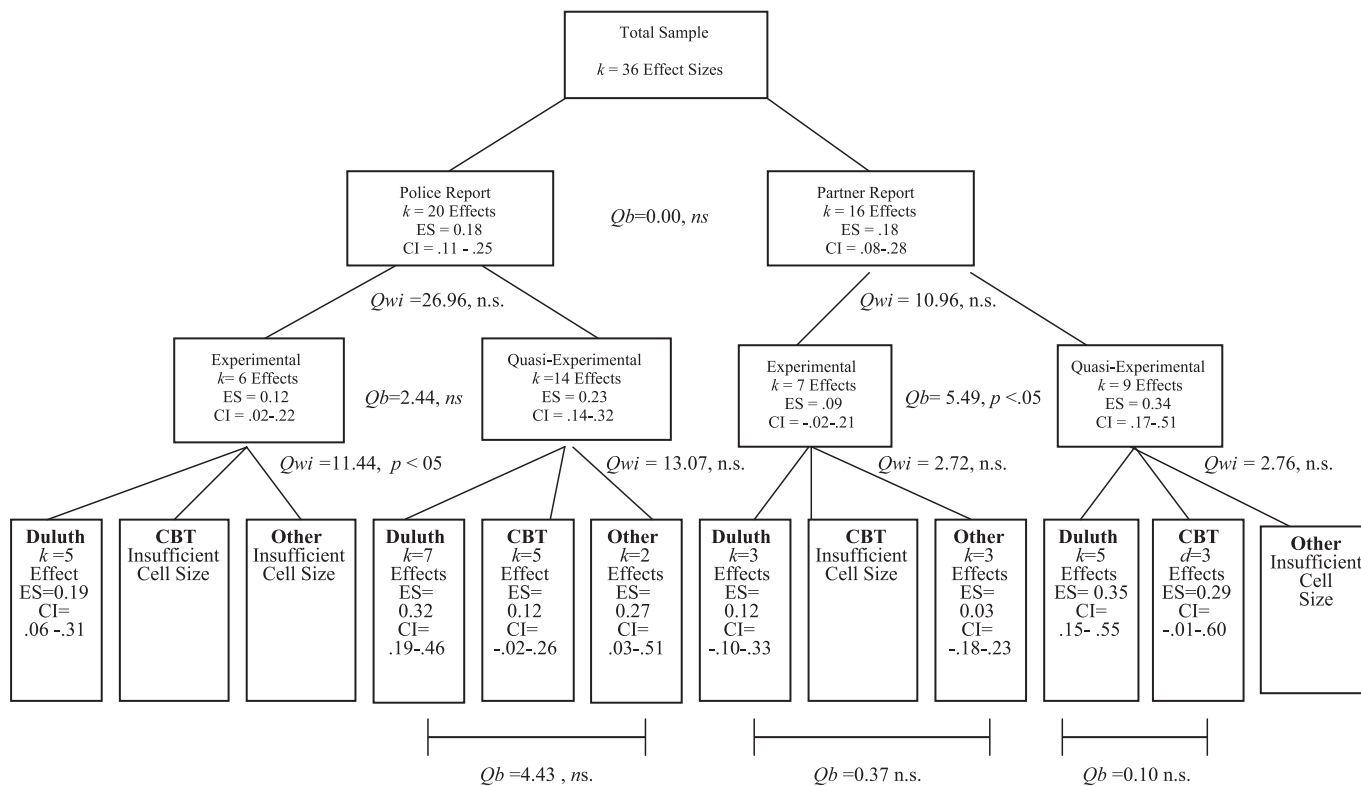


Fig. 2. Meta-analytic model testing recidivism report, study design, and type of treatment as moderators.

overall effect size for quasi-experimental designs with police report ($k = 14$) was $d = 0.23$ (95% CI = 0.14–0.32). For both experimental and quasi-experimental designs, treatment had a significant yet small impact on the cessation of domestic assault. There was not a significant difference between the overall effect sizes for experimental and quasi-experimental designs based on police report ($Q_b = 2.44$, $df = 1$, ns). Examination of results based on police report indicated that there was significant heterogeneity among effect sizes among experimental designs ($Q_w = 11.44$, $df = 5$, $P < .05$.) but not for quasi-experimental designs ($Q_w = 13.07$, $df = 13$, ns).

Similar analyses were conducted for effect sizes based on partner report ($k = 16$). Analysis of research design as a moderator for effect size within partner report revealed an average effect size for experimental designs ($k = 7$) of 0.09 (95% CI = -0.02 – 0.21), not significantly different from zero. The overall effect size based quasi-experimental designs with partner report ($k = 9$) was $d = 0.34$ (95% CI = 0.17–0.51). This represents a significant yet small effect size. There was a statistically significant difference between the overall effect sizes for experimental and quasi-experimental designs based on partner report ($Q_b = 5.49$, $df = 1$, $P < .05$.) Examination of the effect sizes based on experimental designs and partner report indicated that there was not significant heterogeneity ($Q_w = 2.72$, $df = 6$, ns). Inspection of the effect sizes based on quasi-experimental designs and partner report indicates that there is not significant heterogeneity ($Q_w = 2.76$, $df = 8$, ns) within these cells.

3.6. Effect due to treatment type

The third moderator variable entered into the model was treatment type. This was examined for effect sizes based on experimental design and police report, quasi-experimental design and police report, and quasi-experimental design and partner report. Calculation of the effect overall effect size due to treatment type within experimental designs with police report indicated that Duluth ($k = 5$) had an effect size of $d = 0.19$ (95% CI = 0.06–0.31). CBT and “other” therapies lacked sufficient cell size ($k < 2$) to calculate an effect size. Thus, Duluth demonstrated a small effect based on police report and experimental design.

Examination of the effect overall effect size due to treatment type within quasi-experimental designs with police report indicated that Duluth ($k = 7$) had an effect size of $d = 0.32$ (95% CI = 0.19–0.46), CBT ($k = 5$) had an effect size of $d = 0.12$ (95% CI = -0.02 – 0.26), and other ($k = 2$) had an effect size of $d = 0.27$ (95% CI = 0.03–0.51). In this case, the effect sizes from the Duluth model and “other” interventions were significantly different than zero, whereas CBT interventions were not significantly different from zero. However, these effect sizes did not differ significantly from one another ($Q_b = 4.43$, $df = 2$, ns).

Examination of the overall effect size due to treatment type within experimental designs with partner report indicated that Duluth ($k = 3$) had an effect size of $d = 0.12$ (95% CI = -0.10 – 0.33) and other ($k = 3$) had an effect size of $d = 0.03$ (95% CI = -0.18 – 0.23). CBT therapies lacked sufficient cell size ($k < 2$) to calculate an effect size. Effect sizes did not differ significantly from one another ($Q_b = 0.37$, $df = 2$, ns).

Calculation of the overall effect size due to treatment type within quasi-experimental designs with partner report indicated that Duluth interventions ($k = 5$) had an effect size of $d = 0.35$ (95%

Table 3
Effect size due to factors not tested in the model

	<i>d</i> based on police report	<i>k</i>	95% CI	<i>d</i> based on partner report	<i>k</i>	95% CI
Overall treatment length	0.18	18	0.11–0.25	0.20	14	0.10–0.32
Long	0.16	8	0.08–0.25	0.18	8	0.06–0.31
Short	0.20	10	0.09–0.32	0.30	6	0.08–0.51
Overall follow-up length	0.18	19	0.11–0.25	0.18	16	0.08–0.28
Long	0.25	8	0.14–0.35	0.48	3	0.21–0.75
Short	0.13	11	0.04–0.22	0.13	13	0.02–0.24
Overall attrition rate	0.18	19	0.11–0.25	0.20	14	0.09–0.31
High ($\geq 50\%$)	0.20	8	0.10–0.30	0.09	2	–0.23–0.40
Low ($< 50\%$)	0.16	11	0.07–0.26	0.22	11	0.10–0.34

k = number of studies.

CI = 0.15–0.55) and CBT ($k = 3$) had an effect size of $d = 0.29$ (95% CI = –0.01–0.60), while the “other” category lacked sufficient cell size to be included in this analysis. The two effect sizes, however, were not significantly different from each other ($Q_b = 0.10$, $df = 1$, ns).

Due to the small cell sizes for each treatment type a second model was examined that aggregated the experimental and quasi-experimental effect sizes for each reporting method (i.e., police or partner). Q -within and Q -between statistics were identical to the initial model for police and partner report. Calculation of the overall effect size due to treatment type within police report indicated that Duluth ($k = 11$) had an effect size of $d = 0.25$ (95% CI = 0.16–0.34), CBT ($k = 6$) had an effect size of $d = 0.09$ (95% CI = –0.03–0.20), and other ($k = 3$) had an effect size of $d = 0.09$ (95% CI = –0.01–0.32). There were no statistically significant differences between effect sizes for among the three treatment categories ($Q_b = 4.80$, $df = 2$, ns).

Examination of the overall effect size due to treatment type within partner report indicated that Duluth ($k = 8$) had an effect size of $d = 0.24$ (95% CI = 0.09–0.39), CBT ($k = 4$) had an effect size of $d = 0.20$ (95% CI = –0.001–0.40), and other ($k = 4$) had an effect size of $d = 0.04$ (95% CI = –0.16–0.25). There were no statistically significant differences between effect sizes for among the three treatment categories ($Q_b = 2.36$, $df = 2$, ns).

There was inadequate power to assess effect due to treatment length or follow-up length as moderator variables under different types of treatment. The overall effect sizes for treatment length, follow length, and attrition are reported in Table 3. Further analysis was conducted to examine the degree to which the inclusion of outliers in the analysis altered the present findings. In particular, a “best-case” scenario was evaluated in which only the low outliers were excluded from the analysis. The results were not significantly different from the model with all outliers removed.

4. Discussion

In general, the effect size due to group battering intervention on recidivism of domestic violence is in the “small” range. There were no significant differences in average effect size

between Duluth-type and cognitive-behavioral battering intervention programs using either police records or victim reports as the index of recidivism. While quasi-experimental designs tended to yield higher effect sizes than true experiments, the differences in effect sizes were not significant. Regardless of reporting method, study design, and type of treatment, the effect on recidivism rates remains in the small range. In the best case scenario, using quasi-experimental designs based on partner report, the effect size is $d=0.34$ indicating that treated offenders showed a one-third standard deviation in improvement in recidivism as compared to nontreated batterers.

If one relies exclusively on the five experimental studies, the effect sizes are even smaller. However, the effect sizes may be small as a result of measurement error and methodological difficulties common to research in applied settings (McCartney & Rosenthal, 2000). McCartney and Rosenthal (2000, p. 178) warn that “(g)iven that the stakes are so high, we should be wary of accepting the null hypothesis when it might very well be false—as it almost always is.” Based on the experimental studies, the effect size (d) due to treatment is 0.09 and 0.12, based on victim report and police records, respectively. This means that treatment is responsible for an approximately one-tenth of a standard deviation improvement in recidivism. Based on a partner report, treated batterers have a 40% chance of being successfully nonviolent, and without treatment, men have a 35% chance of maintaining nonviolence. Thus, there is a 5% increase in success rate attributable to treatment. To a clinician, this means that a woman is 5% less likely to be re-assaulted by a man who was arrested, sanctioned, and went to a batterers’ program than by a man who was simply arrested and sanctioned. Whether this success rate is cause for celebration or despair depends on a cost-benefit analysis; taking into account the cost of treatment and any potential “side effects” vs. the benefits of injury prevention and decreased psychological risk to the victim as well as the children exposed to family violence. A 5% decrease in violence may appear insignificant; however, batterers treatment in all reported cases of domestic violence in the United States would equate to approximately 42,000 women per year no longer being battered.

4.1. How large of an effect size should we expect?

One way to contextualize the effect size due to treatment is by comparing it to the effect sizes for treatment in other populations. Davis and Taylor (1999) compared their treatment effect size of 0.41 to the effect size of an early clinical trial on the effect of aspirin on heart attacks, which was only 0.068 and constitutes a 4% reduction in heart attacks (Rosnow & Rosenthal, 1988). Compared to this standard, they conclude that “the effect sizes seen in batterers’ treatment studies are quite substantial” (Davis & Taylor, 1999, p. 85). However, the average effect size across psychotherapy studies is much larger, approximately $d=0.85$ (Smith, Glass, & Miller, 1980). In practical terms, psychotherapy leads to benefits in 70% of cases (Rosenthal, 1995). Compared to this standard, there is great room for improvement in our batterers’ treatment interventions.

However, comparison with psychotherapy outcomes in general may not be fair. Most psychotherapies address internalizing problems (e.g., depression, anxiety) rather than

externalizing problem behavior, like aggression. Given that aggression is difficult to treat, compounded with the fact that batterers are generally not seeking treatment voluntarily and do not necessarily expect the interventions to help (Gondolf, 2001), perhaps an overall small effect due to treatment is to be anticipated. A recent meta-analysis of psychotherapy with children and adolescents reveals that the effect size for treatments of aggression was $d=0.32$ (Weisz, Weiss, Han, Granger, & Morton, 1995), indicating a 16% improvement in success rate over no treatment. Correctional treatments with adult prisoners result in effect sizes averaging $d=0.25$ (Loesel & Koefler, 1987, cited in Lipsey & Wilson, 1993), approximating a 12% improvement rate. Based on Rosenfeld's (1992) earlier review of the literature, Dutton (1998, p. 177) speculated that the effects of battering interventions fall midrange between the effects due to psychotherapy and the effects due to rehabilitation of offenders. Results from this meta-analysis reveal that even Dutton's rather modest claim appears to be overly optimistic. The effects due to battering intervention are much closer to rehabilitation effects than the effect sizes of psychotherapy in general.

4.2. Have "all won and all must have prizes?"

While the effect attributable to treatment is to some extent dependent on the methodologies employed by the studies, the effect sizes for Duluth model and CBT treatments remain relatively similar. With liberal estimates based on quasi-experimental studies, Duluth interventions yield a small effect size of $d=0.35$ while CBT interventions yield a smaller effect size of $d=0.29$. Given the variability in effect sizes of the studies that make up these averages, however, we cannot say that CBT is outperformed by Duluth-type treatment. While some may attempt to selectively use these data to bolster their arguments, claims for the superiority of one treatment type over another is unwarranted.

In retrospect, it is not surprising that there were no significant differences between CBT and Duluth-type interventions. Modern batterer groups tend to mix different theoretical approaches to treatment, combining both feminist theory of power and control as well as specific interventions to deal with anger control, stress management, and improved communication skills (Davis & Taylor, 1999; Healy et al., 1998). The "brand name" labels can be misleading. No researchers to date have conducted a head-to-head comparison between CBT and Duluth-type battering interventions, perhaps due the difficulty in identifying treatment techniques unique to either school.

It is common in the psychotherapy outcome literature to find that different modalities of treatment are equally effective—and to conclude that all have won (Beutler, 1991). This phenomenon of finding comparability in treatment outcomes is referred to as the "dodo bird verdict" (Beutler, 1991; Luborsky et al., 1975). Equivalent effect sizes due to treatment are common results of comparative studies of two active treatments (DeRubeis & Crits-Cristoph, 1998). In this case, only one study has conducted a randomized clinical trial of two active treatments (CBT and couples groups) against a no-treatment control (Dunford, 2000). Within this study and across the domain of studies to date, effects sizes due to all types of interventions are small.

4.3. *Have all lost?*

While the effect size due to treatment overall is in the small range, there are some specific studies finding large effect sizes. As shown in [Table 1](#), the interventions with the largest effect sizes were obtained from 16-week group therapies supplemented with retention techniques ([Taft et al., 2001](#)) and 12-week relationship enhancement skills training groups ([Waldo, 1988](#)). These findings can either be dismissed as “outliers” among scientific treatment studies, or viewed as harbingers of potentially powerful interventions. In the first study, [Taft et al. \(2001\)](#) randomly assigned men to either CBT or supportive therapy groups, both of which were supplemented with techniques designed to improve treatment retention based on the principles of motivational interviewing ([Miller & Rollnick, 1991](#)). These techniques consisted of reminder phone calls and supportive handwritten notes after intake and after missed sessions. As a result, the authors report one of the lowest attrition rates in the literature. The core therapies differed dramatically from one another, one being highly structured and the other unstructured, but both revealed strong effect sizes, especially when based on police report. This study suggests that the small effect sizes due to batterers’ interventions may be in part attributable to the client’s noninvestment and subsequent attrition from the programs. These simple techniques, which can be an adjunct to any type of program, may increase the client’s perception that the program is aware of his absence and is invested in his welfare. Thus, he may be more motivated to complete and actively participate in the program, lowering attrition and recidivism.

The second study to find a large effect size was an evaluation of an intervention called relationship enhancement ([Guernsey, 1977](#)). The goals of relationship enhancement as applied to battering are to help the men develop interpersonal skills that enhance relationships and enable them to stop their use of violence ([Waldo, 1988](#)). Interventions include role-plays and assigned homework targeted to improve expressive skills, empathy, communication with the partner, and the identification and management of their emotions (see [Waldo, 1985](#)). This study suggests that more emotion-focused, rather than cognitively focused, interventions may increase the effect size of batterers treatment. Of course, the results of any single, unreplicated study should not be over generalized. More research is needed on the effectiveness of motivational interviewing as well as emotion-focused approaches as treatment modalities or as additive components to existing batterers’ intervention groups.

4.4. *Limitations*

One of the greatest concerns when conducting a meta-analysis is the ease at which the “bottomline” is recalled and the extensive caveats for caution are forgotten or ignored. Although we selected only studies that met our minimal criteria for rigor (inclusion of a comparison group, a follow-up period beyond the end of treatment, not relying on batterers’ self-report), there remains significant variability in the quality of research studies. Even the experimental studies are hindered by problems with high attrition rates, inconsistencies in reporting recidivism for dropouts, and low reporting rates at follow-up ([Gondolf, 2001](#)). Some of these factors that affect the quality of the research studies are confounded with

treatment quality and quality of the community response, broader factors that cannot always be ascertained. Therefore, caution in interpreting these results is warranted. Meta-analyses are only as robust as the individual studies taken into account.

Quasi-experiments make up the bulk of the studies included in this meta-analysis, but studies comparing treatment completers to dropouts are inherently confounded by self-selection. Quasi-experiments capitalize on “creaming” (Davis & Taylor, 1999); that is, comparing the most highly motivated batterers with the least motivated batterers, “thereby stacking the deck in favor of finding program effects” (Davis & Taylor, 1999, p. 74). Yet, experiments have interpretational biases as well. Most studies base outcomes according to the original random assignment. If the experimental treatment suffers from high attrition rates, and the outcome data are based on “intention to treat,” there is a strong possibility that few people received an adequate “dose” of treatment (Gondolf, 2001). The alternative, using treatment actually received, results in a violation of random assignment while simultaneously engaging in “creaming,” making the experiment no more rigorous than a quasi-experiment. Policymakers want to know whether mandating counseling leads to lower rates of recidivism in comparison to other approaches. This question has two parts: (1) Will they attend treatment if mandated? (2) Will treatment have an impact on recidivism if they do attend? Both true and quasi-experiments must grapple with how to tease apart the two parts of this question.

Other limitations include variability across studies concerning what constitutes successful treatment completion. In some cases, the definition was clear (e.g., completing 70% or 80% of the required sessions) and in other studies, it was unspecified. Future researchers should carefully specify what qualifies as successful completion of treatment and also examine the relationship between number of treatment sessions attended and outcome to identify any potential “dose–response” curve. The reliance on dichotomous variables of recidivism may be an overly conservative estimate and dampen the effect size of batterers’ treatment. The overall effect sizes may be larger if one uses a reduction of violence rather than cessation of violence as the outcome measure. However, doing so would result in the inclusion of a smaller number of studies, as several early studies do not report the necessary statistics. In addition, the clinical significance of the change in violence attributable to batterers’ intervention may be questionable.

All longitudinal studies are affected by follow-up rates. As shown in Tables 1 and 2, many studies fail to report participation rates of partners at follow-up. Where partner follow-up contact rates are reported, they range from 22% to 90% of the sample. Those who are lost to follow-up are thought to be more abusive (DeMaris & Jackson, 1987), and therefore success rates may be inflated (Tolman & Bennett, 1990). As such, the resultant effect sizes would also probably be overestimates.

Like partner reports, police reports as outcome measures of recidivism are also problematic and may not adequately reflect reality. With couples already involved in family violence interventions, only about one out of every five domestic violence assaults are reported to the authorities (Rosenfeld, 1992). In some jurisdictions, police reports themselves are inaccurate. Crimes committed outside of the state or local jurisdiction, or incidents of violence in which adjudication was deferred may not appear on the criminal record. Crimes that do appear on the record may be ambiguous as to whether they were family violence or other types of

assault, and researchers have to grapple with which types of crimes “count” in terms of recidivism.

Moreover, the effect size due to treatment for court-mandated batterers is confounded with the strength of the coordinated efforts of the police, probation, and legal system. The potency of the legal system that sanctions men for noncompliance may have a profound effect on treatment completion rates and, as a result, the effect of treatment. Yet, few studies attempt to examine the additive effects of arrest, prosecution, treatment, probation, and legal action for noncompliance (Babcock & Steiner, 1999; Murphy, Musser, & Maton, 1998, are exceptions).

Given these methodological and pragmatic issues, it is not surprising that the effect sizes attributable to batterers’ treatment are small. Although we excluded treatment comparison studies because they only allow an estimate of the size of the difference between two active interventions, the entire literature on batterers’ intervention is actually predominated by component analysis studies, attempting to measure the additive component of the treatment on top of the legal interventions. Since involvement in the legal system is probably beneficial in reducing recidivism (Dutton, 1987), court-ordered treatment programs must reduce abuse recidivism further to demonstrate the effectiveness of treatment over and above legal-system interventions (Rosenfeld, 1992). Differences between two active interventions are more difficult to find than between treatment and no-treatment conditions. Added to that is the spontaneous violence cessation rate in nonclinical samples of about 35% (O’Leary et al., 1989). For batterers’ interventions to be proven effective, they must supercede both the spontaneous recovery rate and the effects of legal interventions.

4.5. Clinical and policy implications

Policymakers should not accept the null hypothesis and dismiss the potential for batterers’ interventions to have an impact on intimate partner abuse. Results showing a small effect of treatment on violence abstinence do not imply that we should abandon our current battering intervention programs. Similar small treatment effects are found in meta-analyses of substance abuse treatments when abstinence from alcohol is the outcome of interest (Agosti, 1995). Yet, some people are able to dramatically transform their lives following substance abuse or battering interventions. Given what we now know about the overall small effect size of batterers’ treatment, the energies of treatment providers, advocates, and researchers alike may best be directed at ways to improve batterers’ treatment. Because no one treatment model or modality has demonstrated superiority over the others, it is premature for states to issue mandates limiting the range of treatment options for batterers. Battering intervention agencies are more likely to improve their services by adding components or tailoring their treatments to specific clientele, than by rigidly adhering to any one curriculum in the absence of empirical evidence of its superior efficacy. Different types of batterers may preferentially benefit from specific forms of interventions (Saunders, 1996), yet no controlled treatment-matching studies have been conducted to date. While a small number of studies have assessed group and couples’ formats, no published studies to date have attempted to assess the efficacy of individual treatment for battering, although these researchers are embarking on this frontier (e.g., Fruzzetti, 2001; Rathus, 2001). Promising directions for improving treatment efficacy

include targeting treatments to specific subsamples, such as different ethnic minority groups, batterers who are chemically dependent, batterers at different motivational stages, different types of batterers (e.g., family-only, borderline, and antisocial/generally violent types), and women arrested for domestic violence. Treatment providers should develop alternative techniques and collaborate with researchers to evaluate their efficacy in an effort to develop evidence-based practice. To this end, researchers need to become an integral part of the coordinated community response to domestic violence.

Batterers' treatment is just one component of the coordinated community response to domestic violence. Police response, prosecution, probation, as well as treatment all affect recidivism of domestically violent partners. Even the best court-mandated treatment programs are likely to be ineffective in the absence of a strong legal response in initial sentencing and in sanctioning offenders who fail to comply with treatment. Even then, treatment may not be the best intervention for all batterers. Alternative sanctions should be developed and empirically tested along with alternative treatments.

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Transforming a flawed policy: A call to revive psychology and science in domestic violence research and practice

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Abstract

Intimate partner violence (IPV) continues to be social problem in the United States. Unfortunately, legislation aimed at solving the problem has been based on models of IPV that are not empirically supported. One example is “psychoeducational” intervention models legislated by the courts in many states. These models eschew psychological treatment even of empirically established factors supporting habits of intimate abusiveness. They have, in effect, removed a psychology of abusiveness from intervention and replaced it with a gender political model. In contrast to this model, research from several longitudinal peer cohort studies shows that a propensity for IPV is predictable in both genders during adolescence. Yet treatment or prevention of psychological risk factors is either neglected or negatively legislated. This paper reviews the prevailing criminal justice intervention model, provides examples of how the paradigm supporting this model distorts interpretation of research and compares this flawed research with methodologically superior studies suggesting a different and potentially more effective approach.

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Keywords: Domestic violence; Criminal justice; Intimate partner violence

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“Any country that has tried to create a political solution to human problems has ended up with concentration camps and gulags.” —Erin Pizzey

1. Introduction

For over thirty years, the public policy response to the problem of domestic violence has been defined by activists as the socially sanctioned dominance of women by men. This view of patriarchy as the sole cause of domestic violence is the underpinning for a policy/practice paradigm that has dominated the regulatory, legal, and policy discourse of the United States, Canada and other countries (Gelles, 2001; Maiuro, Hagar, Lin, & Olson, 2001; Mills, 2003). It has influenced legal policy including arrest priorities (Sherman et al., 1992), prosecutorial decision making (Ford & Regoli, 1993) and post arrest intervention (Maiuro et al., 2001). During the same period, researchers from a variety of disciplines have repeatedly found that domestic violence is influenced by a much wider range of factors (Elliott, 1977; Rounsaville, 1978; Straus, 1973). Violence between intimates and family members stems from a complex of etiological processes with neurological (Dutton, 2001; Meloy, 1992; Schore, 2003a,b), psychological (Dutton, 2002; Dutton & Holtzworth-Munroe, 1997a,b; Dutton, Saunders, Starzomski, & Bartholomew, 1994; Dutton & Starzomski, 1993; Hamberger & Hastings, 1991; Holtzworth-Munroe, Bates, Smutzler, & Sandin, 1997; Holtzworth-Munroe, Stuart, & Hutchinson, 1997), interpersonal (Jacobson et al., 1994; Leonard & Roberts, 1998; Margolin, John, & Gleberman, 1989), situational (Eckhardt, Barbour, & Davis, 1998; Fagan, 1989; Fagan, Stewart, & Hansen, 1983), and cultural influences (Archer, 2005; Dutton, 1985). The etiology of intimate partner violence has been found to have long term development (Dutton, 2000, 2002) stemming from early family influences such as witnessed violence (Dutton, 2000; Eglund, 1993), shaming (Dutton, Starzomski, & Ryan, 1996; Dutton, Swanson, van Ginkel, & Starzomski, in press), and trauma (Dutton & Holtzworth-Munroe, 1997a,b).

Recent evidence from the best designed studies (Ehrensaft, Moffitt, & Caspi, 2004; Moffitt, Caspi, Rutter, & Silva, 2001) indicates that intimate partner violence is committed by both genders with often equal consequences (Laroche, 2005; Pimlott-Kubiak & Cortina, 2003; Serbin et al., 2004). The violence is not committed because of “sex role beliefs” but formation into an intimate abuser begins developmentally much sooner, from a much broader array of psychosocial risk (Dutton, 2002; Putallaz & Bierman, 2004; Serbin et al., 2004; Sroufe, Egeland, Carlson, & Collins, 2005). This occurs in both genders (Dutton, 2002, 2001). Personality disturbance and behavioral features in fifteen year old girls predict their use of violence in relationships at age 21 independent of violence usage by a male partner (2001).

Recurring intimate partner violence (IPV) is most frequently sustained by interactive factors (Leonard & Senchak, 1993; Levenson & Gottman, 1983; Margolin et al., 1989; Stets & Straus, 1992a,b) and bilateral violence is the most common form of IPV; the stereotype of male perpetrator–woman victim is the least common form (Stets & Straus, 1992a,b). Left without state intervention, most violent marriages de-escalate rather than escalate (Feld & Straus, 1990) and state intervention in the form of mandatory arrest has differentially effective impact on different populations as function of their marginality in the social fabric (Sherman et al., 1992). Even summed across all groups the ability of arrest to depress recidivism is slight and limited to about 8 months (Sherman et al., 1992).

In spite of numerous studies identifying these psychological risk features for both genders, many US states and Canadian provinces remain rigidly locked into outmoded and poorly informed policies. For example, prohibited practices in Georgia include any therapeutic intervention involving linking “causes of violence to past experiences,” “communication enhancement or anger management,” systems theory and addiction counseling models (Georgia,

2002). Similar prohibitions exist in many states (Healey, Smith, & O'Sullivan, 1998; Maiuro & Eberle, in press). In short, any practice that could be construed as psychological treatment is prohibited. Instead these states legislate a variant of a "psychoeducational model" that originated in Duluth, Minnesota and is called the Duluth Model. The primary goal of this model is to get male clients to acknowledge "male privilege" and how they have used "power and control" to dominate their wives. Many men coming to court-mandated therapy feel no sense of power and control in any arena of their lives, including their marriage (Dutton & Starzomski, 1994). Hence, not only is a political model mapped onto intervention, but the model commits the primary mistake of therapy: to not acknowledge the client's reality.

Why have professional associations such as the American Psychological Association and the National Association of Social Workers not taken a public position on this issue acknowledging the lack of scientific support for these practices? Psychology has a long-standing tradition, dating back to the Boulder Model, of basing practice on research data that indicates the most effective practices. This is nothing more than common sense pragmatism. Why then are psychologists not doing that in intimate partner interventions? Why are we not doing assessments to establish: 1) the interactive form of the couples' violence, 2) the power dynamic in the couple, 3) the lethality potential in the couple, and 4) the best fit between treatment and client profile? Instead, a "one size-fits all" approach, based on a contraindicated political model of male domination prevails. Evidence-based practice, under a variety of rubrics, has become established in psychology, social work, medicine, and other professions as the guiding framework for effective treatment, yet the Duluth model remains intact in the face of extensive contradictory evaluation findings.

Evaluation research on interventions for domestic violence perpetrators based in the Duluth model shows no methodologically sound evidence that these programs significantly change violent behavior. To the contrary, several experimental outcome studies yielded an effect size of zero (Davis, Taylor, & Maxwell, 1998; Feder & Forde, 1999; Levesque, 1998; Shepard, 1987), yet this model is mandated in many states as the only acceptable form of intervention. Forty-three states have set up domestic violence certification agencies to oversee the "intervention" with abuse perpetrators (2001). These agencies, often staffed by political appointees and activists, have formulated and applied policies that regulate not only the conditions of probation for persons found guilty of domestic assault but also which form of intervention is deemed acceptable by the courts. Hence, program funding is only available to those programs that conform to these policies, called interventions (using "batterer accountability" strategies) instead of "treatment" because the Duluth model deems assault to be a willful exercise of male privilege, a choice made by men acting in concert with the norms of a sexist society. In this view, poverty, stress, chemical dependency, anxiety, deficits in self-esteem or the man's own lifetime experience of victimization are never risk factors for male abuse perpetration. It is never influenced by an also violent wife or partner, or by a relationship where substance abuse or personality disorders may occur in the perpetrator, victim, or both. At least this is so for male violence, female violence, to the extent that is acknowledged at all, is deemed to be always self-defensive. (Dobash & Dobash, 1979; Saunders, 1988) These beliefs persist, despite considerable evidence to the contrary, including both survey data showing approximately equal levels of severe violence and injury by gender (Archer, 2000; Laroche, 2005) and the fact that several large longitudinal studies in age cohorts show equal abuse perpetration by gender with roughly equal results in terms of physical injury (Ehrensaft et al., 2004; Magdol et al., 1997) or psychological trauma (Pimlott-Kubiak & Cortina, 2003).

Although some critics have disparaged the instrument of measurement, the Conflict Tactics scale or CTS (Straus, 1992), in fact this scale is 16 times more sensitive than government "crime victim" surveys (Straus, 1999) such as the National Violence Against Women Survey (Tjaden & Thoennes, 1998). These surveys, in turn, tend to filter out male reports of victimization because of the "set" of the survey (criminal victimization of women). When this set is altered, more equivalent rates of violence are reported, as in the Canadian General Social Survey of 25,876 respondents, equally split by gender. In this survey (Laroche, 2005) the "crime victim" filter was dropped and the focus was on "perceptions of crime". In addition, men were asked about instrumental controlling behaviors used against them, (Laroche, 2005) something that had not previously been asked because of the assumptions of the patriarchal paradigm. Equivalent rates of severe abuse were found, 8% of women, and 7% of men reporting victimization. Use of repeat, severe instrumental violence by a partner was reported by 2.6% of men and 4.2% of women. Equivalent injuries, use of medical services and fear of the abuser were also discovered in cases where the abuser used repeat instrumental abuse. Why is this small but destructive sub-group not receiving a concentrated intervention strategy? Instead, they are mixed with less serious cases in a "drift net" approach.

Stets and Straus (1992a,b) combined the 1985 US National Family Violence Resurvey ($N=5005$) with a sample of 526 dating couples to generate a large and representative sample of male-female relationships, in which they

reported incidence of intimate violence by gender. Using a subset of 825 respondents who reported experiencing at least one or more assaults the authors found that in 1/2 (49%) of the incidents the couples reported reciprocal violence, in 1/4 (23%) of the cases the couples reported that the husband alone was violent and 1/4 (28%) reported the wife alone was violent. Men ($n=297$) reported striking the first blow in 43.7% of cases and that their partner struck the first blow in 44.1% of the cases. The women ($n=428$) reported striking the first blow in 52.7% of the cases and that their partner struck first in 42.6% of the cases. Stets and Straus (1992a,b) concluded that not only do women engage in a comparable amount of violence, they are “at least as likely” to instigate violence. The results also indicated that women were more likely to hit back (24.4%) than men (15%) in response to violent provocation by a partner (Straus & Gelles, 1992). This latter result is difficult to explain from the patriarchal view that women are more afraid of male violence than the reverse. Stets and Straus also analyzed for level of violence \times gender. They concluded that equal levels of violence by both men and women were the most common form of violence (40% of married couples). The second most frequent form was women using severe violence against men who were either completely non-violent or who used only minor violence (about 16% of married couples). The stereotypical pattern (male severe, female none or minor) was found for only 8% of married couples. The greater frequency of a female severe pattern was even more pronounced in cohabiting couples (19% vs. 8.5%) and dating couples (26% vs. 5%). These data were first published in 1989. Most professionals are still unaware of these data patterns. In fact, in many states a court-mandated “intervention program” that specifically eschews psychological treatment is in place, based on the notion that interpersonal partner violence is a form of gender oppression akin to slavery (Pence & Paymar, 1993). “Facilitators” are advised to use the slavery model in “raising consciousness” of clients and any mention of mutual violence is treated as “victim blaming,” despite its having some statistical likelihood. The APA Website, Public Information Directorate provides an executive summary of the 1996 APA Presidential Taskforce on Violence and the Family. The “public information” provided includes the following on the first page: “Men batter women far more frequently than women batter men. Boys who witness or experience violence in their own homes as children are at major risk for becoming batterers”....and “Approaching the forms of family violence as a unified field of study underscores the common dynamic at the heart of them: the perpetrator’s misuse of power, control, and authority” (www.apa.org/pi/violandfam.html). Hence the notions that family violence is primarily male perpetrated and based on “power and control” are offered in the APA’s own website.

2. The Duluth model: overview and brief history

Established in 1981, the Duluth Domestic Abuse Intervention Project (DAIP) designed an intervention program to be applied to men who had assaulted their female partners but who were not going to receive jail time. The objective of the program was to ensure safety of the women victim (protection from recidivist violence) by “holding the offenders accountable” and by placing the onus of intervention on the community to ensure the woman’s safety. The curriculum of the Duluth model was developed by a “small group of activists in the battered women’s movement” (Pence & Paymar, 1993) (including representatives from EMERGE in Boston, *op.cit.* p. viii) and was designed to be used by paraprofessionals in court-mandated groups. It is now one of the most commonly used court-sanctioned interventions for men convicted and having mandatory treatment conditions placed on their probation. This is true in many U.S. states and Canadian provinces. The curriculum of the model stresses that violence is used as a form of “power and control” and a “Power and Control Wheel” has become a famous insignia of the program. Also, power and control is seen as being an exclusively male problem. As the authors put it “they are socialized to be dominant and women to be subordinate” (p. 5, all quotes are from Pence and Paymar (1993)). Hence, the “educational” aspect of the program deals with male privilege that exists in patriarchal structures such as North American countries. The DAIP view of female violence is that it is always self-defensive; in fact, can only be self-defensive. “Women often kick, scratch and bite the men who beat them, but that does not constitute mutual battering” (p. 5). Male battering stems from beliefs which are themselves the product of socialization. These include the belief that the man should be the boss in the family, that anger causes violence, that women are manipulative, think of men as paychecks, if a man is hurt, it is natural for him to hurt back, smashing things is not abusive, “women libbers” (sic) hate men, women want to be dominated by men, men batter because they are insecure, a man has the right to choose his partners’ friends and associates and a man cannot change if the woman will not (p. 7–13). According to the manual, the basis for these beliefs came from a sample of 5 battered women and 4 men who had completed the Duluth program. This then became the empirical foundation of domestic violence practice: a sample of nine clients recently completing an ideologically infused intervention. The

authors (and those who support this model) apparently do not realize the obvious problems with the samples' small size or lack of representativeness.

The Duluth model focus on power and control¹ obliges men to keep “control logs” and review the socialization that leads to expectations of “male privilege.” It “discusses how making women into sex objects and then defining sex objects as bad degrades women and lowers their self-esteem. From there it goes on to discuss why men would want women to have low self-esteem” (p.41). It does not address any psychological issues or emotions that group members may have. “Negative feelings” are seen as caused by patriarchal beliefs (p. 48). Instead, it focuses on patriarchy, including drawing a pyramid on the board and asking “who is at the top”? and how did he get there? (p. 43). The facilitator is advised to use slavery or a colonial relationship as an example to “draw a picture of the consciousness of domination” (p. 49) (Pence & Paymar, 1993). The Duluth model uses role plays to show male abusiveness (p. 61) and raises men’s consciousness about trivializing women’s anger (p. 62). Men are encouraged to “respond in a respectful way” (p. 63) when their female partner gets angry. Any and all risk factors for IPV (stress on the perpetrator, impulse control problems, trait anger, communication skill deficits, couples negative interaction, personality disturbance, *inter alia*) are dismissed as “excuses.”

The major goals of the Duluth model (respectful and non-abusive relationships) do not differ from those of other theoretical models of intervention for abusive men (such as Cognitive Behavioral Therapy or even psychodynamic treatment) or from the goals of more general mainstream psychosocial treatments. However, the means to the end differs significantly from psychological and family systems models that have been proven to be more effective than the pure Duluth model (Babcock, Green, & Robie, 2004). The primary difference seems to be in their unyielding adherence to their etiology of violence, their monolithic model of male domination and instrumental violence taken as a given and the emphasis on socialization and control of women to the exclusion of other factors contributing to abuse and of subtypes of abuse perpetrators. This ideologically narrowed view of domestic violence distorts and limits other approaches to behavioral and psychological change and generates an atmosphere in the client group that cannot be conducive to honest exchange, vulnerability, trust or disclosure. Rather, judgment and humiliation is the central feature of these groups, as the result can only be grudging compliance in clients who wish they were elsewhere, or high dropout rates; 75% in one program (Davis, Taylor, & Maxwell, 2000).

The Duluth perspective on psychological problems is also outlined in their manual “Most group members are participating not because of a personal or family dysfunction but rather because violence is a socialized option for men. To attach a clinical diagnosis to the batterers’ use of violence provides a rationalization for behavior that may not be accurate” (p.23).(Pence & Paymar, 1993) In the rare case where “mental illness” is diagnosed, other treatment is recommended.

The Duluth model imbeds its perpetrator intervention strategies within a framework called “Coordinated Community Response” (CCR) (<http://www.duluthmodel.org/documents/catalogue.pdf>). The CCR seeks to bring the ideological assumptions underlying the Duluth model to law enforcement, criminal justice, human services, and other sectors of the community. As a general strategy, coordinating services at the community level is often a method of avoiding duplication and maximizing resources. The CCR of the Duluth model, however, maintains an ineffective system where resources are diverted from other potential program responses (e.g., joint treatment of violence and chemical dependency or mutuality of partner violence).

The problem, in a nutshell, is that according to the model’s proponents a political model (a radical form of feminism) is incongruent with psychological and biological models. The Duluth model avoids utilizing the term “therapy” because therapy implies there is something wrong with clients, whereas, according to the Duluth philosophy they are normal, simply following cultural dictates. Our belief is that psychological, biological and social/political factors are not inherently incongruent but rather co-exist in a four-level “nested ecological” framework (Dutton, 1985). The research to date suggests that if we want to develop effective models of intervention for domestic violence, we must consider all levels with perpetrators, victims and witnesses.

¹ Dutton (1994) pointed out that men in treatment groups were more often characterized by powerlessness than by power and that the concept of power was misused by feminism. Power as a motive can be manifested through seeking political office, stamp collecting, or becoming a serial killers’ girlfriend (McClelland, 1975). It refers to any activity that enhances the self. Hence, Walker’s inappropriate discussion of the “androcentric need for power” (Walker, 1989) views only those power enhancing activities believed to be used more frequently by males, the ones McClelland called “type 3” power orientations. Feminist theory seemed unaware of the broader manifestations of the psychological power motive. Most people seek to have “power and control” in their lives, the feminist focus is on the more specific application of “power over” another person.

3. Outcome studies of the Duluth model

The Duluth model's negligible success in reducing or eliminating violence among perpetrators in tandem with the iron-grip of prohibition of other approaches is perhaps its most damaging feature.

In a treatment outcome study done on the Duluth model, Shepard (1987, 1992) found a 40% recidivism rate in a six month follow-up of Duluth clients, higher than most control recidivism levels. Babcock et al. (2004) put recidivism rates at 35% for a 6–12 month follow-up according to wives, and 21% for the same time period using criminal justice data (arrests).

Feder and Forde (1999) randomly assigned perpetrators on probation to either a feminist-psychoeducational program or no treatment in Broward County, Florida. In general, there were no statistically significant differences between the two groups on recidivism as measured by police records ($d=0.04$) or by victim report ($d=-0.02$). There was a small but significant effect on recidivism among the subset of men randomly assigned to group treatment who attended all 26 sessions. In this study, random assignment apparently failed, with an uneven number of men being assigned to the treatment and control condition (Feder & Forde, 1999). Moreover, this study suffered from a particularly high attrition rate of men from treatment (60%) and low response rate from victims at follow-up (22%) (Feder & Forde, 1999).

In a large evaluation of U.S. Navy personnel stationed in San Diego, Dunford (2000) compared a 36-week cognitive-behavioral group and a 26-week couples therapy format to a rigorous monitoring condition and a no-treatment control (victims safety planning). Neither CBT men's groups ($d=0.13$) nor couples therapy ($d=0.10$) had a significant impact on recidivism at one-year follow-up based on victims' report. This study represents the most methodologically rigorous study conducted to date in terms of sample size, length of follow-up, attrition rates, follow-up reporting rates, and assessment of treatment adherence. However, it is important to note that this sample of perpetrators, those employed through the Navy in San Diego, are not representative of the population of perpetrators court-mandated to domestic violence programs around the country. All of the research participants were employed, had a high stake in social conformity, and thus, were more "socially bonded" (Sherman et al., 1992). Any intervention, including arrest and being identified by authorities, may work to deter socially bonded individuals from repeat offenses. This may be reflected in the unusually low official recidivism rates of the non-treated perpetrators (4%).

Davis et al. (1998) compared a long (26-week) psychoeducational group to a brief (8-week), psychoeducational group, and to a community service control in Brooklyn, New York. They found a statistically significant reduction in recidivism and a small but respectable effect size of $d=0.41$ based on criminal records among the long treatment group only; the 8-week group was indistinguishable from the community service control ($d=0.02$). When based on victim reports of recent offenses, neither the long nor the brief intervention had a statistically significant effect on recidivist assault when compared to no treatment. Correspondingly, the effect size due to treatment based on partner report of subsequent violence was small ($d=0.21$). It is important to note that, like in the Broward County experiment (Feder & Forde, 1999), random assignment may have been compromised. In the Brooklyn experiment (Davis et al., 2000), nearly 30% of initial assignments were subjected to "judicial overrides" that is, judges reassigned defendants to different interventions.

Ford and Regoli (1993) designed a study that randomly assigned perpetrators into treatment as a pretrial diversion (i.e., defendants' criminal records would be cleared pending treatment completion), treatment as a condition of probation post-conviction, vs. alternative sentencing strategies (e.g., paying a fine or going to jail). Even though this study was designed to test different sentencing options rather the effects due to treatment, one can compare perpetrators sentenced to treatment vs. perpetrators not sentenced to treatment (although the type of treatment and actual attendance rates were not specified). Again, there were no significant differences or effect sizes comparing recidivism rates based on victim report between men sentenced to treatment vs. those who were not. Neither treatment as pretrial diversion ($d=0.00$) nor as a condition of probation post-conviction ($d=-0.22$) was found to be superior to purely legal interventions.

Babcock et al. (2004) conducted a meta-analytic study of 22 studies of treatment outcome. The d' for Duluth treatment was .19. Comparisons between CBT and Duluth were not significant but "pure" Duluth models were hard to find. As the authors state "modern batterer groups tend to mix different theoretical approaches to treatment, combining feminist theory of power and control as well as specific interventions that deal with anger control, stress management and improved communication skill" (p. 1045).

While “treatment” of anger, interactive issues and other psychological issues may infiltrate the approach of frustrated treatment providers, the *rapprochement* of blending Duluth and cognitive behavioral treatment philosophies is stymied by the issue of therapeutic bonding. In other words, Duluth aspects of blended groups work against therapeutic bonding which is necessary for treatment success (Luborsky, 1984; Schore, 2003a,b). The best results in the Babcock et al. study were found for “pure” CBT programs.

There is nothing in the evaluation research on domestic violence treatment outcomes that justifies mandatory Duluth-type programming. On the contrary, there is a distinct absence of evidence for their efficacy. Often, the safety of victims is used as a rationale for mandating Duluth-type interventions. It is difficult to imagine how the safety of victims is improved by programs with negligible impacts on the violent behavior of their partners. Despite these data, here is what the APA Website says about mandatory treatment: “Psycho-educational models that are cognitively and behaviorally oriented seem to be most effective in helping many offenders stop their physical violence” (www.apa.org/pi/issues/issie10.html).

Because of the assumed ideological infallibility of the Duluth model, the kinds of program quality, client-satisfaction, “customer” driven analyses of other kinds of programs are not critically explored. Contrast, for example, the detail and openness in the following review of psychosocial interventions for substance use disorders with the statements from a domestic violence agency ad seriatum:

“Between 7% and 15% of patients who participate in psychosocial treatment for substance use disorders may be worse off subsequent to treatment than before.. Probable person-related predictors of deterioration associated with treatment include younger age and unmarried status, more serious current diagnoses and substance use problems and more psychiatric and interpersonal problems. Probable intervention-related predictors of deterioration include lack of bonding; lack of monitoring; confrontation, criticism and high emotional arousal; deviancy modeling; and stigma, low or inappropriate expectations and lack of challenge” (Moos, 2005).

This kind of self-appraising orientation to treatment is made impossible by this sort of program rhetoric: “Battering is never.... provoked, hereditary, out of control, accidental, or an isolated incident with no further dynamics. Battering is not caused by disease, diminished intellect, alcoholism/addiction or intoxication, mental illness or any external person or event. Domestic violence is a means for men to systematically dominate, control, devalue and disempower women. Battering/violence is greater than an individual act; it supports the larger goal of the oppression of women. Men batter because they can and it serves as a means to an end.” This quote was from a “health counseling” presentation in New York State (Corvo & Johnson, 2003). No other circumstances, motivation, or interpretations are permitted. With this mindset, high levels of program attrition are inevitable. No therapeutic bond can form and clients who comply will feel judged and disbelieved. Empathy is impossible, change is unlikely, group process is subverted, and clients’ commitments to change are rarely internalized. It is a “take it or leave it” posture and many clients do just that: leave. Approximately 40–60% of men attending the first session of treatment actually fail to complete Duluth model-type treatment in spite of participation often being a condition of probation and failure to comply risks incarceration (Buttell and Carney, 2002).

4. Re-establishing therapeutic relationships

Dutton (2003) argued that Duluth models had two major flaws that were contraindicative of effective treatment; they attempted to shame clients and, in taking a strong adversarial stance to clients (based on a view of male sex role conditioning as a major issue in domestic violence), failed to establish a therapeutic bond with their clientele.

The single most predictive factor for successful therapeutic outcome (even those labeled “interventions”) is the therapeutic bond (Schore, 2003a,b; Sonkin, 2005). However, it becomes extremely difficult to form a positive relationship when the therapist is required to assume that strategic intentional domination is the sole motive for all clients and to presumptively disbelieve any claims of mutuality raised by clients (whether legitimate or not). Treatment providers in many states may not be certified or can lose their certification for court-ordered treatment if they do not confront their clients even in relationships where abuse is mutual (Healey et al., 1998). Since, one must balance confrontation with support, belief and caring in order to develop a solid therapeutic alliance. Building a therapeutic alliance without colluding with dangerous acting out behaviors is one of the greatest challenges facing domestic violence perpetrator treatment providers. Because so many of these individuals experienced abuse by authority figures, the process of building a trusting relationship is particularly difficult.

5. The Duluth model and patriarchy fail as explanatory social theory

How do the Duluth model and its ideological assumptions fare as explanatory social theory regarding domestic violence? Social theory can be evaluated according to a set of epistemological principles. These evaluative criteria have been consistently identified in various formats, e.g. Dubin (1978), Monet, Sullivan and DeJong (2005) and Reynolds (1971). The patriarchal view of domestic violence fares poorly when assessed against these criteria of sound social theory:

- a. How well does the theory generate hypothetical statements that can be empirically tested?
- b. How well does the theory predict relevant events, characteristics, or circumstances?
- c. How well does the theory explain variation in the phenomena observed?
- d. How well does the theory fit with known empirical data?
- e. How well does the theory provide a sense of understanding of what causes events, characteristics, or circumstances?
- f. How well does the theory generate effective intervention and prevention approaches?

5.1. Ideology as theory

The development of theory as a model for understanding a particular area of knowledge is necessarily bounded and hence excludes realms of phenomena. What is excluded, however, may include crucial variables that would improve the precision of prediction. The Duluth model has over-simplified the range of domestic violence phenomena it addresses in order to better understand and address that limited range of phenomena.

The theoretical deficits of the patriarchal model have been explored above and in other papers (Archer, 2000; Corvo & Johnson, 2003; Dutton, 1994). Simply put, the evidence for theoretical patriarchy as a “cause” of wife assault is scant and contradicted by numerous studies: male dominant couples constitute only 9.6% of all couples (Coleman & Straus, 1985); women are at least as violent as men (Archer, 2000); women are more likely to use severe violence against non-violent men than the converse (Stets & Straus, 1992a,b); powerlessness rather than power seems related to male violence; there are data contradicting the idea that men in North America find violence against their wives acceptable (Dutton, 1994; Simon et al., 2001) and that abusiveness is higher in lesbian relationships than in heterosexual relationships (Lie, Schilit, Bush, Montague, & Reyes, 1991) suggesting that intimacy and psychological factors regulating intimacy are more important than sexism (Dutton, 1994). The research evidence has not favored the simplistic patriarchal view of domestic violence: that male intimate violence is a form of gender political suppression. Using “slavery” as a model when men are dominant in families 9.6% of the time is sheer folly. Were only 9.6% of white slave owners dominant? Studies such as the Archer (2000) meta-analytic combination of numerous studies with a combined *n* of 60,000 found women to be more violent than men, especially among younger women. In fact, only about 3% of all males (and about 1/3 of males in court-mandated treatment) fit the stereotype of terrorist violence put forward by the Duluth model (Dutton, in press; Dutton & Nicholls, 2005). Many males will be arrested who come from families where violence is dyadic, minor, or female perpetrated (Stets & Straus, 1992a,b). According to the Duluth model, all must be treated as patriarchal terrorists regardless of differences how the violence developed.

It is not that perpetrators described by the patriarchal view of domestic violence do not exist, it is that they represent a small segment of the range and patterns of perpetration. It would be the theoretical equivalent of viewing anyone who used any illegal drugs or any amount of alcohol above acceptable social levels as a long term heroin or crack cocaine addict. Further, substance abuse, dependency, and addiction would all be products of a single moral weakness.

The awareness among policy-makers and researchers that the Duluth model creates a divide between pertinent research on violence and aggression and domestic violence practice is not new. For example Fagan (1996) stated: “Yet theory and research on domestic violence have segregated theories of violence from theories of battering. The social and ideological constructions of battering have limited the types of variables considered in research on domestic violence. Assuming that patriarchy and power relations alone cause domestic violence leads us toward conclusions that do not consider a full array of explanatory variables from other disciplines” (Fagan, 1996).

As a by-product of the group polarization underlying the Duluth model, the stereotyping of males and even assaultive males leads to his one-size fits all approach (Corvo & Johnson, 2003). Essentially, the Duluth model views every man convicted as equivalent to the worst man convicted without gradations or nuance. In some cases the assault is trivial, yet it is viewed as a prelude to an inevitable escalation to “battering”, despite evidence that shows de-

escalation is far more likely (Feld & Straus, 1990). Furthermore, scientific studies repeatedly show that many different types of abusive male and abusive couples exist but their heterogeneity is reduced by the monolithic view maintained by the Duluth model (Hamberger, Lohr, Bonge, & Tolin, 1996; Holtzworth-Munroe & Stuart, 1994; Tweed & Dutton, 1998). In many states, treatment of the psychology that may drive male abusive behavior (e.g., inordinate jealousy stemming from attachment problems and exposure to early trauma) is specifically eschewed, as is treatment of the man's anger, communication deficiencies, couple interaction problems, impulse and emotional regulation deficiencies. There is a lengthy scientific literature that implicates all of these as features of abuse that increase the risk for abusive behavior, so, ipso facto, if they are treated properly by a psychologist, social worker, or family therapist, abuse should diminish.

The politically based interventions mandated by states following the Duluth model, present mental health professionals with a dilemma: do they attempt to provide a form of treatment that could be considered a form of malpractice when viewed through their own codes of ethics and requirements for professional licensure?

If then the patriarchal view underlying the Duluth model fares so poorly as social theory, why does its influence persist? Put simply, it is not a theory; it is an ideology. Turner's (1986) distinction between science and ideology is useful here. Ideologies seek knowledge to confirm how the world *ought* to be, not how the world is. Therefore information that does not conform to adherents' views of how the world ought to be is excluded from consideration. Further, criticism or contradiction of scientific findings is an inherent (if not always appreciated) component of knowledge-building. Ideology, on the other hand, prohibits contradiction and criticism and views them as betrayal.

5.2. *Belief perseverance*

Maintaining the conviction that patriarchy is THE cause of IPV constitutes a form of belief perseverance. The first principle (male perpetrator, female victim) is unquestionable, all contradicting evidence is rejected for not adhering to the first principle, and, once accepted, all subsequent considerations must conform to the first principle. Many of the inaccurate assumptions embedded in the Duluth model have been so often repeated and so widely assumed that they seem to be true. Social psychologists have shown how people (and groups) ward off disconfirming data to sustain important beliefs. Lord, Ross and Lepper (1979) showed how subjects would disparage research methodology when the research findings contradicted their own. The feminist attack on the CTS/CTS2 is a social science version of this phenomenon (see also Dutton & Nicholls, 2005). Janis's (1982) notion of "groupthink" showed how groups with a shared ideology and sense of moral superiority would enhance this phenomenon. In this section we review some of the types of epistemological legerdemain that have been used to obscure gender symmetry in violence use. The interested reader should examine the works of proponents of the feminist view (Bograd, 1988; Dobash, Dobash, Wilson, & Daly, 1992; Kimmel, 2002).

Research methodology, instead of serving as buffer against "Type 1 error," has been used to artificially inflate "evidence" for a political position. Dutton and Nicholls (2005) referred to this as the "gender paradigm" and claimed it acted to shape research focus and ward off disconfirming results. One way of doing this is through defining variables in overly inclusive or misleading ways. Feminist ideology sees socio-structural "patriarchy" acting through individual men via negative attitudes toward women and positive towards use of violence. No explanation is given for individuals' differences. Definitions of attitudes accepting of violence are often misleading. For example, Hanson, Cadsky, Harris and Lalonde (1997) administered questionnaires to 780 men from a forensic out-patient clinic and 217 men from a community based employment center, assessing personal history, criminal behavior and "attitudes towards violence." The sample was divided into 184 non-abusive men (based on self-report), 517 moderately abusive and 296 severely abusive. The variable called "attitudes tolerant of wife assault" was defined as follows: "An unfaithful wife deserves to be hit," "I might slap my wife to make her listen," "I could slap my wife to stop her being hysterical," "I might slap my wife if she made me really angry." The authors then did linear comparisons on 53 variables in order to find which ones differ significantly between groups. They concluded, "The single strongest group difference concerned attitudes tolerant of wife assault. Most (68%) of the severely abusive men endorsed one or more of the items on the scale, whereas only 22% of the non-abusive men endorsed any items." There are some serious flaws in this study: the attitude measures are worded so they are predictions of a likelihood of violence; "I might slap my wife if..." For "severely abusive" men, these are not indicative of tolerance of abuse they are merely accurate predictions of likelihood of one's own behavior. These men indicated some accuracy in describing how they might react. Therapists usually

want their clients to have this ability to see themselves as high risk in certain situations. Then they can be more vigilant in those situations.

Smith (1990) also tested “patriarchal beliefs” by asking female respondents to estimate their partner’s response to a series of four questions tapping this attitude and then correlating the projected attitude with her reports of his violence on the CTS. (No women were asked about their own use of violence). Smith argued that he was assessing “patriarchal ideology” but the responses supplied looked predominantly non-patriarchal. The women said their partners would disagree with a man has a right to decide 1) whether his partner has a right to work outside the house (64%), 2) whether she should go out for the evening (68%) and 3) whether to have sex without a consenting partner (80%). The only statement that did not get a majority disagreement was “sometimes it’s important for a man to show his partner that he’s head of the house” (47%). The women also said that 90–96% of their husbands would not approve of violence towards them. Even if he learned she was having an affair or she hit him first, the majority (75%) said he would not approve of violence. The most obvious conclusion from Smith’s data would be that “patriarchal ideology” simply did not exist for these men and was not related to use of violence. Instead, Smith piggybacked the attitude measure onto educational attainment and other “socioeconomic risk factors” and claimed he had “parsimoniously explained 20% of the variance in wife beating.” Of course, it is impossible to tell what proportion of that is accounted for by projected attitudes since Smith offers no proof that people can accurately predict another’s attitudes, let alone the precise contribution of the “attitudes” to the independent variable. Instead, Smith hypothesizes about a “violent subculture” made up of low income, violent men. You may ask, reading his paper, where is the violence?

Misleading research has tended to consistently err on the feminist side. For example, Reitzel-Jaffe and Wolfe (2001) examined history of family violence, negative beliefs, negative peer associations and current relationship abuse by male perpetrators. Using structural equation modeling, they examine history of exposure to family violence, “negative beliefs about gender roles,” and “friends with these negative beliefs.” The authors found that negative beliefs regarding gender and interpersonal violence were found to have a direct effect on relationship abuse. The study was done only on males (a form of “male chauvinist pig” theory) and did not consider that males with these subcultural beliefs may have girlfriends from within the same subculture. That aspect was never examined. Even though these young men were in university, they had non-normative beliefs and may have chosen like-minded girlfriends. The question that researchers focused on male violence never ask is this: why would a bright, independent young woman enter a relationship with these men? Were these women violent too? A study by Douglas and Straus (2003) showed women at the same university as this male sample were 167% as violent as males and a model of dating violence developed by Follingstad et al., that did include both partners behaviors found that both were significant predictors of couple abuse (Follingstad, Bradley, Helff, & Laughlin, 2002). If the men in the Reitzel-Jaffe and Wolfe sample were violent, could not the “association” between male attitudes and violence both be by-products of the female violence? Could this not also be true for unmeasured beliefs and attitudes in the females? Simon et al. (2001), in a methodologically sound study with a large and representative sample, found that only 2% of US men agree with the statement “it’s ok for a man to slap his wife to keep her in line.” Normative support for wife assault simply does not exist.

Results are routinely miscited in a direction favoring activist ideology, e.g., Arias, Dankwort, Douglas, Dutton and Stein (2002), DeKeseredy and Schwartz (1998), and Kimmel (2002). For example, Arias et al. (2002) describe how the “state of victimization among men is significantly lower” (p. 159). The authors state “Women were seven to fourteen times more likely to report that intimate partners had beaten them up, choked them, threatened or actually assaulted them with weapons, or attempted to drown them.” The source they cite for these data is Stets and Straus (1992a,b, p. 156). However, Stets and Straus reported equivalent rates of violence by gender and were making the point that women were ten times as likely than men to report violence to the police (p. 155). Furthermore, Stets and Straus never reported the action by action data that Arias et al. report. This misstatement of results is so frequent in domestic violence research that Gelles and Straus (1988) invented a name for it: the “Woozle Effect” after an event in Winnie the Pooh where a mythological “Woozle” is discovered by its footprints (footprints made by the discoverers). Other Woozles include the following: DeKeseredy and Schwartz (1998) asked women who had been violent in a relationship since the age of 16 whether their own use of violence was in self-defense. Men were surveyed too ($n=1300$) but were never asked questions about their own abuse victimization, only perpetration, guaranteeing a self-fulfilling prophecy. When both genders are asked about victimization and perpetration, college women are more violent than college men (Douglas & Straus, 2003) across nineteen countries.

Dekeseredy and Schwartz report levels of severity of violence used by women (according to their self-report) and the woman's own report of whether it was never, some, mostly or always self-defense. At both non-severe and severe levels of violence, these women (p. 82–83) report that their violence was rarely self-defensive; 422/678 and 205/356 in the non-severe and severe groups, respectively, reported that they “never” used violence in self-defense. Amazingly, the authors report “Our overall conclusion is that much of the violence by Canadian undergraduate women is self-defense and should not be labeled mutual combat or male partner abuse” (p. 91).

It is hard to understand a methodological mistake this obvious. It is worth noting that other investigators (Follingstad et al., 2002) found that women reporting their motives for intimate partner violence listed control (not self-defense) as the most common motive.

Similarly, Kimmel's (2002) finding that “men who are assaulted by intimates are actually more likely to call the police, more likely to press charges and less likely to drop them” (p. 1345) needs examination. The claim, which is contradicted by large surveys, is based on three studies. One of these, Rouse, Breen and Howell (1988) was based on a small sample of 260 college students of whom males were slightly more likely to call police (4% vs. 0%) but also more likely to require medical help (5% vs. 2%). The second (Ferrante, Morgan, Indermaur, & Harding, 1996), was based on a small sample in Australia. The third (Schwartz, 1987), was based on a reading of National Crime Survey data for a sample of 1743. The focus of the study was on injuries (same for men and women) and the reference to calling police was as aside by the author but never reported in a data table. The representativeness of the sample is questionable, with 79.7% of the men reporting an injury. Kimmel does not report the data from the 1985 US National survey (Stets & Straus, 1992a,b) that found, for a sample of 6000+, that 8.5% of women and .9% of men called the police. Hence, some selective referencing, and ignoring the larger and methodologically superior studies allowed Kimmel to come to this dubious conclusion. The conclusion is politically important to the feminist view as it supports the “crime victim surveys” that show gender asymmetry for intimate partner violence perpetration.

Despite Kimmel's claim that men call the police more frequently, they in fact, rarely do—(Brown, 2004; Laroche, 2005; Stets & Straus, 1992a,b). Stets and Straus reported men calling police for less than 1% of assaults initiated by their partner (p.155). The reason for this is obvious. Men are rarely taken seriously by the police and charges are rarely laid (Brown, 2004; Buzawa, Austin, Bannon, & Jackson, 1992). Brown found only moderate increases in police arrest of women, even when the man was injured. Buzawa et al. cite a case in Detroit where the police refused to arrest the woman despite the man's being stabbed in the back. Any studies that base estimates of domestic violence incidence on criminal justice statistics will be greatly biased. It is for this reason, we suspect, that Kimmel tries to manufacture the belief that men call the cops more often. The true finding reveals the bias in criminal justice studies.

Using techniques for assessing marital interaction that originated with Levenson and Gottman (1983) and assessed three dimensions of marital interaction, positive–negative affect, reciprocity and asymmetry, a University of Washington study focused marital interaction techniques on domestic violence. As used initially, Levenson and Gottman had only focused on marital satisfaction and had measured physiological linkage (interconnectedness in heart rate, skin conductance and pulse transmission time) using time series techniques for physiological measurement as well as self-report of affect using a video recall procedure. Their finding was that parallel patterning of physiological responses was related to reported marital satisfaction. In the UW studies these techniques would be used, on DV couples in an “experimental apartment” created in the psychology lab. Couples would re-create their most serious conflicts in that environment and physiological reactions would be measured.

In a high profile study of domestic violence, Gottman et al. (1995), Jacobson and Gottman (1998) and Jacobson, Gottman, Gortner, Berns and Shortt (1996) developed two fear-inducing names for male perpetrators: “cobras” and “pit bulls”. The criterion for the grouping was wives' reports of husband violence on the CTS. Wives reports were used because “we assumed husbands might underreport their own violence” (Babcock, Waltz, Jacobson, & Gottman, 1993, p. 42). The focus of the study was on husband violence and categories of violent husband derived from a popular book based on the research (Jacobson & Gottman, 1998), classifying violent husbands as “pit bulls” (tenacious, emotional) or “cobras” (cool, instrumental). Couples were solicited as “couples experiencing conflict in their marriage.” One has to read the fine print in the method section then to discover that “according to the wives themselves, almost half (28/57) would have qualified for the DV group if wife violence had been the criterion” (Jacobson et al., 1994, p. 983). In other words, there were bilaterally violent couples in the mix, although the focus became entirely on the males. No measures were taken of the wives' use of violence and all independent variables focused on male violence as though it were being produced unilaterally in all relationships (even though it clearly was not).

These are some of the consistent (in that they all support feminist views) misreporting errors that occur in domestic violence “research” and which contribute to the gender paradigm of male-perpetrator/woman-victim view. A fuller description is available in work by Dutton (2006) and Dutton and Nicholls (2005).

6. Ripple effects of the patriarchal model

6.1. *Criminal justice practice: does mandatory arrest reduce future assaults?*

Stemming from the ideological assumption that domestic violence is entirely a political act, mandatory arrest has been pursued as a necessary exercise of countervailing power, particularly necessary to overcome the putative patriarchal inclinations that may influence police discretion. The promotion of mandatory arrest for domestic violence accompanied a change in the common law rule authorizing police to make warrantless arrests in misdemeanor cases only when they observe the crime being committed. By 2000, all states authorized warrantless arrests of domestic violence offenders based solely on a probable cause determination that an offense occurred and that the person arrested committed the offense. In 21 states and the District of Columbia arrest is mandatory when the officer determines that probable cause exists (Miller, 2004).

What is the evidence that arrest is so effective in reducing domestic violence that the historical precedence of common law should be discarded and replaced not only with the permitting of arrest for unobserved misdemeanors, but the mandatory arrest for these particular unobserved misdemeanors?

Sherman et al. (1992) performed the largest and most extensive of six replications of the Sherman and Berk (1984) study. The arrest potential for recidivism reduction suggested by the Sherman and Berk study led to replications with larger samples in six US cities. Largest of the studies was in Milwaukee with 1200 cases of domestic violence. Sherman et al. (1992) addressed the question of whether arrest works to reduce recidivism for certain kinds of offenders and whether it may increase recidivism for others. Police responding to wife assault calls deemed the call eligible for the experiment if the victim was not seriously injured, the perpetrator was on the scene, and no warrants existed for his arrest.

Experimental treatments included “warning” (suspect not arrested but read warning of arrest if police have to return), “short arrest” (suspect arrested, booked, and released, typically within 2 h) and “full arrest” (suspect arrested, booked, eligible for release on \$250 bail). These treatments were randomized within all eligible cases.

Outcome measures were subsequent “hotline” reports called in by all police to the local battered women’s shelter whenever they encountered a case of wife assault (whether or not they could make an arrest). Arrests, offense reports, and victim interviews were also used as data. Using all of these data sources, the authors composed a “time at risk” index.

The initial effects of arrest were to suppress recidivism. For thirty days after the presenting incident, the prevalence (proportion of cases with one or more incidents) of repeat violence reported in the victim interviews was substantially lower in the arrest groups. However, at about 7–9 months after the presenting incident, the arrest and non-arrest recidivism curves cross over and from that point on the arrest group has a higher rate of recidivism. That is, for this sample, the long term effect of arrest was to increase the rate of repeat violence. This increase is small in magnitude but consistent across all measures of repeat violence. The arrested group averaged 124 days before repeating, whereas the warned group averaged 160 days. Hotline data showed a statistically significant long term escalation effect from arrest (but only for the short arrest group). The authors conclude that police departments with policies of releasing arrestees within 3 h of arrest might want to reconsider this policy.

The persons for whom arrest backfired in the long term were socially marginal (defined by the authors as black, unemployed, not married to the victim and high school dropouts). While arrest deterred those who were most likely to socially conform, it escalated other groups into higher frequencies of domestic violence. As Sherman et al. put it “When the majority of domestic violence incidents responded to by police involve unemployed suspects, then mandatory arrest fails to produce the greatest good for the greatest number” (p.160). Replications in Omaha and Colorado Springs confirmed these findings. In general, the authors conclude that in areas where urban problems are great and “marginality” high, arrest may be contraindicated. In other words, when general social constraints have broken down, arrest “in a vacuum” will not reduce recidivism in wife assault cases. Arrest only works for men with something to lose by being arrested.

There is another troubling aspect to the Milwaukee results. Mills (2003) reports the conclusion of Sherman et al. that when Milwaukee police arrest 10,000 Caucasian men, they produce 2504 fewer acts of domestic violence. When they arrest 10,000 African-American men, they produce 1803 more acts of domestic violence. If they have a pattern of

arresting 3× as many black as white offenders (which is typical in many cities), they prevent 2504 acts of violence against white women at the cost of 5409 acts of violence against black women. If their results are generalizable, it would mean that mandatory arrest and release policies could endanger sub-groups of women in the long term, a point that the authors themselves raise. Garner and Maxwell (2000) make the point that the main contributor to the results in the Milwaukee experiment were the hotline calls and that this measure does not prove that an assault occurred but is merely a *prima facie* indication of an altercation. Hence, the shelter data does not prove deterrence from arrest.

The Omaha replication (Dunford, Huizinga, & Elliott, 1990) found (and later studies confirmed) that when probable cause existed to make an arrest, the offender was absent 40% of the time and police did not wait to make an arrest. The use of arrest warrants was associated with less offending. Dunford et al. did not find a significant effect for arrest when the offender was present. The recidivism rate in Omaha was over 40% whereas it had been 26% in Minneapolis (despite a more restrictive measure of new violence in Omaha).

A subsequent replication in Charlotte, South Carolina also failed to find evidence for deterrence through arrest (Hirshell & Hutchinson, 1992). Hirshell and Hutchinson (1992) added a feature of police-issued citations as a fourth treatment option. The investigators conclusion was that “arrest of spouse abusers is neither substantially nor statistically a more effective deterrent to repeat abuse than either of the other two responses (separation, mediation) examined in the study” (Garner & Maxwell, 2000).

Two other replications were performed, in Dade County and in Colorado Springs. Both found a statistically significant effect of arrest when re-offending was measured through victim interviews but not when it was measured through police reports. The surveillance problem raised above may have occurred in Colorado: extensive interviewing of victims may have created a surveillance effect where the suppressed recidivism was created not by arrest *per se*, but by arrest + surveillance. The problem this raises is that such heightened surveillance is not possible under ordinary probation circumstances.

Garner, Fagan and Maxwell (1995) and Garner and Maxwell (2000) pooled data across all six replication sites to standardize the methodologies and measures. Using victim interviews (the more sensitive measure) as outcome measures, this re-analysis found that independent of site, length of time between initial and follow-up interviews, and suspect characteristics, offenders in the arrested group were significantly less likely to repeat their “aggression” (subsequent assaults, verbal threats of assault, and property damage) than those in the non-arrest group. Additionally, the frequency of re-offending was significantly lower in the arrest than the non-arrest group. However, no statistically significant effects of arrest were found when prevalence and frequency measures were based on officially recorded aggression. Even with victim interviews, estimated effect sizes were modest, especially compared to suspect characteristics, such as prior arrests and age, and a general trend of cessation over time held for both the arrested and non-arrested groups. In other words, individual characteristics counted more in generating cessation than did arrest and cessation occurred independent of arrest. Garner and Maxwell (2000) report the effect of arrest on future deterrence to be a change in subsequent aggression ranged from 4% to 30% depending on the data source and the measure of re-offending used. By comparison, the suspects’ age and prior criminal history were associated with changes in subsequent re-offending of 50% to 330% (ten times as important). Across all sites, most suspects did not re-offend. Arrested suspects desist from further violence unless they are young and have a record of criminality. These offenders generated about five new incidents prior to follow-up interviews. As Sherman puts it “Does punishment deter crime? This question provokes fierce debates in criminology and public policy. Yet there is ample evidence that this is the wrong question. Widely varying results across a range of sanction studies suggest a far more useful question: under what conditions does each type of criminal sanction reduce, increase, or have no effect on future crimes?” (Sherman, 1993).

Sugarman and Boney-McCoy (1999) did a meta-analysis of all sites combined. They found, on average, no deterrence effect for arrest based on police data but a modest deterrence effect based on victim interview data. The only measure that could be used was frequency of new offending. As strange as it may seem, different data sets were collected at the various sites with little standardization. For a thorough discussion of these issues, the reader is directed to Garner and Maxwell (2000). Gelles (1996) argued that the media ignored subsequent studies that questioned deterrence effects.

The evidence in support of arrest for misdemeanor domestic violence is small and inconsistent. Arrest in some cases escalates violence. Mandatory arrest policies are a product of the ideologically driven view that since domestic violence is always strategic, always intentional, always unidirectional, and always with the objective of female domination by men that it must be contravened by the power of the state. Once one removes this ideological presumption, the rationale for mandatory arrest disappears.

6.1.1. Other legal sanctions

Dugan (2003) re-analyzed data from the National Crime Victim Survey to ascertain whether legal sanctions in state statutes regarding domestic violence deter violence. These sanctions include: 1) beyond cohabitation—states that allow victims who do not live with offender to petition for a protection order, 2) custody—states that authorize the court to award temporary custody of children to the victim once a protection order is issued, 3) discretion index—range of sanctions available to a judge when a protection order is violated, 4) felony—states that classify protection order violations as a felony, 5) mandatory arrest—mandatory arrest laws for protection order violations and 6) states that confiscate offenders' firearms once a protection order is served. Note that these sanctions are for enforcement of protection orders, not assault.

Dugan then calculated odds ratios for these sanctions. The base rate for reporting any domestic violence incident was 0.5%, (1 in 200 households) and spousal violence was 0.18%. The custody sanction had a boomerang effect, increasing the odds of spousal assault by a factor of 1.2 (significant at .05 given the sample size). Mandatory arrest generated an odds ratio of .885, a small effect, consistent with the Garner and Maxwell findings. No other state sanctions had significant effects on subsequent violence odds. The largest effect was for the status separated/divorced, an odds ratio of 4.3 ($p < .01$) and clearly not a state legal sanction. In this study, the gender of the victim was not reported. Public housing had an odds ratio of .628. Dugan suggests that other apartment residents may serve as guardians to the victim.

One other issue remains for police/prosecutors who use mandatory arrest/no drop policies. Will the “overkill” nature of the response discourage women who want an end to a temporary conflict but do not want their husband arrested? Some data from Colorado suggest that they might: once mandatory arrest/no drop policy was instituted in Colorado Springs, in 1994; 911 calls for domestic violence began to decrease while other 911 calls increased with population increases. Dugan (2003) replicated this finding in her examination of post policy recidivism in the US. States that had brought in mandatory arrest, subsequently received only 85% as many dv calls as those who had not.

Mandatory prosecution and “no-drop” prosecution policies were designed to shift the burden from the female victim to the state in intimate assault calls. However, they appear in many cases, to violate the wishes of the victim. In Colorado Springs, 911 calls for domestic disturbance declined after mandatory arrest was invoked (Dutton, 2006).

A study by Hotaling and Buzawa (2003) supports the Colorado finding. The authors examined the impact of case processing in the Quincy, Massachusetts (QDC) court on disclosure of re-victimization. The QDC was chosen as a data collection site because of its status as an acknowledged leader in implementing pro-intervention strategies in domestic violence cases and was a model program, recognized by VAWA (Violence Against Women Agency). Multivariate analysis was used to control for the impact of incident, victim, offender and case processing characteristics. Findings suggested the importance of indicators of victim frustration with the criminal justice system. Offenders of women who did not report were no more violent than those who re-reported. The decision to report re-victimization was related to 1) a perception of the criminal justice system as unresponsive to their preferences (non-reporters said they had no voice or rights 55% of the time compared to 12% for reporters) and 2) being less likely to have wanted the offender prosecuted in the first place (Hotaling & Buzawa, 2003). Offender dangerousness did not differ between groups. The authors conclude “what is troublesome is that this research has found that despite the victim’s experience with a “model” intervention program, re-reporting was still a major concern as the majority of victims did not report subsequent offenses to the police. In fact, research adds credence to earlier expressed fears that a too aggressive criminal justice response that did not reflect diversity of victim desires might have had the unintended effect of deterring future reporting” (p. 28). The authors also suggest that because the majority of women chose to stay with the offender, the treatment that offenders were receiving needed to be improved. Overall these data tend to support the criticism of the criminal justice system response made by Mills (1999). As a reaction to the futility of many criminal justice practices, Mills (2003) has suggested restorative justice circles be used in an attempt to honor victims’ wishes, which are frequently overlooked by criminal justice system reactions.

6.2. Impact on custody assessment

Domestic violence is very much an issue in custody assessments. In high conflict custody cases, interparental physical abuse rates run to 72–80% (Johnston and Roseby, 1997; Newmark, Hartnell, & Salem, 1995). Two recent

publications (Bancroft, 2002; Jaffe, Lemon, & Poisson, 2003) have linked domestic violence and custody assessment. Both are written with professional audiences in mind, both cite research studies on domestic violence with a view to expanding the awareness of “professionals, therapists, child protective and court personnel, battered mothers and to anyone else who is in a personal or professional position to touch the lives of children of battered women” (Bancroft & Silverman, 2002, p. 13). Both provide one-sided analyses of domestic violence based on self-selected and non-representative samples. The relevance of these data for custody resides in the fact that, according to these authors, the co-occurrence of wife abuse and child abuse is high. Jaffe et al. (2003) put the co-occurrence of these types of abuse at 30–60%. That is, “30–60% of children whose mothers had experienced abuse were themselves likely to be abused” (p. 30). Jaffe et al. (2003) also note that direct abuse is not the only concern because the child becomes a pawn, used by the batterer to maintain abusive power and control in the relationship after separation. The authors then go on to define abuse using the “Duluth Power and Control Wheel” that includes “Using Male Privilege” (p. 40) as a part of an octant of abusive strategies used against women. Jaffe et al. (2003) then list three categories of “whom to assess”: “victimized mothers” (p. 44), “battering fathers” (p. 46), and “war torn children” (p. 49). Jaffe et al. (2003) suggest using an abuse checklist given to the mother and asking the victimized woman to describe the “first, worst, and last” incident, followed by allowing the “alleged perpetrator an opportunity to respond.” It is not clear what response, apart from denial, might be expected from an accused father. Indeed, the authors warn an assessor that the male perpetrator may “minimize their abusive behavior by blaming their victims or proclaiming that the abuse was uncharacteristic” (p. 42). It seems that, once accused, the father can only use responses that the evaluator is already primed to see as disingenuous. In addition, this view blinds assessors to another source of threat to children: their mother. As we will see below, severe physical child abuse is more likely to be perpetrated by mothers than fathers.

What is problematic about the analysis of Jaffe et al. (2003) is that while their description of the actions and consequences of abuse on the child is accurate, there is a priming of assessors to look only at the father as the abuse perpetrator, and having done so to suspect his denial of abuse. Denial of abuse will not exonerate him because highly abusive men deny abuse as well. Although Jaffe et al. (2003) tell evaluators to “review allegations with each party and give each side an opportunity to explain what happened” (p. 47) or to “have the alleged perpetrator complete a standard inventory about the abuse to engage him in a discussion about what transpired during the course of the relationship,” they provide this suggestion to a reader who has already been informed that males are the perpetrators and that perpetrators lie. No algorithm is provided through which the truth might mystically emerge. Essentially the authors develop skepticism about male accounts and then advise the evaluator to use a clinical judgment already primed to disbelieve the alleged perpetrator. There is a substantial literature on the problems with clinical judgments (Grove & Meehl, 1996; Kahneman, Slovic, & Tversky, 1982), the essence of which is that actuarial judgments outperform clinical judgments consistently. Subjective “engaging in a discussion” with an evaluator, who is already primed to disbelieve the male respondent, is the very type of situation that forensic assessment has sought to eliminate.

Both Jaffe et al. (2003) and Bancroft and Silverman (2002) use “he” to refer to perpetrators of abuse and both are convinced that male abuse is by far the more serious. The section on battering fathers of Jaffe et al. (2003) has no counterpart called “battering mothers” (p. 46). These authors estimate the likelihood of mutual abuse in custody cases as only 9% (p. 54). Cases where the mother is the sole abuser are not considered or reported. Actual data from the U.S. National Survey, reported by Stets and Straus (1992a,b), showed that 28.6% of married couples were female violent (with a non-violent male) and 48.2% used mutual physical abuse. In the 1975 US National survey, physical abuse by the mother was 10% more likely than physical abuse by the father (Straus, Gelles, & Steinmetz, 1980).

Jaffe et al. (2003) devote one paragraph of their entire book to describing men as victims of female violence, pointing out that, in a study done by the Canadian Centre for Justice Statistics, rates of spousal victimization were only slightly higher for women than for men. This finding is quickly dismissed because the violence is “qualitatively different”; women reported more serious violence, three times as much physical injury, and more chronic violence.

Bancroft and Silverman (2002) express many of the same concerns about batterers as parents as do Jaffe et al. Both books have an awareness of the deleterious effects of a battering personality on vulnerable children, however, throughout both books, the terms “batterer” and “he” and “victim” and “mother” or “she” are used interchangeably. The eventual mindset is that abuse perpetrators are almost always male, and when they are not, the abuse is not serious.

What Kahneman et al. (1982) call a “representative heuristic” is developed; batterers have the attributes of maleness and they alone pose a risk to the child.

Both books describe the developmental problems that occur in children of battered women. Indeed an entire literature has developed chronicling psychological problems of children from abusive families. This literature consistently assumes that the source of the abuse is the father. Almost without exception this literature is based on samples drawn from battered women shelters or from treatment groups for men who batter (Bancroft & Silverman, 2002, p. 13) and then inappropriately generalized to the general population.

For example, McCloskey, Figueredo and Koss (1995) describe their study as examining “the link between different forms of family aggression and children’s symptoms of psychopathology” (p. 1239). They then recruited 365 women from women’s shelters and the community. Even in the community sample, women “were screened for the presence of violence in the home in the year prior to the interview” (p. 1242). In other words, the entire sample was based on victimized women. Mothers and children were then asked to list abusive acts by both the mother and father. The authors stated that collecting samples of battered women from the community would “avoid bias in our sample” (sic). They also used a community control group that was “solicited without reference to family or partner violence” (p. 1242). Not surprisingly, in the battered women sample, children reported more violence from the fathers; the control sample children reported as much violence from their mothers as from their fathers. Mothers’ reports of their own violence were not published. The McCloskey et al. literature review on effects of family violence on children focused exclusively on children of battered women and cited works by Jaffe amongst others. Hence, the domestic violence paradigm influences custody evaluators, again with misleading data either drawn from shelter samples and biased or misrepresenting the statistical risk of female violence in community samples.

Another example of the problem in applying the patriarchal paradigm based on shelter samples to the general public can be seen in a paper by Appel and Holden (1998). These authors found in a review of 31 studies that wife assault and physical abuse of children occurred from 20% to 100% when the sample selection basis was either battered women or abused children (average of 40%). However, in “representative community samples,” the overlap was only 6%. In other words, the assumptions drawn from a shelter sample or a male perpetrator sample do not apply to community samples. Overlap rates diminish when items like “physically coerces” (as the authors point out, a legal form of punishment) were dropped from the study. The item “pushed, grabbed or shoved” generated the highest overlap, followed by “slapped and spanked.” While these actions too are problematic, (Douglas & Straus, 2003) they do not constitute “battering.” They inflate overlap rates for apparent abuse; however, they do so by including corporal punishment of children in the equation even though this corporal punishment is not legally or technically abuse (so long as it does not injure the child as is done for correction). As the authors put it, “some of the highest rates of overlap came from reports of children of battered women but these reports included slap/spank” (p. 585). Even after examining the data on co-occurrence and noting that all came from women’s reports and that shelter samples were not representative of community samples, Appel and Holden (1998) outline five models of co-occurring spouse and physical child abuse. Not one of these models depicts the wife as a sole perpetrator of abuse to the husband. This argument creates an erroneous impression that spouse assault is entirely husband to wife and that such assault has a high likelihood of being accompanied by physical child abuse.

Just to set the record straight, a large sample survey of child abuse allegations was done by the Canadian government (Trocmé, 2001), examining 135,573 child abuse investigations. About 45% of these were substantiated (no difference in substantiation rates by gender). Mothers were more likely than fathers to be perpetrators for physical abuse, emotional maltreatment and neglect (p. 49).

6.3. Beliefs about gender and violence perpetration

Emphasis on male violence has been promulgated as well with police departments to the point where males are disproportionately arrested for equivalent violence as females (Brown, 2004). In a random digit dialed survey of 3679 residents of Los Angeles, Sorenson and Taylor (2005) found that actions are considered abusive by the general public if performed by males. This was true across all sociodemographic groups. This includes what we normally would call “psychological abuse”, not just physical abuse. Furthermore, respondents deemed the same action when performed by a man (as “should be illegal”). This included “punch” and “pressure for sex”.

Of perhaps greater concern to psychologists is that Follingstad, DeHart and Green (2004) found that this gender bias was also true of psychologists. Two scenarios describing the context and psychologically abusive behaviors with the

genders reversed were given to 449 clinicians (56% male), median age 52. Psychologists rated male perpetrated behavior as more abusive and severe than the wife's use of the same actions. Contextual factors (frequency/intent/perception of recipient) did not affect this tendency. The items rated as significantly more abusive if performed by a man included "made to account for whereabouts at all times," "would not allow to look at members of same sex," "threatened to have committed to an institution" and "made derogatory comments." The significance on these items was independent of the sex of the psychologist.

As Follingstad et al. concluded, "the stereotypical association between physical aggression and males appears to extend to an association of psychological abuse and males" (p. 447). Unfortunately this sometimes leads to serious problems. Coontz, Lidz and Mulvey (1994) found that clinical predictions of dangerousness made in psychiatric emergency rooms consistently underestimated female dangerousness. Predictions that a male would not be violent were correct 70% of the time, but for females, they were correct only 55% of the time. Skeem et al. (2005) had 147 clinicians assess 680 patients in a psychiatric emergency room for risk of future violence. Mental health professionals of both genders were "particularly limited in their ability to assess female patients' risk of future violence" (p. 173). In fact the "false negative rate" for female patients (the rate at which one was judged to be low risk but subsequently re-offended) was double that of male patients (p. 181). The criterion for violence was physical violence: the patient had to have been reported to have "laid hands on another person with the intent to harm him or her, or had threatened someone with a weapon in hand" (p. 178). This finding was true across all professional groups and was unrelated to type of violence. That is, the finding occurred for general violence and for severe violence. In the MacArthur Risk Assessment study of psychiatric patients released into the public, Robins et al. (1987) found that women were just as likely as men to be violent during the first year after discharge. Robins and her colleagues attributed the underestimation of women's violence to it being less visible "since it occurs disproportionately in the home with family members" (p. 182). An urban emergency room in Pennsylvania (Mechem, Shofer, Reinhard, Hornig, & Datner, 1999) that asked about sources of male injuries, found that 13% of 866 male patients were injured by their female intimate partner.

7. Moving beyond gender analysis

7.1. Meta-analysis of gender differences in aggression

The most comprehensive study on gender differences in intimate violence was conducted by Archer (2000). This meta-analytic study examined combined results from 82 independent studies (including the National Violence Against Women Survey) where data were available for comparing gender rates of abuse perpetration. Based on combined data across studies (a combined data sample of 64,487), women were slightly more likely than men to use physical abuse (defined using the CTS) against an intimate partner (effect size or $d' = -.05$). This was true whether or not outliers were removed or whether studies with a ceiling n of 800 were considered to offset swamping of the outcome by studies with huge samples. Samples from shelters were unrepresentative of community samples, since, by definition they were male violent–female victim samples. This was not true of community samples. As with the dating samples reported above, the younger the sample, and the higher the level of female violence relative to male violence.

Medical treatment for injuries across studies revealed an effect size of $+ .08$, with women being slightly more likely than men to seek treatment (Archer, 2000). Neither the use of violence nor medical treatment resulted in a large effect size. An effect size of $d' = .08$ is less than 1/10 of a standard deviation difference between genders. Given the methodology employed by Archer, his work has to be considered the "gold standard" of studies in gender usage of violence.

In addition, large sample longitudinal studies (to be reviewed below) have shown that personality disorder and substance abuse, not gender, are the key predictive factors (Ehrensaft, Cohen, & Johnson, in press; Ehrensaft et al., 2004; Moffitt et al., 2001). Furthermore, evidence speaks strongly against any normative acceptance of wife assault. Data from a large, nationally representative sample of 5238 adults in the US found that acceptance of male to female violence was low in all sub-samples, regardless of gender or ethnicity (Simon et al., 2001). Overall about only 9.8% of males (and 7.2% of females) approved of a man hitting a woman even "if she hits him first." Only 2.1% of men (and 1.4% of females) approved of a man hitting a woman "to keep her in line." Hence, the "norm of acceptance" of violence towards women upon which patriarchal theory is based (Dobash & Dobash, 1979), is a myth. Evidence also contradicts the simplistic patriarchal view of male power in marriage; only 9.6% of marriages report they are "male dominant" (Coleman & Straus, 1992).

7.2. Longitudinal peer cohort studies and the reconceptualizing of female intimate partner violence

A number of longitudinal peer cohort studies have now been concluded. These studies have several methodological advantages over prior “snapshot” studies in that they all use large and demographically representative samples and follow these samples over extended time periods. Hence, the etiology of abusive behaviors can be traced prospectively. This set of studies, focusing specifically on developmental trajectories of female aggression has been ignored by the domestic violence paradigm. A recent collection of several such studies has been published (Putallaz & Bierman, 2004) incorporating thirteen independent studies of female aggression. The collection examines the development of both traditional forms of female aggression (indirect) and more direct (against children and intimates). One of these studies, Serbin et al. (2004) reports on the Concordia Longitudinal Risk Project in Montreal, a study that began in 1976 with a sample of 4109. Children were categorized into aggressive and withdrawn categories using the Pupil Evaluation Inventory. Extremes in aggression were developed by taking children who scored above the 95th percentile on aggression and below the 75th on withdrawn. This sub-sample yielded 101 girls and 97 boys (similarly reverse criteria yielded a “Withdrawn” group of 129 girls and 108 boys). Age matched comparisons were developed by taking children who were between the 25th and 75th percentile (average) on both aggression and withdrawal. Serbin et al. describe their sample as “community based “and therefore “avoiding biases inherent in clinic-referred samples” (p 266). Aggressive children of both sexes had lower IQs and academic achievement than comparison controls. Both were more physically aggressive during play. Girls’ aggression was associated with a preference for male partners who were also aggressive. As they approached adolescence, these aggressive girls had elevated rates of smoking, alcohol and illicit drug use and “continue (d) to seek out behaviorally compatible peer groups, probably comprised of boys and girls with similar aggressive or “predelinquent” behavioral styles” (p. 268). They also had elevated rates of gynecological problems and were more likely to go on birth control sooner. They had elevations in rates of sexually transmitted diseases between ages 14 and 20. The aggressive group had elevated levels of depression and anxiety disorder by late teens. When they married their children had higher health and the “Aggressive” girls had become aggressive mothers, exhibiting maternal childhood aggression and having children who had more visits to the ER, specifically for treatment of injuries.

Magdol et al. (1997) followed a birth cohort of 1037 subjects in Dunedin, New Zealand. As they put it, “Early studies of partner violence assumed that men’s perpetration rates exceeded those of women, in part because these studies relied almost exclusively on clinical samples of women who sought assistance or of men in court-mandated counselling programs” (p. 69). At age 21, 425 women and 436 men who were in intimate relationships from the Magdol et al. cohort answered CTS questions about their own violence and their partners’ use of violence. Both minor and severe physical violence rates were again higher for women whether self- or partner-reported. The female severe physical violence rate was more than triple that of males (18.6% vs. 5.7%). Stranger violence was also measured and was again more prevalent by women than men (36% vs. 25%).

In a further report on the Dunedin sample, Moffitt et al. (2001), reported that antisocial traits in females 1) made them more likely to become involved in a relationship with an abusive man and 2) even after controlling for their partners physical abuse, “women with a juvenile history of conduct problems were still more likely to commit violence against their partners” (op. cit., p. 65). With a longitudinal study earlier data can be used to forecast later behavior. Antisocial behavior in women measured at age 15 was predictive of assaultive behavior towards intimate partners at age 21. This sample was originally selected when they were quite young and was demographically representative of persons their age. A similar design was used in the US and found the same results with respect to gender parity of violence (Morse, 1995).

Capaldi, Kim and Shortt (2004) examined data from an ongoing community-based longitudinal study of youth in Oregon (Oregon Youth Study: OYS). By young adulthood, 9% of men and 13% of women were identified as engaging in frequent partner violence. Consistent with prior findings, frequent violence was most common in relationships with bidirectional abuse. As far as injuries were concerned, 13% of the young men and 9% of the women indicated they had been hurt at least once by partner violence, and again injury was also likely to be mutual. No gender differences were found in fear of partner’s abusive behavior. Women’s prior antisocial behavior and depressive symptoms predicted both their own abusive partner behavior, as well as their male partners’ abuse. Notably, the women’s characteristics were predictive over and above the contribution of their male partners’ antisocial characteristics. These findings suggest assortative mating for antisocial behavior, as well as the independent contribution of women’s risk factors to

the development of violent relationships. Stability of aggression was found for both genders. As Capaldi et al. concluded “aggression thus appears to be predominantly bidirectional” (p.235).

Ehrensaft et al. (2004) reported that, in the Dunedin birth cohort of 980 individuals, 9% were in “clinically abusive relationships”, defined as those that required intervention by any professional (e.g., hospital, police, lawyers). More such help exists for women, and they are more likely to use it (Stets & Straus, 1992a,b), so the results may be skewed. However, the authors found comparable rates of violence, 68% of women and 60% of men self-reporting injury. Both male and female perpetrators evidenced signs of personality disturbance. The authors noted, for instance, the women had “aggressive personalities and/or adolescent conduct disorder” (p. 267). As the authors put it, “these findings counter the assumption that if clinical abuse was ascertained in epidemiological samples, it would be primarily man-to-woman, explained by patriarchy rather than psychopathology” (p. 258).

The Montreal, Oregon and Dunedin studies present clear examinations of the development and expression of aggression to others in a female sample. They show the developmental trajectory and the “trait” character of this aggression. Both studies indicate that these women will select aggressive men and contribute to the intra-couple aggression.

Ehrensaft et al. (in press) followed an unselected sample of 543 children over 20 years to test the effects of parenting, exposure to domestic violence between parents (ETDV), maltreatment, adolescent disruptive behavior disorders and substance abuse disorders on risk of violence to and from an adult intimate partner. Conduct Disorder (CD) was the strongest predictor of perpetration for both sexes, followed by ETDV. Essentially, the CD in some individuals developed into a variety of adult personality disorders. Ehrensaft et al. call these personality disorder trajectories. A failure of personality disorders to decline predicted intimate violence in both sexes. Women with a pattern of distrust, interpersonal avoidance, unusual beliefs and constricted affect were more likely to assault intimate male partners. Personality disorder, not gender, predicted violence. As the authors put it “it was personality functioning measured prospectively from adolescence to early adulthood (that) can distinguish individuals who will go on to perpetrate partner violence”.

Pimlott-Kubiak and Cortina (2003) analyzed the US National Survey of Violence Against Women (Tjaden & Thoennes, 1998) study of gender differences in incidence of abuse and traumatic reactions to intimate violence, stalking and emotional abuse. The authors cluster analyzed the reports from the NVAWS, identifying 8 distinct profiles of exposure profile to various forms of abuse. Of the 16,000 respondents, men were more likely than women to report exposure to physical abuse (albeit outside the home more than inside), women more likely to report exposure to sexual abuse. Of the 8000 women interviewed about 390 had experienced “multiple forms of abuse” as an adult, as had 350 men. The authors examined a variety of adverse reactions to abuse victimization (depression, PTSD, alcohol abuse) and found no difference by gender. The main predictor of adverse reactions was frequency of exposure, not gender. No meaningful interactive effects of gender and interpersonal aggression were found, once lifetime exposure to aggressive events was adequately taken into account. The authors concluded that their findings argued against theories of greater female vulnerability to pathological outcomes.

Some have argued that female violence is not “instrumental and controlling” as is male violence (Johnson, 1995). However, Laroche (2005) re-analyzed data from the General Social Survey of 25,876 persons in Canada. Unlike Johnson’s data, this survey asked men about their wives’ control tactics. Hence, female “intimate terrorists” emerged from the data, something that Johnson had never described. Laroche clearly found that female intimate terrorists existed (women who used violence and control tactics), at a rate of 2.6% compared to 4.2% for male intimate terrorists. Laroche found that men who were terrorized by female intimate terrorists were as afraid as women terrorized by males (83% vs. 77% of women). This was verified using an assessment of controlling behaviors developed by Johnson and Leone (2005) and used in the Canadian General Social Survey. There appears to be no difference by instrumentality between genders and again, no difference in reported fear of violence.

7.2.1. Consequences of underestimating of female violence

The underestimation of female violence occurs in police departments to the point where males are disproportionately arrested for equivalent violence as females.

The most common form of intimate partner violence is bilateral (Stets & Straus, 1992a,b). That being the case, studies of couple interaction that result in violence are important and several have been done (Jacobson et al., 1994; Leonard & Roberts, 1998; Margolin et al., 1989). These studies have found escalating negative reciprocity to precede assaultive behavior, suggesting that couples therapy may be required in many cases of intimate partner violence. Some

positive results of such work have been reported (O’Leary, Heyman, & Neidig, 1999; Stith, Rosen, & McCollum, 2003) but couples work is mandated as unacceptable by activists even though an assessment could determine whether the couple might benefit from couples work (e.g., where violence was bilateral and there was no current risk). This is another example of the monolithic view of current practice. Acknowledging the interactive nature of much IPV would allow marriage and family therapist to operate instead of Duluth interventions.

7.3. The connection between anger and violence

One shibboleth of the Duluth philosophy (Pence & Paymar, 1993) is that anger does not cause violence (p. 9, 105). The Duluth perspective is rather critical of cognitive–behavioral treatment (CBT) which it frequently mislabels as “anger management,” although CBT has never focused primarily on anger and anger management would be one of approximately 16 treatment objectives in CBT. Duluth’s view of abuse is that it is always an instrumental, strategic act and hence, not a product of anger. Again, this view is not supported by the evidence that Maiuro, Cahn, Vitaliano, Wagner and Zegree (1988) found that domestically violent men had significantly higher levels of both anger and hostility than controls. The author concluded that their findings supported the “idea that anger dyscontrol is a key issue in the profile of domestically violent men” (p.17) and noted that depression, as well as anger was elevated in this group. Margolin et al. (1989) found that physically aggressive husbands reported significantly higher levels of anger than husbands in three control groups. Dutton and Browning (1988) showed videotaped husband–wife conflicts to wife assaulters and control males. The assaultive males reported significantly higher levels of anger, especially in response to an “abandonment” scenario than controls. Dutton and Sonkin’s (2003) application of attachment theory to intimate violence (see below) also contradicts this notion. According to attachment theory, insecure attachment patterns are essentially maladaptive methods of regulating affect, particularly anger and other emotions stemming from loss.

Dutton and Starzomski (1994) found elevated anger scores for assaultive men as measured by the Multidimensional Anger Inventory (Siegel, 1986). They related the anger to certain personality disturbances, especially Borderline Personality Disorder, Antisocial PD, Aggressive–Sadistic PD and Passive–Aggressive PD, all of which have anger as a component of the personality disorder. Dutton et al. (1994) found elevated anger in assaultive males to be related to certain attachment disorders, especially an attachment style called “fearful” attachment and which they re-labeled “fearful–angry” attachment. Citing Bowlby’s (1977) work on attachment that viewed anger as having a first function of re-uniting with an attachment object and dysfunctional anger as further distancing the object. Dutton et al. (1994) explored developmental origins of elevated anger in assaultive males, viewing it as being produced by paternal rejection, exposure to abuse and a failure of protective attachment. Failure to address these underlying issues therapeutically while focusing on symptomatic beliefs and “male privilege” would be counter-indicative of treatment success.

Jacobson et al. (1994) recruited physically aggressive and martially distressed non-violent control couples to discuss “areas of disagreement” in a laboratory setting. Both martially violent husbands and wives displayed significantly more anger than controls (although the study focused on, and reported abusive husbands, 50% of the wives committed severe acts of abuse as well (p.983)).

Eckhardt et al. (1998) and Eckhardt, Barbour and Stuart (1997) reviewed several anger measures and argued that anger and hostility were both elevated in martially violent men. Eckhardt et al. (1998) used an “articulated thoughts simulated situations” technique that found martially violent men articulated more anger-inducing irrational thoughts and cognitive biases than non-violent controls. In short, numerous studies from several independent sources have found anger to be prominent in physically assaultive males. For a review of studies not reported above, see Eckhardt et al. (1997).

7.4. Patriarchal beliefs and violence

A central tenet of the Duluth model is that male intimate violence is a product of “patriarchal beliefs”. However, the evidence that patriarchal beliefs cause violence has very little empirical support. A recent meta-analytic review by Stith, Smith, Penn, Ward and Tritt (2004) found only modest effects for “traditional sex role ideology” on partner violence. Stith et al. required four independent studies to show an effect before a factor could be considered a risk factor for intimate partner violence. However, two of the four studies they cited for attitudinal acceptance had dubious measures

of attitude (one took reports of females on their husbands attitudes) (Smith, 1990), the other simply asked abusive and non-abusive men to estimate the likelihood of their being violent in the future and took elevated (and probably accurate) estimates of violent men as measures of “acceptance” (Hanson et al., 1997). The result is that evidence for an association between attitudes and IPV is meager and even if it existed, the causal direction cannot be ascertained by cross-sectional studies.

Measures of beliefs taken post hoc may simply reflect rationalizations for previous violence and causation cannot be inferred. Social psychological research perennially demonstrates that people adjust their attitudes to reconcile attitudes with behavior (Bem, 1972). Also, beliefs and irrational thoughts increase during arousal to anger and, despite the Duluth denial that anger is important, it is typically a prior state aspect of abusive episodes. What the Duluth proponents fail to acknowledge, is that thoughts, emotions and behaviors are inter-related, but that this interaction is bidirectional. For example, when under the influence of strong emotions, thoughts or beliefs may become distorted which in turn will lead to particular behaviors. Likewise, pre-existing thoughts or beliefs may also exacerbate emotions (such as, I cannot depend on anyone for love) also leading to problematic behaviors. Likewise, behaviors can trigger thoughts or emotions that were not present before the action was taken. For example, one can smile and shortly afterwards begin to feel happy. Additionally, many behaviors can occur in a mindless way, with little awareness to thought or emotion (riding a bike for example). In other words, the Duluth model of thoughts and behaviors is simplistic and fails to capture the true complexity of the human intimate relationship. Perhaps this is the central tragedy of the beliefs underlying the Duluth model: that men and women are reduced to socially scripted automatons, without painful personal histories, without current frustrations, and inevitably without meaningful inner lives.

8. Conclusion

It is unfortunate that a once pioneering model has become an impediment to effective program and criminal justice responses to domestic violence. What was intended to be a progressive force for safety and liberation has become a rationale for narrow-minded social control. The Duluth model, and its underlying ideological assumptions, is incompatible with progressive social theory and policy. Progressive views of crime and deviance identify, in part, risk factors rooted in socioeconomic marginalization. These broad indicators of socioeconomic risk are often found to be associated with violence and criminality (Markowitz, 2003) The Duluth model, however, maintains that unlike the bulk of similar aggressive criminal behaviors (e.g., assault, child abuse, elder abuse), violence perpetrated toward women is influenced in no way by social marginalization or psychosocial deficits, but rather is solely a product of gender privilege. A progressive view makes possible a reduction in crime and violence through ameliorating socioeconomic disadvantage. The Duluth model renders such efforts irrelevant.

This is a period of great political polarization. Liberal and conservative perspectives on most social issues have become extreme in their divergence. It is an error to pigeonhole this critique of the Duluth model as a “left–right” issue. It is not. It is a critique of ideologically driven suppression of science, rational policy models, and innovative, promising program development. Scientific empiricism is often rejected by both the left and the right when findings deviate from approved ideological or theological views. The “strange bedfellows” consensus about always-guilty, brute, male perpetrators and always-innocent, pure, female victims speaks to a deeper set of cultural archetypes underlying the shared prejudice of both the left and right on this issue. What is the appeal to “conservatives” of what appears to be a “liberal feminist” framing of this issue, with its use of activist rhetoric? Simply put, it provides a rationale for the further criminalizing of deviance and an expansion of the power of the criminal justice system. For example, the federal STOP Violence Against Women Formula Grant Program makes ineligible for funding “intervention or counseling programs for perpetrators that do not use the *coercive power of the criminal justice system* to hold them accountable for their behavior” (italics added) (Programs, 2004–2005).

There is a closed-mindedness shared by the left (“feminist”) and right (“law and order”) perspectives on the issue of domestic violence. Both views share a belief that the exercise of social control is the preferred response. Both share a commitment to the belief that criminal behavior (“battering”) is fully voluntary and strategic, independent of psychological or psychiatric mediation. This dismal coupling of the progressive and repressive is not uncommon in social policy. Corvo and Johnson (2003) identified a “historical precedent for such sociopolitical sleight of hand, for the substitution of regressive social control measures for progressive policy in

the guise of social enlightenment, particularly where the welfare of women and children is putatively concerned” (p. 265). Corvo and Johnson describe the views underlying the Duluth model not as feminism per se, but as a form of fundamentalism. The meaning here in its psychological not theological sense, connoting an “us against them” ideology and a conviction of the infallibility of one’s beliefs despite contradiction of these claims by empirical reality. This mindset is often reflected by the labeling of any dissent as “backlash,” never as a well founded methodological critique (DeKeseredy & Schwartz, 2003; Faludi, 1981). Duluth model adherents are interfering with the delivery of effective treatment intervention through state laws or policy that require a gender-based but ineffective “intervention” as the model of choice. This disadvantages women partnered with men in treatment by precluding the availability of more effective psychologically based treatment. As Ehrensaft et al. (2004) put it “studies suggest that this single-sex approach is not empirically supported, because both partners’ behaviors contribute to the risk of clinically significant partner abuse, and both partners should be treated. Women’s partner abuse cannot be explained exclusively as self-defense against men’s partner abuse, because a woman’s pre-relationship history of aggression towards others predicts her abuse toward her partner, over and above controls for reports of his abuse towards her” (p. 268).

We call upon the federal agencies with responsibilities for addressing issues of violence and domestic violence to initiate funding programs designed to encourage innovative perpetrator intervention programs. We call upon the state and local offices responsible for maintaining standards for perpetrator intervention to not only permit, but to encourage local shelters and other providers to develop and implement effective programs. We call upon those who study domestic violence to maintain high standards of scientific and methodological rigor regardless of ideological critique. We call upon those involved in helping these troubled persons and families to apply the sound principles of humane, effective practice that their various professions promote. Against a national movement toward evidence-based and best-practice criteria for assessing program continuance, interventions with perpetrators of domestic violence remain immune to those evaluative criteria. The stranglehold on theory and policy development that the Duluth model exerts confounds efforts to improve treatment. There is no rational reason for domestic violence to be viewed outside of the broad theoretical and professional frameworks used to analyze and respond to most contemporary behavioral and psychological problems. On the contrary, this isolation of domestic violence has resulted in a backwater of tautological pseudo-theory and failed intervention programs. No other area of established social welfare, criminal justice, public health, or behavioral intervention has such weak evidence in support of mandated practice.

The bureaucrat/activists of certifying agencies and “batterer” treatment programs have become “true believers,” disregarding research that does not support their views (Dutton & Nicholls, 2005). They are enthralled with the power that comes with having one’s philosophy hold sway and the control they feel from influencing criminal justice policy. Ironically, they often attribute these very “power and control” motives to abusive men. There is no other explanation for resisting treatment that would disprove their philosophy but make the lives of women safer. Is time to relinquish this hegemony of policy and allow the treatment of abusive men, women, and families by professionals who can make clear judgments about appropriate treatment (e.g., couples therapy, family therapy, and group therapy for one or both of the couples’ members) and end the current dysfunction in criminal justice process. Treatment modalities exist that show great promise but are not tried for political reasons. Psychologists, social workers, and other helping professionals have not only a broader array of research-based behavioral change technologies available to them, but also a commitment to rigorous codes of ethics. These codes of ethics may vary in the details, but all leave no doubt as to the primacy of human dignity, growth, and safety. Further, these codes of ethics promote dynamic, scientific views of practice excluded from the approved interventions promulgated by the state certifying agencies (APA, 2002; Howard, McMillen, & Pollio, 2003).

Those with continued allegiance to the patriarchal view should stand back and ask themselves if their primary motivation is to advance the safety of women and families or to preserve a self-interested political stance. The patriarchal view played an important role in addressing domestic violence. If not for the early groundbreaking work of victims’ rights advocates and feminist activists, it is not likely that domestic violence would be so recognized as an important social welfare and public health issue. In the evolution of public policy responses to social problems, the path often followed is an initial politicizing of the issue, followed by programs, followed by evaluations research, followed by a more detailed specification of etiology, risk, and program response. This process has been impeded by the ideological strictures inherent in the patriarchal view. The science has moved well beyond the policy. It is time for the policy to change.

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The Relationship Between Direct Violence Victimization and Arrest History: The Mediating Role of Aggression

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The Relationship Between Direct Violence Victimization and Arrest History: The Mediating Role of Aggression

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ABSTRACT

This study sought to determine whether emerging adults with a history of arrest differed on reported experiences of direct violence victimization (DVV), as well as measures of depression, posttraumatic stress disorder, and aggression. We administered self-report measures to 535 diverse college students. Results revealed that 64 participants reported a history of arrest. Participants with a history of arrest reported significantly higher scores on measures of aggression, as well as a greater number of DVV experiences, when compared to a comparable random sample of participants with no history of arrest. When the total sample was examined, there was no direct relationship between DVV and history of arrest. However, we found evidence for the mediating effect of aggression between the two variables. Our findings suggest that, among emerging adults who have experienced DVV, high levels of aggression may play a role in criminal justice involvement.

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Broadly speaking, exposure to community violence refers to instances of violent behavior that occur within one's neighborhood, home, or in relationships with family members and/or peers. An individual may be exposed to community violence either by witnessing or hearing about a violent event (i.e., indirect violence victimization), or by being the target of the violent event (i.e., direct violence victimization [DVV]). Examples of community violence may include hearing about, witnessing, and being physically assaulted, raped, or mugged. Research suggests that exposure to community violence is a common occurrence among youths living in an urban environment. For example, within a sample of 217 inner-city high school students, Weist, Acosta, and Youngstrom (2001) found that 93% of participants reported knowing at least one person who had been the victim of a violent act, 77.4% reported that they had witnessed a violent act, and 47% reported that they had been the target of at least one violent act. Recent research echoes these results; specifically, using a daily diary technique, Richards et al. (2015) obtained data from 169 African American adolescents who were living

in an inner city environment. Overall, results demonstrated that participants were exposed to approximately one incident of community violence per day.

In addition to children and adolescents, research suggests that exposure to community violence is a common occurrence among emerging adults. For example, previous research found that, within a sample of 159 college students, participants reported an average of almost nine DVV experiences, and an average of 22 witnessed violent events (Rosenthal & Hutton, 2001). Research conducted by Scarpa, Hurley, Shumate, and Haden (2006) found that almost 40% of college students reported hearing about some form of violence within their community. Similarly, Hassan, Mallozzi, Dhingra, and Haden (2011) examined the prevalence of community violence exposure within a sample of 211 racially and ethnically diverse college students. Results revealed that the majority ($n = 129$; 60%) of participants reported being physically assaulted at least once in their lifetime.

Research suggests a strong relationship between community violence exposure and negative outcomes among younger populations, including risky sexual behaviors (Voisin, Chen, Fullilove, & Jacobson, 2015), dating violence (Black et al., 2015), violent criminal behavior (Baskin & Sommers, 2014), and substance use (Bennett & Joe, 2015). Research also supports a strong link between community violence exposure and aggression. Barroso et al. (2008) examined this relationship within a large sample of middle school students ($N = 8,259$). Results revealed that witnessing violent acts in the community was significantly positively associated with aggression, and this relationship was consistent across races/ethnicities and gender. Similarly, Goodearl, Salzinger, and Rosario (2014) followed 667 middle school students in an urban area from sixth to eighth grade and found that exposure to community violence predicted more aggressive behaviors among students. It has been suggested that individuals who are exposed to community violence may be prone to aggressive behaviors, due to the fact that it serves a protective function; if an individual presents themselves in an aggressive manner, they may be able to protect themselves from further violence victimization (Garbarino, Kostelny, & Dubrow, 1991). Others have suggested that, through repeated exposure in the community, violence is “normalized,” which promotes the belief that violence is morally acceptable and elevates rates of aggressive behaviors (Boxer et al., 2008; Ng-Mak, Salzinger, Feldman, & Stueve, 2004).

In addition to aggression, youth with high levels of community violence exposure report more symptoms related to depression, anxiety, and posttraumatic stress disorder (PTSD) symptoms (Bacchini, Miranda, & Affuso, 2011; Baskin & Sommers, 2015; Javdani, Abdul-Adil, Suarez, Nichols, & Farmer, 2014). Following exposure to community violence, youth may interpret their surroundings as unsafe, or believe that they are not deserving of protection from dangerous situations (Margolin & Gordis, 2000). These feelings may result in a negative self-view and/or hopelessness, ultimately leading to symptoms of

depression (Hong, Huang, Golden, Patton, & Washington, 2014). Moreover, repeated exposure to stressful violent events may lead to changes in brain structures and function, thus leading to the development of anxiety and/or PTSD symptoms (Bremner, 2006).

The strong relationship between community violence exposure and negative psychological outcomes among college students has also been documented. Within this population, exposure to community violence has been positively associated with a variety of factors, including higher levels of aggressive behaviors, anxiety, depression, and PTSD symptoms (Banerjee, Rowley, & Johnson, 2015; Haden & Scarpa, 2008; Scarpa & Haden, 2006), as well as substance use, risky sexual behaviors, risky driving behaviors, and psychological distress (Brady, 2006; Spenciner Rosenthal & Wilson, 2003). Amanor-Boadu et al. (2011) found that, among college students, DVV was associated with increased levels of depression, anxiety, and PTSD symptoms. In sum, it appears as though exposure to community violence, and more specifically, being the direct victim of a violent act, has a negative impact on the psychological functioning of young adults.

In addition to poor psychological outcomes, a small amount of research has also examined the relationship between community violence exposure and arrest. Importantly, it has been estimated that approximately 30–40% of young adults will report a history of arrest by age 23 (Brame, Turner, Paternoster, & Bushway, 2012). A large portion of criminal-justice involved youth are minorities living in urban areas (e.g., Yoder, Bender, Thompson, Ferguson, & Haffejee, 2014), and these demographic characteristics have been demonstrated to increase the risk of exposure to community violence (Aisenberg & Herrenkohl, 2008). A recent study found that, within a sample of homeless youth, those who were exposed to childhood physical abuse were almost twice as likely to be arrested, compared to youths without a history of physical abuse (Yoder et al., 2014). Similarly, among male adolescents, exposure to childhood physical abuse was associated with later violent offending (Spaccarelli, Coatsworth, & Bowden, 1995). However, to our knowledge, research has not yet examined the relationship between DVV and arrest within a sample of emerging adults. It is also unclear what psychological mechanisms underlie this relationship. Further research is also needed to determine whether negative psychological outcomes that are commonly associated with DVV increase one's likelihood of reporting a history of arrest. Finally, research has not yet examined whether college students with a history of arrest report higher levels of DVV, depression, PTSD, and aggression, when compared to students without a history of arrest.

This study had two specific hypotheses. First, we hypothesized that participants who reported a history of arrest would report higher rates of DVV, depression, aggression, and PTSD symptoms, when compared to participants without a history of arrest. Second, we hypothesized that DVV would

significantly predict arrest history, through the pathways of aggression, as well as depressive and PTSD symptoms.

Method

Participants

The current study is part of a larger study that aimed to examine the relationship between exposure to community violence and a number of psychological factors, including perceived social support and psychopathology, in a racially diverse sample of emerging adults. The data used in this study were collected from 2008–2011 at a private university in the northeastern United States. After approval by the Institutional Review Board, male and female undergraduates ($N = 535$) were recruited using posted advertisements in the psychology department. In order to participate, participants were required to be enrolled in the university and be between the ages of 18–24 years. Informed consent was obtained, and participants were asked to complete a number of self-report measures with a trained research assistant. Participation took approximately 1 hour. In exchange for participation, participants received course credit. Participants had a mean age of 19.38 ($SD = 1.92$), and the majority identified as female ($n = 360$). Participants reported their racial identity as Black ($n = 192$), White ($n = 147$), Asian/Pacific Islander/Hawaiian ($n = 117$), and American Indian ($n = 4$). Further, 59 participants identified with more than one race. Participants reported year in college was as follows: first year ($n = 239$), sophomore ($n = 198$), junior ($n = 68$), and senior ($n = 26$).

Sixty-four participants (11.96%) reported a history of arrest. We then randomly selected a sample of participants who did not report a history of arrest to compare to those who reported a history of arrest. Within this subsample, participants had a mean age of 19.32 ($SD = 2.23$) and the majority identified as female ($n = 79$). Participants reported their racial identity as Black ($n = 47$), White ($n = 31$), and Asian/Pacific Islander/Hawaiian ($n = 24$). Furthermore, 22 participants reported that they identified with more than one race. There were no significant differences in reported racial identity, $X^2(3, N = 124) = 7.25, p = .064$, or reported gender, $X^2(1, N = 128) = .30, p = .585$ between participants who reported a history of arrest and those who did not within the subsample. Since no significant differences were detected, the two groups were considered matched and were examined in subsequent analyses.

Measures

Aggression Questionnaire (AQ; Buss & Perry, 1992)

The AQ is a 29-item, self-report measure designed to assess various facets of aggression. Participants were asked to indicate their level of agreement, using

a 5-point scale (1 = *extremely uncharacteristic of me*; 5 = *extremely characteristic of me*). The AQ is composed of four subscales, which include physical aggression, verbal aggression, anger, and hostility. Examples of items include: “I may hit someone if he or she provokes me” (physical aggression); “My friends say that I argue a lot” (verbal aggression); “At times I feel like a bomb ready to explode” (anger); and “I wonder why sometimes I feel so bitter about things” (hostility). Scores were obtained by summing item responses, with higher scores indicative of higher levels of aggression. Cronbach’s alpha for the total scale in the study sample was .99, with Cronbach’s alpha for each subscale as follows: .98 (anger), .99 (physical aggression), .99 (hostility), and .98 (verbal aggression).

Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996)

The BDI is a 21-item, self-report measure designed to assess symptoms of depression. Participants were asked to rate items related to depressive behaviors, thoughts, and mood over the previous 2-week period, using a 4-point scale. Sample items include the following: “I do not feel sad” (1), “I feel sad much of the time” (2), “I am sad all of the time” (3), and “I am so sad or unhappy that I can’t stand it” (4). Items are summed to create a total score, with higher scores suggestive of more depressive symptoms. Cronbach’s alpha for the total scale in the study sample was .90.

Survey of Exposure to Community Violence (SECV; Richters & Saltzman, 1990)

The SECV is a 54-item, self-report measure that was designed to assess exposure to violent experiences in the community. Participants were asked to report how often they have directly experienced, witnessed, or heard about violent events in the community, using the following metric: 0 = *never*, 1 = *one time*, 2 = *two times*, 3 = *three–four times*, and 4 = *five or more times*. For the purposes of the current study, we utilized items that represented DVV only (i.e., violent acts that were directly experienced by the individual). Participants were presented with six questions that assessed how many times the participant was slapped or punched, raped, mugged, attacked with a knife, shot with a gun, and/or other situation. A total score was calculated by summing the frequencies of DVV reported across different incidents, with higher scores indicative of more DVV experiences in the community. The SECV was also used to assess history of arrest. Participants were asked the frequency with which they have been arrested, where the arrest occurred, and the last time the participant was arrested.

Purdue PTSD Scale-Revised (PPTSD-R; Lauterbach & Vrana, 1996)

The PPTSD-R is a 17-item, self-report measure designed to assess symptoms associated with PTSD. The PPTSD-R corresponds with the *Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition*

(DSM-IV) criteria for a diagnosis of PTSD. Participants were asked to rate how often a particular event occurred during the past month, using a 5-point scale (1 = *not at all*, 5 = *often*). Items are summed to create a total score, and higher scores are suggestive of more PTSD symptoms. The PPTSD-R may also be examined using its three subscales, which are meant to represent the reexperiencing, avoidance, and arousal symptom clusters of PTSD. Examples of items include: “Have you had upsetting dreams about the event” (reexperiencing), “Did you avoid activities or situations that might remind you of the event” (avoidance), and “Did you react physically (heart racing, breaking out in a sweat), to things that reminded you of the event” (arousal symptoms). Cronbach’s alpha in the current sample was .94.

Data analysis plan

Initial descriptive, analysis of variance (ANOVA), and correlational analyses were conducted using the total sample. We randomly selected a sample of participants who did not report a history of arrest to compare to those who reported a history of arrest. We then conducted independent samples *t*-tests to examine scores on measures of depression, PTSD symptoms, aggression, and direct violence victimization between the two groups. In order to examine the mediation hypothesis, we utilized Hayes (2013) PROCESS macro for examining indirect effects and reported bias correct confidence intervals. Meditational analyses were conducted using the total sample.

Results

Descriptive characteristics of study variables are presented in [Table 1](#).

The most commonly reported DVV experience was slapped/punched ($n = 253$; 47.29%), followed by raped ($n = 72$; 13.46%), mugged ($n = 33$; 6.17%), other situation ($n = 27$; 5.04%), attacked with a knife ($n = 6$; 1.12%), and shot with a gun ($n = 4$; 1%). We also examined whether there were significant differences in all study variables between races. There were statistically significant differences between groups in DVV as determined by a one-way ANOVA ($F(4,512) = 5.463$, $p < .001$). A Tukey post-hoc test revealed significant differences in DVV between White ($M = 2.97$; $SD = 2.36$) and Black participants ($M = 4.23$; $SD = 3.32$), White participants and participants who identified as more than one race ($M = 4.78$; $SD = 4.12$), and participants who identified as more than one race and Asian/Pacific Islander/Hawaiian participants ($M = 4.25$; $SD = 4.57$). We also examined descriptive characteristics of the arrest/no arrest subsample, which are presented in [Table 2](#).

Table 1. Descriptive statistics of study participants.

Scale	<i>M</i>	<i>SD</i>
Total sample (<i>N</i> = 535)		
Depression	10.55	9.91
PTSD	34.75	15.83
AQ total score	69.63	16.11
AQ physical aggression	23.19	4.92
AQ verbal aggression	11.69	4.04
AQ Anger	15.57	4.60
AQ hostility	19.16	5.31
DVV total score	3.77	3.19
Black participants (<i>n</i> = 192)		
Depression	9.63	8.17
PTSD	34.31	14.46
AQ total score	70.70	16.57
AQ physical aggression	23.53	5.15
AQ verbal aggression	11.87	4.01
AQ anger	15.41	4.73
AQ hostility	19.84	5.36
DVV total score	4.23	3.32
White participants (<i>n</i> = 147)		
Depression	9.97	10.14
PTSD	34.89	17.18
AQ total score	68.19	14.75
AQ physical aggression	22.97	4.57
AQ verbal aggression	11.32	3.89
AQ anger	15.78	4.24
AQ hostility	18.83	6.52
DVV total score	2.97	2.36
Asian/Pacific Islander/Hawaiian participants (<i>n</i> = 117)		
Depression	11.12	9.94
PTSD	33.87	15.34
AQ total score	69.19	17.27
AQ physical aggression	22.83	5.19
AQ verbal aggression	11.50	3.97
AQ anger	15.59	4.70
AQ hostility	18.87	5.85
DVV total score	3.37	3.03
Other race participants (<i>n</i> = 63)		
Depression	12.70	12.68
PTSD	35.85	16.50
AQ total score	70.84	15.32
AQ physical aggression	23.30	4.50
AQ verbal aggression	12.51	4.28
AQ anger	15.48	4.94
AQ hostility	19.56	4.95
DVV total score	4.74	4.11

Note. AQ = Aggression Questionnaire (Buss & Perry, 1992). DVV = direct violence victimization (Survey of Exposure to Community Violence; Richters & Saltzman, 1990). PTSD = Purdue PTSD Scale-Revised (Lauterbach & Vrana, 1996).

There were no statistically significant differences between groups in DVV as determined by a one-way ANOVA ($F(15,108)=1.03, p = .431$).

All study variables were significantly correlated with one another and in the expected direction (see Table 3).

Table 2. Descriptive statistics of arrest/no arrest subsample.

Scale	<i>M</i>	<i>SD</i>
Depression	11.37	10.22
PTSD	37.36	16.43
AQ total score	73.25	18.04
AQ physical aggression	24.35	5.67
AQ verbal aggression	12.17	4.13
AQ anger	15.94	4.91
AQ hostility	20.90	6.76
DVV total score	4.40	3.62

Note. *N* = 128. AQ = Aggression Questionnaire (Buss & Perry, 1992). DVV = direct violence victimization (Survey of Exposure to Community Violence; Richters & Saltzman, 1990). PTSD = Purdue PTSD Scale-Revised (Lauterbach & Vrana, 1996).

Table 3. Zero-order correlations between study variables.

	1.	2.	3.	4.	5.	6.	7.
1. Depression							
2. PTSD	.582*						
3. AQ total score	.424*	.380*					
4. AQ physical aggression	.318*	.307*	.826*				
5. AQ verbal aggression	.420*	.360*	.847*	.548*			
6. AQ anger	.425*	.353*	.830*	.580*	.670*		
7. AQ hostility	.315*	.303*	.888*	.655*	.698*	.635*	
8. DVV	.175*	.148*	.203*	.209*	.162*	.201*	.142*

Note. *N* = 535. AQ = Aggression Questionnaire (Buss & Perry, 1992). DVV = direct violence victimization (Survey of Exposure to Community Violence; Richters & Saltzman, 1990). PTSD = Purdue PTSD Scale-Revised (Lauterbach & Vrana, 1996).

**p* = .01.

As previously discussed, 64 (11.57%) participants endorsed a history of arrest. Of the participants who reported a history of arrest, most reported being arrested 3–5 years ago ($n = 21$; 32.81%), followed by about a year ago ($n = 11$; 17.19%), and 1–2 years ago ($n = 6$; 9.38%). Only eight (12.5%) participants reported having been arrested within the past 3 months. Arrest history did not differ significantly by gender (women: $n = 38$, men: $n = 26$), $X^2(6, N = 533) = 6.247, p = .396$. Due to the small amount of participants who endorsed their racial ethnicity as American Indian and more than one race (“Other”), these two categories were combined to assess potential racial differences in arrest history. Nearly half of those arrested identified as Black ($n = 30$), followed by White ($n = 14$), Other ($n = 9$), and Asian/Pacific Islander/Hawaiian ($n = 8$). Like gender, arrest history did not differ significantly by reported racial identity, $X^2(6, N = 535) = 10.80, p = .213$.

We then examined our first hypothesis using the arrest/no arrest subsample ($n = 128$). There were no significant differences in mean scores on measures of depression or PTSD symptoms between participants who reported a history of arrest and those who did not. However, participants who reported a history of arrest endorsed significantly more experiences of

Table 4. Independent samples *t*-test results.

	No Arrest (<i>n</i> = 64)		Arrest (<i>n</i> = 64)		<i>t</i> -test
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Depression	10.83	10.46	11.92	10.03	-0.60
PTSD	36.40	15.84	38.27	17.05	-0.63
AQ total score	69.21	17.88	77.43	17.38	-2.60*
AQ physical aggression	23.22	6.04	25.51	5.05	-2.28*
AQ verbal aggression	11.07	3.70	13.32	4.28	-3.10*
AQ anger	15.05	4.17	16.85	5.46	-2.07*
AQ hostility	19.86	7.90	21.97	5.19	-1.75
DVV	2.95	2.09	5.84	4.22	-4.91**

Note. *N* = 128. AQ = Aggression Questionnaire (Buss & Perry, 1992). DVV = direct violence victimization, as measured by the Survey of Exposure to Community Violence; Richters & Saltzman, 1990). PTSD = Purdue PTSD Scale-Revised (Lauterbach & Vrana, 1996).

p* < .05. *p* < .001.

DVV, as well as higher scores on measures of aggression, when compared to participants with no history of arrest (see Table 4).

Using the total sample (*N* = 535), we found partial support for hypothesis two. The standardized regression coefficient between DVV and the PTSD total score was statistically significant ($B = .755$, $p < .01$; $CI[.312-1.198]$). The standardized regression coefficient between DVV and the depression total score was also statistically significant ($B = .605$; $p < .01$; $CI[.327-.883]$), as was the standardized regression coefficient between DVV and the aggression total score ($B = .1071$; $p < .01$; $CI[.625-1.517]$). Results did not reveal a direct effect of DVV on history of arrest ($B = -1.053$; $p = .196$; $CI[-2.649-.543]$). There was no indirect effect of either the depression total score ($B = -.229$; $CI[-1.09-.202]$) or the PTSD total score ($B = .116$; $CI[-.028-.565]$) in the relationship between DVV and history of arrest. Only the aggression total score demonstrated a significant indirect effect in the relationship between DVV and history of arrest. The number of bootstrapped samples for bias corrected confidence intervals was 1,000. The bootstrapped unstandardized indirect effect was .568, and the bias corrected confidence interval ranged from .002 to 1.951.

Discussion

This study sought to determine potential differences in negative psychological outcomes between participants who reported a history of arrest and those who did not. We also hypothesized that there would be a significant positive relationship between DVV and history of arrest, and that this relationship would be mediated by aggression, depression, and PTSD. Our results indicated that 64 (11.96%) participants reported a history of arrest. Research is limited on general arrest history on college campuses, as the majority of studies have focused on alcohol-related arrests/infractions (e.g., Leinfelt & Thompson, 2004; McChargue, Klanecky, & Anderson, 2012; Thompson,

2007). However, our findings are consistent with previous research, which suggests that college students continue to endorse engagement in illegal and/or delinquent behaviors at fairly high rates (e.g., Bacon, Burak, & Rann, 2014; Pfefferbaum & Wood, 1994). In contrast to previous findings, our results revealed that history of arrest did not differ by gender. For example, Langhinrichsen-Rohling, Arata, Bowers, O'Brien, and Morgan (2004) found that male college students reported higher levels of illegal behaviors, including property damage, theft, physical violence, and selling drugs, when compared to female college students. Similarly, Brame, Bushway, Paternoster, and Turner (2014) examined arrest rates among emerging adults. The authors found that male participants reported significantly higher rates of arrest, when compared to female participants, while Black males reported higher rates of arrest than White males. Notably, we found no significant difference in arrest history among reported racial identities. Since our study was conducted in an urban environment, it could be argued that surveyed participants, regardless of reported racial identity, might be exposed to higher rates of crime, which may in turn promote participation in illegal activities.

Regarding our first hypothesis, we found that participants who reported a history of arrest also endorsed higher rates of DVV, when compared to a random sample of participants without a history of arrest. Furthermore, participants who reported a history of arrest also endorsed higher rates of aggression, including physical aggression, verbal aggression, and hostility, when compared to participants without a history of arrest. Although no studies to date have examined differences in psychological functioning in college students with and without a history of arrest, our findings are consistent with previous research, which has demonstrated a relationship between traumatic experiences and later offending (e.g., Fox, Perez, Cass, Baglivio, & Epps, 2015), as well as aggression and arrest more broadly (Barroso et al., 2008; Goodearl et al., 2014).

In contrast to our predictions, participants who reported a history of arrest did not endorse higher scores on measures of depression or PTSD, when compared to a random sample of participants who did not report a history of arrest. These findings are in contrast to previous research, which has demonstrated a relationship between depression and delinquent behaviors (e.g., Langhinrichsen-Rohling et al., 2004). Moreover, a large amount of research suggests that criminal justice involvement is associated with PTSD symptoms in a variety of populations (e.g., Becker & Kerig, 2011; Green et al., 2016; McMackin, Leisen, Cusack, LaFratta, & Litwin, 2002; Nikulina, Widom, & Czaja, 2011). Therefore, it remains unclear why some youths who are exposed to DVV go on to endorse symptoms of depression and/or PTSD, while others do not. In regards to the current study, perhaps unmeasured resiliency factors, such as adaptive coping strategies, the effective management of one's emotional experience, social support, and/or the ability to

fluidly adapt to life's challenges, accounted for the lack of differences in depression and PTSD between those who reported a history of arrest and those who did not. For example, research suggests that, among those who have experienced trauma, social support acts as a protective buffer in the development of depression and/or PTSD symptoms (e.g., Holt & Espelage, 2005; Schumm, Briggs-Phillips, & Hobfoll, 2006). Although impossible to determine, perhaps the participants in the current study experienced higher levels of social support, which protected from the development of negative psychological outcomes.

Finally, when the total sample was examined, we found no evidence for a direct effect of DVV on history of arrest. However, there was a significant direct effect of DVV on depression, as well as DVV on PTSD. These findings are consistent with previous research, which has demonstrated a consistent relationship between negative psychological outcomes and community violence exposure (Bacchini et al., 2011; Baskin & Sommers, 2015; Javdani et al., 2014). Moreover, while there was no significant indirect effect of depression or PTSD in the relationship between DVV and reported history of arrest, we found a significant indirect effect through the pathway of aggression. Some have posited that aggression is an adaptive personality characteristic among youths living in an urban environment, as the trait allows the individual to better protect themselves in the face of community violence (e.g., Anderson, 1999; Garbarino et al., 1991; Latzman & Swisher, 2005). Although impossible to determine based upon the current findings, individuals who have been exposed to violence within their communities may endorse higher levels of aggression as a way in which to protect themselves from further victimization (e.g., Garbarino et al., 1991). Despite this potentially adaptive function of aggression, such behaviors may lead to increased criminal justice contact within this population, which may account for the indirect relationship of DVV and arrest history.

There are several study limitations that warrant further discussion. Due to the small number of participants who reported a history of arrest, we may not have found significant relationships due to lack of sufficient power. In addition, we did not obtain reasons for arrest; therefore, we were unable to account for whether participants who reported a history of arrest were allegedly involved in violent or non-violent incidents. It is also possible that aggregating the arrest data in this manner may have contributed to some of the study's non-significant findings. Time of DVV was also not assessed, and it is possible that some participants may have been exposed to DVV following arrest. Data were also obtained via self-report measures and in the presence of a research assistant. Thus, some participants may have been hesitant to share sensitive information (e.g., arrest history), or answer questions in a truthful manner. Due to the correlational and cross-sectional design of the study, we were unable to infer any causal relationship between

DVV and arrest. Despite the diversity of our participants, it remains unclear whether our results would generalize to other samples (e.g., a clinical sample of emerging adults).

In sum, our findings suggest that arrest is a relatively common occurrence among diverse college students. Moreover, while DVV is generally considered an important risk factor for later criminal justice involvement, high rates of aggression, including physical aggression, verbal aggression, and hostility, may help to explain why individuals who are the direct victims of violence may experience higher levels of arrest. However, further research is needed to determine the common types of charges among college students, beyond those associated with drug and alcohol use. An additional important line of research would be to assess how criminal justice involvement impacts the mental health and academic functioning of college students. Research should also be conducted to determine resiliency factors that promote healthy psychological and psychosocial adjustment among individuals who have experienced DVV.

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Running head: Family Violence and Methamphetamine Use

Family Violence and Methamphetamine Use

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Overview of Methamphetamine

Methamphetamine, a schedule II illegal synthetic stimulant that is smoked, injected, ingested, or snorted; is considered to be highly addictive; and is easily produced in clandestine laboratories (Stretsky 2009). The white, odorless, bitter-tasting crystalline powder is also commonly known as meth, speed, and chalk. It is often referred to in its smoked form as crank, crystal, ice, and glass (NIDA 2006). Many of the ingredients required are relatively inexpensive and can be purchased in many stores over-the-counter (Stretsky 2009).

Prevalence

As an illicit drug it was originally isolated in Hawaii and then moved east with major problems developing in Oregon. As of January 2006 it was noted to be the fastest growing problem in metropolitan Atlanta as it moved east from such high-level areas as Honolulu, San Diego, Seattle, San Francisco, and Los Angeles, touching both urban and rural areas (NIDA 2006). In the 2005 National Survey on Drug Use and Health (NSDUH) about 10.4 million people age 12 or older (4.3 percent of the population) have tried methamphetamine during their lives. Four and half percent of high-school seniors reported usage of the drug in the Monitoring the Future survey of student drug use and attitudes. Between 1995 and 2002 hospital emergency departments have seen a 50 percent increase of the number of visits related to methamphetamine abuse. Admission to treatment programs with methamphetamine/amphetamine as the identified primary drug of use was at 8% by 2004 and increasing as it moves into more states. (NIDA 2006)

Usages

Like its parent drug, amphetamine, it was originally used as a nasal decongestant

and bronchial inhalers. As a street drug it is usually sold as a powder that can be ingested orally, smoked, snorted, or injected (Murray 1998). The preference of drug administration changes over time and between areas. Smoking it increases the uptake of into the brain and creates more intense effects and well increasing the likelihood of addiction and potential health problems (NIDA 2008). There is some evidence that it is helpful in the treatment of narcolepsy and attention deficit hyperactivity disorder. The therapeutic amounts for treatment of these disorders are much lower than that which is commonly abused. As a schedule II drug is has a high likelihood of abuse and addiction while maintaining limited medical usage and as a prescription cannot be refilled (NIDA 2008).

Effects

Methamphetamine is a stimulant in the same category as cocaine, and provides euphoria, alertness, and a sense of well being (Murray 1998). It can also increase physical activity and decrease appetite according to the National Institute for Drug Abuse (2008). Negative effects include cardiovascular problems: including rapid heart rate, irregular heart beat, and increase blood pressure and other problems such as hyperthermia and convulsions. Methamphetamine is structurally similar to amphetamine and dopamine, but higher concentrations in the synapse, which can be toxic to nerve terminals. The euphoric effects of are contributed to the release of very high levels of dopamine. It is also this large release of dopamine and the blocking of reuptake that is thought to create the negative effects on the nerve terminals in the brain. Long-term methamphetamine abuse can lead to addiction, which is accompanied by functional and molecular changes in the brain. Other long-term effects may include anxiety, confusion, insomnia, and violent

behavior along with psychotic features: paranoia, visual and auditory hallucinations and delusions. These effects may last for months or years after use have been stopped. With two years of abstinence improvement was seen in areas of motor and verbal memory tests, however recovery was not seen in all brain areas even after two years. There is also an increased risk of stroke with methamphetamine use, which would lead to irreversible brain damage. It should be noted that the drug's effects could differ based on administration of the drug. Smoking or injecting the drug intravenously creates an intense rush that is short lived but described as pleasurable. Snorting or oral ingestion produces euphoria without the rush. While the effects are similar to amphetamine a comparable dose equates a longer lasting more intense high since more of it gets into the brain and affects the central nervous system. Unlike cocaine, the drug is metabolized at a much slower rate, thus its effects can last from six to eight hours according to Murray (1998). The half-life of Methamphetamine is 12 hours where as the half-life of cocaine is an hour. Methamphetamine causes increased activity and talkative, decreased appetite and a euphoric state. Negative effects from the drug include increased heart rate, stomach cramps, anxiety, paranoia, and hallucinations (Anglin, Burke, Perrochet, Stamper, & Dawud-Noursi, ^{[[[}2000; Wermuth, 2000). Consistent with other abused stimulant the pattern of methamphetamine use is a "binge and crash" pattern (NIDA 2008). Users tend to use excessively over time, exhibiting stereotypic or repetitive behavior during binge use. For example, a user may excessively clean an apartment or disassemble and assemble a computer. Binges may last from several days to a week without sleep. Users then crash and may sleep for 12-18 hours during withdrawal, which has been associated with an intense depression and irritability (Murray, 1998). While the blood content of

Methamphetamine will be high for hours, the desired feeling will wear off quickly leading to high repeated doses. Treatment for methamphetamine addiction includes behavioral therapies: cognitive behavioral and contingency management interventions. Wellbutrin may also have some positive effect in the treatment of addictions (NIDA 2008).

Methamphetamine and its Relationship to Domestic Violence

It is clear that methamphetamine is a powerful substance that affects both the body and brain. The prevalence rates have increased dramatically over the past decade and methamphetamine knows no boundaries in terms of those who use it. It shows similar rates of use for gender, age groups, ethnicity and race. The focus on this paper is to review the literature on the relationship between methamphetamine use and domestic violence, which will also include neglect of children by parents who use methamphetamine. The goal is to better understand the unique relationship of methamphetamine and violence.

Methamphetamine and Violence

Use of methamphetamine has been repeatedly linked with higher rates of violence and aggression, including domestic violence and violence in drug trafficking (Brecht, O'Brien, von Mayrhauser, & Anglin, 2004).

Sommers and Baskin (2006) surveyed a large group of individuals who had been using methamphetamine for at least three months. 26.8% of these individuals committed at least one violent act while under the influence of the drug. While men comprised more than half of the sample population, of those who committed methamphetamine related violence, 30% were men and 23% were women. There were 80 separate acts of violence

reported, and of these, 41 involved incidents in domestic relationships.

Anger, frustration, and situational opportunities were the most common motivations for the violent acts. Many of the individuals also reported disorganized thinking and a narrowing of perceptual fields as a result of their use. They also described their language as more provocative while intoxicated and reported an exaggerated sense of outrage over perceived transgressions (respect, space, verbal challenges) which led them to resort to violence in order to exert social control or retribution.

Another common effect of methamphetamine is paranoia. This paranoia contributed to hostile attributions that created an air of danger and threat, leading to defensive or preemptive violence. Several sample members reported that their decision making within violent events was compromised.

While Sommers and Baskin (2006) concluded that methamphetamine use increased the possibility of violence, violence is not an inevitable outcome of use. There is an interaction between the pharmacological properties of a substance and the physiological characteristics of a user, which are mediated by users' norms, values, practices, and circumstances. No matter how seductive methamphetamine is, it is always used in social contexts that shape how it is used and what its effects are taken to mean by users. The variation in intoxicated behaviors within social contexts suggests that the context itself exerts a powerful influence on the violence outcomes of methamphetamine situations. While methamphetamine use appears to increase violent behavior, this behavior results ultimately from a complex interaction of a variety of social, personality, environmental, and clinical factors whose relative importance is varied across situations and time.

26.8% of surveyed residents (those who had used methamphetamine) in California said they had been violent (“any form of deliberate physical harm inflicted on another individual”) while under the influence of methamphetamine (Sommers and Baskin, 2006). These researchers also found that methamphetamine users were likely to engage in domestic violence at home, work, or social events (Meredith, Jaffe, Ang-Lee, & Saxon, 2005).

Methamphetamine Use and The Legal System

At least half of all adults arrested in the United States test positive for one or more drugs at the time of their detainment. Almost one-third of victims of violent crime perceived the perpetrator to be under the influence of drugs at the time of the offense. During 2003, 21.5% of all drug arrests made by the Drug Enforcement Agency were methamphetamine related and these users were described as being “among the highest risk offenders” (U.S. Department of Justice, 2005) due to the frequent and erratic violent behavior displayed.

Due to the increase in methamphetamine related crimes, and the violence associated with these crimes, there is has been an increase in involvement of law enforcement agencies in methamphetamine related incidents. Cartier, Farabee, and Prendergast (2006) surveyed 641 state prison parolees in California and found that use of methamphetamine was significantly predictive of self-reported violent criminal behavior and general recidivism (a return to custody).

Increased Aggression as a Result of Chronic Methamphetamine Use (seen in mice)

Several studies have noted the heightened propensity for violence when methamphetamine is used. However, the exact cause of this heightened propensity is not

well understood. Sokolov, Schindler, and Cadet (2004) suggested that aggressiveness could result from chronic methamphetamine use. In order to test this, they gave either single or chronic (long term intermittent over 8 weeks) administrations of the drug to mice. They found that a single injection of methamphetamine did not augment fighting. However, chronic administration increased the number of animals which initiated bite attacks as well as shortening the latency before the first attack. The researchers concluded that repeated injections of methamphetamine can increase fighting behaviors in mice as well as alter the social interactions.

Methamphetamine and Homicide

Perhaps the most striking statistic on methamphetamine and violence was found by Stretsky (2009): the odds of someone committing a homicide are 9 times greater for an individual using methamphetamine than for an individual not using methamphetamine. Moreover, this association between methamphetamine use and homicide persists even after controlling for alternative drug use (alcohol, heroin, crack, cocaine, PCP, LSD), sex, race, income, age, marital status, previous arrests, military experience, and education level! This suggests that methamphetamine use is different from other drug use in terms of its effects on violence. Methamphetamine changes the body's chemistry in a way that may cause users to act violently. Some medical researchers have argued that methamphetamine is a neurotoxin that acts on the central nervous system to produce a variety of physical manifestations and psychiatric complaints such as "depression with severe dysphoria, irritability and melancholia, anxiety, marked fatigue with hypersomnia, intense craving for the drug, and even paranoia or aggression" (Meredith et al, 2005). Methamphetamine may lead to more violence by increasing the stakes in everyday social

interactions and “transforming them from non-challenging verbal interactions into the types of character contests whose resolution often involved violence”(Sommers & Baskin, 2006). It is not surprising then that chronic methamphetamine use has also been associated with psychotic behavior that may result in serious violent acts such as homicide or suicide.

Methamphetamine and Parenting

In addition to the propensity for violence, there are also profound effects on the parenting skills and styles of parents who use substances. Children of parents who use substances often live chaotic and neglectful lifestyles. There has been an increase in the number of women who use methamphetamine in recent years, and many of these women are in their early 20s and in their prime child-bearing years. Between 1997 and 1999, 11,300 women in San Diego alone admitted themselves to public alcohol and drug treatment facilities and cited methamphetamine as their primary drug. These women had an average of 1.5 children under the age of 18, which means that 16, 950 children had been affected by maternal methamphetamine use.

Brown and Hohman (2006) found that while using, parents used a polarized parenting style, allowed exposure to violence, and created upheaval and transition in the child’s daily life and schedule. Social workers sent to these homes often found children suffering from neglect to the degree that infants would be in unchanged diapers, without formula or food, or with dirty needles or syringes nearby. Not only are these children affected by their parent’s drug use, but they are also affected by the likely home manufacturing of the drug (exposure to toxic chemicals and fumes, fire, or explosion). In addition to these difficulties, parents who use methamphetamine often have inconsistent

or inappropriate emotional responsiveness and tend to be impulsive and unpredictable. They may also have disorganized or paranoid thinking, and experience interpersonal violence. Consequently their children have a compromised sense of security and cannot rely on the parents to meet basic needs.

Based on the findings from this study the researchers devised six broad themes about parenting styles of those who use methamphetamine:

- 1) Polar Parenting: extreme feelings of anger or apathy (not balanced with praise, joy, or laughter)
- 2) Drug Management: logistics of using methamphetamine as a parent of young children
- 3) Separate Life: Parents remove drug use, and therefore themselves, from their children
- 4) Domestic Violence: Violence between adult partners, as well as violent crimes against family members in the home
- 5) Effects on Children: physical, environmental, emotional, and psychological impacts
- 6) Retrospective Ambivalence: differing opinions and beliefs about whether or not they were able to handle roles as parents while using methamphetamine.

As the problem of methamphetamine abuse spreads across the nation effecting families in disruptive and often violent ways, therapists and addiction counselors need to consider treatments that are effective in treating the one using the drug as well as the others involved. During a client's addiction the likelihood of a child in the home suffering from neglect is far greater than if the parents are not using methamphetamine. Its long term effects on the brain can create complications for therapeutic alliance and issues of shame and forgiveness. The long term effects of methamphetamine are still not

completely understood so further research is needed to assess the implications families, communities and the larger social system.

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Dialectical Behavior Therapy for Domestic Violence: Rationale and Procedures

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Domestic violence is a significant social problem with significant psychological and medical consequences for its victims and their children. In part because treatments for domestic violence are often not effective, and in part because of the hypothesized similarities between the problems of chronically aggressive men and chronically suicidal women (e.g., emotion dysregulation), a rationale for applying Dialectical Behavior Therapy (DBT) to domestic violence is provided. This new application of DBT, designed to treat aggression and violence in families, is described. Aggression assessment procedures and conceptualization issues are presented, along with a case to illustrate treatment principles and intervention strategies. Typically targeting men who batter their partners, this new application includes the four essential functions of DBT, including attending to client motivation, skill acquisition, skill generalization, and team/therapist consultation. In addition, a number of new treatment developments are presented to target reducing and eliminating aggression: validation and empathy skill training; a focus on reconditioning anger responses to be more normative (including identifying alternative emotions and their associated effective coping responses); skills training on accurate interpersonal emotional expression; and understanding the functions of aggression and teaching skills in how formerly aggressive partners can get relationship and self-management needs met skillfully. A brief overview of the other strategies and components of DBT, and how they are applied to treating domestic violence, is also provided. Particular attention is devoted to therapists maintaining a nonjudgmental stance by utilizing mindfulness practice and team consultation.

DOMESTIC VIOLENCE (also referred to as partner abuse, battering, aggressive or violent behavior, etc.) is a significant social problem in the United States. Data from a national survey indicate that 1 out of 8 husbands engaged in at least one violent act toward his wife during the year of study, and 1.8 million wives are assaulted by their spouses or partners each year (Straus & Gelles, 1990). The National Institute of Justice (1994) estimates that partner abuse occurs in between 2.5 million and 4 million homes each year in the United States, with the vast majority of violence perpetrated by men against their female partners. Moreover, once battering has begun, it is likely to continue to occur, and will often escalate in frequency, intensity, and severity (Feld & Straus, 1989).

Domestic violence has enormous negative consequences for its female victims, who show both increased psychological problems (e.g., depression, substance abuse, posttraumatic stress disorder, and higher suicide risk) and increased physical health problems (e.g., over 1 million women seek medical care for injuries related to battering, and 20% of all women's emergency room visits are the result of battering; Houskamp & Foy, 1991; Stark & Flitcraft, 1982). In addition, significant problems have been identified in children, both as a direct result of ob-

serving aggression and violence between parents and indirectly as a function of the other consequences (e.g., depression, health problems, jail) of their parent victims and perpetrators.

Applying Dialectical Behavior Therapy to Domestic Violence: Rationale

Developing or implementing a new treatment for any problem is justified under the following circumstances: (a) data show that existing treatments do not work well; (b) data demonstrate better outcomes with a new treatment; (c) a new treatment is more resource efficient than an old one (without diminishing outcomes); or (d) treatment providers prefer a new treatment (e.g., reduced burnout), as long as outcomes are not diminished and costs do not increase.

The rationale for applying Dialectical Behavior Therapy (DBT) to problems of aggression and violence in families generally follows this logic: (1) Outcomes for existing treatments for battering (both recidivism and drop out rates) are generally poor; (2a) there are several theoretical links between parasuicidal and borderline behaviors successfully treated by DBT and aggressive and violent behaviors of batterers; (2b) empirical findings suggest that aggressive behaviors in batterers may be reinforced by *both* instrumental gains and diminished negative emotional arousal, paralleling reinforcers for parasuicidal behaviors of borderline clients; (2c) empirical outcomes of DBT are strong with respect to relevant overlapping treatment targets (outcome and treatment retention); (3)

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 **Continuing Education Quiz located on p. 526.**

DBT costs much less than prison (and any successful treatment likely would measure up well against the social and individual costs of battering), and (4) stress and burnout among treatment providers is believed to be high, and DBT targets reducing stress and burnout among providers.

Problems With Existing Treatments

Domestic violence treatment programs typically treat male batterers using a weekly group format for periods ranging from 8 to 36 weeks. Most batterer treatment programs use cognitive-behavioral interventions, with a curriculum that includes core instruction in anger management (e.g., anger recognition, time-out, self-talk strategies, and relaxation training) and violence cessation (e.g., time-outs, self-talk, relaxation). The curriculum may also include interventions from a feminist perspective, including sex-role education, resocialization, and discussions of patriarchal, male power issues, and may include training in skills to improve relationship functioning, such as communication and conflict resolution skills,

Given the difficulties with dropout rates in treating batterers, the emphasis in DBT that is placed on orienting, committing, and collaboration may be effective for this population of clients.

social skills, and assertion skills (Holtzworth-Munroe, Beatty, & Anglin, 1995).

Poor outcomes. Most published studies have found limited if any reductions in rates of recidivism. For example, Rosenfeld (1992) reviewed 25 outcome studies of batterers' treatment programs and found that across the studies, the average recidivism rate (defined as at least one act of violence by the time of the follow-up assessment) was 27%. Rosenfeld concluded that batterers who completed treatment had only slightly lower rates of recidivism than batterers who refused treatment, dropped out of treatment, or were arrested and not referred to treatment. Gondolf (1997) evaluated the outcomes of 840 batterers receiving treatment at four "well-established" cognitive-behavioral batterer treatment programs, finding that 39% reassaulted at least once during the 15-month follow-up, 70% engaged in verbal abuse, and 43% percent committed threats of violence during that time.

High dropout rates. The dropout rate between initial contact with batterer treatment programs and program completion is often greater than 90% (Gondolf & Foster, 1991). Additionally, even among batterers who are court-ordered to treatment, 40% to 60% or more do not complete the prescribed number of sessions. For example,

Babcock and Steiner (1999) evaluated 339 male batterers who had been court-ordered for batterer group treatment: Only 106 (31%) completed the treatment.

Support for an Emotion-Dysregulation Model

Most treatments for domestic violence (e.g., anger management, general cognitive-behavioral interventions, role resocialization) are pragmatic. That is, they have been developed in response to behaviors of batterers that are proximal to their aggression (anger, attitudes and attributions, beliefs about roles). However, researchers studying batterer typology have found that batterers are a heterogeneous population with respect to these variables. Moreover, most studies that have measured appropriate variables have identified a subtype of batterers who exhibit borderline personality disorder behavior traits or emotion regulation problems (e.g., Hamberger and Hastings, 1986), and most batterers fit profiles in *DSM-IV* Cluster B.

Tweed and Dutton (1998) conducted a cluster analysis of 79 batterers, and found that 38 (48%) of the batterers fell into an "impulsive" cluster, 32 (41%) fell into an "instrumental" cluster, and 9 (11%) did not fit into either cluster. These authors found that the "instrumental" group was more narcissistic, antisocial, and aggressive, and reported more severe physical violence, whereas the "impulsive" group was more passive-aggressive, borderline, and avoidant, and had higher chronic anger and fearful attachment. They suggest that instrumental batterers use violence to maintain control of their partners (for instrumental gain), whereas impulsive batterers engage in violence to reduce their own aversive arousal and negative affect.

Rubio and Fruzzetti (2000) argue further that many men who have antisocial personality disorder or a significant subset of antisocial behaviors (partner abuse) may have disorders that overlap with borderline personality disorder. They suggest that many aggressive and violent men have the same psychological difficulties with emotion regulation (and related problems of "self" such as being unable to identify emotions, wants, etc.) as do chronically suicidal and parasuicidal borderline women. Furthermore, they argue that in addition to the frequent instrumental gains accrued by the use or threat of aggression, such behaviors may also be negatively reinforced by diminished negative arousal following threats or use of aggression.

Effectiveness of DBT

DBT is a treatment for emotion dysregulation and the various behavioral difficulties associated with severe and chronic emotion dysregulation. DBT is the only treatment to date to have garnered significant empirical support for treating multi-problem, parasuicidal borderline

women (e.g., Linehan, Armstrong, Suarez, Allmon, & Heard, 1991). Moreover, the established efficacy of DBT in treating concomitant problems (e.g., substance use, affective disorders, other quality-of-life problems) is important in considering treating batterers, who also are likely to have problems with substance use as well as other significant behavioral problems.

DBT has demonstrated an ability to keep suicidal and self-harming borderline individuals in treatment to its completion (16% dropout over 1 year; Linehan et al., 1991), despite the fact that this population (borderline women) has a very high dropout rate in other treatments. Given the difficulties with dropout rates in treating batterers, the emphasis in DBT that is placed on orienting, committing, and collaboration may be effective for this population of clients.

Finally, working with batterers is challenging and demanding for treatment providers: Dropout rates are high, outcomes are poor (recidivism rates are high), crises are common, and successes and reinforcers are relatively infrequent. This parallels the difficulties of therapists in treating multiproblem, chronically suicidal and borderline clients. "Treating the therapist" is a tenet of DBT (Linehan, 1993a), recognizing that motivating skillful therapists is essential both for their well being and for improved outcomes in their clients. This approach seems particularly appropriate with providers of batterer treatment as well.

Describing DBT for Domestic Violence

DBT has been comprehensively described elsewhere (e.g., Linehan, 1993a). Applying DBT to aggressive and violent behaviors has been accomplished primarily through a systematic utilization of existing DBT principles, structures, and strategies, with a few modifications. The modifications to established DBT have been developed specifically for the treatment targets and problems of this client population. In this section we will describe each of the essential components of DBT and their relevant application to aggressive partner behaviors.

Assessment

Assessment in DBT for domestic violence serves three primary purposes: to determine appropriateness for the treatment, to identify treatment targets, and to measure the effectiveness of the treatment:

Assessment to determine appropriateness for inclusion in the treatment. This assessment simply identifies factors relevant to inclusion and exclusion criteria: Does the client have the kinds of problems for which the treatment (and the specific treatment program) is intended? Does the client meet any exclusion criteria of the treatment program? These might include imminent suicidal behaviors,

current threats toward others (e.g., with Tarasoff implications), current severe psychosis that makes participation in treatment difficult or impossible, current prison inmate status (unless the treatment program is operated within the facility or the facility allows brief furloughs for treatment), and so on.

Assessing inclusion and exclusion criteria requires clear program guidelines from the treatment team regarding how it is applying DBT: For whom/what behaviors is this treatment being offered? Are there any empirically derived exclusions? Similarly, inclusion and exclusion policies of the clinic, agency, or other setting in which the treatment is being offered must be determined and assessed. The more specific these criteria are, the easier they are to assess efficiently with questionnaires, phone screening, or a face-to-face interview. Moreover, inclusion and exclusion criteria can be highlighted in brochures or advertisements to those making referrals so that a minimum amount of time (for both staff and those who would be excluded) can be devoted to this phase of assessment.

Assessment to identify treatment targets to aid the delivery of services. Identifying primary treatment targets is especially important in DBT in general as well as in DBT for batterers. Because the problems of domestic violence are within the set of priority targets within DBT, these "first stage" targets must be assessed continuously (see Table 1). Because DBT is a behavioral treatment, the antecedents and consequences of these target behaviors must be

Table 1
Stage 1 Treatment Targets

Decrease:
Life-threatening behavior: suicidal and parasuicidal behaviors, thoughts, urges, actions; aggressive and violent thoughts, urges, and actions; child neglect
Therapy-interfering behaviors
Quality-of-life interfering behaviors (that threaten stability, individually or in the family)
<ul style="list-style-type: none"> • Criminal behaviors that may lead to jail • Problematic sexual behavior (outside relationship, high risk/unprotected) • Seriously dysfunctional interpersonal behaviors • Significant employment or school related dysfunctional behaviors • Illness-related dysfunctional behaviors • Housing-related dysfunctional behaviors • Mental health-related dysfunctional behaviors (e.g., severe DSM Axis I-IV Disorders)
Increase: Individual Behavioral Skills and Self-Management
Mindfulness
Distress tolerance
Emotion regulation
Interpersonal effectiveness
Validation and empathy

identified as intermediate or secondary targets for change in order to influence primary targets.

There are, of course, a number of ways to assess these secondary targets (antecedents and consequences of aggression). We have developed a semistructured interview, the Domestic Violence Interview (DVI; Fruzzetti, Saedi, Wilson, Rubio, & Levensky, 1999), that provides a functional analysis of aggressive and violent behaviors vis-à-vis emotion dysregulation, couple intimacy and relationship factors, and instrumental gains. In the DVI, the assessor (usually the therapist in the first or second appointment) guides the client through a behavioral analysis of the vulnerability factors, emotions, thoughts, actions, events, etc., along the chain of behaviors toward a specific aggressive episode. The target of the therapist is to be nonjudgmental and noncritical, eliciting as much descriptive data as possible from the client, utilizing cues (such as establishing context—date, day, time, place, room, temper-

ature, events of the day) to enhance reporting. This is, of course, typical of behavioral or functional analysis in general. This strategy allows the therapist to listen to the client's whole story without responding except to communicate acknowledgement and understanding of the events (including thoughts and feelings) of the client. No attempts are made to suggest alternative behaviors at this time, nor to engage in any therapeutic strategies other than assessment per se. This affords the therapist with early targets for intervention once a commitment to treatment is established.

The assessor . . . guides the client through a behavioral analysis of the vulnerability factors, emotions, thoughts, actions, events, etc., along the chain of behaviors toward a specific aggressive episode.

Of course, use of formal assessment protocol is only one option and may not be necessary. However, careful, comprehensive, and detailed behavioral analysis (including a focus on identifying emotions along the chain of behaviors) must be completed in some manner.

Assessment of outcomes to determine the effectiveness of the treatment. There are at least four consumers of outcome data that should be satisfied when considering which outcomes to measure: (a) the client; (b) the therapist (and other members of the treatment team); (c) whomever is paying for the treatment (this may be the client exclusively, but often also includes third-party payers, the public, etc.); and (d) administrators responsible for resource allocation, at all levels of care and administration (i.e., from direct supervisors to agency heads, legislators). If the program has a research component, human

subject review boards and scientific peers must also be considered.

In general, there are two types of relevant "data" (this word is used loosely here to represent any kind of information used to determine effectiveness) that should be considered: primary outcomes and intermediate outcomes. Most obvious is outcome on the primary target: Has aggression and violence ceased? The longer the follow-up period, of course, the more confidence we may have in the effectiveness of the program. Thus, knowing that the client has not battered during the 6-month period of treatment would not be as useful as knowing about recidivism over a 1- or 2-year (or longer) follow-up period. The other kind of data relevant to understanding outcomes involves measuring putative mediators of outcome; these are often the secondary targets of treatment needed to achieve success on primary targets. For example, skill acquisition and generalization, client collaboration, attendance, substance use, and other secondary targets of treatment are believed to predict long-term outcome (e.g., primary target of decreasing aggressive behaviors). By measuring these variables, treatment providers can tell whether or not the immediate targets are affected, thereby increasing the likelihood that longer term (primary) targets will be achieved in an enduring way. Of course, measuring intermediate variables is only useful when data support the model on which they are predicated and the variables in question actually do predict outcomes empirically.

Measures of mediators and direct indices of outcome can be collected during time intervals or continually (daily or weekly) throughout the treatment. Long-term outcomes are collected at termination and at subsequent posttermination intervals. We typically utilize quarterly assessments (every 3 months), daily self-monitoring cards, and therapist reports and ratings. During the initial and quarterly assessments, data that can likely be collected reliably with interval sampling are assembled. This might include questionnaire data (social support, alcohol and drug use, skill acquisition, depression severity, attitudes toward treatment, etc.) or interview data (covering similar topic areas). Daily self-monitoring cards include daily recording of aggressive thoughts, urges, and action (and suicidal thoughts, urges, and action if present in past year), drug and alcohol use, sleep and other relevant vulnerability factors, skill practice, emotions, social contacts made that day, and so on. As secondary targets are identified they are included on the diary card; as targets are achieved they are removed.

In order to have high confidence in treatment effectiveness, it may be important to have collateral sources of data. For example, police and court records, and either interview or questionnaire data from a current partner

concerning client conflict and other potentially aggressive behaviors may aid in understanding the true impact of the interventions provided (there are significant demand characteristics on the client's self-report in many cases). If partners are asked to provide any information, it is essential that clients do not have access to it for obvious safety reasons. One easy way to do this is to collect follow-up data anonymously from partners. Although it may be impossible to identify individual treatment successes and failures, this method maximizes safety for partners and allows the overall impact of the treatment program to be evaluated in a more valid manner.

Let us use a case example to illustrate how treatment targets would be assessed and organized initially with the DVI. This case is a composite of typical behaviors of multiple client presentations, and will be employed throughout the rest of this paper to illustrate other components of DBT for aggressive and violent behavior.

Case example. Mr. A. is court-referred for treatment while waiting for adjudication subsequent to battering his partner. In the most recent episode of battering, neighbors called the police late at night in response to loud noises and screaming. Both partners were found with bruises and facial lacerations, and the female partner's eyes were swollen almost shut. She was treated in the emergency room and released. He was treated in the forensic unit and released on bail the next day, and went to live, temporarily, with his brother across town. He told police that "she started the fight, I was only protecting myself" while she told police that he escalated over the course of the evening, finally beating her with his hands when she attempted to leave to go stay with a friend.

The domestic violence interview (see above) was conducted around this specific episode and determined the following chain of behaviors:

1. He had been late to work on that day, in part because he had driven his wife to work after her car would not start;
2. He was anxious arriving for work late (reported that his lateness is a frequent problem);
3. He tried to sneak in but his supervisor saw him;
4. He felt "angry" and in the interview also identified fear of losing his job and embarrassment over getting caught trying to hide his lateness;
5. He felt angry at his wife all day (ruminated) for "making him late" to work;
6. He further ruminated about the effect of his lateness on his employee evaluation, which would be completed later that month;
7. He was angry and upset upon returning home for the evening;
8. He drank "a couple of beers" while waiting for dinner;
9. He argued verbally with his wife during dinner; he was critical of her in many ways which continued for several hours through the evening (she watched television and generally ignored his criticisms);
10. Around 10:45 p.m. she yelled at him, called him "irresponsible" regarding work, pointing out that he had been late many times previously because he had not set the alarm, not remembered his work schedule, and so on;
11. He verbally threatened her, telling her to "shut up or I'll shut you up";
12. He identified intense anger, which he called a "white out";
13. He grabbed her;
14. She pulled her arm loose and yelled at him that she had told him she would leave him if he threatened her again;
15. She went to get her coat and keys;
16. He grabbed her by the arm again, they struggled, pushing and scratching each other;
17. She again tried to get to the door;
18. He knocked her down, knelt down on the floor and slapped and punched her repeatedly in the face;
19. She went into the bathroom;
20. He sat down on the sofa;
21. The police arrived and he was arrested.

Let us turn our attention now to the treatment structure and hierarchy of treatment targets, to understand which behaviors are addressed, in what order, in DBT for domestic violence.

Treatment Hierarchy, or Structure of Treatment

One of the essential structures of DBT is its detailed attention to a hierarchy of treatment targets. Table 1 highlights the essence of the treatment hierarchy, which is described below.

Orienting and committing to treatment. After one or more assessment sessions, but prior to treatment per se, one to two sessions are devoted to describing in detail what a client can expect if she or he participates in this treatment (orienting) and evaluating the pros and cons of participation, culminating in an active decision whether or not to participate (commitment). Clients begin identifying intermediate targets for treatment, complete a diary card daily to track relevant behaviors as they are identified, and complete out-of-session assignments designed to clarify and enhance commitment.

This phase may be complicated by the fact that clients may be court-ordered to treatment. It is essential for these clients that the therapist highlight their freedom to choose (or not) DBT, even given the apparent absence of alternatives (they must attend *some* treatment or be remanded to court or jail). This has at least a couple of im-

plications: First, therapists must be knowledgeable concerning alternative treatments available in order to compare and contrast them accurately with DBT. Especially relevant are any outcome data available, the structure and expectations of other programs, and so on. The target here is not to dissuade someone from participating in another treatment or to convince someone to participate in DBT per se, but rather to facilitate an active commitment to treatment (DBT or other) or an active commitment to no treatment. The target is active commitment to a course of action that will likely help the person achieve the kind of life he or she desires, from a “wise mind” perspective.

It is essential to highlight how DBT is likely different from most other treatments for domestic violence (such as anger management or more standard CBT, in one or both of which many clients will already have participated): In DBT:

- there is an emotion regulation focus, and not just on anger as the precipitant for aggression;
- active skills are taught as the solutions to problems (aggressive and violent behavior, of course, but other problems that are in any way connected to aggression also);
- mindfulness is a core skill in DBT (with emphasis on both the attention-focus and wise-mind aspects of mindfulness);
- although there is a psychoeducational component to DBT skills, the treatment involves a collaborative and integrative application of these skills (including attention to generalization);
- idiographic behavioral assessment (behavioral or functional analysis, self-monitoring) and behavioral interventions/behavior therapy are the primary change strategies (not insight or understanding, per se);
- there is an assumption about the value of the client as a human being, and that she or he has a repertoire that includes valuing the integrity of others and valuing nonviolent action with partners (the client also may have a repertoire that values the use of aggressive and violent behaviors; the former repertoire then would be the target for enhancement, consistency, and reinforcement, the latter for reduction or elimination);
- it is assumed that treating aggressive and violent clients is demanding of therapists’ treatment skills and sometimes challenging emotionally, and that therefore therapists need a team for support in order to be effective.

Pros to be considered with a client trying to decide whether to commit to DBT may include the following: previous treatments may not have been effective (i.e., en-

tering repeatedly into a treatment that has not worked may diminish motivation; DBT may not only be a new treatment for batterers, but also directly addresses motivation and commitment in treatment); other parts of the treatment hierarchy may be relevant to the client (e.g., depression, substance use, poor relationships, etc.; see below); DBT is a demanding and comprehensive treatment (involves skill training, behavioral analysis, generalization of skills, homework/practice) that operates within a treatment hierarchy, so clients may be motivated by treatment targets in addition to reducing aggression; treatment is very focused on specified targets, so clients are well-oriented participants in their therapy; treatment is a collaborative enterprise; and so on. Of course, as a dialectical treatment, every one of these potential pros to DBT may also be a reason *not* to participate in DBT: It is a complicated and demanding treatment, is very focused, requires active commitment, participation, and collaboration. After clients commit to DBT in principle, commitment to specific aspects of treatment are continually monitored and addressed as needed throughout treatment.

Also with respect to commitment, it is important to clarify what role, if any, the therapist or treatment program will take vis-à-vis court-related matters. For example, states or counties have different limits to confidentiality with court-mandated clients than for purely voluntary clients. Also, DBT is an empirically minded approach to treatment, and, as such, we are loath to make predictions about a client’s future behavior unless an index or instrument or assessment methodology has demonstrated predictive incremental validity in making such predictions. Thus far, we are aware of no such indices for domestic violence and consequently we will agree to report *only* what we observe directly. Thus, clients (even apparently highly motivated or successful ones) should not expect us to make predictions about the likelihood of their recidivism. Rather, they should expect us to report only the specifics of their participation in treatment and any group aggregate outcome or follow-up data collected in a particular agency.

Case example. Mr. A. and the therapist identified several pros to treatment for him: He had been through other treatments (at least three); he desired a more stable, nonviolent life; he wanted to have children and did not think raising them in a violent environment was healthy for them; and he expected his wife would leave him again (he had moved back in with her about 3 weeks after the most recent episode), possibly permanently, if he battered again. The identified cons to treatment were that it involved a lot of time and effort (minimum 6 months, daily monitoring practice) and he “did not like” the idea of focusing on emotions other than anger. However, he did commit to 6 months of treatment as a package (i.e., all components), and began treatment after

these three sessions focusing on assessment, orienting, and committing.

Stage 1. This is the stage in which aggressive and violent behaviors are targeted (see Table 1). In this first stage of treatment, the highest-order targets are those on the continuum of life-threatening behaviors: suicidal/ parasuicidal behaviors, aggression toward others, and child neglect. Thus, assessing these behaviors in every session via daily diary card and targeting these problem behaviors in session are the first order of business for the therapist. Although not explicitly part of the original set of targets in DBT for borderline women (Linehan, 1993a), aggressive and violent behaviors against partners are clearly on the continuum of life-threatening behaviors in DBT.

Even if a client has not been aggressive or violent in a given week, this may be targeted in session. The first goal in this stage of treatment is sufficient *self-management* that the person no longer engages in life-threatening behaviors (toward self or others, including threats and other verbal behaviors that may have the same function as actual aggression). Thus, until enough of the pieces or links of the chain of behavior have been addressed that the client has sufficient skills for comprehensive self-management (no aggressive or suicidal actions, etc.), prior episodes of aggression (as well as current thoughts or urges) continue to be examined and treated.

Self-management is approached behaviorally to establish intermediate targets (toward enhanced safety, reduced—and ultimately no—aggression) in Stage 1: Is the person able consistently to engage in reasonably safe behaviors (not harming self or others: having a reasonable life expectancy him- or herself, and predictable behavior such that others' behavior does not function to avoid harm from the person)? Does the person participate actively in treatment (come to sessions, come on time, collaborate in treatment, complete practice exercises and daily self-monitoring) and not engage in other behaviors that interfere with treatment? Does the person exhibit behavioral control to a degree sufficient to maintain a reasonable and stable quality of life (stable housing, stable and sufficient income for minimal standard of living, not in jail, substance use modest or less)?

Case example. With repeated behavioral analyses (and after learning emotion identification skills), Mr. A. identified hurt and shame in response to his wife's statements (that he was "irresponsible") during the episode described earlier. Later he also described shame regarding his own "completely pathetic" behavior, overwhelming fear that she would leave him, shame that he was harming her in order to force her to stay, and "overwhelming" feelings of worthlessness prior to beating her. As prior violent and current near-violent episodes were analyzed using the DVI format of behavioral analysis, a pattern of aggres-

sion was identified, in proximal response to fears of his wife leaving, shame about his own behavior, and hurt resulting from verbal, invalidating statements from his wife (or others). Anger was identified as a generally secondary emotion, primarily functioning as an escape from fear, shame, and hurt. Vulnerability factors (earlier in the chain of behaviors) such as poor work performance, social rejection, poor sleep, and alcohol use were identified. The primary reinforcers for aggression seemed to be: (a) It successfully inhibited his wife from leaving, at least temporarily; (b) it did result in reduced arousal from or awareness (albeit temporarily) of fear, shame, or hurt.

In this stage of treatment, assessment, skill training, behavioral analysis and behavior therapy, and multiple therapeutic strategies (validation, problem solving, reconditioning emotional responses to stimuli to make them more normative, shaping, etc.) are used to identify links in the chain toward aggressive behaviors (antecedents) that can be changed. In addition, reinforcing consequences that can be altered are identified and targeted, and the reinforcement of alternative, nonaggressive behaviors is emphasized. These processes will be described later regarding Mr. A.

Stage 2 and beyond. Just as with DBT for suicidal behaviors, once stability and self-control are established, the targets may shift. Once a client is stable, treatment moves to Stage 2 and may target other emotional and life problems in continuing individual treatment (e.g., Linehan, 1993a) or may turn to focus more on improving couple and family relationships in couples or family therapy (Fruzzetti et al., in press). Because DBT as it is applied to treat aggressive and violent behaviors is the focus of this paper (and by definition are Stage 1 targets), please see these other sources for information about subsequent stages of treatment.

In DBT, self-management (Stage 1 target) is achieved by the comprehensive acquisition, application, and generalization of skills. In the following section, a brief description of these skills is provided.

In the first stage of treatment, the highest-order targets are those on the continuum of life-threatening behaviors: suicidal/ parasuicidal behaviors, aggression toward others, and child neglect. Thus, assessing these behaviors in every session . . . and targeting these problem behaviors in every session are the first order of business.

Mindfulness skills are essential to help reduce confusion about self, decrease (or inhibit increasing) cognitive and emotion dysregulation, increase attention-focus, increase contact with wise-mind values (core values), and enhance awareness of one's own behavior. Mindfulness aids assessment in general and enhances client ability to recognize when they are on problematic chains of behavior (the earlier on the change they become aware, the better), which makes successful changes (e.g., nonaggressive outcomes) more likely. In DBT mindfulness skills, clients are taught how to observe, describe, and participate in experiences in a nonjudgmental, effective way, focusing attention on one thing at a time. The focus here is both on observing, describing, and participating in one's own experience and on being able to observe and describe the actions, feelings, and so on of significant others in a nonjudgmental way. We have augmented the standard DBT mindfulness handouts (Linehan, 1993b) with skill focus on "relational mindfulness," or the ability to observe and describe, nonjudgmentally (and empathically), another person. Mindfulness is the foundation on which the other skills rest. Thus, we teach mindfulness first, before going on to other skills, and then again prior to teaching additional skill modules.

Distress tolerance skills are integral to increasing safety and self-control, and are employed to forestall aggressive behaviors. Given research that has identified a subtype of batterers as particularly impulsive, these skills may be especially important. Furthermore, they are used to reduce impulsive behaviors that likely lead to further dysregulation, even if not aggressive per se (rumination, substance use, etc.), and to provide a "window" (a break from escalation) in which a client can utilize mindfulness (of current status and where the current "chain" of behavior is likely to lead). This window, in which the client briefly tolerates distress, allows him or her to orient to using skills to alter the trajectory of current behaviors, ultimately reducing distress via more functional means (not through dysfunctional escape behaviors, aggression, etc.). These skills include many strategies for surviving crises, accepting reality, controlling arousing stimuli (inhibiting escalation or fostering deescalation; e.g., time-out) and tolerating distress to allow natural change. To the extent that ag-

gressive behaviors are negatively reinforced by subsequent reductions in negative emotional arousal, finding nonaggressive means to reduce painful arousal, such as distress tolerance, emotion regulation and interpersonal skills (below), may be particularly important.

Emotion regulation skills help stabilize and manage labile emotions and decrease painful negative emotional arousal. Clients are taught new ways to think about and understand emotions and new strategies for managing them, including decreasing emotional vulnerability, reducing unnecessary emotional suffering, and strategies for changing painful emotions over time. In particular with batterers, we emphasize accurate identification of emotions (DBT Handout 4), reducing vulnerability to painful negative emotional arousal (DBT Handout 6), and reducing emotional suffering (DBT Handouts 9 and 10; Linehan, 1993b). We have augmented existing skills with additional focus on the following: (a) possible functions of anger as a secondary emotion (i.e., a secondary emotion is hypothesized to function as to escape from or block primary emotions such as fear/jealousy, sadness and guilt/shame; it is assumed that stimuli that normatively elicit these other emotions have been conditioned to elicit anger instead, so reconditioning these stimuli to elicit their normative emotional response is an important part of this treatment); (b) how to disclose emotions effectively (combined with interpersonal effectiveness skills); and (c) understanding the links between emotion and aggressive behaviors, including the reinforcing functions of aggressive behaviors both privately (i.e., to reduce negative arousal) and publicly vis-à-vis an intimate partner (e.g., to titrate intimacy; cf. Saedi & Fruzzetti, 2000).

Interpersonal effectiveness skills help reduce interpersonal chaos and increase interpersonal effectiveness. Included are skills designed to help balance (a) objectives or goals in a specific situation, with (b) maintaining the relationship, and (c) maintaining (or enhancing) self-respect. Somewhat paradoxically, we use self-respect effectiveness (utilizing mindfulness) to reduce aggression (increased respect of others) by targeting increased awareness of wise-mind values of nonaggression, noncoercion, and fairness.

Validation skills are used to reduce one's own dysregulation (self-validation), to improve relationships (validating others), and to enhance empathic understanding as a means of reducing aggressive behaviors (thoughts, urges, and actions). These skills include (a) understanding the forms and functions of validation (including empathy) and invalidation, (b) specific skills to identify targets (e.g., emotions, opinions, effective behaviors) for understanding and validation, (c) empathy and validation practice, and (d) the verbal and communication skills to validate others effectively. Part of validation necessarily

Self-management in Stage 1 is achieved by the comprehensive acquisition, application, and generalization of skills: mindfulness, distress tolerance, emotion regulation, interpersonal effectiveness, and validation/empathy.

includes understanding the impact of aggression and violence on others. This is a kind of “empathy” training that involves integrating mindfulness of others (relational mindfulness) with mindfulness of core values (wise mind). The result is more empathic understanding of the impact of aggression, and this may function (via contingency clarification) to decrease avoidance of emotion and increase motivation not to use aggression. Thus, we practice understanding and validating the impact of aggression (empathy) not as a kind of aversive counterconditioning, but more as a means of mindfulness practice and recommitment to nonaggressive behavior.

The first four modules mentioned (mindfulness, distress tolerance, emotion regulation, interpersonal effectiveness) are adapted directly from Linehan’s *Skills Training Manual* (1993b). The last module (validation) is adapted both from Linehan (1997) and Fruzzetti (1995, 1996), and is elaborated elsewhere (Fruzzetti, Hoffman, & Linehan, in press; Hoffman, Fruzzetti, & Swenson, 1999).

Modes and Functions of Treatment

Linehan (1993a) has argued that DBT must include the following four functions: skill acquisition; skill generalization; enhancing client motivation to change (behaviorally defined); and enhancing therapist motivation and skills. At times, a fifth function, structuring the environment, is also important in DBT. As a direct application of DBT, these four (and sometimes five) functions of treatment are considered essential in treating domestic violence as well. However, the modes with which these functions are achieved may vary from program to program. Some of the options for delivering these services are described below.

Skill acquisition. Skills may of course be taught in traditional groups (cf. Linehan, 1993b), and this is perhaps the most common mode in which this function is achieved (it is resource efficient). However, individual skill training, self-study, email or internet augmentation, video or CD-ROM formats, and so on, could be employed, consistent with other skill training approaches in behavior therapy.

Skill generalization. DBT with batterers similarly employs the full behavioral array of strategies to bring skills into clients’ daily lives: telephone skill coaching, generalization programming, between-session practice exercises, in-vivo shaping, etc. It is essential to structure generalization in small, achievable steps with considerable (albeit temporary) therapist reinforcement to enhance practice and skills until the use of new skills is naturally reinforced in the client’s life (i.e., under the control of natural reinforcers). This is especially important to convey to clients: Because they have used aversive and aggressive control strategies in the past, others may require repeated and

consistent alternative (nonaggressive, nonaversive) behaviors of the client before they respond in trusting, reinforcing, appreciative, reciprocal (all likely reinforcing) ways. Until that time, the therapist must provide social reinforcement and help the client find ways to be reinforced by the intermediate success of behaving skillfully, even if others do not yet respond in naturally reinforcing ways.

Client motivation. The essence of motivation from a behavioral viewpoint is, What are the controlling variables for target behaviors? That is, what antecedent conditions (discriminative stimuli, or sometimes conditioned stimuli) are necessary to elicit the target behavior (e.g., aggressive behavior) and what consequent stimuli reinforce it (or punish or extinguish alternative, less problematic, behaviors)? Client motivation (i.e., acting more skillfully and with self-control) is enhanced via behavioral analysis, solution analysis, and the application of skills (behavior therapy).

Battering, like parasuicidal behavior, may be difficult to change because it may be extremely difficult to remove its reinforcers. As noted above, these behaviors may be negatively reinforced by diminished negative emotional arousal, as well as positively reinforced by intermittent instrumental gains. Thus, DBT strategies often must focus on changing antecedent steps on the chain of behaviors toward aggression by identifying and reinforcing alternative, nonaversive means of reducing painful negative emotional arousal. These antecedent steps include: (a) mindfulness of present state, including identifying what “chain” (or pattern) of behavior the client is currently participating; (b) awareness of the wise mind commitment to getting off chains that could lead to aggression; (c) using skills to decrease negative emotional arousal, especially early in the chain; (d) using skills to achieve goals, in ways that are consistent with the client’s wise-mind values (e.g., nonaggressive means; fairness); and (e) using skills to accept what is not possible, those immediate goals that can not be achieved skillfully (at least not at that moment), within wise-mind values of one’s own behavior.

Battering, like parasuicidal behavior, may be difficult to change because it may be extremely difficult to remove its reinforcers: aggressive behaviors may be negatively reinforced by subsequent diminished negative emotional arousal, as well as by intermittent instrumental gains.

The function of enhancing client motivation for skillful behavior may be addressed in individual treatment (typical in DBT) or in a group format. Either way, the focus is on using the treatment hierarchy to establish targets, use various assessment tools (especially diary cards) to monitor targets, to conduct behavioral analyses, solution analyses (employing skills as solutions to problems), and to plan generalization strategies in this part of the treatment (cf. Linehan, 1993a).

Motivation and skill enhancement of the therapist. Treating batterers can be a demanding set of tasks. Not only are clients themselves suffering, their behavior has often had a very harmful impact on one or more people. Drop-out rates are high and success rates low in this client group, and can easily result in therapists becoming demoralized. Clients often do not immediately reinforce “good therapy,” and may in fact be quite critical of the therapy or the therapist. By definition, batterer clients have violent histories, few skills for self-management in difficult emotional situations (like those that therapy may

elicit), the therapist him- or herself could legitimately feel threatened, and progress is often slow. This parallels treatment for chronically suicidal women in DBT. For many of these reasons, “treatment of the therapist” is an essential part of DBT, both as a means of enhancing therapist skills and as a means of providing therapists support to do difficult work (Fruzzetti, Waltz, & Linehan, 1997).

Typically, these functions are met through weekly team meetings that consist of two or more therapist providing peer supervision and support. Most therapists treating batterers already work with at least a cotherapist, so many of the

support functions of the team naturally are met. However, targeting effective and adhering treatment sometimes requires more effort: Giving feedback to peers may be difficult, especially when the work is already demanding. Nevertheless, improving treatment delivery *and* providing support are essential in DBT, regardless of client group or target problems.

Treatment Strategies

DBT with batterers employs the usual set of DBT treatment approaches and strategies: a focus on both *acceptance* of the client and her or his current problems and

difficulties, and a focus on *change*. The way DBT instantiates this dialectic of acceptance and change is with the comprehensive application of behavioral principles and behavior therapy in the context of a validating therapeutic environment. Full discussion of these strategies is beyond the scope of this paper (cf. Linehan, 1993a). Nevertheless, a couple of important points in applying DBT with batterers are emphasized below.

Behavior therapy. One of the most important developments of the “new wave” of behavior therapies in recent years has been the focus on the role of emotion in behavioral analysis and therapy, from both an operant and a respondent perspective. This is especially true of DBT, and with batterers this focus on emotions is just as important. Moreover, additional focus is placed on the theoretical (and practical) difference between primary and secondary emotions. For example, many batterers are able to identify only anger in the chain of behaviors leading to aggressive action. Further analysis may reveal instead that anger is a secondary emotion whose function is to block a different (primary) emotion such as shame, fear, sadness, or hurt.

Thus, the behavior therapy techniques employed with batterers include the full array of intervention strategies (exposure/response prevention, skill acquisition and generalization, contingency management and clarification, stimulus control procedures, cognitive modification, etc.) with a focus on negative emotional arousal involving a variety of emotions, not just anger. We do not assume that aggression is necessarily a “natural” response to anger (an implied respondent model). Rather, we assess its function, not only regarding external reinforcers but especially vis-à-vis negative emotions. And, as noted above, we target reconditioning stimuli to elicit a broader, more normative range of emotions than simply anger, teach how to identify and label these other emotions, and how to manage them effectively. Again, this is not different from DBT with other client populations per se, but does represent a departure from many other treatments for domestic violence.

Validation. Similarly, validation in DBT for domestic violence is no different from DBT for other target behaviors. What may be particularly difficult for therapists is the activity of finding the validity in aggressive and violent behaviors. That is, we may be so against aggression that suggesting it has validity may be, particularly at first, difficult. But how is it valid? First, it may be valid in the sense that it “works,” or is effective in some immediate sense (either instrumentally or to diminish or escape aversive emotional arousal, or both). In addition, aggressive behaviors may be valid responses given a person’s life history (that may have included modeling condoning of aggression). Moreover, other behaviors of the client may be valid, and it is essential (from a shaping standpoint) to

DBT strategies often must focus on changing antecedent steps on the chain of behaviors toward aggression by identifying and reinforcing alternative, nonaversive means of reducing painful negative emotional arousal.

identify even small valid behaviors along the chain toward aggression in the service of reducing and eliminating violence.

Case example. After his initial commitment to treatment, Mr. A. then attended only four of the next eight skill groups and missed several appointments with his individual therapist. When he did come in for treatment, he often had not completed his daily assessments or his practice. Behavioral analysis of these therapy-interfering behaviors (e.g., missed sessions, noncompliance) showed that Mr. A. had been quite ashamed of his behavior following earlier behavior analyses, and had felt “horrible, miserable” for several days following earlier sessions. The therapist validated how difficult this must have been and targeted ending the assessment and change phase of the session 20 minutes early, with the last part of the session devoted to using skills to manage difficult emotion that Mr. A. was feeling at that moment. In addition, a brief skill-coaching telephone call was scheduled for the day after sessions to assist with in-vivo assessment and subsequent skill generalization. Mr. A. subsequently missed fewer sessions and regularly completed his diary card, at least several days per week.

In addition to doing repeated comprehensive behavior analyses and solution analysis (with practice and rehearsal of new skills) of prior aggressive behavior, therapy devoted increased time to current nonaggressive but emotionally volatile conflict episodes between Mr. A. and his wife. Mr. A. learned to be mindful of her and the larger context of their relationship and, whenever possible, his own hopes and goals for the relationship prior to conflict situations—and to take a minute off from conflict to achieve this constructive orientation. Using interpersonal skills, he was able to highlight what he was doing and why for his wife, who was quite supportive of his efforts.

Significant therapeutic time was expended in exposure and response prevention/learning alternative responses to stimuli that formerly elicited anger. For example, imaginal (and later, in vivo) exposure to criticism targeted identifying hurt and defensive feelings, in addition to angry ones, and Mr. A. practiced appropriate coping responses (distress tolerance, emotion regulation, and interpersonal skills). In addition, imaginal exposure to situations in which Mr. A. could not get what he wanted, even with interpersonal skills, was targeted. Instead of only responding with frustration and disappointment, Mr. A. practiced identifying disappointment or sadness and their appropriate coping responses. Similar procedures were practiced with fear, shame, guilt, and other stimuli that typically had elicited only anger (and concomitant aggressive urges) in the past.

There were several times over 6 months that Mr. A. reported urges to use violence, and twice “got in the face”

of his wife. Because of the risk of harm, Mr. A. did agree to move out of the house for at least 1 week following any subsequent physically threatening or actual physically aggressive behavior (contingency management).

After 5 months in treatment, Mr. A.’s wife shoved him into the refrigerator during a conflict episode. He got up and left the house (he yelled at her that he was angry and that her behavior was “unfair” because of all the work he put in to being nonviolent). Despite being angry and emotionally hurt, he was also pleased with his self-control. After the full 6 months of individual treatment, Mr. A. graduated from Stage 1 and he and his wife entered couples therapy to work on reducing their aversive conflict styles, increasing their constructive conflict skills, and enhancing support and intimacy in their relationship. Both partners reported no further violence at the end of 6 months of couples therapy.

Dialectics

Dialectics is both a method of argumentation and an approach to ontological questions. In DBT, therefore, it is the comportment of the therapist (approach to argumentation and discourse with clients and on the team) and an assumption about the nature of reality. Therefore, at least with respect to behavior, causation can be understood from multiple, even apparently opposite, perspectives, and change is most likely to occur in the context of appreciating multiple perspectives and synthesizing them. Thus, a dialectical worldview in DBT balances and synthesizes not only acceptance (validation) and change (behavior therapy), but also other therapeutic strategies (consulting to clients versus environmental intervention; reciprocal versus irreverent communication, etc.), multiple team member perspectives, and so on. DBT with batterers fully embraces this dialectical perspective, without modification to standard DBT (Linehan, 1993a).

Therapist Mindful Practice

Again, DBT with batterers involves the standard target of therapists taking a nonjudgmental stance. Although this may at times be difficult in treating clients who have

While we do not hesitate to highlight their aggressive behaviors, analyze them behaviorally, and include a frank look at their consequences (including natural consequences such as jail, separation or divorce), we are committed to using positive change strategies as much as possible.

harm (and may continue to harm) others, this remains the ongoing target. Of course this perspective is informed by dialectics: It is essential to be completely committed to change (elimination of aggression) while simultaneously committed to being nonjudgmental about aggressive behaviors and about the person.

Many batterer clients have had experiences in treatment of being judged, chided, criticized, and so on regarding their violent behaviors. While we do not hesitate to highlight their aggressive behaviors, analyze them behaviorally, and include a frank look at their consequences (including natural consequences such as jail, separation, or divorce), we are committed to using positive change strategies as much as possible, not using arbitrary aversive control to effect change (it is also not a very effective means), and to remaining mindful of the whole client from a nonjudgmental perspective. Team support is essential to maintain this position, especially in cases of recidivism, client verbal abuse toward the therapist, repeated slips toward noncommitment to change, and so on.

Case example. The early phase of Mr. A.'s treatment, as noted above, included repeated missed sessions and other treatment-interfering behavior (no diary cards, little practice between sessions). Moreover, despite his clear commitment early on to living a life that had no room for aggression, he discounted this desire later on ("Hey, everybody has to watch out for himself, including me. If I need to be a little rough around the edges to take care of myself, so be it") and was frequently critical of the therapy ("these skills are worthless") and the therapist ("What do you know about this? You don't give a

. . . "treatment of the therapist" is an essential part of DBT, both as a means of enhancing therapist skills and as a means of providing therapists support to do difficult work.

shit about me. You're just doing your job [sarcastically] and don't give a damn how it fucks me over"). The ability of the team to support the therapist in observing limits (reducing verbal aggression in session was important to this therapist) while simultaneously fostering a humane attitude of acceptance that the client was doing the best he could (and needed to do better) helped the therapist maintain balance. Thus, the therapist could recognize that the treatment was very demanding for Mr. A.: Diary cards and behavior analysis elicited a lot of shame for which he initially had few skills with which to cope effectively. Similarly, there were many factors in Mr. A.'s life that could easily be understood to contribute to his use of aggression. It was also true that his behavior had a very

negative impact on his wife and was in many ways ruining his life. By maintaining a nonjudgmental stance, the therapist was able to balance these factors, validate his efforts and potential to change, noticing even very small improvements in behavior (shaping) that might easily not have been recognized without team support in the context of his considerable therapy-interfering behaviors. Consequently, the therapeutic relationship was strengthened and the client expressed less and less hostility in sessions over time, along with more consistent skill practice both in and out of session.

Summary and Conclusions

Developing and evaluating new treatments for domestic violence are justified in general due to the high dropout rates and moderate to poor outcomes reported for existing treatments. DBT is promising because of its theoretical links to, and empirical support for, treating related targets in other client populations. Nevertheless, only pilot cases have been evaluated so far, but outcomes have been promising. Dropout rates have been low (15%) and recidivism rates, at least at termination, have also been low (less than 10%). However, client samples have been quite limited. For example, few clients have been court-ordered (most have been voluntary), so the promising results may not endure with more court-ordered clients. Similarly, the majority of our clients so far have begun treatment in the context of wanting couple or family treatment, and battering treatment has been required (Stage 1) prior to couple or family interventions (Stage 2 and beyond). Thus, pretreatment motivation may be particularly high in our samples. Finally, no randomly controlled study has been completed, so direct comparisons with other treatments are not yet possible.

Nevertheless, DBT with batterers may be an appropriate choice for clients who have failed in other treatments, and is appropriate for further study. More systematic study is needed specifically to test further the applicability of the underlying model of emotion dysregulation, to determine the overall effectiveness of DBT for domestic violence, and to try to identify client factors that make this treatment likely to be effective for some clients and not others. For example, data may demonstrate that for "instrumental" batterers (those for whom emotion regulation does not seem to be a factor in aggression) DBT is not effective.

The problems of domestic violence are big enough such that no one treatment is likely to be effective universally. However, DBT does address factors that may have contributed to poor outcomes in other treatments: The DBT focus on commitment to treatment may help reduce dropout and enhance compliance and practice; the nonjudgmental comportment and focus on validation by

the therapist may enhance the therapeutic alliance and help reduce dropout; and the focus on emotions other than anger may allow other skills to be learned (e.g., emotion identification and regulation) to treat skill deficits likely to contribute to aggressive and violent behavior.

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DBT With an Inpatient Forensic Population: The CMHIP Forensic Model

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Implementation of Dialectical Behavior Therapy (DBT) in a forensic or criminal justice setting differs dramatically from standard outpatient DBT. Forensic patients are multiproblem patients with violent histories and multiple diagnoses including borderline personality disorder (BPD), antisocial personality disorder (ASPD), and concomitant Axis I psychotic or mood disorders. DBT was selected for this population because of its emphasis on treating life-threatening behaviors of patients and therapy-interfering behaviors of both patients and staff. The forensic inpatient DBT model described here includes modification of agreements, targets, skills training groups, and dialectical dilemmas. An additional skills module, the Crime Review, was developed to supplement standard DBT. Conclusions and recommendations for applying DBT in a forensic setting are presented.

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FORENSIC INPATIENT SETTINGS, including criminal justice and forensic hospitals, differ significantly from standard DBT outpatient settings. The patient/inmate population is incarcerated, male, and characterized by antisocial behaviors. In one study, 97% of correctional in-

PTSD Symptoms Predict Outcome in Trauma-Informed Treatment of Intimate Partner Aggression

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Objective: This study sought to extend findings from a randomized controlled trial of the *Strength at Home Men's Program (SAH-M)* for intimate partner aggression (IPA) in military veterans by examining the impact of pretreatment posttraumatic stress disorder (PTSD) symptoms on treatment efficacy, and by examining new data on postintervention follow-up for individuals who received *SAH-M* after completing the *enhanced treatment as usual (ETAU)* wait-list control condition. **Method:** Using data from 125 male veterans who attended the *SAH-M* program immediately after an intake assessment or after waiting 6-month in the *ETAU* condition, this study used generalized linear modeling to examine predictors of physical and psychological IPA over a 9-month period of time. **Results:** PTSD symptoms at intake significantly predicted both physical and psychological IPA use, even after accounting for the effects of treatment condition, time, and number of sessions attended. PTSD had a strong association with both physical and psychological IPA. An interaction between PTSD and *SAH-M* was observed for psychological IPA but not physical IPA, and the magnitude of the effect was not clinically significant. There was a significant effect of *SAH-M* in reducing IPA in the full sample, including previously unanalyzed outcome data from the *ETAU* condition. **Conclusion:** The study results suggest that while *SAH-M* does not need to be modified to address the interaction between PTSD and treatment, outcomes could be enhanced through additional direct treatment of PTSD symptoms. Results extend prior analyses by demonstrating the effectiveness of *SAH-M* in reducing use of IPA in both the treatment and *ETAU* conditions.

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What is the public health significance of this article?

Among those with higher PTSD symptoms, results from the *SAH-M* treatment may be enhanced through the addition of treatment for PTSD. Findings also underscore the need for all IPA treatment programs to incorporate assessment and treatment planning for PTSD into their programming. Results further support the overall efficacy of *SAH-M* in reducing partner aggression in military samples.

Keywords: posttraumatic stress disorder, veterans, partner violence, aggression

Intimate partner aggression (IPA) is a serious public health issue, conveying significant risks for negative physical and mental health outcomes and threatening the social and economic stability of those who have experienced it (Marshall, Panuzio, & Taft, 2005). High rates of posttraumatic stress disorder (PTSD) symptoms are a strong risk factor for IPA (Okuda et al., 2015), particularly in military and veteran populations (Taft, Watkins, Stafford, Street, & Monson, 2011). We therefore examined whether PTSD symptoms predict response to a trauma-informed group intervention that has been recently shown to reduce IPA use among veterans, the *Strength at Home Men's program (SAH-M)* (Taft, Macdonald, Creech, Monson, & Murphy, 2016).

Although efforts to introduce effective treatments for IPA use are not new, until recently, no IPA treatment has shown efficacy in reducing aggression in a military sample within a randomized clinical trial. In fact, IPA treatment programs have generally been shown to be ineffective, evidencing low rates of reduction in IPA recidivism (Babcock, Green, & Robie, 2004; Dunford, 2000; Stover, Meadows, & Kaufman, 2009). The most widely disseminated programs (e.g., Pence & Paymar, 1993) and state IPA practice guidelines (Stuart, Temple, & Moore, 2007) have been criticized because they often do not adequately take into account the influence of trauma exposure and mental health symptoms on IPA (Dutton & Corvo, 2007).

In contrast, the content of *SAH-M* derives from a trauma-informed social information processing model of IPA in military populations which posits that trauma and PTSD symptoms may contribute to biases and deficits in the processing of social information that elevate IPA risk (Taft, Creech, & Kachadourian, 2013; Taft, Murphy, & Creech, 2016; Taft, Walling, Howard, & Monson, 2010). As described in greater detail elsewhere (Taft, Macdonald, et al., 2013, 2016), *SAH-M* is a 12-week, cognitive-behavioral and trauma-informed group treatment for male veterans who have been physically aggressive toward an intimate partner in the past year. Findings from a randomized controlled trial recently indicated that *SAH-M* resulted in greater reductions in the use of physical and psychological IPA (as reported by both veterans and their partners) in comparison to an *enhanced treatment as usual (ETAU)* condition (Taft, Macdonald, et al., 2016).

Consistent with the social information processing model of IPA, compared to nonviolent men, men who use IPA attribute more negative and hostile intentions to female partners, show an emotional bias toward anger, select less-socially competent responses to relationship challenges, and have more positive expectations for use of aggression (Holtzworth-Munroe, 1992; Murphy, Norwood, & Poole, 2014). Our trauma-informed social information processing model extends this work to implicate trauma, and trauma-

related problems such as PTSD, as drivers of social information processing deficits (Taft et al., 2015). Prior exposure to trauma may make it more likely that ambiguous situations are interpreted as threatening, and aggressive responses may stem at least in part from negatively biased perceptions of social situations (Chemtob, Novaco, Hamada, Gross, & Smith, 1997). Evidence suggests that social information processing mediates the association between PTSD symptoms and IPA in both civilian and veteran samples (Lamotte, Taft, Weatherill, & Eckhardt, 2017; Taft, Schumm, Marshall, Panuzio, & Holtzworth-Munroe, 2008).

Although PTSD symptoms can be directly reduced through trauma-specific treatments such as Prolonged Exposure (PE; Foa & Rothbaum, 1998) and Cognitive Processing Therapy (CPT; Resick, Monson, & Chard, 2016), these treatments do not necessarily address the specific social information processing biases that increase risk for IPA, cover specific skills that assist in recognizing and correcting such biases within intimate relationships, or address motivational issues and core themes that may be common in trauma-exposed men who engage in violent behavior. While the question of treating the PTSD directly to end IPA remains an open one requiring further study, since PTSD increases IPA risk, there is clear value in examining the extent to which PTSD symptoms may influence response to the *SAH-M* treatment.

Although results from analyses of the primary outcomes in our prior trial supported the efficacy of *SAH-M* in reducing use of IPA (Taft, Macdonald, et al., 2016), further examination of data related to treatment response may assist in efforts to optimize the effectiveness of this intervention. First, *SAH-M* is a trauma-informed treatment, but not a treatment for PTSD. Therefore, it is important to examine the influence of pretreatment PTSD symptoms on response to treatment to determine whether the treatment program could be further optimized to address the influence of PTSD symptoms on IPA. For example, participants with higher levels of PTSD symptoms may have trouble acquiring skills due to difficulties sustaining attention or problems processing emotional content in group. Alternatively, these individuals may acquire the skills addressed in *SAH-M*, but have trouble transferring new behaviors to relationship situations due to continued hyperarousal reactions and activation of trauma-related themes (e.g., mistrust).

Second, the prior analyses of *SAH-M* outcomes focused only on comparisons between the active treatment group and the *ETAU* control condition across three measurement periods (Taft, Macdonald, et al., 2016). As those in the *ETAU* condition received *SAH-M* after a 6-month waiting period (everyone in the trial ultimately received the active treatment), an examination of the influence of *SAH-M* on IPA in the full sample, including outcome

data from the *ETAU* condition, extends findings from the analysis of primary outcomes previously published.

The current study first examined whether pretreatment PTSD symptoms had a main effect in predicting IPA. It was hypothesized that higher levels of pretreatment PTSD symptoms would be associated with increased physical and psychological IPA. This would suggest that PTSD continues to influence IPA, even after receiving a trauma-informed treatment for IPA use. Next an interaction was tested to compare the effect of pretreatment PTSD on physical and psychological IPA between the baseline period and the treatment period. It was hypothesized that pretreatment PTSD would limit treatment effectiveness as evidenced by smaller post-treatment reductions in physical and psychological IPA. This would occur if PTSD symptoms were interfering with treatment. It was also hypothesized that treatment would reduce IPA in the full sample which included *ETAU* participants, who served as the control group in the original clinical trial and received *SAH-M* after a 6-month delay.

Method

Participants and Procedures

Participants were 125 male veterans drawn from a study evaluating the efficacy of *SAH-M* (Taft, Macdonald, et al., 2016). Although there were 135 veterans in the parent trial, this study excludes those participants with incomplete data at the baseline session for all variables ($n = 3$), or who reported no contact with their partner during the study period ($n = 7$). Veterans were recruited from two major metropolitan areas in the northeastern United States by clinician-referrals, self-referrals, and court-referrals. Study procedures were approved by the Institutional Review Boards at each site. Regardless of relationship status, participants were included in the study if there was a self-, collateral- or court-report of at least one act of male-to-female physical IPA over the previous 6 months or severe physical IPA over the past 12 months, or an ongoing legal problem related to IPA. Participants were excluded if they evidenced current substance dependence not in remission, current uncontrolled bipolar or psychotic disorder, or severe cognitive impairment. Experience of trauma was not required for inclusion; however, all participants reported at least one trauma on the Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000). Traumatic events rated as most distressing were: exposure to military combat (45.9%), unexpected death of a loved one (9.0%), childhood physical abuse (6.1%), witnessing family violence as a child (6.1%), and car accident (5.7%); all other events were endorsed as most distressing by fewer than 5.0% of the sample.

Additional demographic characteristics and military service history of the sample are provided in Table 1. Regarding military service history, 28.5% of the sample was currently on Active Duty or in the National Guard or Reserves and 72.1% reported a junior-enlisted rank. Fifty-eight percent of the sample had a previous deployment to the U.S. conflicts in and around Iraq and Afghanistan. The average years of education in the sample was 12.99 ($SD = 1.99$).

As described in greater detail in Taft, Macdonald, et al., 2016, after a brief phone screen for eligibility, participants completed an intake assessment session at which they provided written informed

Table 1
Demographic and Military Service History

Demographics and military history of study sample ($N = 125$)	<i>M/N</i>	<i>SD/%</i>
Race ¹		
White	96	76.8
Black or African American	15	12.0
Asian	1	.8
Hispanic	2	1.6
Other	7	5.60
Relationship status		
Married	45	37.5
Separated or Divorced	28	23.4
Dating or Engaged	31	24.8
Single	16	13.3
Employed full or part time	51	41.8
Court involved	71	56.8
Military branch		
Air force	7	5.6
Army	62	49.6
Marines	23	18.4
Navy	15	12.0

¹ race/ethnicity, marital status, missing for 4 participants; Branch of service not reported for 18.

consent and then completed an assessment to determine their eligibility for the parent study. Randomization to study condition was conducted in blocks of 4–5 participants using a random number generator to receive either *SAH-M* immediately, or *SAH-M* after a 6 month period of *ETAU*. Participants completed a total of four assessments at 3-month intervals for a 9-month period of time: intake (0-month), 3-month, 6-month and 9-month. The *SAH-M* condition received the treatment between the intake and the 3-month assessments. The *ETAU* condition received the treatment between the 6-month and 9-month assessments. Veterans were paid 50 dollars for completing each assessment.

Collateral information on IPA use was provided by 118 female partners (82.2%) who provided verbal informed consent for telephone interviews. Six female partners declined to be in the study, and 18 were unable to be reached. Partners were contacted even if the veteran reported that the relationship had dissolved. Female partners' verbal consent was obtained via telephone prior to completing assessments and partners were assessed at time points corresponding with their partner's assessments. Prior research demonstrates high levels of consistency between telephone administrations and in-person administration of the IPA measure used (Lawrence, Heyman, & O'Leary, 1995). Assessments were completed by research assistants or project coordinators who were not the treating clinician for each case. Prior to all assessments, partners were asked if they were in a safe and private place to answer questions. If not, a call-back time was scheduled. Additional safety procedures included the provision of information regarding available emergency resources including crisis hotlines, emergency room/urgent care center numbers, and shelter services. Partners were also asked about their safety and offered safety planning information. Doctoral-level clinical psychologists were available for consultation. Following the assessment, partners who expressed interest in clinical services were provided with referrals. Partners were paid 50 dollars for completing each assessment.

Measures

PTSD symptoms. PTSD symptoms were assessed by trained master's and doctoral-level assessors using the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995). The CAPS is a widely used semistructured clinician interview that assesses PTSD diagnostic status and symptom severity consistent with Diagnostic and Statistical Manual – 4th edition (*DSM-IV*; American Psychiatric Association, 2000) criteria. For each of the 17 *DSM-IV* symptoms of PTSD, interviewers rated the frequency and severity of the symptom in the past month based on participant responses to semistructured interview questions. The CAPS was scored by summing frequency and severity ratings for each item into one summary score. This score was used as a continuous variable in analyses. All participants in the present study were administered the full CAPS interview; 84.0% ($n = 105$) met both *DSM-IV* Criterion A1 (exposure to traumatic event) and A2 (experience of fear, helplessness or horror), however, in anticipation that A2 would be removed from *DSM-5* (American Psychiatric Association, 2013) due to its lack of specificity (Friedman, 2013), participants were not required to meet criterion A2 to be administered the CAPS.

The CAPS has demonstrated strong psychometric properties, including excellent reliability, and excellent convergent and discriminant validity (Weathers, Keane, & Davidson, 2001). All CAPS assessments were conducted by assessors who were masked to participants' treatment condition and audio recorded. A random sample of 10% of each site's administrations was evaluated by an independent doctoral-level clinical psychologist for reliability. In the current study, an intraclass correlation (ICC; Shrout & Fleiss, 1979) between the assessors' and independent assessment reliability monitor's CAPS ratings was excellent (ICC = .995), and diagnostic concordance on the CAPS was excellent ($\kappa = .851$; Fleiss, 1981).

Intimate partner aggression. Use of physical and psychological IPA was measured using the 12-item Physical Assault and the 8-item Psychological Aggression subscales of the *Revised Conflict Tactics Scales* (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). At four time-points, male participants and their female partners reported the frequency with which the male participant had engaged in IPA behaviors in the past 3 months on a scale ranging from 0 (*never*) to 6 (*more than 20 times*). Participant-reported and partner-reported items were compared and the larger

of the two individual item responses were used in the calculation of CTS2 scores (Taft, O'Farrell, et al., 2010).

Following the recommendations of Straus and colleagues, prevalence scores for physical aggression were then calculated (Straus et al., 1996). Prevalence scores indicate whether one or more acts on the scale occurred in the past three months; a score of one indicates one or more types of physical aggression occurred, whereas a score of zero indicates no physical aggression occurred. Psychological aggression was calculated as a frequency score, which was more appropriate due to the greater overall incidence of psychological aggression in the sample (LaMotte, Taft, Weatherill, Scott, & Eckhardt, 2014). Items were recoded to represent the estimated frequency of the behavior, with mid points used for responses containing a range of scores (e.g., "3 to 5 times" received a score of 4; Straus et al., 1996), and reports of more than 20 times recoded as 25. Mean scores for physical and psychological IPA over time are presented in Table 2.

Intervention

SAH-M is a 12-session trauma-informed, cognitive-behavioral group treatment designed specifically to help military populations reduce and end their use of IPA (Taft, Macdonald, et al., 2016; Taft, Murphy, et al., 2016). It consists of 12 120-min group sessions organized into four treatment phases: (a) psychoeducation on IPA and common reactions to trauma; (b) conflict management skills; (c) coping strategies and negative thought patterns; and (d) communication skills. Participants are asked to complete practice assignments at home.

Components of the treatment that target social information processing deficits include psychoeducation on "survival mode" thinking and alternative thoughts, self-monitoring of thoughts, feelings, and physical reactions, and learning and practicing "Time Outs" to diffuse difficult relationship situations and allow time to recognize and correct social information processing biases (Taft, Murphy, et al., 2016). Other trauma-informed elements of the treatment program include conducting sessions in a safe space, prioritizing the development of rapport and trust, working on enhancing motivational readiness for change, and removing stigmatizing labels such as "batterer," "perpetrator," or "victim." The program content seeks to educate clients on the influence of trauma and PTSD symptoms on intimate relationship problems. Consistent throughout the *SAH-M* program is a trauma-informed

Table 2
IPA Means and Standard Deviations Over Time

Condition	Time			
	Intake	3 Month	6 Month	9 Month
<i>SAH-M</i> Group	Baseline	Treatment	Treatment	Treatment
Physical aggression	.79 (.41)	.25 (.44)	.20 (.40)	.23 (.43)
Psychological aggression	51.51 (41.08)	24.43 (31.51)	28.57 (36.37)	17.12 (27.19)
<i>ETAU</i> Group	Baseline	Baseline	Baseline	Treatment
Physical aggression	.69 (.47)	.45 (.50)	.28 (.45)	.26 (.44)
Psychological aggression	47.27 (40.68)	37.94 (42.71)	28.54 (31.52)	26.76 (33.22)

Note. IPA = intimate partner aggression; *SHA-M* = *Strength at Home Men's Program*; *ETAU* = *enhanced treatment as usual*. The "Treatment" variable refers to data on use of IPA that was collected regarding the 12-week treatment period and the follow-up period. Means are presented for each time period with standard deviations in parentheses.

philosophy that clinicians can recognize the devastating impacts of trauma on clients (Harris & Fallot, 2001) while also the holding the client accountable and responsible for their abusive behavior (Taft, Murphy, et al., 2016). Trauma-informed care such as *SAH-M* is different than trauma-specific care, which specifically seeks to treat the symptoms and sequelae of trauma exposure such as PTSD (Harris & Fallot, 2001).

As described in additional detail in Taft, Macdonald, et al. (2016), individuals randomized to the *ETAU* condition received referrals to mental health treatment (within and outside VA), resources (for connecting with other IPA services in the community), assessment and monitoring of IPA, and a check-in call between assessments. After a 6-month period of time, individuals in this condition received the *SAH-M* intervention. A series of chi-square tests for independence were performed to determine if the *ETAU* condition reported greater engagement in treatment while waiting for and receiving the *SAH-M* intervention. Results revealed no statistically significant differences between men randomized to *SAH-M* or *ETAU* on engagement in individual, IPA, couples, substance abuse, inpatient psychiatric, or other treatment services at the 3-month, 6-month or 9-month assessments (all p 's > .05).

Analyses

Analyses were conducted on the 125 participants who had complete data for all independent variables and reported contact with their intimate partner during the study period. Table 2 shows how IPA decreases over the study period for both the *SAH-M* and *ETAU* conditions. Analyses determine how IPA was influenced by (a) time; the overall trend of IPA over time for both the *SAH-M* and *ETAU* conditions; (b) treatment; the effect of treatment in both the *SAH-M* and *ETAU* conditions, compared to baseline measurements; (c) condition; any remaining differences between the *SAH-M* and *ETAU* conditions. A significant time effect indicates how much IPA changes in each 3-month period, across both the *SAH-M* and *ETAU* conditions. A significant treatment effect indicates the magnitude of the difference in IPA between the baseline periods and the treatment periods. A significant condition effect would indicate that the delayed application of *SAH-M* resulted in different outcomes than the immediate application of *SAH-M*. No remaining differences between conditions were expected because assignment was randomized. Analyses also controlled for the number of sessions attended.

Generalized linear modeling (SAS Version 9.2, PROC GLIMMIX, method = RSPL) was used to analyze repeated measures of physical and psychological IPA. Physical IPA was recoded as a dichotomous variable due to the low frequency of counts greater than 1; psychological IPA remained a count variable. Physical IPA was modeled using a binomial distribution with a logit link, and transformed to odds ratios using $\exp(b)$. Psychological IPA was modeled using a Poisson distribution with a log link, with a $\log(\text{time})$ offset and transformed to rates using $\exp(b)$. Models included a random intercept to estimate individual differences in baseline IPA level (i.e., repeated measurements clustered within-person). Models also included variables for treatment, baseline PTSD symptoms (standardized with $M = 0$ and variance = 1), an *ETAU* cohort variable, and the number of sessions attended. Models included the interaction between PTSD and treatment. Interac-

tions were probed by calculating simple slopes and the difference between the simple slopes using SAS Proc PLM. Interactions were graphed using Microsoft Excel (<http://www.jeremydawson.co.uk/slopes.htm>).

Results

PTSD Symptoms

The mean CAPS score for participants in the sample was 51.83 ($N = 125$, $SD = 29.35$) and 55.2% of the sample met criteria for a diagnosis of PTSD based on a total CAPS score greater than 45 and meeting all criteria for a *DSM-IV* diagnosis of PTSD (Weathers, Ruscio, & Keane, 1999). Although the proportion of the sample meeting diagnostic threshold for PTSD was higher in the *ETAU* (58.0%) than the *SAH-M* group (42.0%), a chi square test indicated there was no between-groups difference in the proportion of the sample meeting the threshold for a diagnosis of PTSD ($\chi^2 = 2.83$, $p = .09$). An independent samples t test, however, indicated PTSD symptoms were higher in the *ETAU* group ($M = 57.08$, $SD = 27.28$) than in the *SAH-M* group ($M = 46.30$, $SD = 27.28$), $t(123) = -2.08$, $p = .04$.

Physical Aggression

A random intercept model was estimated to calculate the effect of the intervention on physical IPA. Results are presented in Table 3. The intercept is the odds of experiencing physical IPA in a 3-month period. The intervention had a strong effect; physical IPA was 56% less likely for patients who have received the treatment, after accounting for the effect of time and the covariates. Results indicate a strong effect of time; physical IPA was 45% less likely for every 3-month period following enrollment in the study. Further, there was no significant difference between treatment conditions, indicating that the delayed application of *SAH-M* to the *ETAU* control group was not less effective than the initial application of *SAH-M* to the experimental group. PTSD had a strong effect. An increase of one standard deviation in PTSD symptoms was associated with 60% increased risk of physical IPA. There was no significant interaction between PTSD symptoms and the receipt of treatment. A wide confidence interval indicates that the effect of treatment for physical IPA is not precise; there is a large proportion of unexplained error in the treatment estimate. This may indicate the presence of an unmeasured moderator variable, a condition under which treatment is more or less effective.

Psychological Aggression

A random intercept model was estimated to calculate the effect of the intervention on psychological IPA. Results are presented in Table 4. The intercept is the average number of events in a 3-month period. The intervention had a modest effect on psychological IPA; number of psychological IPA incidents for the veterans receiving treatment was 19% lower than for veterans who had not yet received treatment. There was a strong effect of time, with the number of psychological IPA incidents decreasing, on average, by 50% every 3-month period. Again, there was no significant difference between study conditions, indicating that the delayed intervention was not significantly different than the immediate

Table 3
Odds Ratio Estimates for Treatment Effects and Covariates of Physical IPA Incidence

Variable	Model 1			Model 2		
	Estimate	95% confidence interval	p-value	Estimate	95% confidence interval	p-value
Intercept	4.55	(2.04, 10.18)	<.01	4.60	(2.05, 10.28)	<.01
Treatment	.44	(.20, .97)	<.05	.44	(.29, .65)	<.05
Time	.55	(.40, .74)	<.01	.54	(.46, .64)	<.01
ETAU Group	1.75	(.85, 3.59)	.13	1.74	(1.20, 2.51)	.13
PTSD	1.60 ^a	(1.20, 2.15)	<.01	1.50 ^a	(1.25, 1.81)	<.01
# Sessions	.94	(.88, .99)	<.05	.94	(.88, .99)	<.05
Interaction				1.16	(.72, 1.86)	.55

Note. IPA = intimate partner aggression; ETAU = enhanced treatment as usual; PTSD = posttraumatic stress disorder. Model 1 tests the main effects. Model 2 adds the interaction term. Estimates are odds ratios. Intercept is the baseline odds of physical IPA in the three-month period.

^a Clinician-Administered PTSD Scale (CAPS) score was standardized with a $M = 0$, standard deviation = 1 to aid interpretation.

intervention. PTSD had a moderate effect. An increase of one standard deviation in PTSD symptoms is associated with a 36% increase in psychological IPA incidents. A significant interaction was observed between PTSD symptoms and receipt of treatment. During the baseline period, the odds ratio for PTSD was 1.32 with a 95% confidence interval (1.07, 1.62). During the treatment period, the odds ratio for PTSD was 1.44 with a 95% confidence interval (1.17, 1.77). The difference between these two simple slopes can be represented by an odds ratio of 1.09 with a 95% confidence interval (1.05, 1.13). This indicates that PTSD has a modest impact on the effectiveness of the SAH-M treatment, by decreasing the treatment effect for psychological IPA between 5% and 13% for a one standard deviation increase in PTSD symptoms. Figure 1 shows that this effect of PTSD on treatment effectiveness is small.

Discussion

The present study extends findings from a randomized controlled trial supporting the efficacy of SAH-M in reducing physical and psychological IPA (Taft, Macdonald, et al., 2016). As expected, results indicated there was a significant effect of treatment

on reducing IPA in the full sample, including previously unanalyzed outcome data from the ETAU control condition. The hypothesized main effect of PTSD symptoms on physical and psychological IPA was supported. PTSD symptoms had a strong association with both physical and psychological IPA after accounting for the effects of time, treatment, study condition, and the number of sessions attended. The hypothesis that PTSD interferes with treatment effectiveness was not strongly supported. The interaction was only observed for psychological IPA, not physical IPA. While it may be the case that the large proportion of unexplained error variance in the treatment estimate obscured interaction results from physical IPA, the clinical significance of the interaction for psychological IPA was minimal.

The study results therefore suggest that while there was no interaction between PTSD symptoms and treatment, treatment outcomes may be strengthened through additional direct treatment of PTSD symptoms. Further research is needed to determine the optimal timing and format of such intervention, for example whether PTSD treatment should be delivered before, concurrently with, or after, IPA intervention. Given that many SAH-M participants were court-ordered to receive IPA services (and may have

Table 4
Odds Ratio Estimates for Treatment Effects and Covariates of Psychological IPA Frequency

Variable	Model 1			Model 2		
	Estimate	95% confidence interval	p-value	Estimate	95% confidence interval	p-value
Intercept	59.92	(41.83, 85.84)	<.01	60.12	(41.96, 86.14)	<.01
Treatment	.81	(.76, .86)	<.01	.80	(.77, .83)	<.01
Time	.50	(.49, .51)	<.01	.50	(.44, .56)	<.01
ETAU Group	1.01	(.67, 1.45)	.97	1.02	(.82, 1.25)	.94
PTSD	1.36 ^a	(1.11, 1.67)	<.01	1.32 ^a	(1.19, 1.46)	<.01
# Sessions	.98	(.94, 1.03)	.50	.99	(.94, 1.03)	.51
Interaction				1.09	(1.07, 1.11)	<.01

Note. IPA = intimate partner aggression; ETAU = enhanced treatment as usual; PTSD = posttraumatic stress disorder. Model 1 tests the main effects. Model 2 adds the interaction term. Estimates are odds ratios. Intercept is the baseline rate of psychological IPA in the three-month period.

^a Clinician-Administered PTSD Scale (CAPS) score was standardized with a $M = 0$, standard deviation = 1 to aid interpretation.

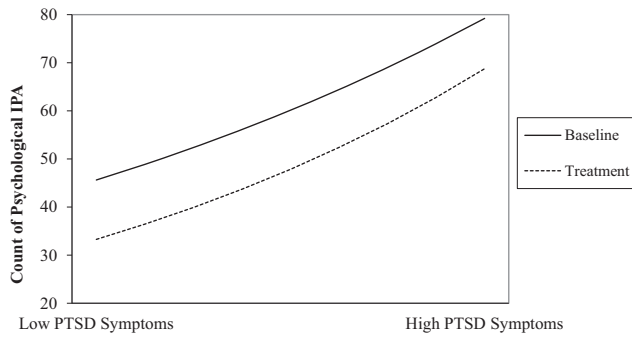


Figure 1. Interaction of posttraumatic stress disorder (PTSD) and treatment on psychological intimate partner aggression (IPA) counts.

had little or no prior engagement with mental health services), efforts to engage them immediately into PTSD treatment before addressing IPA and related safety issues may be counterproductive.

Another option is to adapt the *SAH-M* treatment to directly address the relationship between PTSD symptoms and IPA through the addition of new content and added sessions. However, such adaptations may present challenges for participants who have few traditional symptoms of PTSD. Alternatively, it may be feasible to develop a modular treatment component to directly address PTSD symptoms within *SAH-M*, specifically for those with significant PTSD symptoms. Finally, *SAH-M* may be combined with posttreatment strategies, such as motivational interviewing, as a cost-effective method of transferring gains made in *SAH-M* treatment into enhanced readiness for PTSD treatment. Indeed, one focus of the final session of *SAH-M* is to review treatment progress and examine the need to move from a trauma-informed treatment approach to a trauma-focused approach. Future research is needed to determine how to best facilitate such transitions for those with elevated symptoms of PTSD.

An important question raised by these findings is the extent to which early treatment for PTSD may serve to reduce IPA risk and thus prevent the need for treatments such as *SAH-M*. Along these lines, it may be important to consider the extent to which IPA may cease if PTSD is effectively treated. Prior work examining the influence of behavioral marital therapy (BMT) on IPA among couples in which the male partner was also abusing alcohol offers an example; those individuals whose alcohol use had remitted after BMT no longer had elevated IPA use in comparison to matched controls, while those who had relapsed remained at elevated levels of IPA (O'Farrell & Murphy, 1995). Future research is needed to determine whether remission of PTSD symptoms is similarly associated with cessation of IPA. However, recent work has shown that approximately 50% of individuals still had PTSD after receiving high quality evidence-based treatment (e.g., Eftekhari et al., 2013; Resick et al., 2017). In addition, findings from a study of CPT suggested that improvements in the avoidance symptoms of PTSD were associated with declines in extended family adjustment (Monson et al., 2012), suggesting that attention to PTSD alone, without concurrent improvement in relationship skills, may not be sufficient. Thus findings from the current study suggest that the combination of *SAH-M* with evidence-based treatment for

PTSD may be most effective in reducing IPA in those with high levels of PTSD symptoms.

The current findings also underscore the need to include formal assessment and treatment planning for PTSD as a standard part of intake procedures prior to IPA treatment. Available data from both community-based and veteran samples highlight high rates of trauma exposures among individuals who engage in IPA (Maguire et al., 2015; Semiatin, Torres, LaMotte, Portnoy, & Murphy, 2017). Given that most individuals who are court-ordered to IPA treatment will receive that treatment within a program that is not trauma-informed and does not include such assessment, a vast number of individuals may go through such programs with untreated PTSD. In our current work to implement *SAH-M* at Veterans Affairs hospitals nationwide, we recommend referral for PTSD treatment when the veteran exceeds empirical cut-offs for probable PTSD diagnosis on a screening instrument. Across the system of IPA treatment programs nationwide, implementation of assessment and treatment for PTSD as part of the standard of care is likely needed if we are to reduce rates of IPA.

Current study findings extend the work of Taft, Macdonald, et al. (2016) by providing a more robust estimation of efficacy by also including treatment outcome data from the *ETAU* group, and accounting for the effect of time, which was strong for both physical and psychological IPA. The strong effect of time is likely related to monitoring of IPA by the justice system in those who were justice involved, but may also be attributable to a Hawthorne effect, in which participating in assessments and other study related procedures influenced IPA (McCambridge, Witton & Elbourne, 2014). An important limitation of these data is that there was less time to observe IPA after treatment in the *ETAU* condition and therefore results for this group could be vulnerable to concerns regarding reporting bias. Despite this limitation, results support the effectiveness of the *SAH-M* intervention in reducing IPA use among veterans and service members.

Another limitation is that the sample was comprised primarily of Caucasian and heterosexual veterans, which may limit generalizability of the findings to more diverse samples of veterans. In addition, since the study enrolled only veterans or active duty service members, generalization to the general population is limited. In addition, this study did not examine the influence of *SAH-M* on the use of aggression by both partners. Results also indicated there was a baseline difference in PTSD symptoms between the *SAH-M* and the *ETAU* control group, however, concerns regarding bias of results are mitigated given that treatment condition was controlled for in statistical models. Strengths of the study are the randomized design, use of masked assessors, gold-standard clinical interview for PTSD symptoms, inclusion of partner report of IPA to mitigate any underreporting, and multiple time points of assessments to allow longitudinal analysis.

Despite great attention paid to the public health problem of IPA and its various impacts, until recently there has been little evidence from randomized clinical trials to suggest the efficacy of any treatment program in reducing use of IPA. Widely used intervention models and many state guidelines for IPA interventions ignore or downplay the influence of trauma despite the wealth of scientific evidence indicating that trauma and PTSD symptoms convey significant risk for IPA. Results from the current study are promising in that they support the effectiveness of the *SAH-M* program in reducing IPA in veterans and service members. Findings also

point to how we may improve this efficacious trauma-informed intervention, and perhaps other IPA interventions, by incorporating evidence-based treatment for PTSD. Results also underscore the need for all IPA programs to include assessment of trauma and PTSD.

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SPECIAL ISSUE

Safety, risk, and aggression: Health professionals' experiences of caring for people affected by methamphetamine when presenting for emergency care

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ABSTRACT: *The crystalline form of methamphetamine, commonly known as crystal meth (crystal methamphetamine) or ICE, is a highly-addictive and powerful stimulant. Users of crystal meth often require emergency care, and are associated with a substantial burden of care by emergency care providers. The aim of the present qualitative study was to explore health professionals' experiences of providing care for patients affected by ICE who presented to the emergency department (ED). Nine semistructured interviews were conducted. The major theme, 'staying safe', was revealed, in which participants described their experiences of being exposed to potentially unsafe situations, and their responses to challenging behaviours, including aggression. The findings highlight the need for ED staff to understand the nature of ICE use and its adverse impact on the mental and physical health of users. Furthermore, it is clear that establishing and maintaining safety in the emergency care setting is of utmost importance, and should be a priority for health-care managers.*

KEY WORDS: *aggression, crystal methamphetamine, emergency department, ICE, violence.*

INTRODUCTION

The crystalline form of methamphetamine, commonly known as crystal meth (crystal methamphetamine) or ICE, is a highly-addictive and powerful stimulant that is widely used in many countries (Heilbronn 2013; Pasic *et al.* 2007; Pluddemann *et al.* 2010; Pomerleau

et al. 2012; Tompkins-Dobbs & Schiefelbein 2011). Proportionally, methamphetamine use in Australia is higher than in any other country, with more than 200,000 Australians reported using ICE in 2013 (compared with fewer than 100,000 in 2007), with figures noted to be conservative and already dated (Commonwealth of Australia, 2015).

ICE is a very potent stimulant and can produce psychological disturbances or violent and aggressive behaviours (Commonwealth of Australia, 2015). ICE users often present for emergency department (ED) care (Tompkins-Dobbs & Schiefelbein 2011) for various reasons, including trauma, physical health complications, and acute and long-term mental illnesses and behavioural disturbances. Callouts to emergency services by ICE-affected people are on the rise in Australia, with

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one Australian state reporting a rise in callouts to ambulances of 136 in 2009/2010 to 592 in 2011/2012 (Lloyd *et al.* 2014).

People affected by ICE are more likely to be aggressive and dangerous to others (Grant *et al.* 2012), and are often a danger not only to themselves, but others in their vicinity, including health professionals (Clark 2008). However, currently, little is known about the experiences of health professionals charged with caring for people who use ICE and subsequently report to emergency departments for attention (Cleary *et al.* 2017).

Within health-care services, EDs have among the highest rates of violence and aggression (Kowalenko *et al.* 2013; Spector *et al.* 2014; Wolf *et al.* 2014). Violence in the ED takes various forms and can include physical assault, verbal abuse, sexual assault, intimidation, or damage to the environment (Hyland *et al.* 2016; Luck *et al.* 2007; Tan *et al.* 2015). Evidence suggests that aggressive incidents towards staff in the ED environment remain largely unreported (Hogarth *et al.* 2016). Reasons for this are complex, and are attributed to the time and effort required to report an incident; aggression being an accepted occurrence (Hodge & Marshall 2007); fear of retaliation and an absence of support by peers, ED management, and hospital administrators (Gacki-Smith *et al.* 2009); and the meanings that individual nurses ascribe to acts of violence against them (Luck *et al.* 2008).

Considerable efforts have been made in trying to understand why this violence occurs and how it can be predicted, minimized, and eradicated (Jackson *et al.* 2014; Luck *et al.* 2008); however, considerable gaps in understanding remain. In EDs, staff have experienced injuries, acute stress with negative consequences, and lost productivity arising from acts of violence towards them (Kowalenko *et al.* 2013). The effects of aggressive behaviours not only impact staff health and well-being but extend to economic and resource costs that could arise if staff require time off work to recover from these experiences. For some staff, the impact of these experiences could compromise their capacity to return to the workplace and face these situations again.

These factors underscore the importance of understanding and managing workplace violence and aggression in the health-care environment, and of identifying and responding to patients more likely to demonstrate violence towards health-care staff and others. The present study is drawn from a larger study that sought to better understand the particular challenges or difficulties experienced by health service personnel in

providing emergency care for people affected by ICE. Previous findings relating to the provision of emergency care to persons affected by ICE have been published elsewhere (Cleary *et al.* 2017). In the current paper, we report findings pertaining to safety and aggression management.

METHODS

The present study was approved by relevant university human research ethics committees. Health professionals with experience working in ED were recruited through relevant professional networks and a form of snowball sampling, in which participants shared study information with other eligible colleagues.

Written consent was given, and the same interviewer – an experienced mental health nurse researcher – conducted all interviews over 4 months in early 2016. Interviews were conducted face to face or via telephone, depending on participant location and preference. Questions asked included demographic information about the participant's professional background and experience working in health and mental health. Other questions explored professional experiences with patients affected by ICE presenting for emergency care, challenges associated with care, and the treatment and support(s) required.

Interviews were conducted until no new data emerged, that is, until data saturation was reached (Cleary *et al.* 2014; Fusch & Ness 2015). Length of interviews varied between 40 and 90 min. Interviews were all digitally recorded and transcribed verbatim, and a copy of the transcript was provided to participants who requested a copy.

Data analysis

Thematic analysis guided the analysis of data (Braun & Clarke 2006). This approach required members of the research team to examine patterns within the data using a six-step process. This process entailed: (i) reading and rereading the transcripts, and notating the text; (ii) coding the data in relation to the research question, and collating codes and extracts; (iii) distinguishing themes; (iv) considering themes; (v) specifying and explaining themes; and (vi) writing the paper (Clarke & Braun 2013). The transcripts were read several times by two members of the research team to identify possible patterns; the transcripts were then independently coded to categorize initial themes, with any differences discussed with team members until consensus was

reached. Following this, the themes were collapsed into one major theme and subthemes, which were refined on the basis of feedback and discussion using a group consensus approach to strengthen the validity of the findings. This approach enabled the linking of emergent themes to the data (Braun & Clarke 2006), and supported the research team to clarify and understand participants' experiences and perspectives (Lincoln & Guba 1985; Rebar *et al.* 2011).

RESULTS

A total of nine participants were interviewed, comprising five nurses, two paramedics, a social worker, and a psychotherapist. All were experienced clinicians and all had extensive experience of providing emergency care to persons affected by ICE. Participants were drawn from two states in Australia, and the majority of participants ($n = 8$) were working in urban areas at the time they were interviewed. They identified safety and management of aggression and behavioural disturbance as major issues in ensuring the best possible emergency care for these complex patients. Safety and aggression management were revealed as comprising a major theme: 'staying safe'. This theme described the experiences of participants when they were exposed to potentially unsafe situations and the strategies they used to manage in these situations.

Staying safe

Patients affected by ICE commonly exhibited frightening behaviours that were difficult to manage, encompassing unparalleled physical strength and aggressive, violent behaviour. Participants realized the danger and safety issues this presented. As experienced clinicians, study participants readily recognized the likelihood of these behaviours escalating in ways that could threaten the safety of the environment, and generating the need for additional resources to maintain patient and staff safety. Staff expertise in dealing with these situations was not only underpinned by knowledge and experience, but a duty of care tempered with caring and compassion:

Often when they come in if they're in full blown – well ICE situation, I guess; they're incoherent. Some of them I think they'd kill you if they got hold of you.

(Participant (P) 5)

Participants acted to protect the safety of the patient, as well as others in the environment. Participants also acknowledged how they felt about their own

personal safety, and demonstrated understanding of the implications that any violent or aggressive act would (or could) have for the patient:

We have definitely taken the approach of careful, careful and you go with your gut instinct. . . I'm not going to even approach them until the police are there. . . I don't want to be attacked, and I would hate for this person under the influence of drugs to attack me and end up in gaol. (P7)

Participants described patients requiring emergency care when affected by ICE as often being 'paranoid' (P4), 'aggressive, violent' (P5), 'combative' (P9), and 'not predictable' (P8). These challenges were further complicated by the sense patients had phenomenal strength, which made it necessary for staff to ensure adequate back-up help was at hand:

If they're really going off and you have to sedate them, you need really high doses of sedation. They seem to have that. . . that superhuman strength about them. I've had a few of those. . . very little, petite ladies. . . who usually a tiny dose of sedation would be tons, and those kind of people I've found you've had heaps of coppers having to hold them down while you give massive doses of sedation to be able to try and manage them. (P8)

Another participant described the importance of looking at the big picture and being self-aware. She described her experiences of seeing how situations could rapidly escalate, and how escalation could sometimes be prevented by staying in control and not allowing the patient's actions to fuel the situation:

It's keeping your cool. Quite often they want to pick a fight, so they sit there deliberately pressing your buttons. (P8)

In addition to staying cool and not reacting to provocation, it was crucial to be continually cognizant and alert to the potential for harm and escalation of behaviours, and to plan ahead for managing difficulties. Strategies underpinned by a calm and cautious demeanour were deemed to be more effective. The context of practice (i.e. in an ED ward or on the road in an ambulance) further influenced the need for considered, planned, and decisive action:

Their mood is just not predictable, so. . . you need to be on your guard. . . have a plan, because it (vehicle) is a confined space. If they launch at you, there's going to be quite a period of time before your partner can pull over, open the doors, get you out of the car. (P8)

Participants noted that there were other confronting and potentially dangerous situations when working within the ED context. In addition to maintaining their own safety, health service staff also had a responsibility to ensure the safety of other people in the environment, including other service users and those accompanying them. Participants considered rapid and accurate appraisal of the situation to be crucial to maintaining safety for all of these groups. An essential element was identifying and managing risk:

When they come to the department, they actually have to be searched by the nursing team. If they do have any weapons on them, these get confiscated and locked up. (P1)

In addition to the patients themselves, those accompanying patients – their relatives and friends – could also be a potential source of aggressive behaviour. When relatives witnessed challenging behaviours, they sometimes became stressed and agitated. Participants reported that staff were mindful of this and tried to allay anxiety so as to reduce the potential for any aggression from this source:

I tried to take him (relative) aside and to distract him, in the sense that security were dealing with the patient and he (relative) was getting in the way, getting more agitated. I had...to explain to him that we're trying to protect her...You brought her here because you were concerned. (P4)

The behaviours exhibited by ICE users varied between individuals and situations. Each situation was unique in that it was also influenced by the impact of any other substances the patient might have consumed, in addition to other factors, such as comorbidity. Safety issues were further raised, because important information that could further influence safety of staff and other service users and inform appropriate safety interventions was often lacking. Complete and full information about use of substances is generally not known initially, and this, along with other missing information about a patient's personal background, meant that emergency staff were sometimes working in volatile and quite dangerous situations. Aggressive behaviours could quickly escalate, and so they had to be able to quickly identify the potential for aggression and be ready to respond appropriately.

We've had nurses who've been punched in the face. We've had security officers who've been kicked and spat at, medical staff as well...violence towards health-care providers does tend to increase when you have a

patient that you can't reason with...That's why we...use drugs to sedate patients. (P1)

In addition to physical abuse, staff could also be subjected to intimidating and threatening behaviour. Participant 4 recounted such an experience:

Then (patient) mentioned that he was friends with prominent drug dealers in this city, or bikie gangs, and if anyone came close, they'll be killed. He was quite – invading their (staff) personal space, quite difficult to de-escalate...and threatening, intimidating, screaming. (P4)

Different clinical circumstances required different approaches to dealing with aggressive and challenging behaviours. Paramedic participants reported the need for use of restraints when it was perceived that there was no effective alternative to maintain the safety of patient and staff. In the context of emergency transport, restraint was sometimes needed for short periods to ensure the safety of the patient and staff:

They're the soft Posey restraints that we've got – the quick release ones...we're just escalating depending on which path to go down, depending on how approachable and communicative the patient is. (P7)

However, despite the need to maintain safety, decision-making regarding the use and the type of restraint was also viewed within the context of patient safety and dignity:

Generally, I feel like if someone is restrained and thrashing against restraints, I'll sedate them, because I don't think that's humane to have somebody tied down and thrashing. I don't think that's okay. (P8)

A complicating factor was that the effect of ICE on patient behaviours and responses was sometimes so severe that sedation could have little effect or take longer than usual to take effect:

They (staff) used every sedation under the sun, and they (patient) were still combative and fighting, spitting, and all of that behaviour...it's quite traumatizing in terms of somebody spitting at you. (P4)

The high volatility meant that participants were fearful of patients at times. There was the feeling that any distraction or loss of concentration could place them, their colleagues, and other service users in immediate danger:

Some of them, I think they'd kill you if they got hold of you...you can't rationalize with them. You can't

ascertain how safe they are because, well, we don't know what's going in their head. (P5)

The availability of backup support by hospital security staff to assist in protecting staff and other service users was considered pivotal. Some facilities had isolation rooms that participants considered to be an effective element of an overall strategy aimed at maintaining patient and staff safety.

In some of the hospitals, they have like a special room with a mattress on the floor where, you know, with no linen or anything so that the people can't hurt themselves, but even that's very undignified, but I suppose it's a bit more safer than having a bed in there and then try to do things to hurt themselves on the bed or with the bed...because you can't get near them sometimes. (P5)

However, as suggested by the above narrative, on their own, these spaces were not adequate, and the additional support of police and security staff was also needed on some occasions. These events could be extremely frightening for staff:

It wasn't a human. He (patient) would have killed me...he went berserk. Trashed the ED. They got him over to the seclusion room...It wasn't a human. I was terrified...I've never seen this amount of medication ever used and I was absolutely packing it, but this fellow had no ill effects...just imagine what he would have done if he had have got someone, got hold of me...they had the police there and they had security on him all night. (P5)

Situations such as that described by participant 5 reinforced their vulnerability. Circumstances in which participants were fearful for their lives were not easily forgotten and did not necessarily diminish with repeated exposure. Consistency in the level of support provided varied across hospitals. Some provided good support where ambulance staff could ring ahead of time and alert staff as to what to expect. This mechanism allowed some (minor) degree of forward planning, and enabled security to be notified, available, and ready to assist when the patient arrived:

I know that I can phone ahead and that I will have trained professionals that will work together as a team. They will have gloves on and they will know their hold points...how to safely handle an aggressive, agitated patient. (P7)

Procedures for accessing security staff, and how the security staff roles and procedures were enacted, varied across the hospitals. Participant 7 described some

security personnel as being employed in a strictly 'hands-off' fashion, in more of an observational capacity:

I would have to wait for security. He said 'I'm sorry, I can't get involved'...he said he was there to document the event...said that he couldn't physically restrain her because that would be assault. (P7)

Not having security close and involved was felt to significantly impact staff capacity to respond effectively to escalating behaviours:

With escalating presentations over the past few years, it would be ideal to have security personnel based in the emergency department. Because, right now, our security is in a different location. (P4)

The onus to report incidents of aggressive and violent behaviour was on the individual health professional. However, these events were not always formally reported as incidents, aside from being noted in the patient notes:

Incidences like verbal abuse and intimidating behaviour, it's not actually recorded as an incident or it's merely documented on the notes that the person was verbally abusive and threatening. (P4)

Whilst this might be a very appropriate response in some situations, it could also mean that health service managers are not kept fully cognizant of the nature, extent, and effect of these incidents. It might also reflect an increasing desensitization to workplace violence and aggression:

ED nurses sort of desensitize...it's just psych patients, this is how they behave if they are upset or they aren't well...when maybe there was an assault or if there is a physical restraint required. Then they (complete the) incident report. (P4)

Staff acknowledged the value of incident reporting nonetheless, and identified how reports provided a basis for improving practice and for management to provide more support to these frontline staff. Participants reported some forms of debriefing were available; however, the level of debriefing offered varied across services. Generally, if an instance of physical assault or violence was reported, it led to debriefing. Regular support was also available to some staff in some services:

Every 2 weeks, we have a session with a psychologist for an hour...I think we have support for each other too. I think we manage to work well as a team and utilize that as some sort of release. (P9)

DISCUSSION

The present study is one of the few to have explored health professionals' actual experiences of providing care to people affected by ICE use seeking emergency care. The study is unique in that it included a range of health professionals and health services, all from different emergency settings, in two states in Australia. Participants all described having regular contact with people using ICE, and all identified challenges in caring for these patients. Staying safe and ensuring the ED remained safe for their colleagues and other service users was a major concern. According to participants, patients affected by ICE who behaved aggressively usually demonstrated manifestations of psychosis and unpredictable, hostile behaviours. Individually and collectively, these factors are known to increase the potential for health worker safety to be threatened (Commonwealth of Australia, 2015). The use of crystal methamphetamine is known to adversely impact the behaviour of the user, and effects reportedly include ICE intoxication (irritability, physical aggression, agitation), long-term intoxication (psychotic paranoid state), delirium (disorientation, confusion, fear, and anxiety), and stimulant-induced psychosis (Maxwell 2005).

In the present study, aggressive behaviours were not only shown to be confronting and sometimes overwhelming but potentially threatening to the safety of everyone in the environment. Health professionals' exposure to traumatic incidents and crises was generally accepted as being part of the job, but participants emphasized the importance of patient centeredness, effective interpersonal communication skills (Hahn *et al.* 2012), and the development of rapport to avoid aggression. This resonates with findings reported elsewhere (Lau *et al.* 2012).

The role of the ED setting is to provide acute accident and emergency services, and as such will always have inherent risks, as people present with behavioural health emergencies and other complex health problems (Taylor & Rew 2011). Participants identified cues to recognizing potentially aggressive situations, and these included, but were not limited to, escalating threatening behaviour and aggressive outbursts, including intimidating actions, such as screaming, spitting on staff, and the destruction of furniture and furnishings; demonstrating excessive strength; and the capacity for significant harm to themselves, staff, and others. These situations potentially compromised safety and security for all in the ED. Similar concerns are identified elsewhere in the literature, and the effects of aggression in

the ED are noted to be far-reaching and costly (Taylor & Rew 2011).

While violence against ED staff is highly prevalent and well documented, previous research identifies that an important factor for mitigating workplace violence in the ED is a commitment by administrators, ED managers, and hospital security (Gacki-Smith *et al.* 2009). Despite this, recent research indicates that violence is endemic to the ED and that there is a culture of acceptance of violence (Wolf *et al.* 2014). The impact violence has on health services and the health workforce needs to be better understood, as does the need to ensure and provide real-time support and resources to staff subjected to aggression and violence so that they feel safe, valued, and respected (Papa & Venella 2013). In one Australian hospital, it was reported that sedations were required for a one-third of amphetamine-affected people presenting to emergency (Gray *et al.* 2007). To sedate a patient in these circumstances might involve paramedics and nursing, medical, and security personnel – a highly resource-intensive intervention. These situations mean staff are required to be redirected from providing care to other patients, and result in service delay and potential harm to other patients through missed care. Importantly, in situations where there are insufficient security staff available, the safety of staff and other patients within the ED is at risk (Gray *et al.* 2007).

Participants identified some variations between EDs, supporting research suggesting that policies and procedures were not always consistent across services (Tompkins-Dobbs & Schiefelbein 2011). An example of this is the role of security officers. The role of security in some EDs was highlighted as problematic, with some security staff taking only an observational role and refusing to assist even when there was a high-risk situation unfolding. Research describing ED workers' views of security officers' effectiveness during actual events of verbal and/or physical violence stressed the importance of early communication between security officers and ED workers, ideally before events occur, and highlighted the need to understand and clarify the respective roles and responsibilities of both security officers and ED workers (Gillespie *et al.* 2012). For paramedics working with different EDs, the differing roles and responsibilities among ED security staff were identified as issues that could benefit from further attention. Future research with hospital-based security staff has been suggested to better understand their perceptions about their role in relation to workplace violence (Gillespie *et al.* 2012).

Noteworthy was the compassion and professionalism evident in the participant responses, even when being exposed to intense and challenging situations. Despite the circumstances, participants still prioritized the dignity and personhood of these challenging patients, and presented as positive, empathic, and confident. The literature suggests that training in mental health and crisis-intervention strategies is needed to enable staff to effectively deal with such challenging situations and to build emotional resiliency (Chan *et al.* 2013). The National ICE Taskforce Report also recommended a national training programme for nurses, paramedics, and physicians focusing on improved drug screening and interventions as an important step in enabling these staff to provide tailored care to people affected by ICE (Commonwealth of Australia, 2015).

The cycle of aggression and violence associated with ICE use in health-care facilities will continue to escalate as long as the drug is readily available. Although law enforcement agencies actively try to interrupt supply, the reality is that it is an accessible and relatively inexpensive substance (Commonwealth of Australia, 2015). For new users, ICE offers the thrill of unprecedented self-confidence, euphoria, and heightened sexual pleasure for as little as \$A50 in some places in Australia, which represents a cheaper alternative to drinking alcohol (Commonwealth of Australia, 2015). However, ICE use carries with it the propensity for dependence and relapse, it has a lengthy withdrawal and recovery time, and resultant cognitive impairment that could continue for months after use (Commonwealth of Australia, 2015).

Strengths and limitations

The present study has several strengths, which include the multidisciplinary backgrounds of participants and the multiple services participants were drawn from. Data quality was also high, as interviews were in-depth, and thoughtful insights were provided by skilled clinicians from both metropolitan and rural settings. However, no consumer accounts were sought, or mental health or behavioural histories obtained, or site-specific policies reviewed.

CONCLUSION

Given current trends in the use of ICE, presentations to the ED of people affected by ICE are likely to continue to increase. With this in mind, staff need to be aware of the nature of ICE use and the adverse impact of this on the mental and physical health of users.

What is clear is that establishing and maintaining safety in the emergency care setting is of utmost importance, and should be a priority for health-care managers.

RELEVANCE FOR CLINICAL PRACTICE

Emergency staff are at increased risk of verbal and physical violence in their busy work settings. Understanding aggression and violence is complicated by a number of factors (Sexton *et al.* 2009), and the need for consistent and effective care for persons affected by crystal methamphetamine (Tompkins-Dobbs & Schiefelbein 2011) was identified by participants. The underreporting of violence and aggression in the ED is well noted (Luck *et al.* 2008), and further research should explore barriers and attitudes that prevent or enhance reporting (Taylor & Rew 2011).

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Effects of methamphetamine abuse and serotonin transporter gene variants on aggression and emotion-processing neurocircuitry

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Individuals who abuse methamphetamine (MA) exhibit heightened aggression, but the neurobiological underpinnings are poorly understood. As variability in the *serotonin transporter (SERT)* gene can influence aggression, this study assessed possible contributions of this gene to MA-related aggression. In all, 53 MA-dependent and 47 control participants provided self-reports of aggression, and underwent functional magnetic resonance imaging while viewing pictures of faces. Participants were genotyped at two functional polymorphic loci in the *SERT* gene: the SERT-linked polymorphic region (SERT-LPR) and the intron 2 variable number tandem repeat polymorphism (STin2 VNTR); participants were then classified as having high or low risk for aggression according to individual SERT risk allele combinations. Comparison of SERT risk allele loads between groups showed no difference between MA-dependent and control participants. Comparison of self-report scores showed greater aggression in MA-dependent than control participants, and in high genetic risk than low-risk participants. Signal change in the amygdala was lower in high genetic risk than low-risk participants, but showed no main effect of MA abuse; however, signal change correlated negatively with MA use measures. Whole-brain differences in activation were observed between MA-dependent and control groups in the occipital and prefrontal cortex, and between genetic high- and low-risk groups in the occipital, fusiform, supramarginal and prefrontal cortex, with effects overlapping in a small region in the right ventrolateral prefrontal cortex. The findings suggest that the investigated SERT risk allele loads are comparable between MA-dependent and healthy individuals, and that MA and genetic risk influence aggression independently, with minimal overlap in associated neural substrates.

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Introduction

Methamphetamine (MA) abuse is associated with a high incidence of interpersonal violence,¹ confirmed by consistent reports of heightened hostility and aggression scores in MA-abusing research participants.^{2–8} Aggressive behavior can stem from abnormalities in neurocircuitry underlying emotion processing, including serotonergic disturbances,⁹ and dysfunction of the amygdala (which is involved in the detection of emotional salience in environmental stimuli) and prefrontal cortex (PFC, which takes part in deliberative and executive functions).^{10–12} MA-abusing individuals indeed show PFC and amygdala abnormalities,^{13,14} as well as differences in serotonergic markers,^{5,15} relating to socio-emotional disturbances such as poor social cognition, insight, and harm avoidance,^{8,16–20} low mood²¹ and hostility/aggression itself.^{5,6,8} In addition to creating personal and public health and safety concerns,²² these mood states and behaviors can negatively impact treatment outcome, as emotional distress can contribute to drug craving and relapse.²³ Given the relevance to abstinence success, therefore, it is important that the etiology of these neurochemical and social–cognitive factors be clarified.

MA is considered a potent neurotoxin,²⁴ and in animal models, repeated administration results in the degeneration of monoamine nerve terminals;²⁵ it is therefore possible that the

observed neurocognitive deficits reflect neuronal damage and/or compensatory changes following long-term MA abuse. However, independently of MA abuse, the same neural circuits and behaviors are also influenced by normal genetic variability in the serotonin system,^{26–28} raising the possibility that the observed differences predate MA abuse. As each possibility may favor different treatment approaches, this study investigated the contribution of genetic factors, in addition to MA abuse, to aggression and brain function.

One integral gene to variability in the serotonin system is *SLC6A4*, which encodes the serotonin transporter (SERT) protein and contains two well-studied functional polymorphisms. The first, the SERT-linked polymorphic region (SERT-LPR), is located within the gene promoter and consists of the insertion/deletion of a 44-base-pair repetitive element, resulting in a short or long allele. An additional single-nucleotide polymorphism mapping within the LPR (rs25531) modifies the effect of the long allele, with the minor (g) allele rendering it functionally similar to the short allele.²⁹ The short allele has reduced transcriptional efficiency and lower expression levels,³⁰ and is associated with phenotypes related to negative emotionality, including aggression and violence,^{31–35} mood disorders and anxiety,^{36–38} altered socio-emotional function

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and social sensitivity^{39–41} and differences in amygdala and PFC structure and function.^{42–44}

The second polymorphism, a variable number tandem repeat in intron 2 of the *SERT* gene (STin2), resulting in 9, 10 or 12 repeats of a 17-base-pair sequence, can also affect gene expression. The 12-repeat allele (particularly the 12/12 genotype) has been linked to aggression,^{45,46} mood and anxiety disorders^{47–49} and impulsivity and disinhibition.^{50,51} The two polymorphisms therefore influence social–cognitive and emotional processes that can result in heightened aggression. Importantly, the two polymorphic domains interact, suggesting that they should be studied in combination rather than independently.^{51–53}

As MA- and SERT-related effects resemble one another, it is possible that differences previously attributed to MA abuse in fact reflect differential risk allele loads or genotype effects between MA-abusing and healthy participants. In this regard, one study reported a higher SERT-LPR short allele load in individuals with MA psychosis and spontaneous relapse to MA abuse,⁵⁴ but another found no difference in SERT-LPR allele distribution between groups.⁵⁵ Given these inconsistencies and limited outcome measures, this study sought to investigate the extent to which heightened aggression and differences in brain function reflect MA abuse status, genetic factors or a combination of both. Specifically, the study aimed (1) to determine whether heightened aggression in MA-abusing populations reflects a higher SERT risk allele load, and (2) to test for effects of genetic risk and MA abuse status on self-reported aggression and brain activation.

Materials and methods

Participants and study procedure. All procedures were approved by the UCLA Office of the Human Research Protection Program. Non-treatment-seeking MA-dependent and healthy control volunteers between the ages of 18 and 55 years gave written informed consent, and were screened for eligibility using questionnaires, psychiatric diagnostic interviewing (SCID-IV⁵⁶) and a medical examination. Participants in the MA group were required to meet the DSM-IV criteria for current MA dependence, and to demonstrate recent MA use by providing a urine sample that tested positive for MA. Control participants were required to have no history of drug abuse or dependence. Exclusion criteria for all participants were: any current Axis I diagnosis, except MA dependence or substance-induced mood/anxiety disorder (MA group) or nicotine dependence (both groups); use of psychotropic medications or substances, except some marijuana or alcohol (not meeting abuse or dependence criteria); and nervous system, cardiovascular, pulmonary or systemic disease.

Eligible MA participants were admitted to the UCLA General Clinical Research Center, and participated on a residential basis in a study lasting 15–30 days. They were required to abstain from all illicit drugs and alcohol for the duration of the study, verified by urine screening and breathalyzer. Eligible control participants visited the laboratory only on test days, and were required to test negative for illicit substances/alcohol on each test day. Study compensation was provided in cash and gift certificates. A total of 100 individuals (53 MA, 47

control) participated in the study (Table 1), and completed one or more (but not necessarily all) of the measures below.

Outcome measures. To assess aggressive behavior, participants completed a paper-and-pencil *Aggression Questionnaire* (AQ),⁵⁷ indicating on a Likert scale (1–5) how well each of 34 items reflected their behavior.

Brain function was assessed using functional magnetic resonance imaging during observation of faces, as viewing faces reliably engages the amygdala and PFC.⁵⁸ Presentation of face stimuli occurred in 25-s blocks, showing five distinct faces⁵⁹ for 5 s each. Participants viewed a total of eight blocks (half showing neutral, and half angry/fearful facial expressions), each followed by 16 s of fixation.

MA use and withdrawal measures. MA participants reported *MA use patterns* (amount and frequency) during intake. Each day following intake, they completed a 30-item rater-scored *Methamphetamine Withdrawal Questionnaire* (MAWQ),⁶⁰ assessing emotional, physical and functional withdrawal symptoms on a 4-point scale, and a *Visual Analog Scale for Craving* (VAS), indicating current levels of MA craving on a line marked from 0 to 100 in 10-point increments. For missing measures, scores from the preceding or following day (or their mean if both were available) were used to estimate scores.

Genotyping methods and analyses. Genotypes for the *SLC6A4* SERT-LPR short/long variant, STin2 and rs25531 were assessed simultaneously according to the protocol published in ref. 29. Polymerase chain reaction products were electrophoresed in 3.5% gold agarose (BMA, Rockland, ME, USA) gels in 1 × Tris/Borate/EDTA and imaged with ethidium bromide under a fluorescent Kodak digital camera. Alleles were determined by comparison with molecular weight standards and data from control individuals with previously determined genotypes. All genotypes were confirmed in duplicate and samples were double-scored by two technicians independent of phenotype information. All assays included positive and negative control samples. All markers were in Hardy–Weinberg equilibrium.

Since complex phenotypes are more accurately predicted by multiple than single polymorphisms, we combined SERT-LPR and STin2 genotypes according to Aluja *et al.*,⁵¹ which predicts that carrying the LPR short (s) allele and homozygosity for the STin2 12-repeat allele should be risk factors for aggression. It is important to note that while our investigation focused on aggression, these risk factors are not specific, and may predispose to aggressive behavior indirectly. To categorize participants, we first calculated a 'number of risk factors' variable. Possible values were: 0 (LPR l/l + STin2 10+), 1 (LPR l/l + STin2 12/12 or LPR s/l (or l(g)/l) + STin2 10+), 2 (LPR s/l (or l(g)/l) + STin2 12/12 or LPR s/s (or l(g)/s) + STin2 10+) and 3 (LPR s/s (or l(g)/s) + STin2 12/12). Since the STin2 9-repeat allele is functionally unique and its effects are unclear,⁶¹ the three MA participants who were carriers were excluded. Given the small samples created by this division, participants were then grouped into *genetic low-risk* (0 or 1 risk factor) and *high-risk* (2 or 3 risk factors) groups. Independent analyses of the individual

Table 1 Demographic measures, genotypes and MA use measures

	MA (N = 53)	Control (N = 47)	Test for group difference
<i>Demographic measures</i>			
Number of men/women	31/22	25/22	$\chi^2(1) < 1$
Years of age (M, s.d.)	34.4 (9.4)	32.1 (9.5)	$t(98) = 1.19$
Years of education (M, s.d.)	12.7 (1.5)	14.9 (2.2)	$t(98) = 5.80^*$
<i>Ethnicity (number of participants)</i>			
Caucasian	29	28	
African American	2	6	
Hispanic/Latino	15	5	
Asian American	2	5	$\chi^2(6) = 10.65$
Native American	0	1	
Multiple	1	0	
Other	4	2	
<i>SERT-LPR genotype (number of participants)</i>			
Short/short	14	11	
Short/long	22	20	$\chi^2(2) < 1$
Long/long	17	16	
<i>SERT-VNTR Genotype (number of participants)</i>			
9/9	0	0	
9/10	1	0	
9/12	2	0	$\chi^2(4) = 3.25$
10/10	9	6	
10/12	18	18	
12/12	23	23	
<i>MA use measures (M, s.d.)</i>			
Years of MA use	11.0 (7.7)		
Years of heavy MA use (3 × per week or 2-day binges)	7.82 (7.0)	NA	NA
Days MA used per month	20.8 (9.1)		
Grams of MA used per week	3.31 (4.29)		

Abbreviations: MA, methamphetamine; NA, not applicable; SERT-LPR, serotonin transporter-linked polymorphic region; SERT-VNTR, SERT-variable number tandem repeat polymorphism.

* $P < 0.05$.

polymorphisms demonstrated consistent but less robust effects than when combined into risk groups (see Supplementary Materials).

Imaging methods and analyses

Apparatus and parameters. Imaging was performed on a 3T Siemens Allegra scanner (Erlangen, Germany), using a standard T2*-weighted gradient-echo echo-planar imaging pulse sequence to collect blood-oxygen-level-dependent signal. Acquisition parameters were: TR = 2500 ms, TE = 28 ms; flip angle = 80°; matrix = 64 × 64. Each volume consisted of 36 interleaved slices, parallel to the AC-PC line, with 2.5-mm thickness and 0.5-mm distance. Each of two functional runs yielded 210 volumes. T2-weighted and high-resolution T1-weighted structural scans were also acquired for region-of-interest (ROI) delineation and spatial normalization. Stimulus displays were generated using the MacStim software (WhiteAnt Occasional Publishing, West Melbourne, VIC, Australia) and presented through video goggles (Resonance Technology, Northridge, CA, USA).

Analysis. Data were processed using SPM5 (Wellcome Trust Centre for Neuroimaging, London, UK). Functional images were spatially realigned to the mean image to correct for head motion (within 3 mm translation/5° rotation; exceeding these parameters was exclusionary), and co-registered to individual structural templates. Amygdala ROIs were drawn

on high-resolution structural images using FSL FIRST.⁶² Functional scans were smoothed with a 5-mm Gaussian kernel, and masked with these ROIs. Using the MarsBaR toolbox,⁶³ a general linear model was applied at each voxel within the ROIs, containing regressors for neutral and emotional face blocks (modeled as boxcar functions convolved with the hemodynamic response function provided by SPM5) and fixation as an implicit baseline. After fitting the general linear model, percent signal change during observation of faces was calculated, and the resulting values exported to SPSS 16.0 (SPSS Inc., Chicago, IL, USA).

For whole-brain analyses, functional images were smoothed with an 8-mm Gaussian kernel, and the general linear model described above applied at each voxel across the brain. The resulting maps of parameter estimates were spatially normalized to a standard template provided by SPM5, and passed to a group-level random-effects analysis with MA abuse status (MA-dependent or control) and genetic risk (high or low) as factors. Results were assessed at a statistical threshold of $P < 0.005$ with a cluster criterion of 30 contiguous voxels, offering a good balance between potential for Type I and Type II errors.⁶⁴

Results

Demographic, genotype and MA use measures. MA and control groups were matched for age, sex and ethnicity, but

MA participants had completed fewer years of education (Table 1). Participants in the low and high genetic risk groups were matched for sex and education, but the low-risk group was marginally older ($t(95) = 1.74$, $P = 0.086$), and groups were not matched for ethnicity ($\chi^2(6) = 12.81$, $P = 0.046$). Demographic measures were therefore used to follow-up all analyses.

MA withdrawal measures. MA craving and physical withdrawal decreased significantly between intake and test days, and functional symptoms showed a similar trend, but emotional symptoms did not significantly decrease (Table 2). Withdrawal symptoms collected on test days did not correlate with outcome measures collected that day (all $P > 0.1$), except for physical symptoms on functional magnetic resonance imaging day correlating with amygdala signal change ($r = 0.436$, $P = 0.042$).

Outcome measures

Risk allele distribution. χ^2 analyses assessing SERT allele distributions found no differences in risk allele loads between MA and control groups (Table 1).

Aggression questionnaire. Analysis of variance of AQ scores, with MA abuse status (MA or control) and genetic risk (low or high) as factors, showed significant effects of MA abuse ($F(1,67) = 11.62$, $P = 0.001$) and genetic risk ($F(1,67) = 7.92$, $P = 0.006$), but no interaction ($F(1,67) = 0.06$, $P = 0.81$) (Figure 1a). As predicted, MA-dependent and high genetic risk participants reported greater aggression than their counterparts. These effects persisted when age, education and ethnicity were entered as additional covariates; entering sex as an additional factor (as allelic directionality can differ between sexes) showed no main effect of sex or sex \times genetic risk interaction, while the effects of MA abuse and genetic risk remained significant. Performing the analysis of variance in a subsample matched for ethnicity (Caucasian only, as this comprised the largest ethnic subgroup: MA, $N = 17$ (12 low risk); control, $N = 22$ (10 low risk)) yielded identical results, suggesting that ethnic make-up of the sample did not bias outcome.

Amygdala ROI analysis. Percent signal change in the amygdala did not differ between neutral and emotional faces ($t(46) = 0.89$, $P = 0.38$), and values were combined by calculating their average. Further, signal change correlated between left and right amygdala ROIs ($r = 0.82$, $P < 0.001$), and values

were combined by calculating a volume-weighted average. Analysis of variance of these values, with MA abuse status and genetic risk as factors, showed a significant effect of genetic risk ($F(1,41) = 5.81$, $P = 0.021$), but no effect of MA abuse ($F(1,41) = 1.18$, $P = 0.29$) or interaction ($F(1,41) = 0.66$, $P = 0.42$) (Figure 1b). Signal change in the amygdala was lower in high-risk than low-risk participants. This effect persisted when age, education and ethnicity were entered as additional covariates; entering sex as an additional factor showed no main effect of sex or sex \times genetic risk interaction, while the effect of genetic risk remained significant.

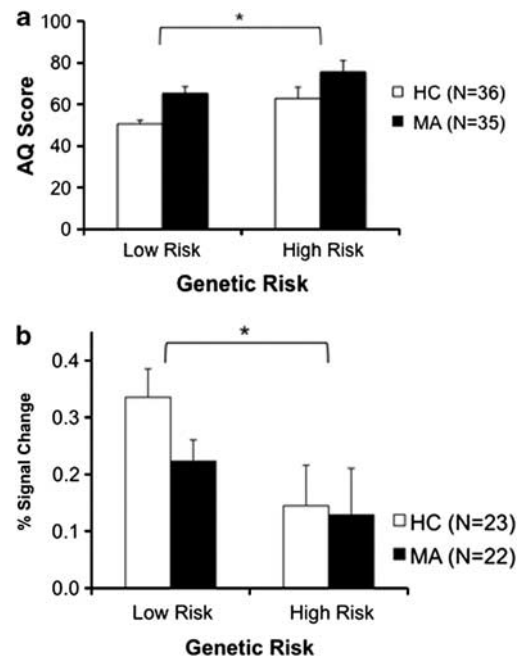


Figure 1 (a) Mean (s.e.m.) Aggression Questionnaire (AQ) scores of participants in the low genetic risk (MA, $N = 22$; control, $N = 19$) and high genetic risk (MA, $N = 13$; control, $N = 17$) groups. MA-dependent participants reported significantly higher aggression than control participants, and high genetic risk participants reported significantly higher aggression than low genetic risk participants. There was no MA abuse \times genetic risk interaction. (b) Mean (s.e.m.) percent signal change in the amygdala during observation of faces for participants in the low genetic risk (MA, $N = 13$; control, $N = 12$) and high genetic risk (MA, $N = 9$; control, $N = 11$) groups. High-risk participants showed significantly less signal change in the amygdala than low-risk participants. There was no effect of MA abuse or interaction. * $P < 0.05$. HC, healthy control; MA, methamphetamine-dependent.

Table 2 MA withdrawal measures

	Day of intake	Day of AQ	Test for difference from intake	Day of scan	Test for difference from intake
Days abstinent (M, s.d.)	1.09 (1.54)	6.92 (1.91)	NA	8.56 (3.05)	NA
MAWQ score (M, s.d.)					
Emotional (range 0–27)	3.45 (3.90)	2.65 (3.24)	$t(36) = 1.05$	3.10 (3.40)	$t(28) < 1$
Physical (range 0–21)	1.43 (2.06)	0.57 (1.09)	$t(36) = 2.73^*$	0.75 (1.21)	$t(28) = 2.05^*$
Functional (range 0–18)	3.33 (3.14)	2.41 (2.32)	$t(36) = 1.17$	2.45 (2.30)	$t(28) = 1.95 (P < 0.1)$
MA craving (M, s.d.)	50.9 (28.7)	28.3 (29.4)	$t(34) = 5.58^*$	30.6 (30.3)	$t(32) = 3.05^*$

Abbreviations: AQ, Aggression Questionnaire; MA, methamphetamine; MAWQ, Methamphetamine Withdrawal Questionnaire; NA, not applicable. * $P < 0.05$.

A similar (but nonsignificant) effect was found in a subsample matched for ethnicity (Caucasian only: MA, $N = 13$ (8 low risk); control, $N = 12$ (5 low risk)). Amount of MA used (g per week) (Table 1) correlated inversely with signal change in the amygdala ($r = -0.710$, $P < 0.001$), and frequency of use (days per month) showed a similar trend ($r = -0.393$, $P = 0.063$).

Whole-brain analysis. To identify regions in which activation varied with SERT genotype, we queried voxels active during observation of faces (vs fixation) for a main effect of genetic risk (low risk vs high risk). Regions showing this effect included occipital cortex, fusiform and supramarginal gyri, and ventrolateral, dorsolateral and dorsomedial PFC (Figure 2a and Table 3). To identify regions in which activation differed by MA abuse status, we compared voxels active during observation of faces between MA and control participants. Regions showing this effect included occipital cortex and right ventrolateral and dorsolateral PFC (Figure 2b and Table 3). A cluster in right ventrolateral PFC showed effects of both genetic risk and MA abuse (Table 3).

Discussion

Our investigation suggests that although SERT genotype influences aggression and brain function, this effect appears to be independent from that of MA. We found no evidence for higher SERT risk allele loads in the MA-dependent group, and no interaction between MA abuse and genetic risk in predicting aggression (AQ scores). The imaging findings suggest that genotype and MA abuse act via distinct neural substrates, overlapping only in right ventrolateral PFC. However, it should be noted that the present sample was relatively small, and negative findings should be interpreted with caution.

Our finding of comparable SERT risk allele loads between MA-dependent and control groups in the present sample is consistent with a previous study,⁵⁵ and is the first report of the relative distribution of STin2 alleles in these groups. The findings argue against the possibility that a disproportionate load of SERT risk alleles in MA-dependent populations drives observed differences in aggression and neurocircuitry. However, only three SERT polymorphisms were queried, and SERT is among many polymorphic genes influencing aggression,⁶⁵ suggesting that other genetic loci may play a role. It is also possible that owing to differences in early environmental experiences,⁶⁶ differential gene \times environment interactions led to distinct outcomes despite similar SERT allele distributions. Given the relatively small sample size, the possibility that the analysis was not adequately powered to detect differences in genotype distribution cannot be excluded. Replication in a sufficiently large sample ($n > 7866$, given *post-hoc* power analyses with present effect sizes) would be necessary to conclusively interpret this negative finding.

The aggression self-report findings, showing effects of both MA abuse and genetic risk, are consistent with previous reports of heightened hostility and aggression in MA-abusing samples,^{2–8} as well as evidence for LPR short allele and STin2 12-repeat allele involvement in social-cognitive and emotional phenotypes associated with aggression.^{31–35} However, there was no interaction between these factors, suggesting that MA abuse and SERT genotype influence aggression via distinct mechanisms.

One such distinction may involve the amygdala, as its activation showed an effect of genetic risk, but not MA abuse. Our finding of SERT-related variation in amygdala activation is consistent with previous reports;^{42–44} however, the direction of the effect was unexpected. In previous studies, LPR short-allele carriers have exhibited amygdala hyperactivation,

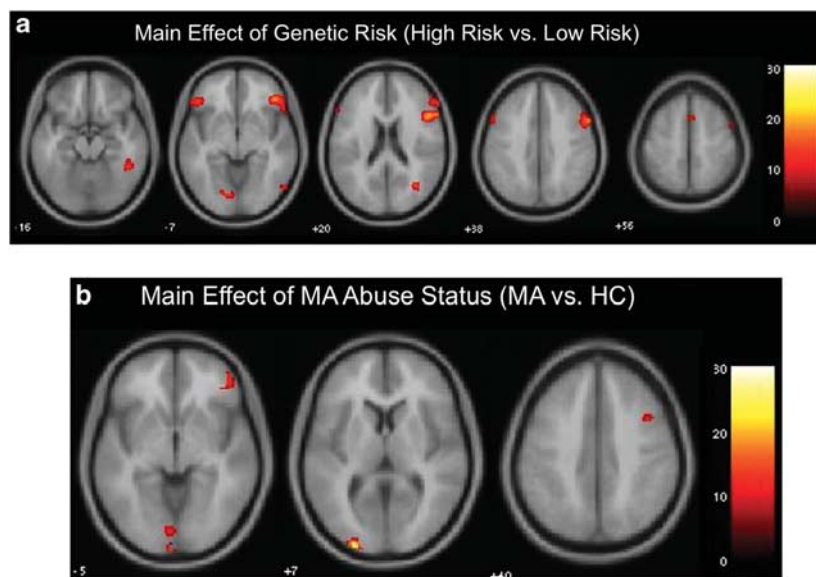


Figure 2 Statistical maps overlaid onto a standard structural template provided by SPM5. (a) Regions showing a main effect of genetic risk (low vs high) in activation associated with observation of faces. Regions included occipital cortex, fusiform and supramarginal gyri, and ventrolateral, dorsolateral and dorsomedial prefrontal cortex (see Table 3). (b) Regions showing a main effect of MA abuse status (MA vs HC) in activation associated with observation of faces. Regions included occipital cortex and right ventrolateral and dorsolateral prefrontal cortex (see Table 3). HC, healthy control; MA, methamphetamine-dependent; SPM, statistical parametric mapping.

Table 3 SPM clusters for observation of faces (compared with fixation)

Contrast	Region	Direction of effect	MNI coordinates of peak voxel (mm)			F-value	Cluster size (voxels)
			x	y	z		
Main effect of genetic risk (low risk vs high risk)	Right inferior frontal gyrus/ orbitofrontal cortex ^a	LR > HR	42	32	4	25.2	2096
			50	16	22	21.7	
			60	18	12	20.1	
	Left inferior frontal gyrus/ orbitofrontal cortex ^a	LR > HR	-60	18	30	19.3	613
			-44	22	4	17.4	
			-46	32	-8	15.0	
	Right lateral occipital cortex ^a	LR > HR	58	-72	0	18.7	37
	Right lateral occipital cortex ^a	LR > HR	34	-66	18	17.2	104
	Left lingual gyrus	HR > LR	-10	-80	-6	14.7	61
	Right fusiform gyrus ^a	LR > HR	44	-44	-18	14.1	175
	Right supramarginal gyrus ^a	LR > HR	52	-40	10	12.8	140
Superior frontal/paracingulate gyrus	LR > HR	2	12	56	10.2	34	
Main effect of MA abuse status (MA-dependent vs control)	Left occipital cortex	HC > MA	-26	-98	8	28.0	135
	Left occipital cortex	HC > MA	-2	-102	-8	17.2	34
	Left lingual gyrus	HC > MA	-2	-84	-2	13.6	78
	Right inferior frontal gyrus/ orbitofrontal cortex	HC > MA	48	46	-2	12.9	125
	Right middle frontal gyrus ^a	HC > MA	38	10	44	12.4	89
	Right precentral gyrus	HC > MA	-32	-14	66	12.0	38
Overlap between effects	Left precentral gyrus	HC > MA	36	6	58	10.8	37
	Right inferior frontal gyrus/ orbitofrontal cortex		44	40	-6	12.7	33

Abbreviations: HC, healthy control group; HR, high-risk group; LR, low-risk group; MA, methamphetamine-dependent group; MNI, Montreal Neurological Institute; SPM, statistical parametric mapping.

^aRegions that survived after entering age, sex and education as covariates.

whereas in the present sample, signal change was lower in this group. It is possible that the finding reflects tonic hyperactivity of the amygdala in the high-risk group, creating a ceiling effect, while individuals in the low-risk group can accommodate a larger change in activation. Several lines of evidence support this view, including a 'tonic model',⁶⁷ suggesting that carriers of the LPR short allele have high amygdala activity at rest and during neutral and undefined conditions.^{68–70} In addition, amygdala activation in the present MA-dependent sample correlated inversely with MA use measures (amount and frequency), so that the lowest signal change occurred in those participants who used MA most heavily. Heavy MA use has been associated with high glucose metabolism in the amygdala,²¹ suggesting that in the present sample, the lowest activation reflected the highest glucose metabolism (tonic activity). The direction of the effect may therefore reflect the relative nature of functional magnetic resonance imaging, rather than an actual reversal of the effect.

Our finding that amygdala activation did not differ between MA-dependent and healthy participants suggests that heightened MA-related aggression may occur via mechanisms independent of the amygdala (for example, higher cognitive and executive processes, life and social experiences or personality traits). Again, we cannot exclude the possibility that our sample size did not permit detection of differences. Replication in a sufficiently large sample ($n > 275$, given *post-hoc* power analyses with present effect sizes) would be necessary to conclusively interpret this negative finding.

Finally, both MA abuse and genetic risk modulated activation in cortical regions linked to emotion processing, but the regions showed little overlap. Genetic risk influenced the core system for visual analysis of faces,⁷¹ and PFC regions involved in recognition and interpretation of facial affect, calculation of stimulus contingencies and regulation of emotional responses,^{11,72} consistent with the idea that SERT-related aggression is linked to social-cognitive neurocircuitry. Effects of MA abuse were less manifest, revealing only small activation differences in PFC and occipital cortex. While also part of emotion processing circuitry, the roles of these regions are less clear. Among the regions identified, the only one that showed overlap between genotype and MA effects was the right ventrolateral PFC, a region implicated in social cognition and inhibitory control.^{13,14} The overlap suggests that this region modulates aggression regardless of sources of variation (genotype or MA abuse), suggesting it may have utility as a biomarker for risk or intervention. Taken together, the data suggest that the effects of MA abuse add to—but mostly do not interact with—genetic risk in modulating aggression and associated neurocircuitry.

Several limitations of the study should be noted. First, statistical power was limited owing to sample size. We maximized power by combining groups, using a small number of outcome measures and including an ROI approach in functional magnetic resonance imaging analyses. Second, not all withdrawal symptoms resolved by the time of testing, possibly confounding results; however, symptoms

and outcome measures were not correlated, suggesting that outcomes were independent of withdrawal. In addition, data were obtained at only one point following a brief abstinence period; differences in brain activation may vary with time. Third, our method for combining genotypes was based on one prior study in a prison population,⁵¹ and generalization to other populations is uncertain; however, our results using both combined and individual variants (see Supplementary Materials) support using this strategy more broadly. Finally, comparable amygdala activation between negative and neutral faces calls into question the psychological significance of the probe task. However, although broad, the measured psychological operation ('detection of socially salient environmental cues') appears highly relevant to aggression, and as such, meaningful to investigate. Potential reasons for comparable amygdala activation between stimulus types are small sample size/low statistical power, attribution of negative valence to neutral faces^{73,74} or general role of the amygdala in detecting socially relevant stimuli rather than merely threat.⁷⁵

In summary, this study adds to our understanding of genotype- and MA-related modulation of aggression and social-cognitive neurocircuitry, suggesting that differences associated with MA abuse occur independently of, and in addition to, the predisposing influence of SERT genotype; it is therefore important to recognize that in a certain proportion of MA-dependent individuals, mere abstinence from MA or attention to MA-use effects will not be sufficient in decreasing propensity for aggression and violence (and, thereby, minimizing risk for stress-induced relapse). At the same time, the findings point to right ventrolateral PFC as a potential biomarker for both MA- and genotype-related aggression, suggesting that modulation of its function may allay this behavior regardless of its source. In light of these findings, continued investigation of socio-emotional function and its neurobiological underpinnings will be critical in addressing problematic behaviors and developing appropriate strategies for intervention.

Conflict of interest

Dr McCracken reports receiving research grants from Sea-side Therapeutics and Bristol Myers Squibb, and has served as a consultant to Roche, Novartis, BioMarin and PharmaNet. The remaining authors declare no conflict of interest.

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New Directions for Domestic Violence Offender Treatment Standards: Colorado's Innovative Approach to Differentiated Treatment

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Colorado has recently adopted revised state standards for the treatment of domestic violence offenders who are court ordered to complete treatment. State standards across the county have been criticized in the past for not being empirically based. This article presents the empirically based principles of Colorado's revised Standards.¹ The Standards are unique in their focus on differentiated treatment for offenders, and their use of the Domestic Violence Risk and Needs Assessment (DVRNA), an assessment tool developed in Colorado to identify offender risk and criminogenic needs. Offenders' overall scores on the DVRNA determine their dosage and intensity of treatment and containment. This article first discusses the history of Colorado's Standards, followed by a presentation of the new Standards. Most importantly, the empirical evidence providing the foundation for these Standards is presented. This article concludes with a discussion of Colorado's implementation plans for the revised Standards, limitations to the utility of Colorado's Standards, and directions for future research.

KEYWORDS: treatment standards; domestic violence offenders; risk and needs' assessments; recidivism

Domestic violence (DV) is the manipulative attempt by one person to obtain power and control over his or her intimate partner with a coercive, systematic pattern of abusive behavior. DV may include psychological, physical, sexual, and stalking behaviors. The intense emotional involvement between the victim, offender, and, oftentimes, children distinguish DV from other types of crime. Walsh (2001) observes that domestic violence is a phenomenon that does not fit entirely within one agency's responsibility because it involves numerous social service agencies such as health systems, criminal

justice systems, and private and nonprofit systems. Many terms have been used synonymously with DV, including intimate partner violence (IPV), relationship violence/aggression, partner abuse, and wife/spousal abuse (Gover, 2009b). Empirical literature has documented numerous negative consequences to this form of violence, which occurs across all segments of society regardless of faith, education level, income level, or sexual orientation. Whereas researchers have documented and agree on the extensive deleterious consequences of DV, having accurate prevalence estimates on the extent to which violence is perpetrated and experienced by both men and women depends on the source of data one uses for these estimates. One of the most common sources of data cited by advocates and academic researchers for DV statistics is the National Violence Against Women Survey (NVAWS) which was conducted by the Bureau of Justice Statistics and the Centers for Disease Control (Tjaden & Thoennes, 2000). According to findings from the NVAWS, 22.1% of women and 7.4% of men surveyed reported experiencing physical assault by a current or former spouse, cohabitating partner, boyfriend or girlfriend, or dating partner at some point during their lifetime. Physical violence experienced during the previous year was reported by approximately 1.3% of women and 0.9% of men. Overall, 2,135,000 men and women experience physical violence by an intimate partner each year in the United States (Tjaden & Thoennes, 2000). While the majority of studies report women as victims and men as perpetrators, several large representative sample surveys and particularly nongovernmental statistics have reported equivalent perpetration rates across gender (Whitaker, Haileyesus, Swahn, & Saltzman, 2007). Although there are studies that support such equivalency rates, these estimates by themselves fail to indicate the higher rates of injuries among female victims compared to male victims (Archer, 2000; Tjaden & Thoennes, 2000).

During the 1980s, the criminal justice system responded to DV with the implementation and passage of mandatory/pro/presumptive arrest policies and statues, which resulted in an increase in arrests for misdemeanor domestic violence in jurisdictions across the country. To put this into perspective, the system went from dispatch dissuading victims during the 1960s from involving the police in a domestic dispute (Parnas, 1967) to, during the 1980s, officers being statutorily required to make an arrest based on probable cause. The criminal justice system was still averse to imposing jail time for misdemeanors, so the common judicial response was referral to treatment, often as part of a diversionary program. As DV arrests were increasing across the country, the DV movement (also referred to as the battered women's movement) was gaining momentum in society through the mass establishment of battered women's shelters and safe houses. Shelters provide safe environments for women and children and often offer crisis intervention, counseling, advocacy, assistance for victims seeking protection orders, and legal assistance as many women navigate their way through the criminal justice system.

Additional criminal justice responses to domestic violence have become common practice in many jurisdictions. For example, in addition to the law enforcement implementation of pro/mandatory arrest policies, some jurisdictions have implemented

no-drop policies, victimless prosecutions, and domestic violence courts (Gover, MacDonald, & Alpert, 2003; Gover, Brank, & MacDonald, 2007). Prosecutorial practices make the decision in place of the victim on whether to charge an offender based on the strength of the evidence in the case. Many prosecutors interact with what they refer to as “uncooperative” victims/witnesses who may recant the details of the incident for a number of reasons. If the responding officer and detective did a thorough job collecting evidence, then the strength of the case is not determined by the victim’s participation and cooperation (Gover, 2009). Additionally, the implementation of specialized domestic violence courts in many jurisdictions indicates that the system is recognizing the importance of a coordinated community response to partner violence (Gover et al., 2003; Gover et al., 2007). Other strides include a postdisposition focus on offender monitoring and containment, improving victims’ access to orders of protection, intensive probation supervision for domestic violence offenders, and mandated intervention programs for batterers.

Because of the increases in arrests that resulted from mandatory and pro arrest policies, many forms of batterer intervention programs correspondingly emerged. These programs, primarily designed for male offenders, serve those who are court ordered to obtain DV treatment in an effort to change offender thinking and behavior. A major component of research within the DV offender literature has been efforts to determine whether batterer intervention programs are producing successful outcomes.

At best, intervention programs for batterers’ court ordered to attend treatment have demonstrated a small deterring impact on subsequent violence (Babcock, Green, & Robbie, 2004; Feder & Wilson, 2005). According to Peterson (2008), the criminal justice system has not been effective in their efforts to reduce recidivism among domestic violence offenders. Lerman (1992) suggests that evidence exists for the efficacy of program approaches focusing on one or two components of the criminal justice response (e.g., arrest, prosecution, and batterer intervention programs). Wooldredge and Thistlethwaite (2002) reported that prosecution and conviction of DV cases resulted in deterrent outcomes (Syers & Edleson, 1992; Ventura & Davis, 2005). Some have argued that approaches and interventions can only succeed if each intervening component is implemented as part of a coordinated community response (Murphy, Musser, & Maton, 1998). Coordinated community responses have been promoted by researchers and practitioners as the most promising approach to obtain reductions in DV offenses (Babcock et al., 2004; Shepard, 1999; Shepard & Pence, 1999).

One noteworthy five year study, funded by the National Institute of Justice, is the Judicial Oversight Demonstration (JOD) project (Visher, Harrell, Newmark, & Yahner, 2008; Visher, Newmark, Harrell, & Turner, 2007). This project attempted to develop state-of-the-art coordinated community response partnerships within three jurisdictions. Several positive findings were reported from this project, including the successful collaborations developed between probation and court services to enhance offender accountability. Despite these positive findings, results also indicated that the JOD did not have strong deterrent effects on DV offenders, and victims did not

report feeling safer. Overall, the JOD study indicates, at best, a small deterrent impact on recidivism among DV offenders.

Generally, despite the lack of empirical support for interventions designed to positively change offender behavior and subsequently keep victims safe, much variability continues to exist in batterer intervention programs in terms of their philosophies, content, and provider credentials. To promote consistency in the provision of treatment, DV activists lead the charge to develop state standards to guide treatment programs. According to Holtzworth-Munroe (2001), the proliferation of batterer treatment programs was one of the main reasons for the development of treatment standards for DV offenders.

Many state standards have similar content and are likely to stipulate the length, format, content, provider qualifications, and method of treatment for offenders. One example of variation is differences in the specified length of treatment. The range includes a nonspecified length of time to 1 year or more. Many states apply the *same* time frame requirements for treatment to all DV offenders, which is anecdotally referred to by some as a “one-size-fits-all” approach, despite the accumulating evidence that DV offenders are a heterogeneous group of individuals.

Several common themes can be identified within standards’ content, which primarily includes the priority of victim safety, followed by offender accountability, the role of a coordinated community response to DV treatment and containment, batterer treatment fees and group treatment as the favored treatment modality. Some standards are required to be revised when necessary. Other common aspects of state standards focus on offender intake, including histories of violence, mental health and substance abuse histories, and lethality issues.

A common criticism of early state standards is their development without being justified in the empirical literature (Austin & Dankwort, 1998). This and related issues will be discussed at greater length in subsequent paragraphs. This article first discusses the prevalence and consequences of DV. Previous policy on batterer intervention in Colorado is explained and followed by a presentation of recently revised standards in terms of their development, implementation, and the empirical evidence supporting the standards’ revisions.

DOMESTIC VIOLENCE IN COLORADO

Scope of the Problem

Understanding the relevance of state standards for batterer intervention treatment requires recognition of DV as a serious public health problem that jeopardizes the safety of thousands of individuals each year. According to the Colorado Division of Criminal Justices’ Office of Research and Statistics, there were over 92,000 DV charges filed by prosecutors in Colorado (not including charges filed by Denver County Court) between 2000 and 2006. According to the Colorado Bureau of Investigation’s

(2006) *Crime in Colorado 2005* report, there were 31 DV related homicides in 2005. In 2009, out of 72,876 criminal cases filed in Colorado County Courts, 13,578 (19%) were categorized as DV, and the frequency of DV was proportionally larger than any other misdemeanor type (Colorado Judicial Branch, 2010). Furthermore, almost half of homicides in Colorado are perpetrated by a current or former intimate partner (Project Safeguard, 2007). The impact of violence reverberates throughout families—almost half (43%) of shelter residents in 2007 were children (Colorado Department of Human Services, 2008). Nineteen children were killed between 2000 and 2007 as a result of DV (Project Safeguard, 2007).

Consequences of Domestic Violence

Research indicates that negative physical and mental health outcomes are prevalent among those victimized by DV. For both men and women, victimization by physical abuse is connected to a heightened risk of ill health, substance use, injury, and developing a chronic disease (Coker et al., 2002). Migraines, headaches, stiff neck or tension, eating disorders, sleeping problems, and even stroke have also been associated with DV victimization (Brewer, Roy, & Smith, 2010). Regarding the psychological impact of DV, many victims report living in chronic fear (Belknap & Sullivan, 2002; Fischer & Rose, 1995), which can lead to severe anxiety and avoidance (Herman, 1992). In a recent study by the World Health Organization, women victimized by DV across 10 countries reported eating and sleep disorders, phobias, posttraumatic stress disorder (PTSD), panic disorders, suicidal tendencies, self-harming, and risky sexual behavior (Ellsberg, Jansen, Heise, Watts, & García-Moreno, 2008). Somberg and Dutton (2002) found that 67% of victims indicated both PTSD and depression, 16% experienced depression alone, and 3% suffered PTSD alone. A separate study indicated that 28% of female DV victims experienced moderate to severe symptoms of depression, and 11% reported severe symptoms (Campbell, Kub, Belknap, & Templin, 1997). Such serious health outcomes are one origin of the high costs of DV—estimated to be more than \$8.3 billion a year (Centers for Disease Control and Prevention, 2003; Max, Rice, Finkelstein, Bardwell, & Leadbetter, 2004), comprising medical care services, mental health care, and loss of productivity in the workforce.

The importance of social support has found some evidence as moderating the relationship between DV and psychological distress (Brewer et al., 2010; Campbell, Sullivan, & Davidson, 1995). Campbell et al. (1995) found that upon leaving a shelter, victims who retained higher levels of social support were less likely to report depression six months later. Brewer et al. (2010) also found that the absence of social support was related to an increased risk for physical illness and frequent symptoms of ill health. With this in mind, and awareness that victims report significant levels of DV victimization postdisposition (Belknap & Sullivan, 2002), it is important that the response to DV involve holistic and coordinated policies (Shepard, 1999; Shepard & Pence, 1999).

Descriptive Data on Domestic Violence Offenders in Colorado

DV is occurring in Colorado at alarming rates, which means that thousands of individuals are experiencing severe forms of trauma while having their lives altered in numerous ways. Often, before a legitimate systematic policy response can be developed, it is important to look at a “profile” of DV offenders. Among a sample of 4,095 DV offenders who participated in court ordered treatment in Colorado, 81% of offenders were male and 56% were White. Offenders were approximately 33 years old on average at the time of their treatment intake. More than half of the offenders (54%) were arrested for a violent offense at the time of the DV incident. Most offenders were not under the influence of alcohol at the time of their arresting offense (63%), were employed at the time of their offense (83%), were on parole or probation supervision when they entered treatment (74%), and were living with their spouse or partner at the time of their offense (71%). But, only 40% were living with their spouse or partner when they were discharged from treatment.

Most offenders (79%) participated in group treatment, and the remaining 21% participated in alternative treatment modalities, which could have been individual and group treatment, individual counseling only, or couples counseling. Only 9% of the sample had prior success in DV treatment and 51% were arrested for the first time for a DV offense. Sixty-eight percent of the sample completed treatment. See Gover, Jennings, Davis, Tomsich, & Tewksberry (in press) for an in depth description of this sample of DV offenders in Colorado who were court ordered to complete treatment.

Previous Policy on Batterer Intervention Treatment in Colorado

The first informal standards for court-ordered DV treatment in Colorado were created in 1986 by a group of advocates and practitioners who were concerned about the response to DV. In 1987, the first DV bill passed in the state, which created the State Commission and Local Judicial District Boards to oversee court-ordered domestic violence offender treatment. This legislation mandated 22 local judicial district boards to oversee domestic violence offender treatment. The bill also stipulated that formal standards be developed and implemented. In 1988, the first DV standards in the United States were published in Colorado. These Standards stipulated that DV offenders who were court ordered to complete treatment *must complete a minimum of 36 weeks of treatment*.

Following the adoption of the 1988 Standards, concerns developed about the inconsistency in the provision of DV offender treatment across Colorado. In response to these concerns, the Colorado Department of Public Safety, in collaboration with other state agencies, collaborated to eliminate the local board system and create a revised system statewide to oversee the provision of DV treatment. During the 2000 Legislative Session, and after a four year effort, statute (C.R.S. 16-11.8-10) was passed that provided for the transition of the former local board system to the current state board system. This legislation created the Domestic Violence Offender Management

TABLE 1. Characteristics of Domestic Violence Offenders in Colorado (N = 4,095)

Variables	%
Male	80.8
White	56.0
Age at Intake <i>M(SD)</i>	33.35 (10.17)
Arrested for a violent crime	54.2
No alcohol intake at the time of the crime	62.5
On probation/parole supervision	73.5
Employed	83.1
Living with spouse/partner at time of offense	71.2
Living with spouse/partner at the time of discharge	39.7
First time DV Arrest	50.6
No prior success in DV treatment	90.6
Participated in group treatment only	78.6
Treatment Completion	67.8

Board (DVOMB), housed within the Division of Criminal Justice (DCJ). The DVOMB is comprised of 19 multidisciplinary members.² The main objective of the DVOMB is to develop and implement the Colorado Standards for the evaluation, treatment, and continual monitoring of adult DV offenders who are court ordered to attend treatment. Another main function of the DVOMB is to approve DV treatment providers across the state.

Colorado's Revised Standards for Domestic Violence Offender Treatment

In 2005, the DVOMB created a Treatment Review Committee to conduct an evaluation of Colorado's Standards. The Committee began their work by examining the evidence-based research on the utilization of risk assessments in reducing recidivism for offenders in the criminal justice system.

According to work conducted by the Committee, DV offender treatment across the state, for over 10 years, had become a *flat* sentence of 36 weeks, instead of a *minimum* of 36 weeks of treatment. In addition, in some instances, judges, district attorneys, and treatment providers created alternative treatment options for offenders that were inconsistent with the mandated Standards. Additionally, offender evaluations were inconsistently conducted due to different assessment instruments being used at intake. Finally, it became apparent that treatment providers' evaluation and treatment were not highly focused on assessing recidivism risk, which was identified by the Committee to be a key component of risk management and offender containment.

Most professionals in Colorado's DV field thought that a time driven model, also referred to as a "one-size-fits-all" approach, was historical, anecdotal, and not

appropriate for all offenders. Professional consensus identified a need to differentiate between higher and lower risk offenders. Higher risk offenders may not have been receiving adequate treatment, and lower risk offenders may have been receiving additional, unnecessary treatment simply to comply with the Colorado Standards. Following the recommendation by Douglas and Skeem (2005) that risk assessment with more dynamic and complex outcomes are needed, the Committee focused their efforts on identifying relevant types of information (e.g., criminal history) that would be needed to determine risk levels for offenders. The Committee then concentrated on the development of an instrument to identify offenders' risk levels for recidivism. The instrument could be used to reassess risk during treatment. The instrument, the Domestic Violence Risk and Needs Assessment (DVRNA), was developed to identify the risk level of offenders for the provision of differentiated treatment. Additionally, the DVOMB acknowledged that to contend with DV offenders, there must be a coordinated community response inclusive of the criminal justice system, treatment providers, and nonprofit victim service providers within the community. The DVRNA was developed to be a multidisciplinary tool for identifying the risk and needs level of an offender to facilitate a coordinated community response. A team of individuals is responsible for reaching consensus on offenders' level of risk according to DVRNA scores. The team is comprised of a treatment provider, probation or parole officer, and a victim advocate, and is referred to as the Multidisciplinary Treatment Team (MTT). The development and implementation of the DVRNA and structure of the MTTs is discussed in detail below.

Colorado's Philosophy of Domestic Violence Offender Treatment

The purpose of DV offender treatment in Colorado is to increase victim and community safety by reducing offenders' risk of recidivism. Treatment provides the offender with the opportunity for personal change by challenging destructive core beliefs and teaching positive cognitive-behavioral skills. Although treatment provides offenders with the opportunity for personal change, treatment can only be effective if the offender desires change and if the rest of the community, including the criminal justice system, is a collaborative partner in offender containment and management. Although the Colorado Standards focus on the offender, treatment must make victim safety the most important consideration.

EMPIRICAL LITERATURE SUPPORTING STATE STANDARDS IN GENERAL AND EMPIRICAL LITERATURE SPECIFIC TO COLORADO

As mentioned earlier, state standards vary in the extent to which they are based on empirical literature (Austin & Dankwort, 1998; Geffner & Rosenbaum, 2001). Holtzworth-Munroe (2001) purported that many assumptions underlying standards are not validated by data. Based on this, the utility of standards has been questioned.

This concern is summed up well by Maiuro, Hagar, Lin, and Olson (2001), “the issue of whether existing state standards are adequately informed by research is a question of questions” (p. 39). To address this specific criticism of state standards, the development of Colorado’s revised treatment Standards and differentiated treatment model was based on a detailed analysis of relevant empirical work of the following prominent scholars: Edward Gondolf, Alex Piquero, Robert Brame, Jeffrey Fagan, Terrie Moffitt, Don Andrews, James Bonta, Stephen Hart, Randall Kropp, Lundy Bancroft, and Jacquelyn Campbell. The main aspects of these scholars’ research that informed the revised Standards are discussed in the subsequent paragraphs.

Gondolf (2001) conducted a longitudinal study to assess the effectiveness of batterer intervention treatment at 30- and 48-month follow-up periods. Gondolf (2001) reported that approximately 20% to 25% of batterers were causing the most injury to victims, recidivating at the highest levels, and were most resistant to interventions. Based on this finding, Gondolf (2002) suggested that there is a need for identifying and containing “repeaters” through on-going risk management. Gondolf also reported that victim perceptions of their own safety is highly predictive of re-assault, which emphasizes the importance of listening to victims and considering their safety as an important component of offender containment. Finally, when following offenders and victims for 30 and 48 months (which is longer than other studies’ follow-up periods), there seemed to be a positive effect from treatment, so his work shows that there can be positive long-term outcomes from batterer intervention and that cognitive behavioral therapy can be effective for many men. Supporting his earlier research, Gondolf conducted subsequent longitudinal investigations with colleagues and identified four trajectories among DV offenders with varying probabilities of future assaults (Jones, Heckert, Gondolf, Zhang, & Ip, 2010). Hence, DV offenders have complex behavioral patterns over time. Gondolf’s work has informed the overarching vision and approach that Colorado has taken toward DV offender treatment in that not all offenders are the same. Some offenders need more treatment and supervision, other offenders need less treatment and supervisions, and offenders’ supervision and treatment needs may change because many offenders are, in fact, amenable to change. Additionally, Gondolf’s work influenced the development of Colorado’s revised differentiated model of treatment by enforcing the importance of victims’ perceptions of their safety in containment management and accurately identifying higher risk offenders prior to the offender beginning the process of treatment. The intensity and dosage of treatment would be implemented accordingly.

Piquero, Brame, Fagan, and Moffitt (2006) examined the key issue of offender specialization among DV offenders. Piquero et al. (2006) reported that about one-third of the DV offenders in their sample did not have a criminal history, about one-third of the sample had histories of nonviolent crime, and one-third of the sample had violent offense histories. Therefore, the minority of offenders in their sample were found to specialize exclusively in violent criminal behaviors. This suggests that DV offenders are generalists rather than specialists (Piquero et al., 2006). Piquero et al., (2006) guided the revised treatment standards by emphasizing the

importance of other criminal activity as an aspect of risk and treatment needs. Additionally, this research demonstrated that because DV offenders did not necessarily specialize in DV offenses, the DVOMB used general criminological recidivism research using samples of general offenders to guide the development of the revised differentiated model. Piquero et al. (2006) suggested that some offenders escalated in their violence perpetration, some offenders de-escalated, some offenders maintained a stable low-level aggression, and some offenders maintained a stable high-level aggression. These findings again suggest that DV perpetrators are not a homogeneous group and therefore supports the need for differentiated treatment, which is consistent with other research showing heterogeneity of offenders (Gondolf, 1988; Hamberger & Hastings, 1986; Holtzworth-Munroe, 2001; Saunders, 1992). According to Piquero et al. (2006), general criminal careers research indicates that DV is a component of a general pattern of problematic behavior. Offenders arrested only for DV appear to be the exception rather than norm. Because Piquero et al. (2006) suggests that DV offenders do not specialize, the DVOMB drew on this study and other relevant criminological literature to apply empirically based findings from the general offending literature for the development of the differentiated treatment model.

Empirical work conducted by Andrews, Bonta, and Hodge (1990) provided direction for the development of Colorado's revised Standards, especially in terms of applying the Risk and Needs Principle to DV offender treatment. The Risk Principle is the premise that future criminal behavior can be predicted by past behavior. This fact has been empirically supported in the criminological literature. Thus, offenders who present the highest risk are those targeted for the greatest number of interventions. According to Carey (1997), when offenders are properly screened and matched to appropriate levels of treatment, recidivism is reduced by an average of 25% to 50%. Andrews and Bonta (1994) also report that to reduce recidivism the intensity of treatment must be matched to the offender's risk level. Providing high levels of treatment to low-risk offenders can have adverse affects on low-risk offenders. Finally, Andrews and Bonta (1994) suggest that criminogenic needs include dynamic factors, such as substance abuse, antisocial attitudes, unemployment, marital relationship, etc., which have been shown to be correlated with criminal conduct and the amenability to change. Criminogenic needs are dynamic aspects of an offender's situation that, when changed, are associated with changes in criminal behavior (Bonta, 2002). As dynamic factors, criminogenic needs may contribute toward criminal behavior (e.g., DV) and if effectively addressed, should decrease one's level of risk (Andrews, 1989; Andrews & Bonta, 1994; Bonta, 2002). Following Andrews and Bonta (1994), Colorado's differentiated model of treatment recognizes that low-risk offenders should not be exposed to high-risk offenders during treatment. Additionally, offender risk is matched to the intensity level of treatment (i.e., the Risk Principle). According to Colorado's revised Standards, it is necessary to assess and reassess criminogenic needs, including incorporating the identified needs into treatment planning (i.e., the Needs Principle).

Prior to the development of the revised differentiated model, the Spousal Assault Risk Assessment (SARA) was the primary risk assessment tool used by approved treatment providers in Colorado. According to Kropp and Hart's (2000) research on DV offender assessments, the SARA, which is comprised of mostly static factors, was found to be valid and reliable. However, the SARA does not provide a guide for the level or intensity of treatment for offenders. Furthermore, because the SARA is comprised of mostly static factors, it cannot be used to assess changes in risk during treatment. Identifying these limitations led to the development of the DVRNA. Because the DVRNA is comprised of static and dynamic factors, it allows for an initial identification of offender risk and can be used to reassess an offender's increase or decrease in risk while treatment is ongoing.

Work by Bancroft and Silverman (2002) informed the development of the revised differentiated treatment model in terms of the importance of incorporating core competencies in offender treatment. Bancroft and Silverman (2002) also focus on the importance of offender accountability in treatment. The Colorado revised treatments Standards include the following example competencies: "understanding of one's own pattern of abuse"; "identifying different types of abuse"; "understanding the impact of one's abuse on others, including partner and children"; and the "development of a relapse prevention plan." According to Colorado's differentiated model of treatment, offenders are required to understand and apply numerous competencies to show progress in treatment. The revised model does not allow offenders to be discharged from treatment until success in all core competencies has been demonstrated.

Jacquelyn Campbell (2001) reported that 67% to 80% of intimate partner homicides involve physical abuse (female victim and male offender) prior to the murder. Campbell identified numerous risk factors for femicide. The strongest sociodemographic risk factor for femicide was the abuser's lack of employment. Other risk factors for femicide included the abuser's access to a firearm and abuser's use of illicit drugs. Additionally, the frequency and severity of abuse over time was found to increase the likelihood of femicide. Campbell's femicide study directly informed the revised differentiated treatment model by the incorporation of specific risk factors for femicide in the DVRNA.

KEY OFFENDER ASSESSMENTS USED FOR THE DEVELOPMENT OF THE DOMESTIC VIOLENCE RISK AND NEEDS ASSESSMENT

Research has consistently shown that actuarial instruments are superior to clinical judgment in the prediction of future criminal behavior (Andrews, 2001; Bonta, 2002). Consequently, the DVRNA is designed to identify risk factors that should be considered when working with DV offenders in treatment. Comprised of risk factor domains that have been identified through empirical research as increasing the risk of violence or escalating its seriousness, the DVRNA presents a framework for assessing the risk of future violence by offenders. By consolidating risk factors into a single measure, the DVRNA provides a method of determining the likelihood of

ongoing or repeat violence. The DVRNA classifies offenders into one of three levels of treatment: low-intensity, medium-intensity, and high-intensity. Included in the DVRNA are the *empirically valid risk factors* most commonly or uniquely related to DV reoffending, DV lethality, and general criminal recidivism. The DVOMB created the DVRNA utilizing items from the following existing risk assessment instruments: the Spousal Assault Risk Assessment Guide (2nd edition), the Ontario Domestic Assault Risk Assessment (ODARA), the Level of Supervision Inventory (LSI VII), the Domestic Violence Screening Instrument (DVSI), and the Danger Assessment Scale (Campbell, 2009). Each one of these will be discussed in the following section.

The SARA is a highly validated clinical checklist for assessing the risk of DV. This instrument is comprised of 20 factors related to the risk of violence in general and the risk of DV (Kropp, Hart, Webster, & Eaves, 1999). These risk factors represent criminal history, psychosocial adjustment, spousal assault history, and the index offense. Using items based in the empirical research literature and used in combination with clinical experience, Kropp & Hart (2000) reported that the SARA significantly differentiated between recidivistic and nonrecidivistic spousal assaulters. A second instrument used in the development of the DVRNA is the ODARA, which is a 13-item actuarial risk assessment constructed specifically for intimate partner violence against women. The items on the ODARA were derived from information available to, and usually recorded by, police officers responding to DV calls involving male perpetrators and female partners. The third risk assessment instrument that was used by the DVOMB to create the DVRNA was the LSI (Andrews & Bonta, 1995). The instrument consists of 54-item additive scales that represent 10 criminogenic domains (e.g., criminal history, familial relationships, alcohol and drug use, attitudes/orientations), and a considerable body of research has demonstrated its reliability and predictive validity (Andrews & Bonta, 1995; Gendreau, Goggin, & Smith, 2002; Schlager & Simourd, 2007). Additionally, the subscales contain both static (e.g., criminal history) and dynamic (e.g., alcohol/drug problems, family/marital status) risk factors. A fourth instrument, the DVSI, was developed by the Colorado Department of Probation Services and contains 12 questions pertinent to the DV offender's supervision level, including past experiences with DV treatment, prior DV violations, criminal history, and so forth. Williams and Houghton (2004) reported that the DVSI provided significant improvement over chance in predicting DV reoffending during an 18-month follow-up period. The fifth instrument considered in the development of the DVRNA is the Danger Assessment Scale. Developed by Jacquelyn Campbell, this scale was designed to assess lethality factors in DV cases based on the consideration of the frequency and severity of battering. The Danger Assessment Scale was designed for nurses, advocates, and counselors to assess the likelihood of intimate partner homicide.

The DVRNA was developed following the detailed review of the five instruments discussed above, and based on a model of differentiated treatment. The DVRNA is comprised of the following 14 empirically based risk factor domains: Prior Domestic Violence Related Incidents; Drug or Alcohol Abuse; Mental Health Issues; Suicidal/

Homicidal; Use and/or Threatened Use of Weapons in Current or Past Offense or Access to Firearms; Criminal History—Nondomestic Violence (both reported and unreported to the criminal justice system); Obsession with the Victim; Safety Concerns; Violence and/or Threatened Violence Toward Family Members Including Child Abuse (does not include intimate partners); Attitudes That Support or Condone Spousal Assault; Prior Completed or Noncompleted Domestic Violence Treatment; Victim Separated from Offender Within the Previous Six Months; Unemployed; Absence of Verifiable Prosocial Support System (See Appendix for Risk Factor Domains and Corresponding Literature). The presence of risk factors determine whether an offender will receive low-intensity (level A), moderate-intensity (level B), or high-intensity (level C) treatment. Each risk factor domain is scored as 1 if the risk factor is present, with 14 as the maximum score on the DVRNA.

The Colorado revised Standards recognize that treatment will vary by intensity and that levels of treatment can change during the treatment process, depending on the offender's progress. Empirical research suggests that when the intensity of treatment corresponds to offender risk for offenses in general, there is a greater possibility for reductions in recidivism. One benefit of the DVRNA is that it contains mainly dynamic risk factors, and gives treatment providers and the MTT the ability to reassess, modify, and change offenders' treatment plans during treatment. Whereas some offenders may remain in the same level throughout treatment, the model allows for offenders to move among different levels of treatment. Additionally, risk factor information may come to the attention of the MTT after the initial offender evaluation. This information would be used to implement a change in treatment to a higher intensity level, and likewise risk factor mitigation information may justify a decrease in the intensity of treatment.

IMPLEMENTING AND SCORING THE DOMESTIC VIOLENCE RISK AND NEEDS ASSESSMENT

Treatment intensity levels determine the offenders' treatment plan. Differences in treatment intensity levels correspond to differences in containment and treatment content. The intensity of treatment contact is differentiated by the amount of time the offender spends in treatment each week. The intensity of content differs by treatment goals. For example, low-intensity treatment content is largely educational, whereas high-intensity treatment is geared toward crisis intervention and the stabilization of the offender. Offenders are evaluated based on objective measures of risk and needs, including responsivity to treatment. Placement into risk level depends on an offender's overall score on the DVRNA. Offenders who have a score of 0 or 1 are placed in level A, which involves low-intensity contact and treatment. Level A offenders participate in treatment once a week in a group clinical session. At the time of their initial assessment, level A offenders have not demonstrated a pattern of ongoing abusive behavior. They may also have a prosocial support system, no criminal history, and no evidence of substance abuse or mental health instability. The DVOMB anticipates

that overall, a small percentage of offenders will be assigned to level A treatment, because this level was intended for offenders with no history of DV. Offenders initially placed in level A can be moved to level B or level C during treatment depending on progress in treatment or change in risk. Offenders, however, initially placed in levels B or C may not be moved to level A.

Offenders placed in level B have a DVRNA score of 2–4. Level B offenders receive moderate-intensity of contact and treatment, and are required to participate in weekly group clinical sessions. Additionally, these offenders are required to participate in an additional clinical intervention at least once a month. These offenders appear to have an identified pattern of ongoing abusive behavior but may exhibit some degree of denial about the abuse, which makes them moderately resistant to treatment. These offenders may or may not have a prosocial support system, may have some criminal history, and may have been assessed for moderate substance abuse or mental health issues at their initial evaluation. Offenders in level C who show a mitigation of risk factors during treatment may be moved to level B. The DVOMB anticipates that offenders assigned to level B will represent the largest DV-offending group.

Offenders who have a DVRNA score of 5 or higher are placed in level C, the highest intensity level of treatment. This group of offenders may be in *significant* denial and therefore have a high resistance to treatment. Offenders placed in level C are required to have two clinical contacts each week: one focused on core competencies and another treatment session such as cognitive skills group, substance abuse, or mental health issues group. Treatment for these offenders is focused on cognitive skills as well as criminogenic needs, with the intent of mitigating offender risk and increasing containment. Offenders who need the highest level of treatment are likely to have criminal histories and substance abuse/mental health issues. Offenders assigned to level C generally do not have a prosocial support system and may have difficulties with finances and maintaining employment. This group requires the maximum amount of resources in terms of MTT meetings, monitoring the offender, and treatment hours with the offender. Offenders in level C who make progress during treatment by mitigating risk factors may be moved to level B.

Length of treatment is determined by the mitigation of offender risk and progress in treatment, as determined by the MTT. To be eligible for treatment discharge, all treatment plan reviews must be completed and all competencies must be demonstrated, which are indicative of positive offender behavioral change. Additionally, the MTT must reach a consensus to discharge an offender.

THE USE OF THE MULTIDISCIPLINARY TREATMENT TEAM FOR THE IMPLEMENTATION OF THE DOMESTIC VIOLENCE RISK AND NEEDS ASSESSMENT

The administration and implementation of the DVRNA and levels of treatment involves members of a collaborative treatment team, the MTT. The MTT consists of a

probation officer, a treatment provider, and a victim's advocate (that functions as a part of the treatment agency). The inclusion of the three different professionals stems from lessons learned in Colorado from effective models of management for adult sex offenders. The DVOMB supported the need for a victim's advocate to work with the MTT as a means of confidential outreach during the offender's treatment. Team consensus is required for the initial review of the DVRNA score, initial placement in treatment, changes to treatment intensity level, and discharge from treatment.

A major benefit of the MTT is greater information sharing between professionals with diverse backgrounds and expertise. The MTT is designed to improve offender containment and management and reduce offender manipulation. Additionally, victim confidentiality is protected at all times.

The Implementation and Future of Colorado's Treatment Standards

The DVOMB created a training committee that was comprised of multidisciplinary professionals to identify effective training strategies for the implementation of Colorado's new treatment model. The committee identified four key training areas: the DVRNA, MTT, offender evaluations, and offender levels of treatment and competencies. These four trainings are being offered statewide in Colorado to reach probation officers, advocates, treatment providers, judges, defense attorneys, and prosecuting attorneys. It is anticipated that these trainings will be completed in 2011. These trainings will give professionals an opportunity to share ideas regarding the implementation of the revised model. The new Standards went into effect July 1, 2010. The DVOMB created a document to provide treatment providers' guidance for offenders in treatment during the transition to the revised treatment model.

Colorado's differentiated treatment model has received national attention. For example, staff from Colorado's DVOMB presented Colorado's new differentiated treatment model at the National Coalition for Domestic Violence conference in Washington, DC. The DVOMB received inquiries from Kansas, Hawaii, and Alaska about their new model of treatment. Presentations on Colorado's innovative model were made to the American Probation and Parole Association and informally as a roundtable discussion at the National Institute of Justice Research and Evaluation conference in Washington, DC. The most common interest in Colorado's new differentiated model of treatment has been the DVRNA. Additionally, many states are interested in treatment options that do not have a standardized number of weeks of treatment, such as 23, 36, or 52.

Although Colorado's revised treatment Standards are supported by the empirical literature, there are questions as to the long-term utility of the revised model of treatment given that the instrument being used to assess offenders' intensity levels for treatment, the DVRNA, has not yet been validated. There are currently no other validated instruments to differentiate DV offender treatment according to offender risk. Therefore, Colorado's Division of Criminal Justice, the Office of Research and Statistics recently received funding for the project: Testing the Predictive Validity of the DVRNA. The purpose of this study is to assess the predictive validity of the

DVRNA using a sample of male and female misdemeanor and felony DV offenders participating in treatment in Colorado.

The DVOMB recognizes that a valid risk/needs assessment is a prerequisite for effective treatment and supervision of offenders. The DVOMB has deliberated extensively about the costs and benefits of implementing an instrument statewide that has not yet been validated. However, the DVOMB is committed to the model of differentiated treatment for offenders and do not want to delay their efforts to implement such treatment. The DVOMB is confident in the development of their model for differentiated treatment and the empirical and face validity of the DVRNA. Additionally, in the absence of an instrument that assesses pertinent risk factors, the DVRNA is more predictive than status quo or decisions based on clinical judgment alone. As mentioned earlier, research has consistently shown that actuarial instruments are superior to clinical judgment in the prediction of future criminal behavior (Bonta, 2002).

A valid actuarial risk assessment instrument incorporates factors associated with the reoffending behavior of interest (e.g., assault) and provides explicit directions on how to combine these items into an overall risk score that can then be used for classification purposes. Further, a valid instrument identifies discrete groups of offenders who pose different levels of risk to public safety. Groups are defined by having a number of factors (“risks”) in common that significantly predict future offending. For the purposes of recidivism reduction for offenders completing their sentences in the community, the principle purpose of a risk assessment instrument is *predictive validity*. In other words, risk assessment should accurately estimate the statistical probability of reoffending (e.g., spousal assault).

DISCUSSION AND CONCLUSION

DV is like no other crime because of the unique and intense emotional involvement between victims, offenders, and often children. Consequently, the criminal justice system has had to develop unique and offense-specific responses to this form of violence. However, developing successful approaches to the treatment of DV offenders continues to be a work in progress. Whereas we look ahead to long-term goals in the criminal justice system’s response to DV, it is important to note that the system has made great strides in their response since the 1980s. Local, state, and national resources are available for victims and their families, in addition to community-based treatment and intervention programs for batterers. Batterer treatment programs provide services to offenders and to enhance victim safety and promote offender accountability. Across the United States, many states have developed an oversight board or committee to monitor and approve aspects of DV treatment.

In Colorado, the DVOMB is legislatively mandated to (a) provide consistent and comprehensive evaluation, treatment, and continued monitoring of DV offenders; (b) create programs that make it less likely for DV offenders to reoffend; and (c) ensure that all methods of intervention prioritize the physical and psychological safety of previous victims and potential future victims. The DVOMB is also legislatively

mandated to continually revise Colorado's Standards based on the new development of empirical and practical information. Consequently, Colorado has recently adopted revised Standards for the provision of DV offenders who are court ordered to attend treatment. Colorado's revised Standards incorporate a differentiated model of treatment that prioritizes victim safety and offender monitoring. Furthermore, the revised Standards recognize that offender treatment should correspond to the risk levels and needs of the offender. The DVRNA is used to assess risk and need levels and classifies offenders into differentiated treatment levels. The development of the DVRNA and differentiated treatment is an innovative approach that reflects significant reform in Colorado's current treatment model for DV offenders. If positive treatment outcomes are produced, the DVRNA and corresponding treatment protocol could serve as a nationwide model.

When almost one-fifth of misdemeanors and almost half of homicides in Colorado are DV offenses, it is apparent that an effective response to this pervasive problem is an urgent public health concern (Colorado Judicial Branch, 2010; Project Safeguard, 2007). Whereas state standards may have been successfully constructed for some matters without significant assistance from empirical research, it may be particularly important for policies surrounding social issues to reflect on information from various experts, including victims, advocates, and researchers. For example, DV was historically considered a phenomenon that primarily occurred among families from lower socioeconomic backgrounds or to particular women who "provoked" such violence through erratic or "bad" behavior (Stark, 2007). However, as noted earlier, domestic violence is a crime that occurs throughout society among all types of people from various backgrounds. Social and behavioral problems may elicit various cultural beliefs and expectations that can hinder the construction of effective policy.

Research has the potential to inform policymakers by providing information regarding aggregate patterns among large samples of offenders. Empirical research cannot only detail which risk factors are significantly associated with recidivism, but can also advise which factors are associated with different levels of risk. Further, empirical information on particular risk factors or clusters of risk factors that can distinguish offenders with a greater likelihood of recidivism requires specialized treatment. Whereas individualized intervention programs can be overly difficult for agencies that lack a systematic and empirically supported method of clustering perpetrators, the DVRNA is an example of a research-based tool that facilitates differentiated treatment.

Victim safety and offender accountability remain a priority for DV legislation. However, the implementation of such goals may be difficult or unlikely without a coordinated response among agencies and the community (Gover et al., 2003; Gover et al., 2007; Gover, 2009a, 2009b). As Walsh (2001) notes, the unique components of DV demand that this crime be confronted with a multiagency response. The MTT successfully employs a coordinated response strategy to DV by providing a multidisciplinary team of professionals to preside over assessing DVRNA scores, treatment placement, changes in treatment level, and discharge. Colorado's commitment to research-based

standards and a coordinated criminal justice response will likely maintain the state's position as a leader in responsive DV policy.

NOTES

1. The statutory term in Colorado that refers to DV offender treatment standards is the *Standards for Treatment for Court Ordered Domestic Violence Offenders*, which is referred to as "Standards" in this article.
2. The seven appointing authorities for the DVOMB include the Department of Corrections, the Department of Human Services, the Department of Regulatory Agencies, the Department of Public Safety, the Colorado District Attorneys Council, the Chief Justice, and the Colorado State Public Defender.

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Appendix: The 14 Risk Factor Domains on the DVRNA and Supporting Literature

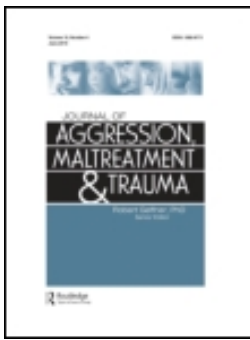
Domain A - Prior Domestic Violence Related Incidents	Cattaneo & Goodman, 2003; Kropp & Hart, 2008; Ontario Domestic Assault Risk Assessment (ODARA), 2005; Williams & Houghton, 2004; DVSI, 1998
Domain B - Drug or Alcohol Abuse	Campbell, 1995; Cattaneo & Goodman, 2003; Williams & Houghton, 2004; DVSI, 1998
Domain C - Mental Health Issues	“B-SAFER,” 2005; Gondolf, 2007; Huss & Langhinrichsen-Rohling, 2006; Kropp & Hart, 2008
Domain D - Suicidal/Homicidal	B-SAFER, 2005; Campbell, 2009; Kropp & Hart, 2008
Domain E - Use and/or Threatened Use of Weapons in Current or Past Offense or Access to Firearms	Azrael & Hemenway, 2000; Campbell et al., 2003; Hart, 1990; Klein, 2008; Kropp & Hart, 2008; Langley, 2008; Mitchell & Carbon, 2002; Paulozzi, Saltzman, Thompson, & Holmgreen, 2001; Saltzman, Mercy, O’Carroll, Rosenberg, & Rhodes, 1992; Vigdor & Mercy, 2006
Domain F - Criminal History–Nondomestic Violence (Both Reported and Unreported to the Criminal Justice System)	Ascione, Weber, & Wood, 1997; Ascione, et al., 2007; “B-SAFER,” 2005; Buzawa, Hotaling, Klein, & Byrnes, 2000; Faver & Strand, 2003; Humane Society of America, 2007; Klein, 2008; Kropp & Hart, 2008; ODARA, 2005; Ventura & Davis, 2005; Volant, Johnson, Gullone, & Coleman, 2008; Weisz, Tolman, & Saunders, 2000; Williams & Houghton, 2004; DVSI, 1998
Domain G - Obsession with the Victim	Block, Campbell, & Tolman, 2000; Campbell, 1995; Campbell et al., 2003; Hilberman & Munson, 1978; Wilson & Daly, 1992
Domain H - Safety Concerns	“B-SAFER,” 2005; Block et al., 2000; Buzawa, et al., 2000; Campbell et al., 1995, 2008; Campbell & Boyd, 2003; Chang, Berg, Saltzman, & Herndon, 2005; Gazmararian et al., 1996; Gondolf, 2001; Gondolf & Heckert, 2004; Heckert & Gondolf, 2004; Klein, 2008; Kropp & Hart, 2008; Martin, Mackie, Kupper, Buescher, & Moracco, 2001; McFarlane, Campbell, & Watson, 2002; McFarlane, Campbell, Sharps, & Watson, 2002; McFarlane, Parker, & Soeken, 1996; ODARA, 2005; Tjaden & Thoennes, 2000; Weisz et al., 2000

(continued)

Appendix: The 14 Risk Factor Domains on the DVRNA and Supporting Literature (*continued*)

Domain I - Violence and/or Threatened Violence Toward Family Members Including Child Abuse (Does not include intimate partners)	Bowker, Arvitell, & McFerron, 1988; Carter, 2000; Kropp & Hart, 2008; U.S. Department of Health and Human Services, 1999; Williams & Houghton, 2004; DVSI, 1998
Domain J - Attitudes That Support or Condone Spousal Assault	“B-SAFER,” 2005; Kropp & Hart, 2008; U.S. Department of Health and Human Services, 1999
Domain K - Prior Completed or Noncompleted Domestic Violence Treatment	Hisashima, 2008; Stalans, Yarnold, Seng, Olson, & Repp, 2004; Williams & Houghton, 2004; DVSI, 1998
Domain L - Victim Separated from Offender Within the Previous 6 Months	Andrews & Bonta, 2005; Campbell et al., 2003; Hisashima, 2008; Williams & Houghton, 2004; DVSI, 1998; Wilson, Daly, & Wright, 1993; Wilson & Daly, 1992
Domain M - Employment	Andrews & Bonta, 2005; Benson & Fox, 2004; “B-SAFER,” 2005; Campbell et al., 2003; Kyriacou et al., 1999; Williams & Houghton, 2004; DVSI, 1998
Domain N—Absence of Verifiable Prosocial Support System	Andrews & Bonta, 2005

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Posttraumatic Stress Symptoms, Aggression, and Substance Use Coping among Young Adults

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Posttraumatic Stress Symptoms, Aggression, and Substance Use Coping among Young Adults

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This study examined how the symptom clusters of posttraumatic stress disorder (PTSD) were related to substance use and self-reported aggression in a college sample. There were 358 participants (ages 18–24) who completed surveys to assess PTSD symptoms, substance use as coping, and aggression. Hierarchical regressions tested for the effects of PTSD symptoms (total symptoms as well as cluster symptoms) on self-reported aggression, along with the main and interaction effects of substance use coping on these relationships. The hyperarousal cluster of PTSD was the only group of symptoms significantly related to aggression. There was an interaction between avoidance symptoms and substance use coping on aggression such that under conditions of high substance use coping, aggression increased regardless of avoidance symptoms; however, the relationship between avoidance and aggression was stronger under conditions of low substance use coping, with greater aggression as avoidance symptoms and low substance use coping increased.

KEYWORDS *aggression, PTSD symptoms, substance use coping, young adults*

The focus of this study was to examine how substance use coping impacts the relationship between posttraumatic stress disorder (PTSD) symptoms and self-reports of aggression in a sample of young adults. In addition, PTSD symptom clusters, specifically hyperarousal, reexperiencing, and avoidance

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symptoms, and their relation to substance use coping and aggression were explored. More than a third of young adults in the United States between the ages of 18 and 24 are attending college (U.S. Census Bureau, 2007). Rates of PTSD in college students are in the range of 6% to 17% (Lauterbach & Vrana, 2001). In regard to substance use, a study of 119 U.S. colleges found that there was an increase from 1993 to 2001 of past year illicit substance use. The numbers increased from 11% to 14% (Mohler-Kuo, Lee, & Wechsler, 2003).

VIOLENCE AND SUBSTANCE USE

Previous research has found an association between violence and substance abuse (Barrett, Mills, & Teesson, 2011; Boles & Miotto, 2003). A study on a community sample found that among individuals who were violent, substance use disorder (SUD) was a common diagnosis (Swanson, Holzer, Ganju, & Jono, 1990). Individuals in treatment for SUDs were more likely to engage in violent behavior than individuals in the general population (Murray et al., 2008). This link between violence and SUD is further emphasized by research done on individuals arrested for violent crimes. These studies have shown there are substantial rates of SUD among these offenders (Drake, 2010; Moore & Stuart, 2004). SUD includes the use of various drugs and alcohol. Research on alcohol, cocaine, benzodiazepines, amphetamines, methamphetamines, and marijuana has shown that the use of each of these drugs could lead to violent behaviors (Boles & Miotto, 2003).

PTSD AND AGGRESSION

Symptoms of PTSD include three primary symptom clusters: (a) feeling as if one is reexperiencing a traumatic event, (b) hyperarousal, and (c) avoidance of cues associated with a past trauma (American Psychiatric Association, 2000). These symptoms are often linked to increased substance use and aggressive behavior. In fact, increased irritability is listed as a symptom of hyperarousal associated with PTSD. Individuals with PTSD often describe holding extreme anger at anyone who is perceived as responsible for the traumatic event (Novaco & Chemtob, 2002). Individuals with PTSD are significantly more likely to report aggression compared to those without PTSD (Jakupcak et al., 2007). It has been suggested that a PTSD diagnosis impairs cognitive processes that increase accuracy to interpret an event as threatening and individuals also experience excessive arousal (Kivisto, Moore, Elkins, & Rhatigan, 2009). In other words, symptoms of PTSD, and in particular hyperarousal symptoms, might actually prime individuals

to behave more aggressively. There are a variety of explanations for the aggression–PTSD relationship.

SUBSTANCE USE AND PTSD SYMPTOMS

Studies suggest there is also an association between SUD and PTSD. In a U.S. national comorbidity survey, men with alcohol use disorder were 2.06 times more likely than those without alcohol use disorder to have cooccurring PTSD (Kessler, Sonnega, Bromet, & Hughes, 1995). Men who had a drug use disorder were 2.97 times more likely than those without a drug use disorder to have cooccurring PTSD. Among women, the cooccurrence of PTSD and alcohol was 2.48 and the cooccurrence of PTSD and drug use disorder was 4.46, compared to women without these disorders (Kessler et al., 1995). Other studies have shown a high occurrence of PTSD in patients seeking treatment for a SUD (Brady et al., 1994; Brown & Wolfe, 1994). An epidemiological study conducted in the United States found that men who met criteria for PTSD were five times more likely to have drug abuse or dependence than men without PTSD (Regier et al., 1990). Women who met criteria for PTSD were 1.4 times more likely to have drug abuse or dependence than women without PTSD (Regier et al., 1990).

One explanation for the relationship between PTSD and SUD is the self-medication hypothesis. Individuals with PTSD use substances to relieve the psychological stress that results from trauma symptoms (Brady et al., 1994). These substances might be used to avoid traumatic memories or other symptoms of PTSD and in essence individuals use substances to cope with this distress. A study by Chilcoat and Breslau (1998) found that having PTSD increased the risk of developing a SUD. Exposure to a traumatic event that did not result in PTSD symptoms did not increase the risk of developing a SUD. It was unclear how symptoms of PTSD and SUD might relate to aggressive behaviors.

PTSD SYMPTOM CLUSTERS, SUBSTANCE USE, AND AGGRESSION

Research has shown a clear link between PTSD symptoms and aggression as well as substance use and aggression. It is speculated that substance use might place individuals with PTSD symptoms at a greater risk of behaving aggressively. A study on a noncombat sample of individuals with SUD and PTSD found increased levels of self-reported aggression in individuals with both SUD and PTSD. There were higher levels of trait aggression compared to the norms reported by Buss and Perry (1992; see also Barrett et al., 2011). Many studies have focused on PTSD as a single construct without taking into account its specific clusters. Only a few studies have looked

at how the specific clusters of symptoms—hyperarousal, avoidance, and reexperiencing—might be differentially related to increased substance use.

A study by Saladin, Brady, Dansky, and Kilpatrick (1995) found that the PTSD symptom clusters differentiated between women diagnosed with PTSD who were seeking treatment for substance abuse and those who were not. In particular, women diagnosed with PTSD who were seeking treatment for substance abuse reported greater arousal and avoidance symptoms than those women without substance use problems. These findings suggest that there is a strong link between substance use and particularly the hyperarousal and avoidance symptom clusters of PTSD. Little research has explored how this interaction might affect aggression.

A study conducted on 376 male Vietnam combat veterans and their spouses by Savarese, Suvak, King, and King (2001) looked at alcohol use and specifically hyperarousal symptoms of PTSD in relation to male-perpetrated marital abuse and violence. The researchers found that the veterans' self-report measures of hyperarousal were associated with their partners' reports of physical and psychological abuse. The relationship between hyperarousal and violence varied because of drinking frequency and drinking quantity. When excessive drinking was reported, there was a relationship between hyperarousal symptoms and husband-to-wife physical violence. In a similar study of participants with both SUD and PTSD by Barrett et al. (2011), participants who reported committing a violent crime in the past month had more severe symptoms of PTSD, especially the in hyperarousal cluster. In particular, the severity of the hyperarousal symptom cluster predicted greater violence. These findings underscore the importance of examining symptom clusters of PTSD and how they are related to substance use and aggressive behavior.

FOCUSING ON YOUNG ADULTS

The majority of past research has focused on veterans and specific populations of trauma survivors (i.e., survivors of rape, motor vehicle crashes) and there is limited research on other populations—especially young adults. Young adults are in a transitional stage of life. During this stage their responsibilities and roles are shifting. Choosing a career can be an extremely daunting task because of the long-term consequences. Young adults who choose to enter college experience a different transition, a tremendous step into adulthood, shaping their interests and career choices. During these precarious life changes, certain adverse life events could have strong negative consequences such as poor academic functioning, symptoms of PTSD, and poorer health and immune functioning. Young adults with a history of more severe life events are likely underrepresented in college, and college students are not immune to past trauma. In fact, first-year students in college who

reported a history of childhood sexual, physical, or emotional abuse were more likely to drop out than nonvictims (Smyth et al., 2008). Although more severe violent behavior and substance use coping is likely underrepresented in college student versus community sample populations, it does exist on college campuses. Few studies have looked particularly at PTSD symptom clusters, violence, and substance abuse in a college sample.

Three studies that examined PTSD symptoms and substance use in college students have indeed found a significant relationship. One study by Edwards, Dunham, Ries, and Barnett (2006) researched the relationship between traumatic stress and alcohol use in a sample of 92 college students. Intrusive thoughts were found to contribute to the amount of alcohol used. The researchers concluded that students who use alcohol as a coping mechanism might do this as a result of painful thoughts, memories, or flashbacks. In other words, in a college population sample, the reexperiencing cluster of PTSD symptoms was particularly linked to substance use. This finding is consistent with the self-medication model, in which individuals with PTSD use substances to cope with the psychological stress that results from trauma symptoms. However, it is unclear how using substances to cope with reexperiencing the trauma might be related to aggressive behavior among college students.

In another study by Avant, Davis, and Cranston (2011) with a large sample of female college students, a history of trauma was found to be associated with nonexperimental substance use and alcohol use. Nonexperimental substance use was defined as individuals who had used a particular substance at least four times in their lifetime. A diagnosis of PTSD was also associated with substance use. However, there was no clear pattern found for specific substance use and PTSD symptom clusters. Whereas reexperiencing symptoms were significantly associated with depressant use, avoidance symptoms were significantly associated with depressants, opiates, and hallucinogen use.

A study conducted on 1,292 undergraduate college students tested how stressful civilian experiences would impact avoidance symptoms, hyperarousal symptoms, and emotional numbing. Results showed that hyperarousal and avoidance symptoms were the best predictor of emotional numbing (Flack, Milanak, & Kimble, 2005). College students with PTSD report drinking to higher intoxication levels than college students without PTSD (McDevitt-Murphy, Weathers, Flood, Eakin, & Benson, 2007).

THIS STUDY

Previous studies have found a significant link among substance use, PTSD symptoms, and aggression. In particular, clusters of PTSD symptoms have been differentially linked to substance use and violence; however, these findings are inconsistent (e.g., Saladin et al., 1995; Savarese et al., 2001).

It appears that avoidance and arousal clusters are particularly relevant when understanding how PTSD symptoms are linked to substance use coping and aggression. However, in a college student sample, reexperiencing symptoms were most strongly related to substance use (Edwards et al., 2006). The goal of this study is to understand how the symptom clusters are related to substance use coping and self-reported aggression in a college sample. It is hypothesized that substance use coping will interact with PTSD symptoms to influence aggression. In particular, the relationship between PTSD symptoms and aggression will be strongest under conditions of high substance use coping. Supplemental analyses will also examine the three clusters of symptoms (avoidance, hyperarousal, and reexperiencing) and how they interact with substance use coping. Findings will add to the literature on the mechanisms of PTSD symptoms, substance use coping, and the aggression relationship in an often understudied traumatized population.

METHOD

Participants

Participants from a larger study examining exposure to community violence, who had completed the three measures described later, were included in this study. All participants were college students enrolled at a Northeastern U.S. university who received course credit for their participation. Out of the larger sample of 532 participants, 358 participants (103 men, 252 women, and others who did not indicate sex) were included in this study as they endorsed experiencing a traumatic event on the Events Scale (ES; Vrana & Lauterbach, 1994) described later. The ages ranged from 18 to 24 years ($M = 19.16$ years, $SD = 2.80$). In regard to race, 39.5% self-identified as Black ($n = 145$), 24.7% as White ($n = 84$), 18.5% as Asian/Pacific Islander/Hawaiian ($n = 75$), 9.9% as Hispanic/Latino/Latina ($n = 48$), 1.2% as American Indian/Alaskan Native ($n = 2$), 13.6% as more than one race ($n = 41$), and the remaining participants did not indicate race. Participants reported their year in college: There were 162 freshman, 128 sophomores, 45 juniors, and 20 seniors. The others did not indicate year in school.

Measures

PURDUE PTSD SCALE

PTSD was measured using the Purdue PTSD Scale (PPTSD-R; Lauterbach & Vrana, 1996), which is based on participants' report of experiencing a traumatic event on their corresponding scale, the ES (Vrana & Lauterbach, 1994). Participants only completed the PPTSD-R measure if they endorsed a traumatic event on the ES. The ES assesses participants' exposure to nine different types of stressful events. For this study, participants reported a range

of traumatic events including hearing about someone close to them who has been killed or seriously injured (16%), serious accident (15%), danger of losing one's life (12%), violent crime (12%), childhood abuse (10%), abusive relationship (6%), rape (6%), natural disaster (6%), witnessing a crime (2%), and other traumatic experiences they felt they could not describe (15%). Participants who endorsed experiencing a traumatic event were included in this study ($n = 358$).

The PPTSD-R is a 17-item scale that assesses the occurrence of PTSD symptoms. The items on the scale correspond to *Diagnostic and Statistical Manual of Mental Disorders* (4th ed. [DSM-IV]; American Psychiatric Association, 2000) criteria for PTSD. Participants rated the frequency of symptoms on a scale from A (*not at all*) to E (*often*). The questionnaire calculates four scores that include reexperiencing, avoidance, arousal, and the total score. Scores can range from 17 to 85, with higher scores corresponding to severe symptomatology. Lauterbach and Vrana (1996) previously conducted three studies to assess the reliability and validity of the instrument. Alphas were .91 for reexperiencing, .84 for avoidance, .79 for the arousal scales, and .81 for the total score. The Purdue scale was also highly correlated with the Civilian Mississippi Scale (.50; Wilson & Keane, 2004). Contrary to the Trauma Symptom Checklist (TSC-33; Briere & Runtz, 1989), the PPTSD-R was not developed to assess the impact of specific types of trauma on adult functioning. Rather, it works in conjunction with the ES and measures general PTSD symptoms across a number of different traumatic experiences. Moreover, the PPTSD-R was developed with a population of college students, unlike the TSC-33. Therefore, the PPTSD-R was a more appropriate measure for this study. For this study, the reliability total was .87 (17 items), reexperiencing was .85 (five items), avoidance was .68 (seven items), and arousal was .84 (five items).

AGGRESSION QUESTIONNAIRE SCALE

Aggression was measured using the Aggression Questionnaire Scale (AQ; Buss & Perry, 1992). The scale allowed participants to rate four factors: physical aggression (PA), verbal aggression (VA), anger (A), and hostility (H). It is a 5-point scale that rates how characteristic or uncharacteristic each statement is for the participant. The total score for aggression is the sum of the factors scored. A study conducted on undergraduate women found that the internal consistency values were similar to the ones reported by Buss and Perry (1992). The alpha values for physical aggression, verbal aggression, hostility, and anger were .85, .72, .77, and .83, respectively (Harris, 1997). The test-retest reliabilities for the scales were found to be moderately high to high ($r = .47-.88$). This study's reliability total was .89 (seven items). The validity of the factor structure of this measure has been tested in a sample of 340 undergraduate students and the measure was considered to be an

appropriate multivariate measure of aggression in this type of population (Bernstein & Gesn, 1997).

SUBSTANCE USE

Use of substances as a way of coping with stress was measured using the substance use subscale of the Cope Inventory (Carver, Scheier, & Weintraub, 1989). This scale includes four items that measure one's use of alcohol or illicit drugs to deal with distress (e.g., "I lose myself in alcohol or drugs to deal with it"). Respondents read each item and indicate how much they engage in each style of coping on a scale ranging from 1 (*not at all*) to 4 (*a lot*). Carver and colleagues (1989) reported discriminant validity between the substance use subscale and other scales measuring more positive and engaged forms of coping on the Cope Inventory in their sample of students. Reliability for this scale was strong, with a Cronbach's alpha of .85. Means were calculated for the total scores, and they ranged from .5 to 4.00 with a mean of 1.34 ($SD = .65$).

Procedure

Participants first registered to participate in the study by signing up on the Sona Experiment Management Program (Sona). After creating an account, students were able to choose the research studies in which they were eligible to participate. Students had to be at least 17 years old and enrolled in a psychology course to access the system. This study was listed as "Community Experiences" and provided information to the students that they would be asked to complete questionnaires regarding their experiences in the community. Freshman, sophomores, juniors, and seniors between the ages of 18 and 24 years were allowed to register for the study. Sessions lasted 1 hr and up to 10 students were in the session at a time. After a student signed up, he or she arrived in the classroom and was asked to read and sign the consent form, which described the purpose of the research and what risks and benefits were associated with their participation. During the session, a research assistant was present to answer any questions that the participants might have. Participants completed a number of surveys but only those already described were analyzed for this study. If participants endorsed experiencing a traumatic event on the ES, they were included in this study.

RESULTS

Preliminary Analyses

The means for PTSD symptoms, substance use coping, and aggression are compared across men and women in Table 1. Women reported

TABLE 1 Mean Differences in PTSD Symptoms, Substance Use Coping, and Aggression

	Men		Women		<i>t</i> -test statistic
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
PTSD total score	33.18	14.02	37.56	17.12	-2.24*
Avoidance cluster	1.92	.89	2.26	1.29	-2.36*
Hyperarousal cluster	1.88	.83	2.10	1.00	1.97*
Reexperiencing cluster	2.18	1.10	2.38	1.29	-1.44
Substance use coping	1.33	.61	1.33	.67	.00

Note. PTSD = posttraumatic stress disorder. $n = 103$ men, $n = 252$ women.

* $p < .05$.

greater avoidance and hyperarousal symptoms compared to men, but reexperiencing symptoms, as well as self-reported aggression and substance use coping, were similarly reported for men and women.

A series of zero-order correlations were also conducted to test for any age effects on the main variables. There was a significant positive correlation for aggression, such that older participants were more likely to endorse aggression, $r(337) = .14$, $p = .01$. None of the other correlations with age were significant (PTSD total, $-.04$; reexperiencing, $-.06$; avoid, $-.07$; hyperarousal, $-.01$; and substance use coping, $.02$). Correlations were also conducted separately for men and women (see Table 2).

Additional analyses tested for effects of ethnicity (Hispanic/Latino/Latina vs. non-Hispanic) and race (White, Black, Asian) on the primary variables. The t test comparing means by ethnic group was significant for self-reported aggression, such that Hispanic participants ($M = 2.70$, $SD = 2.43$) endorsed greater aggression than non-Hispanic participants ($M = 2.43$, $SD = .64$), $t(314) = 2.58$, $p = .01$. Although the variance in aggression for both groups was similar despite the unequal sample size, this difference in mean scores of aggression should be interpreted with caution

TABLE 2 Zero-Order Correlations between Age, PTSD Symptoms, Substance Use Coping, and Aggression for Men and Women

	1	2	3	4	5	6	7
1. Age	—	-.03	-.05	-.04	.01	.01	.23**
2. PTSD	-.19	—	.88**	.90**	.91**	.20**	-.01
3. Reexperiencing	-.17	.88**	—	.62**	.72**	.14*	-.03
4. Avoidance	-.26*	.85**	.77**	—	.71**	.14*	-.02
5. Hyperarousal	-.13	.91**	.66**	.83**	—	.22**	.01
6. Substance use coping	.05	.25*	.22*	.23*	.21**	—	.25**
7. Aggression	-.20*	.35**	.35**	.32**	.35**	.33**	—

Note. PTSD = posttraumatic stress disorder. Data for men are represented in the lower left corner of the table, $n = 103$. Data for women are represented in the upper right corner of the table, $n = 252$.

* $p < .05$. ** $p < .01$.

because Hispanic participants only comprised 13% of the entire sample. No between-subjects effects were significant for race on any of the variables, suggesting similar endorsement of PTSD symptoms, substance use coping, and aggression by White, Black, and Asian participants.

Primary Analyses

Two hierarchical regressions were conducted with self-reported aggression as the outcome variable (see Table 3). Gender was controlled in Block 1 for both regressions. The first regression tested the main effect of PTSD total symptoms in Block 2, substance use coping in Block 3 and their interaction (PTSD Total Symptoms \times Substance Use Coping) in Block 4. The second regression tested for each of the PTSD symptom clusters separately in Block 2 and their respective interactions with substance use coping in Block 4. To reduce multicollinearity as recommended by Holmbeck (2002), the variables were centered and the scale mean was subtracted from each value so that the new centered scale mean was equal to zero. The product terms were computed with centered values. For any significant interaction effects, the effect was probed by creating conditional moderator variables (high and low substance use coping) for each participant and then separately testing the effect of each, along with its product with the relevant PTSD variable, on aggression in a simultaneous regression. Findings for each of the regressions are described next.

Model 1 tested for the effect of PTSD total score and was significant, $F(4, 329) = 17.06, p < .01$. It accounted for 16% of the variance in self-reported aggression. There was a main effect for PTSD total score and substance use coping. The interaction was not significant.

Model 2 tested for the different PTSD symptom clusters and was also significant, $F(8, 329) = 11.05, p < .01$. It accounted for 21% of the variance in self-reported aggression. There were significant main effects for the arousal cluster and substance use coping. The interaction between the avoidance symptom cluster and substance use coping was also significant. A simplified model testing for just the effect of the avoidance cluster, substance use coping, and their interaction was then tested. The model remained significant, $F(3, 331) = 15.31, p < .01$, accounting for 12% of the variance in self-reported aggression. The interaction between avoidance symptoms and substance use coping also remained significant ($\beta = -.09$), $t(331) = -1.61, p < .05$. To confirm that avoidance symptoms interacted with substance use as a form of coping to influence aggression, post-hoc probing recommended by Holmbeck (2002) was performed in which conditional moderators were created (high and low substance use coping), and separate simultaneous regressions tested for the interaction effects of avoidance symptoms and the conditional moderators. These slopes were then plotted (see Figure 1). The slope for high substance use coping was not significant, suggesting that the

TABLE 3 Hierarchical Regressions on Self-Reported Aggression by PTSD Symptoms (Total and Clusters) and Substance Use Coping

Variables	Beta	SE	<i>t</i> test	<i>R</i> ²
Model 1				
Block 1				.01
Gender	-.09	.07	-1.66	
Block 2				.13**
Gender	-.12	.07	-2.36*	
PTSD total score	.35	.00	6.69**	
Block 3				.17**
Gender	-.12	.07	-2.34*	
PTSD total score	.30	.00	5.88**	
Substance use coping	.21	.05	4.06**	
Block 4				.17**
Gender	-.12	.07	-2.35*	
PTSD total score	.30	.00	5.83**	
Substance use coping	.24	.06	4.21**	
PTSD × Substance Use Coping	-.07	.00	-1.26	
Model 2				
Block 1				.01
Gender	-.09	.07	-1.66	
Block 2				.17**
Gender	-.12	.07	-2.32*	
Reexperiencing	.05	.04	.68	
Avoidance	-.07	.04	-.97	
Hyperarousal	.41	.06	5.00**	
Block 3				.20**
Gender	-.12	.07	-2.31*	
Reexperiencing	.05	.04	.64	
Avoidance	-.07	.04	-.99	
Hyperarousal	.37	.06	4.59**	
Substance use coping	.20	.05	3.85**	
Block 4				.22**
Gender	-.11	.07	-2.24*	
Reexperiencing	.05	.04	.71	
Avoidance	-.10	.04	-1.36	
Hyperarousal	.39	.06	4.77**	
Substance use coping	.24	.06	4.23**	
Reexperiencing × Substance Use Coping	.10	.06	1.35	
Avoidance × Substance Use Coping	-.19	.08	-2.05*	
Hyperarousal × Substance Use Coping	.01	.09	.11	

Note. PTSD = posttraumatic stress disorder. *N* = 331. Gender: males = 1, females = 2. Standardized betas presented.

p* < .05. *p* < .01.

relationship between avoidance symptoms and aggression did not change under conditions of high substance use coping. In other words, when individuals employed high degrees of substance use as a way of coping, the relationship between avoidance symptoms and aggression was not significant. However, the slope for low was significant, suggesting that it did change. Examination of the graph indicates that the relationship between

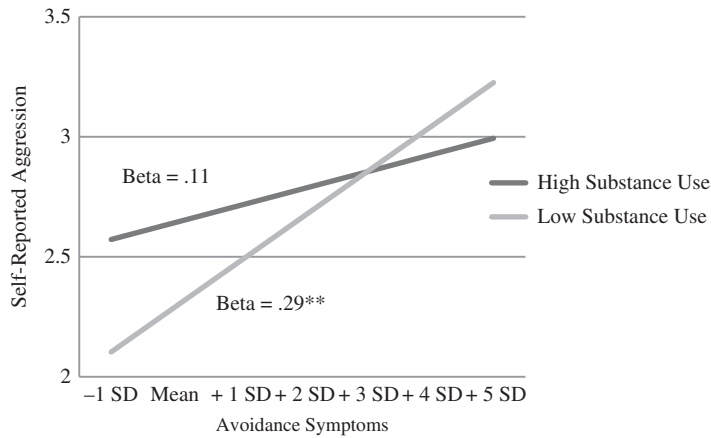


FIGURE 1 Interaction between substance use coping and avoidance symptoms on self-reported aggression (actual range = 1.27–4.66). Beta weights presented are standardized. ** $p < .01$.

avoidance and aggression depends on the degree of low Substance Use Coping. As avoidance symptoms increased, the relationship between low Substance Use Coping and aggression also strengthened.

DISCUSSION

This study examined how substance use coping impacts the relationship between PTSD symptoms and self-reported aggression in a college sample. The particular symptom clusters of PTSD were examined. Hyperarousal, reexperiencing, and avoidance symptoms were analyzed to understand how they affect the nature of the substance use coping and self-reported aggression relationship. It was hypothesized that substance use coping would interact with PTSD symptoms to influence aggression. The relationship between PTSD symptoms and aggression would be strongest under conditions of high substance use coping.

Results from the study indicate that PTSD symptoms are indeed positively and significantly related to aggression. Moreover, increased substance use coping was related to increased aggression. Interestingly, the hyperarousal cluster of PTSD was the only group of symptoms significantly related to aggression. Lastly, the relationship between substance use coping and aggression also depended on the degree of avoidance symptoms.

These findings are important for numerous reasons. First, the findings demonstrate that in a college sample there is a significant relationship between PTSD symptom clusters (particularly the hyperarousal cluster) and substance use coping that might be responsible for increased aggression. These findings are consistent with previous studies that have shown that

there is a link between substance use and avoidance symptoms (Saladin et al., 1995; Tull, Gratz, Aklin, & Lejuez, 2010). This study extends those findings by underscoring the need to explore the relationship among trauma, substance use coping, and aggression among college students.

Second, the results underscore how different clusters of PTSD symptoms are associated with aggression. Interestingly, hyperarousal symptoms (e.g., difficulty concentrating, problems falling asleep or staying asleep) were linked to increases in aggression; avoidance (e.g., avoiding thoughts, feelings, and circumstances associated with the trauma) and reexperiencing symptoms (e.g., recurrent nightmares, upsetting thoughts about the event) were not significantly related to aggression. Another study on PTSD clusters related to aggression among college students reported that reexperiencing symptoms were more pertinent (e.g., Edwards et al., 2006). However, that sample was mostly White women from a rural town. In fact, the finding that hyperarousal symptoms and aggression are significantly linked in our diverse sample of young adults residing in an urban community is similar to findings from Savarese and colleagues (2001) in their sample of veterans. Clearly, the nature of the traumatized sample might inform how clusters of symptoms are related to self-reported aggression. Regardless, assessing the degree of symptom clusters could provide clinicians with insight into how individuals might behave under stress.

Third, although substance use coping was directly related to aggression, it also interacted with degree of avoidance to impact aggression. This interaction effect highlights the importance of examining both substance use coping and the profile of PTSD symptom clusters when screening for aggression. Avoidance symptoms were not directly linked to aggression; therefore, understanding how substance use coping and these particular symptoms contribute to increased aggression is essential. Traumatized young adults who disengage (i.e., avoid actively dealing with the traumatic event) by possibly abusing substances are at a greater risk for aggressive behavior. Essentially, the interaction between avoidance symptoms and substance use as coping helps disentangle how PTSD symptoms and aggression are associated. The association of avoidance symptoms and aggression varied based on how much substance use coping was reported. Although substance use coping was significantly associated with aggression, these findings give insight into how it interacts with avoidance symptoms, leading to a sharp increase in self-reported aggression. These findings are somewhat consistent with those of Saladin and colleagues (1995). They found, in their clinical sample of women diagnosed with PTSD, that avoidance (and arousal) symptoms were linked to substance use. We extend those findings by examining the implications of this relationship. Individuals are least likely to report aggression when they cope without using substances and report low levels of avoidance and emotional numbing symptoms. Future research might be able to study the temporal influence of these variables on aggressive behavior.

Significant Demographic Effects

Important demographic differences were also found. Results showed that there were significant differences for the avoidance and hyperarousal clusters of PTSD symptoms. Women endorsed greater symptoms in these clusters than men. This finding is consistent with previous research that showed women are more likely than men to develop PTSD (Tolin & Foa, 2006; Valdez & Lilly, 2012). A study done by Tolin and Foa (2008) showed that women and girls were more likely than men and boys to meet criteria for PTSD. The data from this study also showed that reexperiencing symptoms were similar for male and female college students. Individuals with PTSD symptoms who use substances might do so to limit negative thoughts, memories, or flashbacks. Substance use can be used as a coping device to make the pain more bearable. This is related to the self-medication hypothesis. Individuals use substances to avoid the psychological stress that results from PTSD symptoms.

Interestingly, there was a significant positive correlation between age and aggression. The older a participant was, the greater the aggression that was reported. Perhaps because this sample was limited to young adults, as individuals approached age 24 they were more likely to endorse employing aggressive techniques. A study conducted on 134 undergraduate students found that both male and female participants displayed aggressive behavior (Nelson, Springer, Nelson, & Bean, 2008). The ages of the participants were 18 to 25 and they were considered emerging adults. The results showed that emerging adults engaged in activities that seemed to be harmful to their peers. Men engaged in more verbal and physical aggression, whereas women engaged in nonverbal and indirect aggression. Relationships, responsibilities, and maturity are all important goals during this stage and endorsing aggressive behavior might be seen as a way of achieving these goals.

The analysis for effects of ethnicity on the primary variables found that self-reported levels of aggression were higher for Hispanics than non-Hispanics. Although this was not a primary focus of this study, this finding emphasizes the importance of how the community and culture affect our lives. Each ethnic group is very unique and has a different perspective on the world. Developing a greater understanding of how culture and the community affect the lives of young adults, in particular the development of PTSD symptoms, substance use coping, and aggression, will help to develop better intervention strategies unique to that ethnicity or culture. Young adults in college come from a diverse background and are experiencing new environments. Adapting to unknown environments that might involve substance use coping can have an adverse impact. Young adults from different backgrounds might not know how to cope with these diverse situations and could behave aggressively toward others or use substances to manage these changing situations. Various studies have shown that the Hispanic population might be

more vulnerable to developing PTSD (Galea et al., 2002; Perilla, Norris, & Lavizzo, 2002; Pole et al., 2001)

Limitations and Future Research

Future research should break up substance use coping into alcohol consumption and types of drugs used. A study conducted by Denson and Earleywine (2008) tested to see how marijuana and alcohol use affected aggression. Their results showed that self-reported aggression was more likely after alcohol use than marijuana use. By identifying the specific type of substance, we can better understand the role substance use coping and PTSD symptom clusters have on aggression. Alcohol and drug use might independently have very different effects on the symptom clusters. By narrowing it down to a specific cluster and a specific type of substance, we can better establish the cause of aggression, informing treatment providers and university personnel.

In light of our finding that PTSD symptom clusters, substance use coping, and aggression depend on demographic variables, future studies might focus on what might account for these differences and how they affect relationships between these variables. This would provide a better understanding of the diverse group of young adults who attend college each year.

Conclusion

Despite these limitations, the results of this study have contributed to the literature by further examining the relationship among PTSD symptom clusters, substance use coping, and self-reported aggression in a college population. Identifying the effect avoidance and hyperarousal symptom clusters have on aggression and substance use coping in a college population can have a tremendous impact on future studies. More effective treatment and intervention programs can be developed by targeting specific symptom clusters, particularly, hyperarousal and avoidance. Results showed that demographics have a significant impact on this relationship, but more information is needed regarding the relationship among age, gender, and ethnicity.

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Violence in Bipolar Disorder

December 16, 2014 | [Bipolar Disorder](#) [1], [Trauma And Violence](#) [2]

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What is the association between bipolar disorder, trauma, and violence? Here: a guide to assessing violence potential in bipolar patients.

*/ The relationship between mental illness and violence is controversial. On the one hand, there is considerable unfounded stigma and discrimination toward the mentally ill based on the popular notion that psychiatric patients are dangerous people. On the other hand, there is a legitimate need for psychiatrists to identify and manage what risk of violence does exist in their patients. Research that examines how and why violence occurs in the mentally ill is necessary for psychiatrists to determine as accurately as possible which patients are prone to violence and to manage their care accordingly.

Traumatic experiences in childhood have been linked to the potential for violence in adulthood as well as to vulnerability to psychiatric disorders.¹⁻⁵ Bipolar disorder has been linked to traumatic childhood experience and to the potential for violence.

In this review, we explain the association between bipolar disorder, trauma, and violence, and we suggest ways of assessing violence potential in bipolar patients.

Childhood trauma in bipolar disorder

DSM-5 defines trauma as exposure to an event that involves “actual or threatened death, serious injury, or sexual violence.” The traumatic event can be experienced firsthand or by learning that the event occurred in a close family member or friend. Moreover, the traumatic event is experienced repeatedly or there is extreme exposure to the details of the event.

A history of childhood traumatic experience has been associated with increased vulnerability to multiple mental disorders, including mood disorders and personality disorders.³⁻⁵ Etain and colleagues⁶ found that a history of 2 or more types of trauma is associated with a 3-fold increase in the risk of bipolar disorder. Prognosis and course of bipolar disorder are worse when there is a history of trauma. Trauma history is associated with earlier onset of bipolar disorder; faster cycling; increased rates of suicide; and more comorbidity, including anxiety disorders, personality disorders, and substance use disorders.⁷⁻¹⁰

Etain and colleagues^{6,11} have shown that in patients with bipolar disorder, more than 50% report childhood trauma, with a high incidence of emotional abuse; 63% of the patients had experienced 2 or more forms of trauma as well as more severe forms. Conus and colleagues¹² found that about 80% of patients with bipolar disorder had experienced at least 1 stressful life event. Among them, 16% had been physically abused, 15% had been sexually abused, 40% had experienced parental separation, and 20% had problems with a partner.

There are several pathways by which childhood trauma could lead to the development of bipolar disorder. Any one or a combination of these pathways could be operational in the development of bipolar disorder in individuals who have experienced childhood trauma. Thus, either the trauma itself or the factors that lead to trauma—or both—could affect the development and course of bipolar disorder.

- Affective disturbances in relationships between parents and their children directly predispose the children to affective disturbances in adulthood
- Children in whom bipolar disorder later develops are prone to more behavioral disturbances in childhood (a prodrome, or early onset, of bipolar disorder), which could disrupt relationships with parents and lead to dysfunctional parenting
- Children of affectively ill parents could be affected by genetic transmission of affective illness predisposition as well as by parental psychopathology, which increases the likelihood of childhood trauma

The link between trauma and violence in bipolar disorder

Childhood trauma history has been found to correlate with increased aggression in adults with and without affective disorders.^{1,2,13} In addition, there is an overlap between the neurochemical changes

found in adults with histories of traumatic stress and those found in adults with increased impulsive aggression—in particular, increased functioning of both the catecholamine system and the hypothalamic-pituitary-adrenal axis.¹⁴

The prevalence of childhood trauma in persons with bipolar disorder combined with the risks that arise from the symptoms of the disorder itself renders bipolar patients at increased risk for violent behavior. Because childhood trauma has been associated with earlier onset and a greater number of episodes, there is more cumulative time when aggressive behavior is most likely to manifest. In addition, a history of trauma is associated with an increase in rates of substance abuse, which itself is associated with significant violence risk. Aggressiveness is often shown in different clinical settings, including bipolar, borderline, and antisocial personality disorders. Comorbidity with borderline personality disorder is associated with a higher risk of aggression in bipolar disorder during periods of euthymia.

Violence and aggression

Persons with bipolar disorder are at significantly increased risk for violence, with some history of violent behavior ranging from 9.4% to just under 50%, often in the presence of comorbid diagnoses.¹⁵⁻¹⁸ Bipolar patients are prone to agitation that can result in impulsive aggression during manic and mixed episodes. However, depressed states can involve intense dysphoria with agitation and irritability, which can also increase the risk of violent behavior. Bipolar patients may have chronic impulsivity during euthymia, predisposing them to aggression. This is especially true with comorbid features of borderline personality disorder. In fact, particularly high levels of impulsivity and aggression in a bipolar patient could be a strong indicator of comorbidity with borderline personality disorder.¹⁹

Impulsive aggression (as opposed to premeditated aggression) is most commonly associated with bipolar and other affective disorders. In animal models, premeditated aggression corresponds to predatory behavior, while impulsive aggression is a response to perceived threat (the fight or flight). As either a state or trait, increased impulsive aggression is driven by an increase in the strength of aggressive impulses or a decrease in the ability to control these impulses. Neurochemically, impulsive aggression has been associated with low serotonin levels, high catecholamine levels, and a predominance of glutamatergic activity relative to γ -amino-butyric acid (GABA)ergic activity.²⁰

Assessing violence risk

In many ways, the assessment of violence risk in patients with bipolar disorder is similar to risk assessment in any patient. Certain data from the patient's history and mental status examination are universally important:

- A history of violent acts, especially recent ones and especially if there were any legal consequences.
- The extent of alcohol and drug use, because there is a strong association between substance abuse and risk of violence.¹⁹
- Trauma history has a unique relationship with bipolar disorder, and it should be assessed in all patients to determine the risk of violence. Trauma is associated with increased aggression in adults in general, regardless of whether an affective disorder is present.
- Other important historical data include demographic information (young men of low socioeconomic status who have few social supports are the most likely to be violent) and access to weapons.
- In the mental status assessment, it is important to note psychomotor agitation as well as the nature, frequency, and severity of violent ideation.
- Use of an actuarial instrument, such as the Historical, Clinical, and Risk Management-20 (HCR-20) violence assessment scheme, can help integrate systematic inquiry about evidence-based risk factors into assessment of the clinical scenario.²¹ Although such instruments are often developed for use in forensic populations, they can be integrated into the assessment of other populations; for example, the 10 historical items of the HCR can be used as a structured checklist in conjunction with a clinical assessment (**Table**).²²

In assessing patients with bipolar disorder, pay special attention to violent behavior that may have occurred when the person was manic. Also consider violence during euthymic periods, especially in patients who are substance abusers or who have Axis II comorbidity. If at all possible, obtain collateral information about the history of violence. Patients may minimize previous violent actions or not remember them, especially if they were in the midst of a manic episode.

Bipolar patients are most prone to violence during manic or mixed states—when maximum behavioral dyscontrol is combined with unrealistic beliefs. Patients with dysphoric mania and mixed states may be at especially high risk; the assessment for concurrent depression in a manic patient

should therefore be a priority.

Symptoms of bipolar disorder often overlap with those of borderline personality disorder. Comorbid borderline personality disorder, which is often associated with trauma history, has been shown to predict violence potential in bipolar patients, especially during periods of euthymia.^{19,23} Impulsivity is a prominent feature of bipolar disorder. Information about previous impulsive acts, especially acts of impulsive aggression, can give the clinician an idea of a person's likelihood to commit violence on impulse. Often, patients with bipolar disorder will use alcohol and other drugs to self-medicate mood episodes or as part of the pleasure-seeking behavior of a manic episode.

Prevention and management of violence in bipolar patients

The bipolar diagnosis introduces some unique aspects to violence prevention and management, although the general principles are similar to those for patients with other disorders. There are 7 areas that are particularly important in the prevention and management of violence in bipolar patients.

A positive treatment alliance. This can be a challenge in bipolar patients who may have low motivation for treatment, especially if they have poor insight or if they enjoy their manic symptoms. In addition, a history of childhood abuse can lead to diminished capacity for trust and collaboration with the clinician.²⁴ To improve the alliance with a reluctant bipolar patient, identify his or her particular barriers to acceptance of treatment and work to diminish them. It may be helpful to normalize the enjoyment of mania and to empathize with the patient's resistance to treatment as an understandable desire to be healthy and independent.

Frame treatment that addresses aggressive behavior in a way that respects the patient's desire for control; for example, convey that the medication will help the patient control himself rather than saying that the medication will control the patient. A collaborative approach maximizes the patient-physician alliance.

Treat the mood episode. Because the risk of violent behavior increases during an episode, the sooner mood symptoms can be ameliorated the lower the risk. In addition to the agitation and hyperactivity of mania (or sometimes depression), psychotic symptoms are important targets of violence prevention. Symptoms such as paranoid delusions or command auditory hallucinations can contribute to violent behavior, with a greater number of psychotic-like experiences associated with a higher risk of violence.^{25,26} Mixed states may be especially high-risk and may respond better to valproate than to lithium.²⁷

Involve significant others. Those close to a person with bipolar disorder can be both potential victims of aggressive behavior and potential sources of help in symptom monitoring, especially for patients with poor insight. Determine with the patient and family what the early warning signs of a mood episode are for that person so that intervention can be instituted early, before behavior becomes unmanageable. Educating friends and family can prevent violence by helping them avoid behavior that could worsen the patient's aggression; help them understand the need to leave a situation that may become volatile and when urgent intervention is needed (eg, calling 911).

Treat emotional lability and impulsivity. Bipolar patients may be impulsive even during euthymia, especially if there is comorbid borderline personality disorder. Consider referring the patient for dialectical behavioral therapy if borderline features dominate the clinical picture or if there is a significant history of impulsive risk taking or self-harm during euthymia.

Treat substance abuse. Substance use disorders are highly comorbid with bipolar disorder and are a major risk factor for violence. Aggressively assess and treat such disorders, and refer the patient to specialized outpatient programs or restrictive residential programs, if needed.

Teach coping skills. Use assertiveness training, social skills training, anger management training, and stress management training as needed to help the person express his needs, manage potentially frustrating interactions, avoid stress, and handle any anger that arises.

Manage emergencies. If a bipolar patient is an acute danger to others, steps must be taken to incapacitate him. These include involuntary hospitalization and medication. Bipolar patients are most often involuntarily hospitalized during manic episodes. An aggressive pharmacological approach should be taken to address the manic symptoms so as to quickly diminish the risk of aggressive behavior.

Aside from treating the manic episode, other measures may be used if needed to quickly control aggressive behavior. These include sedating medication (eg, benzodiazepines, antipsychotics), seclusion, and restraint. It is important to provide an environment that minimizes overstimulation and includes clear interpersonal communication and limit-setting.

Summary

Bipolar disorder is associated with a high prevalence of childhood trauma as well as with the

possibility of aggressive and potentially violent behavior. It is important for clinicians to assess a patient's potential for violence as accurately as possible to minimize risk. Taking clinical and historical information into account, such as mood symptoms and history of violence, substance abuse, childhood trauma, and impulsivity, can help clinicians make an accurate assessment. Handling emergencies and treating mood episodes pharmacologically are first steps in managing risk; this should be followed up with treating substance abuse and trait impulsivity and with involving significant others and teaching coping skills. Recognizing the impact of early trauma on a patient can help improve the therapeutic alliance and lead to better outcomes.

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TABLE: Ten historical items from the Historical, Clinical, and Risk Management (HCR-20) violence assessment scheme ²⁸	
• Violence	• Major mental disorder
• Other antisocial behavior	• Personality disorder
• Relationships	• Traumatic experiences
• Employment	• Violent attitudes
• Substance use	• Treatment or supervision response

TABLE: Ten historical items from the Historical, Clinical, and Risk Ma...

Disclosures:

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Anger and aggression in PTSD

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Trauma and posttraumatic stress disorder have massive negative consequences; associated anger and aggression are particularly damaging. This overview focuses on these relationships and their potential mechanisms, and offers treatment considerations. Research and theory suggests that trauma impacts anger and aggression through social information processing mechanisms, and an aggression model incorporating impelling, instigating, and disinhibiting factors helps us understand who is at risk under specific circumstances. The association between PTSD and anger and aggression appears stronger for men than women, perhaps reflecting differences in internalizing versus externalizing responses to trauma. Some research indicates that intervention for those with PTSD and anger/aggression problems is effective, and recent studies indicate the benefits of trauma-informed violence prevention for trauma-exposed populations more broadly.

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A vast literature indicates a connection between posttraumatic stress disorder (PTSD) and both anger and aggression. Understanding this link is critical for efforts designed to mitigate this relationship and prevent the myriad negative consequences associated with these problems, as anger-related problems are often reported as the greatest clinical concern for PTSD patients entering treatment [1]. This overview will focus on theory and research on the links between PTSD, anger, and aggression, and considerations for intervention. For the sake of brevity, we will discuss the civilian and military literatures together.

PTSD is more strongly associated with anger and aggression in samples of Veterans relative to civilians [2,3] though the association remains across populations and similar processes explain these associations.

Current conceptualizations of anger include physiological, affective, and behavioral components [4]. Although anger can be considered a prelude to aggression, and anger statistically mediates the effects of PTSD on aggression [5], not all who are angry will become aggressive [6]. Aggressive behaviors take many forms. Our focus will be on physical and psychological aggression since they have considerable topographical and functional overlap, and PTSD has been strongly linked to these forms of aggression, while not as strongly linked to sexual aggression [7].

Recent changes to the PTSD diagnostic criteria (DSM-5) have particular relevance for anger and aggression. Within the PTSD symptom cluster formerly known as ‘hyperarousal’ and now renamed ‘alterations in arousal and reactivity that are associated with the traumatic event(s),’ is a symptom that has been changed from ‘irritability/anger’ to ‘irritability, angry or aggressive behavior.’ Acknowledgment of the link between PTSD and aggression appears to represent a positive development, but it is important that we not view aggression as an unavoidable psychological manifestation of PTSD.

Links between PTSD and anger/aggression

The connection between PTSD and anger has been demonstrated in several studies using static questionnaire and interview assessments in uncued conditions [2,8], and longitudinal research indicates that PTSD predicts anger while anger does not predict PTSD [9]. A PTSD diagnosis is associated with more anger difficulties than other psychiatric problems [8]. Laboratory studies have also shown that the most common emotional reaction to exposure to trauma cues among those with PTSD involves anger rather than anxiety or other emotions [10,11]. Further, anger appears to increase more sharply after such trauma cue exposures than anxiety [11].

Correlations between reports of PTSD and aggression have also been demonstrated repeatedly [3,12]. Further, PTSD symptomatology seems to account for the influence of trauma variables on violence [13], and strongly predicts violence even while controlling for a range of other factors [14]. PTSD symptoms reflecting heightened physiological arousal are a particularly strong predictor of intimate partner violence (IPV) [15] and general aggression [16].

Different research groups have attempted to better understand the mechanisms underlying associations between PTSD and aggression using laboratory paradigms to examine social information processing deficits. Social information processing models [17,18] posit that we process social information through a series of stages, and how one perceives and interprets their social world is of central importance. Our extension of this model [19^{*}] builds on prior theory and research by Dodge and colleagues among children that focuses on how trauma impacts our interpretation and processing of information gathered from our social environment [20–22]. Specifically, trauma exposure and PTSD can produce biases (e.g., hostile attributional bias) and deficits in social information processing that place individuals at risk for aggression.

The relevance of this model has been demonstrated in civilians in a sample of 161 community-based men [23]. Early trauma experiences were related to use of physical and psychological IPV in adulthood due to their impact on both PTSD symptoms and social information processing deficits, assessed via responses to hypothetical relationship vignettes intended to assess decoding and decision-making skills. Sippel and Marshall [24] extended this work in a community sample via findings that PTSD is associated with a heightened sensitivity to shame-related content in cognitive processing, and this shame-related cognitive bias in turn was associated with use of IPV. Those with PTSD appeared to be more likely to misperceive ambiguous partner behaviors as rejecting, contributing to social information processing deficits and IPV. Taken together, these findings suggest that in community samples, PTSD not only contributes to misperceptions of others generally, but also perceived threats to interpersonal relationships that may contribute to IPV (see also [25]).

In a more recent study of 92 male Veterans, using laboratory-based assessment of cognitive biases and hostile attributions while angry, we found that cognitive biases mediated associations between PTSD scores and anger expression [26^{**}]. These results suggest the relevance of social information processing mechanisms for the relationship between PTSD symptoms and aggression in Veterans. Consistent with some prior research and expectations based on the social information processing model [27], hostile attribution biases were also a risk factor for IPV.

It may be useful to know who might be at risk under what circumstances, and how multiple risk factors operate together. Finkel and colleagues developed the I³ (I-cubed) Theory [28,29] that is based on the interaction among instigating factors (external circumstances or situations that trigger an individual to behave aggressively), impelling factors (those that make the individual more

likely to respond aggressively to the instigating factors), and inhibiting factors (that counteract the instigating and impelling factors to prevent acting upon the urge to behave in an aggressive manner). An individual may be at risk for aggression but may not become aggressive in the absence of disinhibitory factors.

We can think of PTSD as an impelling factor in the I³ model — a characteristic that increases aggression risk when responding to instigating events. A number of problems that often co-occur with PTSD, such as substance use and traumatic brain injury, may serve as disinhibiting factors, and an example of an instigating factor might be a conflict situation that reminds one of their trauma. Research supports these relationships among Veterans in particular, with evidence that disinhibitory factors such as problematic alcohol consumption [15] and traumatic brain injury [30] interact with PTSD to predict aggression. Novaco and Chemtob [31^{**}] have similarly reported an interactive effect of PTSD symptoms and anger on aggression, suggesting that anger may disinhibit the relationship between PTSD and aggression.

Very little research has examined gender differences in associations between PTSD and anger/aggression, though one meta-analysis demonstrated that PTSD is more likely to be associated with use of violence in men than in women, though the link for women was still evident [3]. Available data appear to suggest that men are more likely to exhibit aggression outwardly when they experience PTSD, while women are more likely to develop internalizing problems such as depression [32]. Indeed, one recent study examining predictors of women Veterans' use of physical or psychological aggression found that PTSD symptoms were not a significant predictor of aggression when other variables such as alcohol misuse or intimate relationship satisfaction were included in the models [33].

Treatment considerations

Responsibility for abusive and violent behavior

It is important to address the issue of personal responsibility (or accountability), which is a major concern among IPV practitioners. Some scholars and practitioners are concerned that acknowledging that PTSD confers risk for aggression will excuse personal responsibility for violent behavior. We believe that a trauma-informed perspective that identifies links between PTSD, anger, and aggressive behavior does not minimize the violence or hold anyone less accountable. We can acknowledge the impacts of PTSD while working with the individual to develop goals and take responsibility, and also ensuring that we do not collude with them in minimizing their personal responsibility. In fact, those who engage in violence will be more likely to accept responsibility if they feel heard and understood by their provider and if

their provider takes seriously their other life challenges and problems.

Core themes

One barrier to treatment for aggressive behavior may be the extensive trauma experienced by this population [34]. PTSD symptoms impact the process of therapy for angry and violent individuals. Common themes that are thought to underlie PTSD symptomatology [35,36] may have an impact on therapeutic relationships, and our efforts to facilitate a positive therapeutic alliance are particularly important when working with a PTSD population [37,38]. Often these core themes require greater attention in treatment than psychopathology, since negative thought patterns underlying trauma and PTSD are very common for those with anger and aggression problems, and affect all areas of interpersonal functioning.

For example, discussions of *guilt and shame* can help clients recognize that it is difficult to acknowledge and take responsibility for one's aggressive behavior. Powerful feelings of shame may provoke denial and externalization of responsibility, leading the individual to avoid coming face to face with the reality of their behavior and the damage it has caused. Helplessness and uncontrollability during a traumatic event(s) can lead to feelings of powerlessness that contribute to PTSD (e.g., [39]) and controlling/aggressive behavior [40]. Such *power and control* conflicts can be difficult to manage in the therapy context as well, since it may be difficult to establish positive therapeutic relationships with controlling clients. It also stands to reason that when angry or aggressive clients have difficulties related to *trust*, they may less inclined to develop a positive therapeutic relationship. Finally, low *self-esteem* commonly resulting from trauma and PTSD may contribute to a tendency to attempt to lower others, including providers, and may impact the self-confidence needed to actively engage in behavior change efforts.

Treatment outcome studies

Some evidence suggests the effectiveness of interventions for anger and aggression among those with PTSD, though this research is limited to mostly small-sample or uncontrolled studies of Veterans. For example, in a sample of 15 Vietnam combat veterans with severe PTSD and high anger, Chemtob and colleagues [41] showed that compared to those who received routine clinical care, individuals who participated in their anger program improved in their ability to control their anger, and these effects were maintained at the 18 month follow-up. Shea, Lambert, and Reddy [42] similarly showed a cognitive-behavioral intervention to evidence relatively better anger outcomes than a supportive control condition in a small sample of 25 veterans from the Iraq and Afghanistan wars. Other studies demonstrated that PTSD treatment may assist in reducing anger symptoms [43,44], though we

are not aware of any examination of the effects of PTSD intervention on aggression outcomes.

There is some evidence that novel approaches to anger management may have some promise for those with PTSD. In a sample of Veterans with PTSD ($N = 125$), Morland and colleagues [45] demonstrated that a telemedicine-delivered anger management intervention was equally effective relative to in-person delivery of anger management. Results suggest that such interventions can be delivered via different modalities without losing treatment effectiveness.

Although not yet examined as a preventative intervention for anger and violence within couples, Cognitive-Behavioral Couple Therapy for PTSD (CBCT [46]) has shown promise in reducing PTSD and enhancing relationship satisfaction in couples via a randomized controlled trial [46]. The intervention consists of 15 sessions and is organized around three phases that build on one another [47]: first, psychoeducation about PTSD and relationship problems; second, behavioral interventions to improve communication and address avoidance; and third, cognitive interventions to address maladaptive thought patterns that may impact both PTSD and relationship problems.

Our team has developed two related programs designed to reduce and prevent IPV: the *Strength at Home Couples'* and *Strength at Home Men's* programs. *Strength at Home Couples'* is designed to prevent IPV before it begins in relationships, and engages groups of couples to work on better understanding links between trauma and abusive behavior, and develop skills to deescalate difficult situations and communicate more effectively. *Strength at Home Men's* was designed for men who engage in IPV, and includes similar material as *Strength at Home Couples'* as well as material focusing on understanding the components of one's anger response, and cognitive distortions related to the aforementioned trauma-informed social information processing model. Both programs are trauma-informed and not trauma-focused, meaning that participants need not have PTSD to participate and PTSD is not the target of treatment, though preliminary data suggest that the program may be effective for reducing PTSD symptoms. Two recent studies demonstrate the efficacy of these programs, representing the first such randomized controlled trials to demonstrate prevention and cessation of IPV in military populations [48^{••},49^{••}].

Summary and future directions

The relationship between PTSD and anger/aggression have now been well-established, with some research suggesting that anger may serve as a mechanism through which PTSD is associated with aggression. A growing research base has identified social information processing mechanisms involved in these relationships. Where the

literature is less clear, however, is regarding our understanding of what combinations of risk factors confer the greatest risk for anger and violence among those with PTSD. We also have relatively little evidence for how to effectively deliver anger/aggression intervention among those with PTSD in particular. Promising interventions have been developed, but more theoretically guided randomized controlled trials need to be conducted that focus on the mechanisms of interest. As the field moves toward developing and evaluating interventions targeting these problems, we will be better equipped to prevent and reduce aggression and violence associated with PTSD.

Conflict of interest statement

Nothing declared.

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Reducing Domestic Violence and Other Criminal Recidivism: Effectiveness of a Multilevel Batterers Intervention Program

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This study evaluated whether the use of a multilevel system of intervention based on batterer assessment resulted in lowered risk of re-arrests for both domestic violence and other crimes. The study conducted analysis of data from 1995 to 2004, including initial arrest and program placement information and re-arrest rates for 17,999 individual batterers. The study found that recidivism rates were substantially lower for participants who completed the programs when compared to those who did not and that the re-arrest rates were substantially lower than are generally found in the literature on batterer recidivism. The study provides guidance to batterers intervention programs in approaches to designing countywide programs that are most effective in reducing recidivism in domestic violence batterers.

Keywords: characteristics; family violence; intimate partner violence; treatment; cognitive-behavioral

One of the main objectives of domestic violence offender treatment programs is to decrease the likelihood that future intimate partner assaults will occur. In 2004, an estimated 466,600 women were the victims of violent crimes at the hands of intimate partners, and 198,000 were victimized by another relative. In addition, 111,750 males were the victims of violent crime by an intimate, and 163,700 were victims of another relative (Catalano, 2005). The number of treatment programs for the perpetrators of domestic violence has been growing steadily since their inception in the late 1970s, and the standardization of these programs has similarly been increasing since the 1990s (Babcock, Green, & Robie, 2004).

Historically, intervention for domestic violence focused on the victim, and little attention was paid to the abuser beyond court-mandated sentencing. In the 1970s the focus began to shift to include treating the batterer with the notion that therapy might halt future abuse (Babcock et al., 2004; LaViolette, 2001). Court-mandated counseling was introduced in the 1980s, and thus current programs are often a combination of rehabilitation and punishment. Although there is some divergence, the most widely used approaches are gender-based cognitive-behavioral interventions. Methods to interrupt violence, discussion and communication skills, and overall attitudes toward women are approached

through the gender-based perspective of establishing greater respect by the man for his partner (Gondolf, 2000). In addition, the group-based format forces offenders to accept responsibility for their own behavior by confronting one another on issues related to denial and blaming of the victim (Babcock et al., 2004; Gondolf, 1997a; Grusznski & Carillo, 1988).

Although offender treatment programs have become more prevalent, rates of attrition and recidivism remain high. Attrition rates reported in programs across the United States range from 40% to 60% (Buttelt & Pike, 2002; Chang & Saunders, 2002; Gondolf, 1997a). In addition, recidivism after program completion continues to be a significant problem; between 20% and 30% of men reassault the original victim or a new partner (Gondolf, 1997b, 2003). Because of such findings, research on the impact of new program directions is crucial. One area of investigation has been the delineation of batterer typologies (Holtzworth-Monroe & Stuart, 1994; Saunders, 1992). In a comprehensive review of the literature, Holtzworth-Monroe and Stuart (1994) found that existing typologies were based on rational-deductive or empirical-inductive strategies and distinguished batterer subtypes along three major dimensions (i.e., severity, generality, and psychopathology/psychopathy). These dimensions included classifications such as frequency of the violence; psychological or sexual abuse; span of the partner's violence, such as family-only or extrafamilial violence; and antisocial behavior, including criminal behavior. Although psychological typologies have contributed to the theoretical understanding of batterers' diverse characteristics (Dutton & Golant, 1995; Gondolf, 1988), they have not typically been directly useful to the criminal justice system either in the identification of dangerousness or in designing interventions (Healy & Smith, 1998; Kantor & Jasinski, 1997). Other categorization schemes have also emerged. Utilizing a criminal profile categorization scheme based on demographic information, criminal history, and substance abuse data, Goldkamp (1997) grouped batterers into two interrelated high-risk categories (i.e., dropout and prior arrest) and found that the probability of re-arrest was significantly heightened for persons with a prior assault and battery arrest and/or who were drug abusers. This type of categorization may provide a more practical and successful method for designing court-based interventions.

This study evaluates a countywide batterer intervention program that is designed to target program response to batterer characteristics. A public health approach was utilized in the development of this multilevel intervention system under study. This approach assumes that a problem as widespread in the population as domestic violence necessitates a population-based intervention plan. Population-based interventions should not only provide for the majority of the population but also allow the specific targeting of higher-risk groups. Therefore, the plan under investigation attends not only to the needs of the majority of offenders (as do most standard intervention plans) but also to those minority subpopulations who require specific services because of special individual characteristics (i.e., chronic history of violence or serious mental health disorder).

Because most batterer programs provide only a single intervention, important differences in the interaction of factors, such as substance abuse or other psychological disorders co-occurring with severity of violence, may not be addressed. If the interaction of batterer's level of violence and co-occurring disorders is an important dimension, then providing interventions that have the capacity to address multiple factors (e.g., partner violence, pervasiveness of violence, and psychological disorders) in addition to a program that targets a single factor (i.e., partner abuse) may result in more effective treatment. This study investigates the effectiveness of a multilevel intervention program by examining the dropout and re-arrest rates for batterers receiving varied intensity of treatment. Batterers

are assigned to varied levels of treatment that are based on chronicity of violence and co-occurring problems.

PROGRAM OVERVIEW

The three-tier treatment program was developed simultaneously with the establishment of the Thirteenth Judicial Circuit Domestic Violence Division and continues to be supervised by the Thirteenth Judicial Circuit System in Hillsborough County, Florida, where this study took place. Although final decisions rest with the head judge of the domestic violence division, a community network participates in planning and refining the program operation. The network is broadly representative of a variety of critical individuals, such as victim advocates, an advisory group of batterer intervention providers, the district attorney's office, and a consultant from the University of South Florida. The three-level community-based treatment program is theoretically driven and utilizes a collaborative system of operation.

All batterers entering the program are administered a battery of screening procedures and tools. The screening protocol, which includes a state-mandated screening instrument, is administered through a structured interview. The protocol includes questions regarding the batterer's demographics; violence in family of origin; childhood history, including school problems, behavior problems, delinquent behavior, fighting, sex, and drug use; history of violence and drug use as an adult; arrests and convictions; availability of social support systems; employment stability; military experience; account of the current domestic violence incident; admission or denial of responsibility for current incident; and issues of power and control. The batterer's previous treatment experience also is obtained, including treatment for domestic violence, drugs and alcohol, mental health, and/or anger management. On the basis of the screening results, a recommendation is made for the appropriate level of treatment intervention (though, by statute, level 1 interventions may be recommended only by the judge). The screening team recommends level 2 or 3 treatment programs and the need for additional services, such as comprehensive substance abuse service. Batterers identified as requiring level 3 treatment undergo further comprehensive psychological, psychosocial, and/or medical evaluations prior to commencement of domestic violence treatment. For delineation of characteristics of each level, see Table 1. Prior to entry into a level 3 treatment program, to confirm the accuracy of the screening recommendation, batterers must complete one of the following: (a) psychological evaluation, (b) psychosocial evaluation, or (c) medical and/or psychiatric evaluation.

Batterers assigned to level 1 treatment by the presiding judge receive a shortened version of a psychoeducational program for 8 to 12 weeks. Those in level 2 intervention receive a 26-week psychoeducational intervention program. Treatment providers who represent public and private agencies are trained in and utilize power and control models based on psychoeducational models, such as the Duluth and Emerge protocols (for details, see Aldarondo & Mederos, 2007a, 2007b; Pence & Paymar, 1993). The duration of treatment for individuals assigned to level 3 groups is between 26 weeks and 1 year. In addition to the power and control models included in level 2 programs, batterers are provided treatment programs tailored to their individual needs. Batterers are provided psychological and psychiatric treatment to address issues such as affective or behavioral disturbances, the need for psychotropic medication management, or chemical dependence. All level 3 treatment groups are conducted by licensed mental health professionals. The program

TABLE 1. Program Level Description

Program	Batterer Characteristics
Level 1	<p>First-time offenders who have no other violent convictions, serious emotional dysfunction, or history of psychiatric disorders. The violence is generally restricted to family members. The identified incident of domestic violence is <i>not</i> a pattern of escalating coercion and control. These individuals are likely to demonstrate remorse for their violence while minimizing its significance. (Level 1 programs must be directly recommended and justified by the judge. State regulations do not allow assignment to less than level 2 programs by domestic violence batterer's intervention programs without judicial justification.)</p>
Level 2	<p>Individuals assigned to level 2 intervention programs typically evidence some recurrent history of violence, either domestic or otherwise. Gondolf (1988) has previously referred to this group as "chronic typical batterers." Violence is generally confined to the family. An individual will be designated as in need of a level 2 program if he or she engages primarily in escalating power and control tactics to intimidate and dominate the relationship and is engaging in acts of physical or sexual violence. The batterer may have some mental health problems, including drug and alcohol dependence, but do not have a history of treatment failures or pervasive violence. These are the majority of batterers.</p>
Level 3	<p>Individuals assigned to level 3 programs are the most complex and exhibit the most chronic violence. Screeners use the following indicators to recommend an offender for this level of intervention, but a further psychosocial or psychological evaluation is required to confirm this placement:</p> <ul style="list-style-type: none"> • Use of a weapon • Severity of injuries to victims • Serious physical violence and/or intent to do permanent physical or cognitive damage (choking, multiple hitting/punching the head, etc.) • A violent criminal history • Serious mental health disorder • Previous group completion with increase of violence • No prior intervention but multiple domestic violence charges • Multiple violations of an injunction for protection • Stalking behavior <p>Any one of these criteria can be sufficient to indicate a level 3 designation. However, if the assessment team feels that the offender fits into a level 2 program, he or she may be so designated. The assessment team may consider other conditions when recommending evaluation for level 3 group levels, such as borderline functioning and safety of the victim (i.e., still living with the offender). The assignment to group level must always err on the side of safety; therefore, if the team is unsure, then a level 3 recommendation should be given.</p>

TABLE 1. Program Level Description (Continued)

Program	Batterer Characteristics
	The presence of more than one indicator should be considered when recommending a level 3 program. Additional services, such as individual therapy, supplemental group attendance, lengthened program format, or medication management, are offered where needed. Mental health practitioners are able to respond to batterers' individual mental health needs within the group setting. All participants are assessed at 26 weeks to determine whether additional services are necessary in order to satisfactorily terminate intervention.

standards require the intervention specialists for the level 3 batterers to be master's- or doctoral-level Florida licensed mental health professionals (i.e., psychiatrists, psychologists, social workers, or mental health counselors). Additional services, such as individual therapy, supplemental group attendance, lengthened program format, or medication management, are offered where needed. Mental health practitioners are able to respond to batterers' individual mental health needs within the group setting. All participants are assessed at 26 weeks to determine whether additional services are necessary in order to satisfactorily terminate intervention.

Batterers are allowed to select their treatment providers, but once enrolled in a particular community program, they must ordinarily remain with that provider until treatment completion. Victims are notified of the attendance of the offender in the program and are invited to attend victims' counseling and/or support groups with other providers.

METHOD

This study evaluates the effectiveness of a countywide, multilevel batterer intervention program by examining the dropout and re-arrest rates for batterers receiving treatment at one of six licensed treatment centers in Hillsborough County, Florida, between 1995 and 2004 via a two-tiered process. These centers include interventions for all offenders in the county with the exception of active military personnel served on base, or veterans served at the veterans hospital. In step 1, basic demographic data, including name, date of birth, gender, race (where available), and Social Security number (where available), as well as information on program level assignment (1, 2, or 3) and program completion status (completed successfully or dropped out), were collected for every client served from each of the six service providers on an annual basis.

In step 2, an Excel file containing all available demographic information for every client provided service at each of the six service providers between 1995 and 2004 was sent to the Florida Department of Law Enforcement (FDLE) to be "matched" to any additional arrests made against them in the period after program enrollment. Arrest data are compiled biannually from each county across the state of Florida, and arrest data were examined through December 2005. Once matched, all cases were coded into a large SPSS data set containing both demographic and programmatic information ascertained in step 1 as well as information ascertained in step 2 regarding the presence and type of re-arrest, if any, a client had experienced in the period after program enrollment. The court contracts with the

university on an annual basis to evaluate the program. Institutional review board approval was sought and obtained to use the data, and individual HIPPA agreements were signed between the university and each provider.

Sample

Batterers (program client cases) included individuals who were convicted of a domestic violence crime in Hillsborough County, entered a diversion program in lieu of conviction, or were persons required to enter the program as part of an injunction at one of six licensed batterer intervention program sites between 1995 and 2004. Each of the batterers was screened prior to entry into intervention services and was assigned to a level 1, 2, or 3 program (see Table 1). These program levels roughly identify increasing levels of past or current violence as well as the need for special services, such as mental health. Batterers who are identified as needing level 3 services at assessment (screening) also received a confirmatory evaluation prior to program entry to ensure appropriate placement. Intervention providers include both private for-profit and private not-for-profit agencies.

Data Analysis

Demographic data of the overall sample were calculated using SPSS version 14.0, and program completion and recidivism rates were reported across program levels and year of program entry. Special attention was paid to program date to ensure that only recidivism after program enrollment was recorded.

The Match Process

A list of all identified program clients who received service between 1995 and 2004 were sent to the FDLE in 2006 to ascertain the presence of re-arrest in the period after program enrollment. The FDLE examined all demographic information available for each case (program client) against arrest databases for the years 1996–2005 and assigned each case (program client) a “match” percentage ranging from 0 to 100. This match rating indicated the degree of certainty that the individual was either present or not present in the FDLE system. For example, if an individual of the same name, birth date, and Social Security number as a provided case (program client) was found in the FDLE arrest records, this case was assigned a match rating of 100%, indicating a high degree of concordance between case and re-arrest record, and the label “recidivism present” was assigned and the reason for re-arrest recorded in the program evaluation data set. Additionally, in cases where no overlap was found between the demographic profile provided (client cases) and any arrest record in the FDLE database, a match rating of 100% was also given, and a label of “no recidivism” was recorded in the program evaluation data set.

Not all cases were assigned ratings at the 100% level, however. Because of many factors, such as clients providing false information at time of arrest, variation in the completeness of demographic information provided, and data entry error (e.g., spelling “Smith” as “Smih” at time of arrest), only 74% of provided cases could be matched at 85% certainty or higher (e.g., same name and Social Security number but no birth date provided or same Social Security number and birth date but one letter of name changed or omitted), and it is these cases that are used as the basis for the recidivism information included in this analysis. In the future, the more information providers are able to provide concerning each unique batterer (sex, race, age, full name with middle initial, Social Security number, address, and so on), the greater success we will have in the matching process.

RESULTS

During the period from January 1, 1995, to December 31, 2004, inclusive, there were 17,999 unique batterers who entered the Hillsborough County Domestic Violence Intervention Program across all six program sites. Demographics of the overall sample are provided in Table 2. Batterers had an average age of 34.5 years and were

TABLE 2. Demographics of the Overall Sample (N = 17,999)

	<i>N</i>	%
Age	Mean (<i>SD</i>)	34.5 Years
Gender		
Male	11,951	66.4
Female	2,862	15.9
No response	3,186	17.7
Race		
White	11,411	63.4
African American	4,860	27.0
Hispanic	5	0.03
Other	211	1.17
No response	1,512	8.4
Marital status		
Married	4,860	27.0
Single	4,140	23.0
Divorced	2,159	12.0
No response	6,840	38.0
Education		
Less than high school	2,160	12.0
High school	7,560	42.0
College	2,970	16.5
No response	5,309	29.5
Number of biological children	Mean	2
None	1,980	11.0
1	3,060	17.0
2	2,700	15.0
3–5	2,340	13.0
>6	180	1.0
No response	7,739	43.0

(Continued)

TABLE 2. Demographics of the Overall Sample (*N* = 17,999) (Continued)

	<i>N</i>	%
Number of children living with client	Mean	2
None	5,220	29.0
1	1,800	10.0
2	1,440	8.0
3–5	1,440	8.0
>6	180	1.0
No response	7,919	44.0
Number of years in current relationship	Mean	4.2
None	720	4.0
1–5	5,400	30.0
5–10	2,520	14.0
>10	2,520	14.0
No response	6,839	38.0%

predominantly male (66.4%). Whites accounted for 63% of the sample, African Americans 27%, and Hispanics 0.03%. Forty-two percent of batterers reported having a high school diploma, 16% reported having a college degree, and 12% reported having not finished high school. Batterers had between one and 23 children, with most reporting two children living with them at home at the time of program enrollment. Batterers reported being in the current relationship for an average of 4.2 years, with 4% reporting no current relationship at program inception.

Data regarding rates and level of enrollment, program completion, and recidivism for the years 1995–2004 are presented in Table 3. Rates of participation in the program have been lower in the last 3 years of the program evaluation (*N* = 1,242 in 2002, *N* = 1,368 in 2003, and *N* = 1,623 in 2004) compared with the initial years of the program (*N* = 2,593 in 1997, *N* = 2,424 in 1996, and *N* = 1,816 in 1997). Of those who entered the program, 1,672 offenders were categorized as level 1, 13,349 were categorized as level 2, and 2,978 were categorized as level 3. Findings indicated that 85.2% (1,424) of the offenders in level 1 programs, 70.3% (9,386) in level 2 programs, and 57.5% (1,712) in level 3 programs had completed their program, with an overall program completion rate of 69.6% across all levels.

Analysis of recidivism data from the overall program revealed that less than one-half of the offenders who had completed their program were re-arrested for domestic violence crimes (8.4%) and other crimes (17.2%) when compared to those who did not complete their program (21.2%, and 33.8%, respectively). This was true across each program level; 8.8% of level 1, 8.3% of level 2, and 8.6% of level 3 batterers had been re-arrested for domestic violence crimes in the period after program enrollment compared to 23.4%, 21.1%, and 20.0% of those who had dropped out of the program. In addition, it was possible to compare rates of completers to noncompleters for commission of crimes that were not domestic violence crimes. For crimes other than domestic violence, the rates were 18.1%,

16.7%, and 19.4% and 33.1%, 32%, and 39.7%, respectively, when comparing completers to noncompleters at levels 1, 2, and 3.

Completion rates have remained stable over the course of the program, and re-arrest rates across all levels dropped between 1995 and 2000, increased slightly between 2000 and 2002, and then dropped again between 2002 and 2004 (see Figures 1–4).

DISCUSSION

The Batterer Intervention Program of the 13th Judicial Circuit Court in Hillsborough County has shown exceptionally positive outcomes. The overall recidivism for crimes of domestic violence occurred at the rate of 8.4% for those individuals who completed the program compared to an overall recidivism rate of 21.2% for those who did not complete the program. In addition, the overall completion rate was approximately 70%, demonstrating that the program was able to retain the majority of the batterers (12,522) who entered. This completion rate far exceeds the completion rates of most programs identified in the national literature, where average attrition rates range between 40% and 60% (Buttelt & Pike, 2002; Chang & Saunders, 2002; Gondolf, 1997a), and recidivism for domestic violence crimes ranges between 20% and 30% (Gondolf, 1997b, 2003).

These positive results held true across all program levels; 85.2% (1,424) of level 1 participants completed their intervention program, and only 8.8% (125) were re-arrested for a domestic violence crime in the years after program enrollment. Of those batterers in the level 2 program, 70% (9,386 individuals) completed their program. These individuals had an overall recidivism rate of 8.3% for domestic violence crimes, while those who did not complete their program had a recidivism rate of 21.1% for domestic violence crimes. Re-arrests rates for domestic violence crimes for those individuals in the level 3 program (1,712 individuals) were only slightly higher (8.6%) for those who completed their program and were twice as high (20.8%) for those who failed to complete their program. These results are especially impressive given the level of violence previously demonstrated by offenders assigned to level 3 programs. Re-arrests for crimes other than domestic violence were higher for individuals in level 3 programs than for those in level 2 programs (19.4% vs. 16.7%, respectively). However, those who did not complete the program had higher re-arrest rates in each program level—32.0% for level 2 participants and 39.7% for level 3 participants—demonstrating that although crime is still occurring, it is occurring at a lower rate in persons who have participated in the batterer intervention program. Because of missing data in some demographic categories, it was harder to subdivide the batterer categories into demographic profiles to further assess the reasons for batterer completion and recidivism.

While the outcomes of the program are exceptionally positive in both re-arrest rates and completion rates (Buttelt & Pike, 2002; Chang & Saunders, 2002) when compared to data reported in other programs across the United States, the decrease in batterers entering the program continues to be of concern. The Hillsborough County Domestic Violence Intervention Program has gradually had fewer clients entering treatment during the period 1998–2004, and these programs currently have approximately two-thirds the number of batterers entering the program than they did in 2004 (1,623) and than they did during the most utilized periods of 1995 and 1996 (2,593 and 2,424, respectively). While it is not possible to assess any bias that might have been introduced by this reduction in referrals, it is probable that the more serious cases continued to be referred, making the current outcomes a cautious assessment. In addition, since all cases were examined for recidivism regardless of when they entered the

2000	1	53	45	84.9	8	15.1	1	2.2	3	37.5	3	6.7	1	12.5
	2	1,005	700	69.7	305	30.3	10	1.6	45	15.3	34	5.3	48	16.3
	3	218	118	54.1	100	45.9	2	1.7	13	13	6	5.1	12	12
		1,276	863	67.6	413	32.4	13	1.6	61	15.2	43	5.4	61	15.2
2001	1	114	98	86	16	14	7	7.1	4	25	14	14.2	5	31.3
	2	1,409	984	69.8	425	30.2	77	7.8	79	18.6	147	15	109	25.7
	3	463	255	55.1	208	44.9	18	7.1	33	15.9	33	13	54	26
		1,986	1,337	67.3	649	32.7	102	7.6	116	17.9	194	14.5	168	25.9
2002	1	52	33	63.5	19	36.5	2	6	3	15.8	7	21.2	7	36.8
	2	917	651	71	266	29	48	7.3	51	19.1	104	16	79	29.7
	3	273	160	58.6	113	41.4	13	8.1	28	24.8	32	20	38	33.6
		1,242	844	68	398	32	63	7.5	82	20.6	143	17	124	31.2
2003	1	127	99	78	28	22	11	11.1	4	14.2	22	22.2	6	21.4
	2	876	602	68.7	274	31.3	66	10.9	45	16.4	102	17	72	26.2
	3	365	176	48.2	189	51.8	14	7.9	37	19.6	28	16	49	26
		1,368	877	64.1	491	35.9	91	10.3	86	17.5	152	17.3	127	25.9
2004	1	131	115	87.8	16	12.2	8	7	2	12.5	13	11.3	3	18.8
	2	1,039	692	66.6	347	33.4	62	9	61	17.6	122	17.6	99	28.5
	3	453	257	56.7	196	43.3	13	5.1	34	17.3	24	9.3	49	25
		1,623	1,064	65.6	559	34.4	83	7.8	97	17.4	159	14.9	151	27
Total	1	1,672	1,424	85.2	248	14.8	125	8.8	58	23.4	258	18.1	82	33.1
	2	13,349	9,386	70.3	3,963	29.7	779	8.3	838	21.1	1,567	16.7	1,269	32
	3	2,978	1,712	57.5	1,266	42.5	147	8.6	263	20.8	332	19.4	502	39.7
		17,999	12,522	69.6	5,477	30.4	1,051	8.4	1,159	21.2	2,157	17.2	1,853	33.8

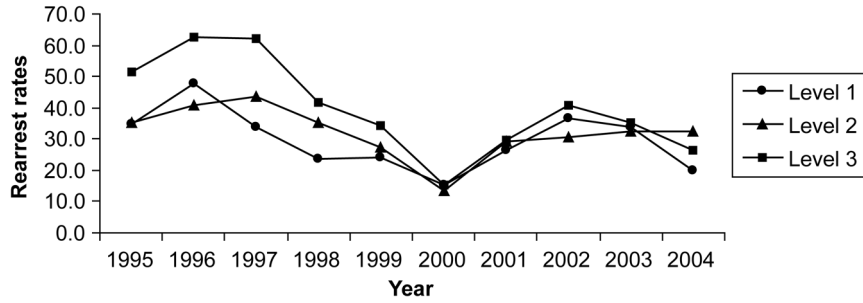


Figure 1. Re-arrest rates by level.

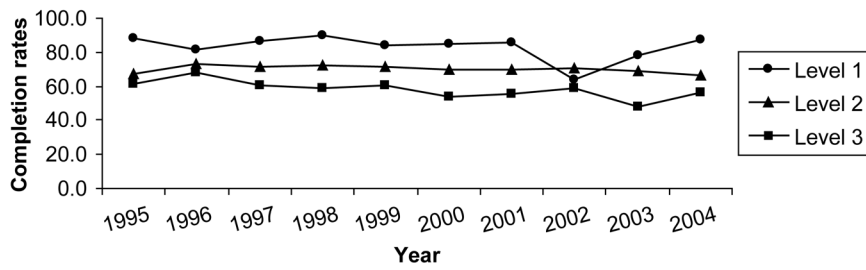


Figure 2. Completion rates by level.

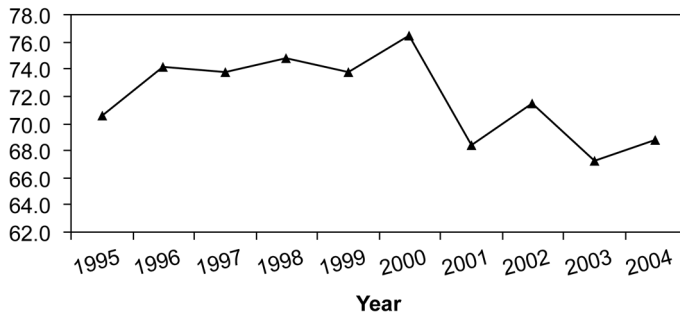


Figure 3. Cumulative completion rate.

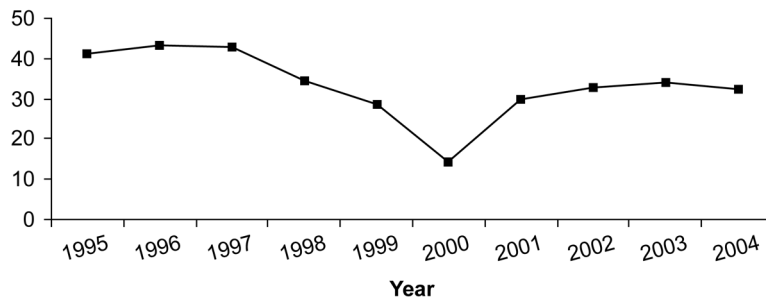


Figure 4. Cumulative re-arrest rates.

system, there is variability in the time that they were followed, and this could not be controlled for. This enabled us to determine the long-term effects of the program; however, those who entered the program at the end of our reporting system had shorter follow-up times.

With our current fiscal climate putting increasing pressure on the need for budget cuts, it is important to evaluate the effectiveness of existing programs and to support programs that are effective. The reduction in recidivism noted in participants of the batterer intervention program translates not only into decreases in crimes committed but also into decreased costs to cover expenses such as court time, health care for injuries, missed days of work for victims, and psychological counseling for children being raised in violent homes.

Limitations and Future Research

These data indicate success in affecting re-arrest rates for this population of individuals when comparing completers to noncompleters of the program. It should be noted, however, that all this reduction might not be attributable to program effect, as it is possible that program dropouts may be different from program completers and thus more likely to be re-arrested. Further analysis of predictors of program completion will be undertaken to investigate what, if any, differences in these groups exist. Analysis of data that capture the length of time the batterer was in the program before dropping out would also be instructive, allowing us to calculate a “dose–response” effect.

In regard to program success, it should also be noted that it is possible that some batterers are not committing fewer domestic violence crimes but rather learning, through interaction with one another and the legal system, the importance of masking their violence and the skills to do so more effectively, or they are simply exchanging one form of domestic abuse (such as physical or sexual violence) for another (psychological abuse). A primary limitation is reliance on police/official record data for the measure of recidivism. This is considered the most crude and weakest measure of batterer effectiveness, as it captures only those who come into contact with authorities again. An expansion of the present study to include follow-up with victims would shed more clarity on this issue.

Finally, this group of batterers is, overall, a group with high levels of criminal activity, and tracking these individuals is becoming a more difficult process as they learn to circumvent the system and as more people with similar characteristics and names are added to the FDLE database. The FDLE match score for the purpose of this analysis was limited to 85% certainty, meaning that only in instances where the FDLE was 85% sure that the record belonged to an identified individual was the case recorded. Additionally, if the FDLE was 85% certain that no record matches for an individual were found (meaning that no additional crime had been committed), records were also taken as a viable match. In total, 74% of cases were able to be matched with certainty. These were used as the basis for the recidivism information included in this analysis. In the future, the more information providers are able to provide concerning each unique batter (e.g., sex, race, age, full names with middle initial, Social Security number, and address where available), the greater success we will have with the matching process.

In summary, the use of a public health approach that not only responds to offenders with standard characteristics but also identifies and responds to offenders with characteristics that require more specialized interventions appears to have positive advantages. We can conclude that recidivism rates do not appear to differ much when batterers are triaged into treatment that seems geared to their violence and personal needs. This analysis of 9 years of program operation with 17,999 batterers followed for subsequent re-arrest shows

effective program outcomes when compared with other available data. Of interest is the fact that the program outcomes are positive not only for a major reduction in domestic violence re-arrests but also for re-arrests for crimes that are not domestic violence crimes.

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Original Article

Predictors of trait aggression in bipolar disorder

Garno JL, Gunawardane N, Goldberg JF. Predictors of trait aggression in bipolar disorder. *Bipolar Disord* 2008; 10: 285–292. © Blackwell Munksgaard, 2008

Objectives: Although aggressive behavior has been associated with bipolar disorder (BD), it has also been linked with developmental factors and disorders frequently found to be comorbid with BD, making it unclear whether or not it represents an underlying biological disturbance intrinsic to bipolar illness. We therefore sought to identify predictors of trait aggression in a sample of adults with BD.

Methods: Subjects were 100 bipolar I ($n = 73$) or II ($n = 27$) patients consecutively evaluated in the Bipolar Disorders Research Program of the New York Presbyterian Hospital-Payne Whitney Clinic. Diagnoses were established using the Structured Clinical Interview for the DSM-IV (SCID-I) and Cluster B sections of the SCID-II. Mood severity was rated by the Hamilton Depression Rating Scale (HDRS) and Young Mania Rating Scale (YMRS). Histories of childhood maltreatment were assessed via the Childhood Trauma Questionnaire (CTQ), while trait aggression was measured by the Brown-Goodwin Aggression Scale (BGA).

Results: In univariate analyses, significant relationships were observed between total BGA scores and CTQ total ($r = 0.326$, $p = 0.001$), childhood emotional abuse ($r = 0.417$, $p < 0.001$), childhood physical abuse ($r = 0.231$, $p = 0.024$), childhood emotional neglect ($r = 0.293$, $p = 0.004$), post-traumatic stress disorder ($t = -2.843$, $p = 0.005$), substance abuse/dependence ($t = -2.914$, $p = 0.004$), antisocial personality disorder ($t = -2.722$, $p = 0.008$) and borderline personality disorder ($t = -5.680$, $p < 0.001$) as well as current HDRS ($r = 0.397$, $p < 0.001$) and YMRS scores ($r = 0.371$, $p < 0.001$). Stepwise multiple regression revealed that trait aggression was significantly associated with: (i) diagnoses of comorbid borderline personality disorder ($p < 0.001$); (ii) depressive symptoms ($p = 0.001$); and (iii) manic symptoms ($p < 0.001$).

Conclusions: Comorbid borderline personality disorder and current manic and depressive symptoms each significantly predicted trait aggression in BD, while controlling for confounding factors. The findings have implications for nosologic distinctions between bipolar and borderline personality disorders, and the developmental pathogenesis of comorbid personality disorders as predisposing to aggression in patients with BD.

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Aggressive behavior occurs in multiple psychiatric disorders and carries diagnostic, prognostic, and therapeutic implications. In the case of bipolar disorder (BD), hostility and aggression have assumed particular importance as core features of manic and mixed states (1–3), independent of psychosis (4), and often emerging as correlates of comorbid substance abuse and suicidality (5, 6). Swann (7) linked impulsive aggression in bipolar mania with decreased serotonin functioning, as others (8) have in other samples, alongside increased catecholaminergic function and behavioral hyperarousal. Low central nervous system serotonergic tone (1, 5) may represent a vulnerability marker for impulsive aggression across affective and other psychiatric disorders. A second hypothesis proposed by Swann (7) is that autonomic hyperarousal leads to disruptive or ‘externalizing’ behaviors of mania, including aggression, impulsivity, and anxiety. Evidence suggests that *mixed* states in BD are likely related to catecholaminergic and adrenocortical hyperarousal, rather than diminished serotonergic function (1).

Unresolved questions persist about the state-versus trait-dependent nature of aggression and factors that mediate its expression in BD and related forms of psychopathology. Clues toward better understanding the predisposition to trait aggression in patients with BD may emerge from studies of its common comorbidities that also involve impulsivity and aggression, notably, substance abuse (9), post-traumatic stress disorder (PTSD) (10), and borderline personality disorder (11).

A unifying thread described from developmental studies of impulsivity and aggression involves the impact of traumatic early life experiences. Histories of physical and sexual abuse during childhood have been linked with the eventual emergence of aggression in adults (12, 13). Previous studies in clinical samples by our group (14) and others (15, 16) have consistently identified histories of childhood abuse in a substantial proportion of individuals with BD. Childhood abuse histories have been associated with greater morbidity, suicidality, Axis II comorbidity, and functional impairment compared to bipolar patients without childhood abuse in clinical samples. In epidemiologic samples, findings from the National Comorbidity Survey indicate a 9.1-fold increased risk for mania among adult women who reported histories of childhood sexual assault (95% confidence interval = 1.4–59.0) compared to women without such childhood histories (17). Specific prevalence rates of sexual or other subtypes of childhood abuse among individuals with BD have not yet been delineated among

non-treatment-seeking individuals within the general population.

In studying links between aggression, impulsivity, and suicide in depressed inpatients, Brodsky et al. (18) found higher levels of aggression in those with childhood physical and sexual abuse. Similar to findings in impulsive aggression, the neurobiological correlates of traumatic stress include increased catecholamine system functioning and hypothalamic–pituitary–adrenal axis function (19).

The current study sought to identify the nature and extent of trait aggression in a group of adult bipolar patients, and to examine its potential links with histories of severe childhood abuse and three common comorbidities of BD, namely substance abuse, borderline or antisocial personality disorders, and PTSD. We hypothesized that the presence of any of the above comorbidities, in addition to severe childhood abuse histories, would be associated with more severe trait aggression. Univariate relationships between trait aggression and each hypothesized factor were initially screened in order to develop a multivariate model examining the relative strengths and hierarchies of association with trait aggression in a large cohort of adults with BD.

Methods

Subjects

Subjects were 100 bipolar patients consecutively evaluated from February 2000 to December 2000 in the Bipolar Disorders Research Program of the New York Presbyterian Hospital-Payne Whitney Clinic. Diagnoses were evaluated by Structured Clinical Interview for DSM-IV Axis I Disorders-Patient version [(SCID-I/P) (20)] and for DSM-IV Axis II Personality Disorders [(SCID-II) (21)]. The evaluations were administered by one of the authors (JLG), a psychologist with over 10 years of experience in administering and supervising others in the administration of the SCID-I and SCID-II. The study group, its ascertainment, and clinical characteristics have previously been reported by our group (11, 14, 22).

Procedures

All subjects provided written informed consent to participate in the research protocol, which was approved by the institutional review boards of New York Presbyterian Hospital and Long Island University. After signing informed consent, subjects underwent diagnostic evaluation via SCID-I/P and SCID-II. Symptom severity was rated with the Hamilton Depression Rating Scale (HDRS)

(23) and the Young Mania Rating Scale (YMRS) (24) by one of the authors (JLG). In previous studies within the broader research program from which current subjects were derived, adequate inter-rater reliability for the HDRS and YMRS was achieved between the present study rater and other senior research staff ($\kappa \geq 0.80$).

Subjects were given the Childhood Trauma Questionnaire (CTQ) (25), a 28-item 5-point Likert-type self-report measure yielding four levels (none, mild, moderate or severe) of 5 types of maltreatment (physical abuse, physical neglect, emotional abuse, emotional neglect, and sexual abuse). For initial analyses, we utilized CTQ scores as continuous variables and then dichotomized group membership according to the presence or absence of (i) *severe* overall abuse (i.e., reaching a severe level of *any* type of maltreatment) and (ii) *severe* level for each type of abuse (i.e., physical, sexual, emotional, emotional neglect, and physical neglect). Trait aggression was measured using the 32-item Brown-Goodwin Aggression (BGA) scale (26) which has previously been validated and used in studies of affectively disordered patients to characterize lifetime histories of aggression (27, 28). The BGA requires a respondent to quantify the frequency he/she engages in 32 different aggressive behaviors on the scale: 0 = never; 1 = 1–3 times a year; 2 = 4–6 times a year; 3 = once a month; 4 = once a week; and 5 = daily. In the present study group, the BGA demonstrated a high degree of internal consistency (Cronbach $\alpha = 0.846$).

Initial exploratory relationships were examined between BGA scores and (i) gender and (ii) presence or absence of (a) borderline personality disorder, (b) antisocial personality disorder, (c) substance use disorder, and (d) PTSD using *t*-tests. Similarly, the associations between BGA score and (i) age, (ii) years of education, (iii) HDRS total, (iv) YMRS total, (v) CTQ total score (not including the minimization/denial subscale), and (vi) CTQ subscale scores for (a) physical abuse, (b) sexual abuse, (c) emotional abuse, (d) physical neglect, and (e) emotional neglect were preliminarily screened using Pearson correlation. A stepwise multiple regression analysis was used to analyze the strength of association between the continuous outcome variable BGA score relative to the independent variables that were significantly associated with BGA score in the univariate analyses at $p < 0.01$.

Results

Seventy-three participants met DSM-IV criteria for bipolar I disorder and 27 met criteria for bipolar II

disorder. The study group consisted of 95 outpatient participants and five inpatient participants. The sample was 49% ($n = 49$) female with a mean (SD) age of 41.18 (12.71) years and 15.73 (2.71) years of education. The sample was 87% Caucasian, 10% African-American, 1% Asian, and 2% ‘other’ racial groups. Additionally, 12% of the sample were of Hispanic ethnicity. At the time of assessment, the sample was predominantly unmarried (26% married, 48% never married, and 26% divorced, widowed, or separated) and 59% of the sample were employed or full-time students. The mean (SD) HDRS score was a 14.19 (9.57) and the mean (SD) YMRS score was 9.59 (8.72). By convention within numerous clinical trials of affective disorder patients, 24-item HDRS scores between 10 and 19 usually indicate mild depression, scores between 20 and 29 indicate moderate depression, and scores of 30 or more indicate marked or severe depression. Similarly, YMRS scores < 12 are generally taken to reflect remission from acute mania, while scores ≥ 20 typically reflect moderate–severe mania.

BGA scores were available for 96 of the 100 participants. Participants for whom BGA data were available did not differ significantly from those without BGA data with respect to age ($t = -1.236$, $df = 98$, $p = 0.22$), education ($t = 0.390$, $df = 98$, $p = 0.70$), gender ($\chi^2 = 1.127$, $df = 1$, $p = 0.29$), marital status ($\chi^2 = 4.51$, $df = 2$, $p = 0.11$), race ($\chi^2 = 1.39$, $df = 4$, $p = 0.85$), employment status ($\chi^2 = 0.44$, $df = 1$, $p = 0.51$), HDRS score ($t = 1.380$, $df = 96$, $p = 0.17$), or YMRS score ($t = 1.923$, $df = 96$, $p = 0.06$). The mean (SD) BGA score for the sample was 11.71 (10.04).

Table 1 indicates the frequency of levels of various forms of child abuse in the study group. Because of the high prevalence of *any* level of abuse, childhood maltreatment was examined as a continuous variable in univariate analyses. For multivariate analyses, childhood maltreatment was treated as a dichotomous variable conservatively reflecting the presence or absence of ‘severe’ maltreatment.

Table 2 presents data on univariate relationships between BGA scores and a number of key clinical

Table 1. Prevalence (%) of severity levels of childhood maltreatment among bipolar subjects

Level of severity	Physical abuse	Sexual abuse	Emotional abuse	Physical neglect	Emotional neglect
None	50	57	27	63	32
Low	9	4	21	15	29
Moderate	16	17	14	9	14
Severe	24	21	37	12	24

Table 2. Brown-Goodwin Aggression scores in bipolar patients: associations with clinical and demographic factors

	n	r	t	df	p
Age (years)	96	-0.236			0.020
Education (years)	96	-0.261			0.010
Gender	46 female, 50 male		1.009	94	0.316
HDRS	95	0.397			< 0.001
YMRS	95	0.371			< 0.001
Child abuse (CTQ)	96	0.326			0.001
Physical abuse	96	0.231			0.024
Sexual abuse	96	0.134			0.195
Emotional abuse	96	0.417			< 0.001
Physical neglect	96	0.133			0.198
Emotional neglect	96	0.293			0.004

	Present (n)	Absent (n)	t	df	p
Substance use disorder	48	48	-2.914	94	0.004
Post-traumatic stress disorder	22	74	-2.843	94	0.005
Borderline personality disorder	16	80	-5.680	94	< 0.001
Antisocial personality disorder	6	96	-2.722	94	0.008

HDRS = Hamilton Depression Rating Scale; YMRS = Young Mania Rating Scale; CTQ = Childhood Trauma Questionnaire.

and demographic parameters. These analyses were performed to provide a preliminary screening of appropriate candidate variables for entry into a subsequent regression model, as described below. As shown in Table 2, age and education were significantly negatively correlated with trait aggression score (indicating that a greater age or greater level of education was related to lower trait aggression scores). Mean (SD) BGA scores were not significantly different between males [12.700 (11.506)] and females [10.630 (8.152)].

BGA scores were significantly correlated with total CTQ (inclusion of five abuse/neglect subscales but not the minimization/denial subscale; $r = 0.326$, $p = 0.001$). When specific subtypes of childhood abuse were examined, significant relationships were observed between total BGA and childhood emotional abuse ($r = 0.417$, $p < 0.001$), emotional neglect ($r = 0.293$, $p = 0.004$), and physical abuse ($r = 0.231$, $p = 0.024$), but not sexual abuse ($r = 0.134$, $p = 0.195$), or physical neglect ($r = 0.133$, $p = 0.198$). Bipolar patients with PTSD had significantly higher mean (SD) BGA scores than those without PTSD [PTSD present versus absent = 16.86 (12.190) versus 10.176 (8.837); $t = -2.843$, $p = 0.005$]. The presence of a substance use disorder (SUD) was also significantly related to higher BGA scores [SUD present versus absent = 14.583 (10.550) versus

8.833 (8.697); $t = -2.914$, $p = 0.004$]. Those with antisocial personality disorder (APD) had a higher BGA score than those without antisocial personality disorder [APD present versus absent = 22.167 (13.197) versus 11.011 (13.197); $t = -2.722$, $p = 0.008$]. Finally, presence of borderline personality disorder (BPD) was found to be significantly related to trait aggression [BPD present versus absent = 23.000 (13.105) versus 9.45 (7.594); $t = -5.680$, $p < 0.001$].

A stepwise multiple regression was next calculated to examine the relationships between BGA scores and variables of interest generated from univariate analyses presented in Table 2. Based on those preliminary univariate associations, a Bonferroni-like correction using an alpha level < 0.01 was adopted for inclusion in the regression model. Nine variables were chosen, including (i) PTSD, (ii) SUD, (iii) BPD, (iv) APD, (v) presence or absence of severe childhood abuse, (vi) severe emotional abuse, (vii) severe physical abuse, (viii) HDRS score, and (ix) YMRS score. After iterative stepwise entries, the combination of three predictor variables (i.e., BPD, HDRS score, and YMRS score) provided the best-fit model for the data.

The model significantly predicted BGA aggression scores [$F(3,91) = 21.763$, $p < 0.001$]. The sample multiple correlation coefficient (r) was 0.646, indicating that approximately 41.8% of the variance of the aggression score in the sample can be accounted for by the linear combination of these three predictors. Table 3 presents indices of the relative strength of the three individual predictors. All three partial correlations were significant, indicating that those with a diagnosis of borderline personality disorder have higher levels of aggression ($p < 0.001$), those with more depressive symptomatology have higher aggression scores ($p = 0.001$), and those with more manic symptomatology have higher aggression ($p < 0.001$).

Table 3. Bivariate and partial correlations of the predictors with Brown-Goodwin Aggression (BGA) score

Predictors	Correlation between each predictor and BGA score	Correlation between each predictor and the BGA score controlling for all other predictors
Borderline personality disorder	0.504***	0.413***
HDRS	0.397***	0.351**
YMRS	0.371***	0.369**

** $p < 0.01$; *** $p < 0.001$.

HDRS = Hamilton Depression Rating Scale; YMRS = Young Mania Rating Scale.

Predictors of trait aggression in bipolar disorder

Table 4. Brown-Goodwin Aggression item means for bipolar patients with and without Borderline Personality Disorder (BPD)

Brown-Goodwin Aggression item	+ BPD (n = 80) ^a	-BPD (n = 16) ^a	<i>t</i>	df	<i>p</i>
1. Screamed or shouted alone	2.50 (1.51)	1.01 (1.29)	-4.10	94	< 0.001
2. Gotten into mild arguments	3.50 (1.41)	2.74 (1.42)	-1.96	94	0.053
3. Gotten into bad arguments	3.06 (1.48)	1.43 (1.34)	-4.39	94	< 0.001
4. Threatened to hurt someone you know spur of the moment	1.00 (1.71)	0.39 (0.97)	-1.99	94	0.050
5. Threatened to hurt someone you did not know spur of the moment	0.19 (0.75)	0.11 (0.36)	-0.619	94	0.538
6. Threatened to get drugs, money, sex	0.00 (0.00)	0.01 (0.11)	0.445	94	0.657
7. Slammed doors/thrown clothing	2.50 (1.55)	0.85 (1.26)	-4.59	94	< 0.001
8. Thrown objects/kicked furniture/punched wall	1.75 (1.39)	0.63 (0.99)	-3.87	94	< 0.001
9. Broken objects/smashed windows	1.13 (1.31)	0.33 (0.84)	-3.14	94	0.002
10. Unsatisfactory evaluation at work	0.69 (1.08)	0.40 (0.77)	-1.27	94	0.209
11. Received disciplinary action at work or school	0.31 (1.01)	0.11 (0.42)	-1.31	94	0.195
12. Suspended from school/on probation at work	0.38 (1.02)	0.08 (0.31)	-2.20	94	0.030
13. Expelled from school/fired from work/dishonorable discharge	0.31 (1.01)	0.08 (0.27)	-1.84	94	0.070
14. Vandalized property/shoplifted	0.50 (1.32)	0.10 (0.47)	-2.16	94	0.034
15. Been involved in criminal acts	0.13 (0.50)	0.01 (0.11)	-1.83	94	0.070
17. Charged with a crime	0.13 (0.34)	0.04 (0.19)	-1.44	94	0.154
18. Menacing gestures/grabbed someone's clothing	0.44 (0.73)	0.24 (0.68)	-1.06	94	0.291
19. Grabbed or pushed someone	0.81 (1.52)	0.21 (0.61)	-2.66	94	0.009
20. Punched/slapped/kicked	0.75 (1.53)	0.11 (0.42)	-3.23	94	0.002
21. Threatened with a weapon	0.31 (1.01)	0.00 (0.00)	-2.82	94	0.006
22. Used a weapon against someone	0.19 (0.75)	0.00 (0.00)	-2.29	94	0.025
23. Physical fights causing minor injury	0.63 (0.25)	0.63 (0.24)	0.00	94	1.00
27. Threatened to hurt yourself	0.50 (1.03)	0.25 (0.77)	-1.12	94	0.268
28. Hurt yourself by picking, scratching, biting	0.81 (1.72)	0.09 (0.43)	-3.35	94	0.001
29. Banged head/body against the wall	0.75 (1.13)	0.11 (0.50)	-3.62	94	< 0.001
30. Hurt someone leaving bruises or red marks	0.25 (0.77)	0.06 (0.24)	-1.79	94	0.076
31. Hurt someone so that they needed minor medical attention	0.06 (0.25)	0.01 (0.11)	-1.28	94	0.205

^aValues are means (SD).

In order to further characterize the differences in aggression between bipolar patients with versus without borderline personality disorder, a series of exploratory tests was conducted. Table 4 provides the BGA scale item-by-item differences between those with and without borderline personality disorder along with *t*-tests evaluating the differences between the two groups. Items 16 (set fires), 24 (seriously injured someone in a fight), 25 (killed someone in a fight), 26 (raped someone), 32 (hurt someone so badly that they required major medical attention) were not included because all subjects reported that these incidents had 'never' happened. In order to adjust for multiple comparisons in this exploratory series of analyses, a Bonferroni-corrected alpha of 0.002 was utilized (0.05/27 comparisons = 0.002). Bipolar subjects with BPD reported higher frequencies on eight of the items than bipolar subjects without borderline personality disorder: (i) screaming or shouting alone, (ii) getting into bad arguments, (iii) slamming doors/throwing clothing, (iv) throwing objects/kicking furniture/punching walls, (v) breaking objects/smashing windows, (vi) punching/slapping/kicking, (vii) hurting yourself by picking, scratching, biting, and (viii) banging head/body against the wall.

The two groups did not significantly differ on the remaining 19 items for which mean scores indicate that both groups engaged in those aggressive behaviors less than one to three times per year with the exception of 'getting into mild arguments'. Both groups reported 'getting into mild arguments' between four to six times a year and once a month.

Discussion

The current findings indicate that, despite univariate associations between trait aggression and (i) histories of childhood trauma or (ii) current affective symptoms, the presence of comorbid borderline personality disorder holds independent predictive value in determining trait aggression in patients with BD. Notably, current affective symptoms may have been a mediator of the cross-sectional relationship between lifetime aggression and historical illness variables. As such, current affective symptoms could impose a cognitive bias that might fluctuate over time. Further longitudinal studies are needed to address such potential mediating effects. Moreover, longitudinal analyses would help to clarify the relative roles of various predictors of aggression with respect to the severity of trait aggression and the presence of

comorbid borderline personality disorder independent of variations over time in affective symptoms.

The present findings bear on unresolved controversies about the differential nosology of borderline personality disorder and bipolar illness. Some authors view borderline personality disorder as a variant of BD, falling within the so-called 'bipolar spectrum' (29–31), while others believe that they comprise two fundamentally separate and unique categorical entities that rarely overlap (32, 33). Only a small subgroup of individuals with complete BGA scores in the present study group met DSM-IV criteria for both borderline personality disorder and BD ($n = 16$), limiting the extent to which complex inter-relationships between both disorders can be fully understood. However, regardless of the conceptualization of borderline personality disorder and BD as discrete or overlapping entities, the present findings suggest that individuals who meet DSM-IV criteria for both conditions have more extensive lifetime aggression compared to those with BD alone. The relative absence or presence (and extent) of historical aggression may represent a useful psychopathologic dimension for discriminating bipolar subtypes that are complicated by overlap with features of borderline personality disorder. The findings also bear on the inter-relationships between developmental issues (and the pathogenic impact of early life abuse on personality development) and the biological diathesis for bipolar illness.

A further consideration regarding links between BD, borderline personality disorder, and aggression involves the role of impulsivity. Prior investigations by our group (6) and others (5, 28, 34) suggest that impulsive (versus premeditated) aggression may be a trait phenomenon holding particular importance for understanding phenomena such as suicidality in both bipolar and borderline personality disorders. Future longitudinal studies might usefully examine the possible mediating role of impulsivity, alongside changes in affective symptoms, in order to better understand the determinants of trait aggression when BD and borderline personality disorder coincide.

It is also equally plausible that the presence of BD superimposed on individuals with borderline personality disorder (rather than the reverse) may contribute synergistically to the emergence of trait aggression in adult survivors of significant childhood maltreatment. In follow-up studies of patients ascertained on the basis of having borderline personality disorder, Gunderson et al. (32) identified BD in a minority of patients with borderline personality disorder. Whether or not

histories of childhood maltreatment, or other moderating factors, could lead to an increased vulnerability for developing BD in such patients remains unknown.

The present findings hold implications for the treatment of individuals with comorbid bipolar and BPD. Limited existing research suggests that comorbid personality disorder contributes to poorer pharmacotherapy outcomes for patients with BD, often prompting clinicians to undertake elaborate and complex combination medication strategies (35). To the extent that trait aggression may represent a driving force behind the complexity of such dual-diagnosis patients, psychotropic agents aimed at reducing aggression and related 'externalizing' features (e.g., agitation) may prove more fruitful than agents directed primarily toward 'internalizing' features (e.g., depression, anxiety). Such a hypothesis is consistent with observations by Hollander et al. (36, 37) that in patients with BPD, the utility of the GABAergic mood-stabilizing agent divalproex lies more in the reduction of aggression than affective symptoms. Moreover, while structured psychotherapies such as dialectical behavior therapy have not specifically been studied for the treatment of BD, such psychosocial approaches that target impulsive aggression and teach skills for their more effective management may hold promise as adjunctive treatments in the management of dual-diagnosis patients with bipolar and borderline personality disorders. Empirical studies are warranted to examine such interventions.

The finding that childhood abuse was associated with trait aggression in univariate analyses, but no longer held significance when controlled for in a multiple regression model, was contrary to initial study expectations. The majority of individuals within the general population who endure childhood maltreatment do not subsequently develop significant problems with the expression of aggression, suggesting the existence of neurodevelopmental, genetic, or psychological factors that may increase vulnerability to (or confer greater protection against) trait aggression. Cognitive factors and limited emotion-regulation skills that play a significant role in borderline personality disorder could also bear on links between aggression and borderline personality disorder. Future studies in this area might usefully incorporate measurement of constructs such as resiliency and adaptation, alongside developmental timing of abuse, as contributors to outcome states (33, 38, 39).

A number of limitations warrant consideration in interpreting the current findings. Generalizability

of the results is limited by the focus on a clinical sample (rather than non-treatment-seeking community samples) drawn from an academic medical center. Retrospective assessment of childhood trauma histories among subjects may have been subject to recall bias. The relatively modest sample sizes also may have been inadequate to detect relationships between trait aggression and predictor variables having medium or small effects. Finally, a large number of exploratory relationships were examined in the process of generating the resultant multiple regression model for predicting trait aggression. Accordingly, these initial observations linking borderline personality disorder with trait aggression in BD require replication with larger sample sizes.

Neither BD nor character are singly determined but rather, likely emanate from genetic underpinnings that are affected over time by environmental influences which may be of differential importance depending on whether they occur at different developmentally critical periods. The present findings suggest that personality structure influences the expression of aggression in individuals with BD. Further longitudinal studies are needed to affirm these initial observations.

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Psychology of Violence

Trauma Cognitions and Partner Aggression: Anger, Hostility, and Rumination as Intervening Mechanisms

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Trauma Cognitions and Partner Aggression: Anger, Hostility, and Rumination as Intervening Mechanisms

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Objective: Previous research has demonstrated a significant association between trauma and intimate partner aggression (IPA) perpetration. However, the precise mechanisms underlying this relationship have yet to be fully elucidated. In the present study, we examined the impact of several key factors implicated in Ehlers and Clark's (2000) cognitive model of trauma (i.e., trauma cognitions, anger, hostility, and rumination) on IPA perpetration. **Method:** Participants in this study were 271 male and female heavy drinkers at high risk for IPA from the community who completed measures of dysfunctional posttraumatic cognitions, dispositional rumination, trait anger and hostility, and IPA perpetration. A moderated mediational model was tested to determine how these variables interact to predict IPA perpetration. **Results:** Results indicated that anger and hostility mediated the effect of negative cognitions about the world on IPA perpetration, with this indirect effect being stronger for individuals with higher levels of rumination. **Conclusion:** These findings suggest that cognitive and affective processes that may result from trauma exposure are associated with IPA and should be targeted in prevention and intervention programs for individuals at risk for perpetration.

Keywords: trauma, cognitions, partner aggression, rumination, anger

Intimate partner aggression (IPA) is a serious public health problem that affects the lives of millions of men and women each year. IPA is associated with numerous negative consequences, including mental and physical health problems, increased use of legal and housing services, and financial burden of up to \$5.8 billion annually (Black et al., 2011; National Center for Injury Prevention & Control, 2003). According to a recent national survey, it is estimated that over their lifetime, approximately 24% of women and 14% of men in the United States experience severe physical violence from their intimate partner, whereas as many as one third of women (32.9%) and more than a quarter of men (28.2%) in the United States are victims of mild or severe physical IPA (Black et al., 2011). These estimates are consistent with rates of IPA obtained in international population-based surveys (World Health Organization, 2012). Whereas the prevalence and negative consequences of IPA are well known, it is clear that more research is needed to better understand the precise mechanisms through

which IPA perpetration occurs. The purpose of the current study was to investigate one potential pathway through which dysfunctional cognitive and affective mechanisms may lead to IPA perpetration.

Past research has identified many possible risk factors for IPA perpetration, one of which is trauma exposure (Bell & Orcutt, 2009; Maguire et al., 2015; Parrott, Drobles, Saladin, Coffey, & Dansky, 2003; Taft, Watkins, Stafford, Street, & Monson, 2011). The relationship between trauma and IPA has been theorized to be driven by factors such as cognitive distortions and emotion dysregulation that arise as a result of experiencing trauma (Bell & Orcutt, 2009; Chemtob, Novaco, Hamada, Gross, & Smith, 1997; Ehlers & Clark, 2000; Taft et al., 2015). Although a substantial amount of research has been conducted in this area, most studies have used samples of either college students or military personnel and veterans with histories of combat-related trauma. In contrast, the current project sought to extend past research by using a diverse community sample of adults at high risk for IPA to examine associations with trauma cognitions.

Trauma Cognitions and IPA

Cognitive models of the effects of trauma provide a basis for understanding negative reactions to trauma exposure (Berkowitz, 1993; Ehlers & Clark, 2000). One model proposes that individual differences in the appraisal of trauma and its consequences facilitate heightened perceptions of threat (Ehlers & Clark, 2000). Trauma appraisals include an overgeneralized sense of threat, which leads to interpreting normal activities as being dangerous, having an exaggerated sense of the probability of the occurrence of future traumatic events, and negative cognitions about others and

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the world (e.g., perceiving others as having violated one's personal rules and treating one unfairly). The perception of threat subsequently triggers a variety of cognitive and emotional sequelae, including reexperiencing symptoms, anxiety, and arousal. In an effort to reduce the perceived threat and its associated distress, a set of behavioral, affective, and cognitive responses may be activated. However, these responses are often maladaptive and serve to maintain a cycle of threat perception and maladaptive response.

As noted above, the development of negative cognitions about the world is a key aversive outcome of trauma exposure (Ehlers & Clark, 2000). Negative cognitions that arise may take the form of viewing the world as a dangerous place, believing that people cannot be trusted, and feeling that one must always be on guard. Several empirically supported theories of interpersonal aggression suggest that such beliefs often lead to dysregulated emotions and increased anger and hostility, which in turn increase the likelihood of responding to a perceived threat in an aggressive manner (Beck, 1999; Berkowitz, 1993; Huesmann, 1998). One situation in which this may occur is in response to a perceived threat from an intimate partner. We are aware of only one study that directly examined the relationship between posttraumatic negative cognitions about the world and IPA perpetration (Marshall, Robinson, & Azar, 2011). This study, conducted with a sample of university students, found that negative cognitions about the world were directly associated with both physical and psychological IPA perpetration and that these relationships were mediated by anger misappraisal and emotion dysregulation. The current project sought to replicate and extend these findings by examining the impact of rumination on this mechanism in a high-risk, diverse community sample.

In line with Marshall et al.'s findings presented above (Marshall, Robinson, & Azar, 2011), it has been theorized that hostility and anger are likely outcomes of harboring negative cognitions about the world, particularly as a response to perceived slights from others (Berkowitz, 1993; Ehlers & Clark, 2000). Hostility is a cognitive construct comprised of enduring cognitions that involve negative interpretations of the environment. Hostility on its own may not have a negative impact on others, but when coupled with the closely related affective state of anger, it can lead to a heightened risk of aggression (e.g., IPA; Buss, 1961). Research indicates that a history of exposure to a potentially traumatic event is associated with greater levels of hostility and violence (Jakupcak & Tull, 2005). Other studies have found maritally violent men to score higher on hostility inventories than nonviolent or less violent men (e.g., Maiuro, Cahn, Vitaliano, Wagner, & Zegree, 1988). Together these findings suggest that trauma exposure may put one at risk for becoming more hostile, which in turn may lead to heightened risk of perpetrating IPA.

Ample research has also illustrated a direct link between anger and IPA perpetration (Eckhardt, Barbour, & Stuart, 1997; Norlander & Eckhardt, 2005). A recent meta-analysis of 61 studies revealed a moderate association between trait anger and aggression, which increased with aggression severity (Birkley & Eckhardt, 2015). In studies examining anger expression, or the tendency to express anger through verbal or physical aggression, maritally violent men have been found to score higher on measures of maladaptive anger expression and to be more likely to engage in outward anger expression during an anger-arousing situation compared with nonviolent men (Barbour, Eckhardt, Davison, & Kassirnov, 1998; Eckhardt, Jamison, & Watts, 2002). Several studies

have also found that daily self-reported intense anger predicted daily IPA perpetration, providing further evidence of a temporal relationship between proximal anger and IPA (Crane & Testa, 2014; Elkins, Moore, McNulty, Kivisto, & Handsel, 2013). Additionally, anger has been shown to mediate not only the relationship between negative cognitions about the world and IPA (Marshall et al., 2011) but also the relationship between rumination and general aggression (Borders, Barnwell, & Earleywine, 2007).

Rumination: A Potential Moderator of This Mechanism

Rumination, or neurotic "self-attentiveness motivated by perceived threats, losses, or injustices to the self" (Trapnell & Campbell, 1999; p. 297), is another dysfunctional cognitive process that may help explain the association between posttraumatic negative cognitions about the world and IPA. Rumination has been conceptualized as a maladaptive cognitive processing style that has the potential to strengthen problematic appraisals of a traumatic event and to trigger reexperiencing symptoms (Ehlers & Clark, 2000). Thus, rumination may focus one's attention on perceived injustices, potentially strengthening the detrimental effects of negative cognitions about the world. This narrowing of attention has the potential to lead to increased hostility and anger toward others, which could subsequently heighten one's risk of IPA perpetration. In a laboratory-based study of undergraduate students, self-focused rumination was associated with increased aggressive behavior, with this relationship mediated by angry affect and self-critical negative affect (Pederson et al., 2011). Studies also indicate that the joint effects of rumination and heavy alcohol consumption facilitate particularly high levels of aggression (Borders, Barnwell, & Earleywine, 2007; Borders & Giancola, 2011). Together these studies support the conclusion that dispositional rumination, or the tendency to dwell on past events or regrets, facilitates aggression by narrowing attention onto angry affect and hostile thoughts. Consistent with this conclusion, dispositional rumination may increase risk for IPA perpetration among individuals with previous trauma exposure by narrowing their attention onto distorted cognitions about the world, which in turn leads to increased anger and hostility. As a result, they are more likely to react aggressively toward perceived threats from partners.

The Current Study

Previous research has established a strong link between trauma and IPA perpetration. However, there are gaps in the literature regarding the putative mechanism that explains this effect. In addition, a large proportion of studies that have examined the trauma-IPA relationship has used either undergraduate or military samples. In the proposed study, we expanded on previous research by examining the mediating effect of anger and hostility on the relationship between posttraumatic negative cognitions about the world and IPA perpetration in a high-risk community sample with a history of IPA victimization. More specifically, we tested the following hypotheses:

1. We expected negative cognitions about the world to be positively associated with greater anger and hostility.

2. We hypothesized that anger and hostility would be positively associated with frequency of IPA perpetration.
3. We hypothesized that rumination would moderate the association between negative cognitions about the world and anger/hostility, such that the association between negative cognitions and anger/hostility would be greater for those high in rumination than for those low in rumination.
4. We expected the indirect effect of negative cognitions on IPA perpetration through anger and hostility to be moderated by rumination. Specifically, we hypothesized that the indirect effect of negative cognitions about the world on frequency of IPA perpetration via anger and hostility would be stronger among participants high in trait rumination relative to participants low in trait rumination (see Figure 1).

Method

The distinct set of hypotheses tested herein used data that were drawn from a larger investigation on the effects of acute alcohol intoxication and IPA. Thus, couples were required to meet eligibility criteria for an alcohol administration study (see below). The present hypotheses are novel, and the analytic plan was developed specifically to address these aims.

Participants and Recruitment

Intimate couples were recruited from two U.S. metropolitan areas through print and online advertisements. Couples were screened individually by telephone to establish initial eligibility, which was then verified by an in-person laboratory assessment. To be eligible, couples needed to have been dating for at least 1 month, and both partners needed to be at least 21 years old and identify English as their native language. At least one partner was required to meet two additional criteria: (a) report consumption of an average of at least five (for men) or four (for women) alcoholic beverages at least twice per month during the past year; and (b) report perpetrating psychological or physical IPA toward their current partner on the Revised Conflict Tactics Scale (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Couples were excluded from the study if either partner reported a serious head

injury, a medical condition that rendered them unable to drink alcohol, or a desire to seek treatment for alcohol use.

Six hundred seventeen couples ($N = 1,234$) were deemed initially eligible by the telephone screen and were brought into the laboratory for a more comprehensive assessment. Three hundred twenty-one couples ($n = 642$) continued to meet inclusion criteria. Of the couples who completed the laboratory assessment, four same-sex couples ($n = 8$) were excluded, 93 couples ($n = 186$) were excluded for failing to meet minimum drinking requirements, 65 couples ($n = 130$) were excluded for endorsing severe physical IPA within their relationship, 10 couples ($n = 20$) were excluded for not endorsing any IPA, 99 couples ($n = 198$) were excluded for failing to meet both alcohol and IPA requirements, and 25 couples ($n = 50$) were excluded for failing to meet other eligibility requirements (e.g., physical or mental health problems, desire to seek treatment, weight). Additionally, 44 couples were excluded for not endorsing bidirectional IPA. An additional six couples were excluded because they failed to provide responses to items on the trauma cognitions and anger or hostility measures. For the purposes of the current study, we sought to examine how an individual's own cognitive and affective processes, regardless of their partners' behaviors, predicted their frequency of perpetrating IPA. Thus, only the member from each couple who reported greater frequency of IPA perpetration was included in the analyses for the current project. This resulted in a final sample of 271 heterosexual participants (see Table 1). The average relationship length was 53.86 months ($SD = 57.41$). Most participants were not married and either noncohabitating (40.2%) or cohabiting (37.0%), whereas only 13.8% were married. Most participants self-identified as African American (61.9%) or Caucasian (27.5%); 5.9% identified as Hispanic or Latino/a. Participants had a median income range of \$10,000 to \$20,000 per year. The relatively low income of participants in this study is a unique aspect of this sample, particularly compared with samples of college students who typically report family incomes falling within the middle to upper-middle classes. This study was approved by each university's institutional review board.

Measures

Negative cognitions about the world. The Posttraumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999) is a 36-item measure of maladaptive posttraumatic cognitions. The PTCI is comprised of three subscales that assess self-blame, negative cognitions about the self, and negative cognitions about the world following a traumatic event. In the current project, we were interested in how negative cognitions regarding others were related to aggression against one's partner. Thus, we focused only on the seven-item subscale measuring negative cognitions about the world. Instructions for this measure require participants to rate the extent to which they agree or disagree with a number of statements that reflect possible responses to traumatic events. Response options for each item range from 1 (totally disagree) to 7 (totally agree) for a total score ranging from 7 to 49, with higher scores indicating stronger negative posttraumatic cognitions. A sample item from this subscale includes "People can't be trusted." The PTCI exhibits good internal consistency, test-retest reliability, and convergent validity with other measures of posttraumatic stress disorder (Foa et al., 1999). The internal consistency of the

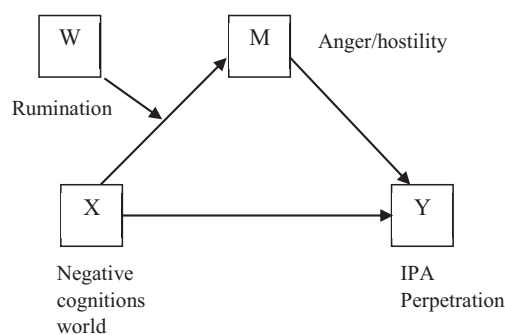


Figure 1. Conceptual model of hypothesized moderated mediation.

Table 1
Participant Demographics and Descriptive Statistics

Variables	<i>M (SD), %</i>
Female	36.6
Marital status	
Single	40.2
Married	13.8
Unmarried, living with partner	37.0
Divorced/Widowed	6.2
Separated	2.9
Race/Ethnicity	
White/Caucasian	27.5
Black/African-American	61.9
Other/Multiracial	10.6
Hispanic	5.9
Annual income	
<\$10,000	33.5
\$10,000–\$20,000	25.8
\$20,000–\$30,000	17.1
\$30,000–\$40,000	10.2
>\$40,000	13.4
Age	33.14 (10.73)
Length of relationship, mo	53.86 (57.41)
Years of education	13.83 (2.98)
Negative cognitions about the world	27.48 (9.89)
Rumination	34.91 (8.31)
Anger	14.72 (5.04)
Hostility	18.04 (6.64)
Physical IPA perpetration	7.67 (12.53)
Psychological IPA perpetration	25.38 (25.85)
Total IPA perpetration	33.05 (35.52)
IPA victimization	16.05 (21.00)

Note. $N = 271$, $M =$ mean, $SD =$ standard deviation.

negative cognitions about the world subscale in the current sample was $\alpha = .83$.

Rumination. Dispositional rumination was measured by the Rumination-Reflection Questionnaire (Trapnell & Campbell, 1999). This questionnaire consists of two 12-item subscales measuring rumination and reflection. The response format consists of a 5-point Likert scale, in which participants endorse their level of agreement with each item from “strongly disagree” to “strongly agree.” The rumination subscale is scored by summing the responses for each of the 12 items, with higher scores indicating higher levels of rumination. An example of an item on the rumination subscale is “I always seem to be rehashing in my mind recent things I’ve said or done.” This subscale has been found to be correlated with neuroticism and has demonstrated high internal reliability and good convergent and discriminant validity (Trapnell & Campbell, 1999). The internal consistency of this scale in the current sample was $\alpha = .82$.

Anger and hostility. The Aggression Questionnaire (Buss & Perry, 1992) is a 29-item measure consisting of four subscales that measure the behavioral, cognitive, and affective components of aggressivity. Given our interest in examining both dysfunctional cognitions and dysregulated emotions, we aimed to capture both the cognitive and affective components of dispositional aggressivity. The Anger subscale consists of seven items and measures trait anger, or the tendency to become angry more frequently and intensely than those low in trait anger (e.g., “I sometimes feel like a powder keg ready to explode”). The Hostility subscale consists

of eight items and measures the attitudinal or cognitive construct comprised of enduring cognitions that involve negative interpretations of the environment (e.g., “I wonder why sometimes I feel so bitter about things”). Response options for each item range from 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me). Each subscale is scored by summing the responses for each item, with higher scores indicating higher levels of anger and hostility. The Aggression Questionnaire has been used widely and has demonstrated good reliability and internal consistency (Buss & Perry, 1992). The internal consistency of the anger and hostility subscales in the current sample were $\alpha = .74$ and $\alpha = .82$, respectively.

Initial analyses found a strong association between the Anger and Hostility subscales, $r = .66$, $p < .01$, suggesting that Anger may share considerable variance and conceptual overlap with Hostility. We formed a composite score by creating z-scores for each subscale and then summing them together. The composite score yielded a more comprehensive assessment of this multidimensional construct, and similar approaches have been used in past studies of IPA (Leonard & Senchak, 1996). We repeated the analyses with Anger and Hostility considered separately and obtained similar results. Therefore, we report the analyses using only the composite Anger/Hostility score.

IPA. IPA perpetration was measured by the Revised Conflict Tactics Scale (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). The CTS2 is a 78-item scale that provides measures of physical, psychological, and sexual aggression perpetration and victimization within one’s intimate relationship as well as the use of negotiation and reasoning to deal with relationship conflicts. In the present study, we used the 5-item minor physical and 8-item psychological/verbal IPA perpetration subscales to examine frequency of perpetration within the past year. One item from the physical IPA subscale is “Have you thrown something at your partner that could hurt?” An example item from the psychological IPA subscale is “Have you shouted or yelled at your partner?” The CTS2 is a widely used instrument and has shown strong internal consistency and evidence of construct and discriminant validity (Straus, Hamby, Boney-McCoy, & Sugarman, 1996).

Response options ranged from 0 (never in the past year) to 6 (more than 20 times in the past year) for each item. Three response options included a frequency range (i.e., 3 = 3–5 times in the past year, 4 = 6–10 times, 5 = 11–20 times), and we recoded these responses to reflect the midpoint of each range. We coded the response option “more than 20 times in the past year” as 25. Thus, possible sum scores for total IPA perpetration ranged from 0 to 325. To minimize the effect of underreporting, we calculated the total perpetration score by calculating maximum scores based on the highest report from either partner. Total perpetration scores obtained by the current sample ranged from 1 to 273. Physical perpetration scores ranged from 0 to 114, whereas psychological perpetration scores ranged from 1 to 159.

Procedures

Individuals who participated in the laboratory session completed a battery of self-report questionnaires assessing a number of behaviors and attitudes, including posttraumatic cognitions, rumination, anger, hostility, and IPA. They were then scheduled to return for a second laboratory session, after which they were debriefed

and compensated for their time. The current project includes data from the first session only.

Analytic Approach

To test our hypothesized model of moderated mediation, we conducted data analyses using the PROCESS macro (Hayes, 2013) for SPSS 23 (SPSS Inc., Chicago, Illinois). The conceptual model for this analysis is presented in Figure 1. The PROCESS modeling technique produces an index of moderated mediation, which is the slope of the line reflecting the association between the moderator and the indirect effect of the independent variable on the dependent variable through the mediator. This index has been established as the gold standard for estimating moderated mediation (Hayes, 2015). PROCESS uses an ordinary least squares or logistic regression-based path analytic framework for estimating direct and indirect effects. PROCESS does not assume that the data have a normal distribution and accounts for skewed distributions by using a bootstrapping procedure (5,000 bootstrap samples) to determine bias-corrected 95% confidence intervals. Each predictor variable was kept in its continuous form and was centered by subtracting the sample mean of that variable from each raw score. An interaction term was created using the centered independent variable (negative cognitions) and moderator (rumination). High and low values of the moderator that are used in the PROCESS moderation analysis are automatically generated by adding and subtracting one standard deviation from the centered sample mean of that variable.

Results

Preliminary analyses. Descriptive analyses and bivariate correlations were conducted in SPSS 23 and can be found in Tables 1 and 2, respectively. Negative cognitions and rumination were both significantly positively correlated with the mediator, anger/hostility. All predictor variables (i.e., negative cognitions, rumination, anger/hostility) were significantly correlated with the dependent variable, IPA perpetration. Separate analyses were initially conducted with physical and psychological IPA perpetration as the dependent variables. Results from each analysis were virtually identical, so the two subscales were combined into a total IPA perpetration composite score for final analyses. *T* tests revealed no significant gender differences for any of the variables, so we conducted all analyses with the full sample. However, it is notable that the male partner reported more frequent use of IPA than the female partner in 65% of the couples included in the present analyses.

Table 2
Correlations Among IPA Perpetration, Anger/Hostility, Rumination, and Negative Cognitions About the World

Measure	1	2	3
1. Negative cognitions	—		
2. Rumination	.279***	—	
3. Anger/Hostility	.485***	.497***	—
4. IPA perpetration	.221***	.265***	.320***

*** $p < .001$.

Simple mediation analysis. The first analysis tested the indirect effect of negative cognitions about the world (IV) on IPA perpetration (DV) through anger/hostility (mediator). The overall model was significant, $F(2, 268) = 4.985$, $R^2 = .036$, $p < .01$. Results revealed significant effects of negative cognitions on anger/hostility ($B = .090$, $SE = .010$, 95% confidence interval [CI] [.070, .109], $p < .001$; mean square error [MSE] = 2.558) and anger/hostility on IPA perpetration ($B = 3.156$, $SE = 1.296$, 95% CI [.604, 5.708], $p < .05$; $MSE = 1155.956$), thus providing support for hypotheses 1 and 2. The direct effect of negative cognitions on IPA perpetration was not significant ($B = .138$, $SE = .239$, 95% CI [−.331, .609], $p = .565$). The indirect effect of negative cognitions on IPA perpetration through anger/hostility was significant ($B = .283$, $SE = .130$, 95% CI [.031, .549]), providing evidence of the hypothesized mediating effect.

Moderation analysis. The second analysis tested the moderating effect of rumination (moderator) on the effect of negative cognitions (IV) on anger/hostility (mediator). The overall model was significant, $F(3, 267) = 60.513$, $p < .001$, $R^2 = .405$; $MSE = 2.007$. The main effects of negative cognitions ($B = .067$, $SE = .009$, 95% CI [.050, .085], $p < .001$) and rumination ($B = .086$, $SE = .011$, 95% CI [.065, .108], $p < .001$) were significant. The interaction term was also significant ($B = .004$, $SE = .001$, 95% CI [.002, .006], $p < .001$, $\Delta R^2 = .028$). These results provide evidence for a moderating effect of rumination on the relationship between negative cognitions and anger/hostility. Furthermore, the effect of negative cognitions on anger/hostility increased in strength from low (−1 *SD*; $B = .038$, $SE = .013$, 95% CI [.013, .063]) to moderate (mean; $B = .068$, $SE = .009$, 95% CI [.050, .086]) to high (+1 *SD*; $B = .098$, $SE = .012$, 95% CI [.074, .121]) levels of rumination, providing support for our third hypothesis.

Moderated mediation analysis. The index of moderated mediation, or the slope of the line relating the indirect effect to the moderator, was significant ($B = .011$, $SE = .007$, 95% CI [.001, .029]). More specifically, results indicated that the indirect effect of negative cognitions on IPA perpetration through anger/hostility strengthened as rumination increased from low (−1 *SD*; $B = .120$, $SE = .070$, 95% CI [.018, .303]) to moderate (mean; $B = .214$, $SE = .102$, 95% CI [.032, .426]) to high (+1 *SD*; $B = .308$, $SE = .149$, 95% CI [.049, .636]) levels. Therefore, although the indirect effect of negative cognitions on IPA is significant at all levels of rumination, the index of moderated mediation indicates that these effects are significantly different from each other, thus providing support for our fourth hypothesis.

Discussion

The present study supports a theory-based pathway in which maladaptive anger and hostility mediate the association between negative posttraumatic cognitions and IPA perpetration, more so for individuals high in rumination than individuals low in rumination. Findings suggest that rumination may increase the likelihood that individuals who already harbor negative cognitions about the world focus even more heavily on perceived slights and injustices from their partner, leading them to interpret conflict situations negatively. This attentional bias may have resulted in increased hostility and anger toward the partner, which in turn may increase the risk of perpetrating IPA. These results shed light on the trauma-IPA relationship and help to clarify one mechanism

through which consequences of trauma may interact to predict IPA perpetration.

Limitations

Several limitations of the current study merit discussion. First, the measures used were retrospective self-report questionnaires and thus are subject to selective reporting and memory biases. This may have led to underreporting of IPA perpetration frequency and aggressive tendencies. The use of only self-report measures in this study also poses the potential risk of shared method variance. Whereas all participants experienced physical and/or psychological IPA victimization within the past year, we do not know whether these incidents were perceived as traumatic and thus cannot make a conclusive determination that all participants had experienced a Criterion A trauma. In addition, the cross-sectional nature of this study hinders our ability to make temporal conclusions about the events implicated in the tested pathway. Event-based methods are needed to address this limitation. However, past research has shown that personality traits are strongly linked with transient mood states and have strong predictive power in acute conflict situations (Rusting, 1998). Thus, although we measured trait variables in the current study, we have reason to believe that they still offer valuable insight into the contextual mechanisms involved in acute incidents of anger-related IPA perpetration. Finally, given the unique aspects of our sample (e.g., relatively low socioeconomic status) and the specific inclusion criteria for the current study (e.g., heavy alcohol users, heterosexual couples), the present findings may not generalize to other populations (e.g., same-sex couples, upper socioeconomic status).

Research Implications

The current findings are consistent with past research. Previous studies have shown a direct link between trauma exposure and IPA perpetration (Bell & Orcutt, 2009; Maguire et al., 2015; Taft et al., 2011). However, the processes underlying this connection have not been studied as widely. In their cognitive model of trauma, Ehlers and Clark (2000) theorized that cognitive distortions such as negative cognitions about the world and rumination, as well as emotion dysregulation (e.g., maladaptive anger response), may help to explain the relationship between trauma and aggression. Although aspects of this model have been empirically tested (e.g., Owens, Chard, & Cox, 2008; Sippel & Marshall, 2011), little research has examined IPA perpetration as a potential aggression-related outcome of trauma cognitions. The only study of which we are aware to examine the effect of negative posttraumatic cognitions about the world on IPA perpetration used a sample of university students (Marshall et al., 2011). Consistent with that study, our results found a positive association between negative posttraumatic cognitions about the world and IPA perpetration. The present findings are also consistent with past research that has found a link between anger and IPA. Anger has been demonstrated to mediate the separate effects of negative cognitions and rumination on IPA perpetration (Borders, Barnwell, & Earleywine, 2007; Marshall et al., 2011). We found that both negative cognitions and rumination significantly predicted maladaptive anger and hostility and that anger and hostility subsequently mediated the relationship between negative cognitions and IPA perpetration, particularly for

those high in rumination. Thus, the current study provides new data regarding a potential mechanism that may explain the relation between trauma exposure and IPA.

The current study helps to fill a gap in the literature by testing cognitive models of trauma and IPA in a high-risk, diverse, community sample of adults who have experienced IPA victimization. Additionally, this is the first study of which we are aware to examine the interaction among two types of maladaptive cognitive processes (i.e., negative cognitions about the world and rumination) as well as anger and hostility in predicting IPA perpetration.

Future research is needed to address the limitations of the current study and to examine the roles that other individual, social, and trauma-related factors play in the trauma-IPA relationship. Future studies should include measures of trauma history and posttraumatic stress disorder symptomatology. Assessment of trauma-specific anger and ruminative outcomes is needed to establish more conclusive relationships among these cognitive processes and IPA perpetration. Conducting research with clinical populations with more severe posttraumatic stress disorder symptoms and interpersonal problems may help to better elucidate these relationships. Additionally, the use of experimental methods could allow for the identification of causal relationships among these variables. Finally, relative to heterosexual couples, same-sex couples face unique IPA-promoting stressors, such as sexual minority stress (Edwards, Sylaska, & Neal, 2015; Lewis, Milletich, Keley, & Woody, 2012). That stated, it is clear that many variables are associated with IPA in both heterosexual and same-sex couples (Edwards et al., 2015). These variables include psychological distress, child abuse, and exposure to IPA as a child—all of which may contribute to trauma-related cognitive and affective processes. These data suggest that the present findings may generalize to same-sex couples. However, future research is clearly needed to support this hypothesis.

Clinical and Policy Implications

The present findings suggest that dispositional rumination and maladaptive anger and hostility may be key factors in the trauma-IPA association. Thus, future intervention programs for trauma-exposed individuals may benefit from targeting these maladaptive cognitive and affective processes, particularly rumination, which was found to exacerbate the effects of trauma cognitions on anger and hostility. These processes may also be useful targets in IPA intervention and prevention programs. Given the high overlap between trauma and IPA perpetration (Bell & Orcutt, 2009; Taft et al., 2011), it is likely that some individuals attending IPA intervention or prevention programs have experienced trauma during their lifetimes and could benefit from techniques that target maladaptive hostile and ruminative cognitions (for a review, see Murphy & Eckhardt, 2005). In fact, a recent study of men receiving treatment for IPA perpetration found that a majority (77.5%) had experienced a traumatic event during their lifetime, suggesting a need to incorporate both routine screening for trauma exposure as well as trauma-related treatment components into IPA interventions (Semiatin, Torres, LaMotte, Portnoy, & Murphy, 2017).

Taft and colleagues' Strength at Home program, a 12-week cognitive-behavioral group therapy, has shown efficacy in reducing IPA perpetration and intimate relationship conflict among trauma-exposed military veterans (Taft, Macdonald, Creech, Mon-

son, & Murphy, 2016). This manualized intervention targets maladaptive cognitive and affective processes and focuses on enhancing skills such as anger regulation and assertive communication. The Strength at Home program aims to help clients understand the impact of trauma on their relationships and to guide them in strengthening their coping mechanisms. Future research should focus on extending this program to nonmilitary samples.

The current study provides a unique analysis of several trauma-related cognitive and affective processes and their associations with IPA perpetration. Present findings suggest that for high ruminators, maladaptive anger and hostility mediate the relationship between negative cognitions about the world and IPA perpetration. Additional work is needed to clarify the temporal ordering of these processes and to test the proposed model in a clinical population. It is hoped that future research will continue to investigate the cumulative impact of trauma-related outcomes to better inform the development of IPA intervention programs.

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Violence in Bipolar Disorder

What Role Does Childhood Trauma Play?

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The relationship between mental illness and violence is controversial. On the one hand, there is considerable unfounded stigma and discrimination toward the mentally ill based on the popular notion that psychiatric patients are dangerous people. On the other hand, there is a legitimate need for psychiatrists to identify and manage what risk of violence does exist in their patients. Research that examines how and why violence occurs in the mentally ill is necessary for psychiatrists to determine as accurately as possible which patients are prone to violence and to manage their care accordingly.

Traumatic experiences in childhood have been linked to the potential for violence in adults and to vulnerability to adult psychiatric disorders.¹⁻⁵ Bipolar disorder has been linked to both traumatic childhood experience and to the potential for violence. This review aims to explain the association between bipolar disorder, trauma, and violence, and to provide guidance for assessing violence potential in bipolar patients.

Childhood trauma in bipolar disorder

Trauma is defined by DSM-IV-TR as:

- Experiencing, witnessing, or confronting an event that involves “actual or threatened death or serious injury, or a threat to the bodily integrity of the self or others”
- An emotional response to the event that involves “intense fear, helplessness, or horror”

A history of childhood traumatic experience has been associated with increased vulnerability to multiple mental disorders, including mood disorders and personality disorders.³⁻⁵ Studies have found that a high proportion (around 50%) of patients with bipolar disorder endorse histories of childhood trauma, with a high incidence of emotional abuse.^{6,9}

In a group of 100 individuals with bipolar disorder, Garino and colleagues⁸ found that 37% had been

emotionally abused, 24% had been physically abused, 21% had been sexually abused, 24% had been victims of emotional neglect, and 12% had been victims of physical neglect. A third of these patients had experienced 2 or more forms of trauma. A history of 2 or more types of trauma has been associated with a 3-fold increase in the risk for bipolar disorder.

hood trauma

Any one or a combination of these pathways could be operational in the development of bipolar disorder in individuals who have experienced childhood trauma. Thus, either the trauma itself or the factors that lead to trauma—or both—could affect the development and course of bipolar disorder.

creased functioning of both the catecholamine system and the hypothalamic-pituitary-adrenal axis.¹¹

The prevalence of childhood trauma in persons with bipolar disorder combined with the risks that arise from the symptoms of the disorder itself renders bipolar patients especially at risk for violent behavior. As mentioned, childhood trauma has been associated with a worse clinical course of bipolar disorder, including earlier onset and a greater number of episodes, which means more cumulative time when aggressive behavior is at its most likely. In addition, a history of trauma has been associated with an increase in rates of substance abuse among bipolar patients, which itself is associated with significant violence risk.¹² Moreover, borderline personality disorder, which has been associated with a history of childhood trauma, has been linked to increased impulsive aggression in bipolar patients during periods of euthymia.^{5,13}

CHECK POINTS

- ✓ **A history of 2 or more types of trauma has been associated with a 3-fold increased risk of bipolar disorder, as well as a worse clinical course that includes early onset, faster cycling, and increased rates of suicide.**
- ✓ **There is an overlap between the neurochemical changes found in adults with histories of traumatic stress and those in adults with increased impulsive aggression, in particular, increased functioning of both the catecholamine system and the hypothalamic-pituitary-adrenal axis.**
- ✓ **Agitation may result in impulsive aggression during manic and mixed episodes in bipolar patients, and depressed states may also carry a risk for violent behavior.**

der.⁹ A history of trauma in bipolar disorder has also been associated with a worse clinical course—including earlier onset of bipolar disorder, faster cycling, and increased rates of suicide. Trauma history has further been associated with more comorbidity in bipolar disorder, including anxiety disorders, personality disorders, and substance use disorders.^{6,8}

There are several pathways by which childhood trauma could lead to the development of bipolar disorder⁹:

- Affective disturbances in relationships between parents and their children directly predispose the children to affective disturbances in adulthood
- Children in whom bipolar disorder later develops are prone to more behavioral disturbances in childhood (a prodrome or early onset of bipolar disorder), which could disrupt relationships with parents and lead to dysfunctional parenting
- Children of affectively ill parents could be affected by genetic transmission of affective illness predisposition as well as by parental psychopathology, which increases the likelihood of child-

The link between trauma and violence in bipolar disorder

Childhood trauma history has been found to correlate with increased aggression in adults with and without affective disorders.^{1,2,10} In addition, there is an overlap between the neurochemical changes found in adults with histories of traumatic stress and those in adults with increased impulsive aggression, in particular, in-

Violence and aggression in bipolar disorder

Studies have found that just under 50% of people with bipolar disorder have some history of violent behavior.¹⁴ Bipolar patients are prone to agitation that may result in impulsive aggression during manic and mixed episodes.¹⁵ However, depressed states, which can involve intense

Table 1

Ten historical items from the Historical, Clinical, and Risk Management (HCR-20) violence assessment scheme²¹

- Previous violence
- Young age at first violent incident
- Relationship instability
- Employment problems
- Substance use problems
- Major mental illness
- Psychopathy
- Early maladjustment
- Personality disorder
- Prior supervision failure

Table 2

Seven steps to prevent and manage violence in bipolar patients

- Establish a positive treatment alliance
- Treat mood episodes and psychotic symptoms
- Involve significant others
- Treat impulsivity and affective instability
- Treat substance use disorders
- Teach coping skills
- Manage emergencies

dysphoria with agitation and irritability, may also carry a risk of violent behavior.¹⁶ Even during euthymia, bipolar patients—especially those with comorbid features of borderline personality disorder—may have chronic impulsivity that predisposes them to aggression.¹³

Impulsive aggression (as opposed to premeditated aggression) is most commonly associated with bipolar

and other affective disorders. In animal models, premeditated aggression corresponds to predatory behavior, while impulsive aggression is a response to perceived threat (the fight in fight-or-flight).^{13,17} As either a state or trait, increased impulsive aggression is driven by an increase in the strength of aggressive impulses or a decrease in the ability to control these impulses. Neurochemically,

impulsive aggression has been associated with low serotonin levels, high catecholamine levels, and a predominance of glutamatergic activity relative to γ -aminobutyric acid (GABA)ergic activity.¹⁷

Assessing violence risk in bipolar patients

In many ways, the assessment of violence risk in people with bipolar dis-

order is similar to risk assessment in any patient. Certain data from the patient's history and mental status examination are universally important:

- Always ask about a history of violent acts, especially recent ones and especially if there were any legal consequences.¹⁸
- Assess the extent of alcohol and drug use because there is a strong association between substance abuse and risk of violence.¹⁹
- Although trauma history has a unique relationship with bipolar disorder, it should be assessed in all patients to determine the risk of violence. Trauma is associated with increased aggression in adults in general, regardless of whether an affective disorder is present.^{1,2}
- Other important historical data include demographic information (young men of low socioeconomic status who have few social supports are the most likely to be violent) and access to weapons.²⁰
- In the mental status assessment, it is important to note psychomotor agitation as well as the nature, frequency, and severity of violent ideation.^{20,21}
- Use of an actuarial instrument, such as the Historical, Clinical, and Risk Management-20 (HCR-20) violence assessment scheme, can help integrate systematic inquiry about evidence-based risk factors into assessment of the clinical scenario.^{22,23} Although such instruments are often developed for use in forensic populations, they can be integrated into the assessment of other populations; for example, the 10 historical items of the HCR can be used as a structured checklist in conjunction with a clinical assessment (**Table 1**).²⁴

The following issues in risk assessment are specific to patients with bipolar disorder.

Recognition of mixed and manic mood states. Bipolar patients are most prone to violence during manic or mixed states—when maximum behavioral dyscontrol is combined with unrealistic beliefs.¹⁵ Patients with dysphoric mania and mixed states may be at especially high risk; the assessment for concurrent depression in a manic patient should therefore be a priority.²⁵

History of trauma. As noted, a history of childhood trauma predicts a more severe course of bipolar disorder, with more rapid cycling, more episodes, and more comorbidity—

(Please see Violence, page 34)



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Violence

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including substance use disorders. Knowing whether a bipolar patient has a history of childhood trauma is especially important in determining risk and prognosis.

Comorbid borderline personality disorder. Symptoms of bipolar disorder often overlap with those of borderline personality disorder. Comorbid borderline personality disorder, which is often associated with trauma history, has been shown to predict violence potential in bipolar patients, especially during periods of euthymia.¹³

History of impulsive acts. Impulsivity is a prominent feature of bipolar disorder. Information about previous impulsive acts, especially acts of impulsive aggression, can give the clinician an idea of a person's likelihood to commit violence on impulse.

Substance abuse. Bipolar patients commonly use alcohol and other drugs to self-medicate mood episodes or as part of the pleasure-seeking behavior of a manic episode.

In assessing patients with bipolar disorder, pay special attention to violent behavior that may have occurred when the person was manic. Also consider violence during euthymic periods, especially in patients who are substance abusers or who have axis II comorbidity. If at all possible, obtain collateral information about the history of violence. Patients may minimize previous violent actions or not remember them, especially if they were in the midst of a manic episode.²⁶

Prevention and management of violence in bipolar patients

The bipolar diagnosis introduces some unique aspects to violence prevention and management, although the general principles are similar to those for patients with other disorders. Below are summaries of 7 areas (listed in **Table 2**) that are particularly important in the prevention and management of violence in bipolar patients.

1. Establish a positive treatment alliance. This can be a challenge in bipolar patients who may have low motivation for treatment, especially if they have poor insight or if they enjoy their manic symptoms. In addition, a history of childhood abuse can lead to diminished capacity for trust and collaboration with the clinician.²⁷

To improve the alliance with a reluctant bipolar patient, identify his or

her particular barriers to acceptance of treatment and work to diminish them. It may be helpful to normalize the enjoyment of mania and to empathize with resistance to treatment as an understandable desire to be healthy and independent.²⁸ Frame treatment that addresses aggressive behavior in a way that respects the patient's desire for control; for example, convey that the medication will help the patient control himself rather than saying that the medication will control the patient.²⁵ A collaborative approach maximizes the patient-physician alliance.²⁹

2. Treat the mood episode, if present. Because the risk of violent behavior increases during an episode, the sooner mood symptoms can be ameliorated the lower the risk.^{16,25} In addition to the agitation and hyperactivity of mania (or sometimes depression), psychotic symptoms are important targets of violence prevention. Symptoms such as paranoid delusions or command auditory hallucinations can contribute to violent behavior.^{18,30} Mixed states may be especially high-risk; these may respond better to valproate than to lithium.²⁵

3. Involve significant others. Those close to a person with bipolar disorder can be both potential victims of aggressive behavior and potential sources of help in symptom monitoring, especially for patients with poor insight. Determine with the patient and family what the early warning signs of a mood episode are for that person so that intervention can be instituted early, before behavior becomes unmanageable.²⁸ Educating friends and family can prevent violence by helping them avoid behavior that could worsen the patient's aggression; teaching them when to leave a situation that may become volatile and when urgent intervention is needed (eg, calling 911).

4. Treat emotional lability and impulsivity. Bipolar patients may be impulsive even during euthymia, especially if there is comorbid borderline personality disorder. Consider referring the patient for dialectical behavioral therapy if borderline features dominate the clinical picture or if there is a significant history of impulsive risk-taking or self-harm during euthymia.

5. Treat substance abuse. Substance use disorders are highly comorbid with bipolar disorder and are a major risk factor for violence. Aggressively assess and treat such disorders, and refer the patient to specialized outpatient programs or

restrictive residential programs, if needed.

6. Teach coping skills. Use assertiveness training, social skills training, anger management training, and stress management training as needed to help the person express his needs, manage potentially frustrating interactions, avoid stress, and handle any anger that arises.

7. Manage emergencies. If a bipolar patient is an acute danger to others, steps must be taken to incapacitate him. These include involuntary hospitalization and medication. Bipolar patients are most often involuntarily hospitalized during manic episodes. An aggressive pharmacological approach should be taken to address the manic symptoms so as to quickly diminish the risk for aggressive behavior.

Aside from treating the manic episode, other measures may be used if needed to quickly control aggressive behavior. These include sedating medication (eg, benzodiazepines, antipsychotics), seclusion, and restraint. It is important to provide an environment that minimizes overstimulation and includes clear interpersonal communication and limit-setting.²⁵

Summary

Bipolar disorder is associated with a high prevalence of childhood trauma as well as with the possibility of aggressive and potentially violent behavior. It is important for clinicians to assess a patient's potential for violence as accurately as possible to minimize risk. Taking historical and clinical information into account, such as violence history, substance abuse, childhood trauma, and impulsivity in addition to mood symptoms can help clinicians reach an accurate assessment. Handling emergencies and treating mood episodes pharmacologically are first steps in managing risk; this should be followed up with treating substance abuse and trait impulsivity and with involving significant others and teaching coping skills. Recognizing the impact of early trauma on a patient can help improve the therapeutic alliance and lead to better treatment outcomes.

Dr Lee is an ECRIP research fellow and Dr Galynker is professor of clinical psychiatry, associate chairman for research, and director of the Family Center for Bipolar Disorder in the department of psychiatry at Beth Israel Medical Center/Albert Einstein College of Medicine in New York. The authors report no conflicts of interest concerning the subject matter of this article.

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Frontal white matter changes and aggression in methamphetamine dependence

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Abstract Chronic methamphetamine (MA) use can lead to white matter (WM) changes and increased levels of aggression. While previous studies have examined WM abnormalities relating to cognitive impairment, associations between WM integrity and aggression in MA dependence remain unclear. Diffusion Tensor Imaging (DTI) was used to investigate WM changes in 40 individuals with MA dependence and 40 matched healthy controls. A region of interest (ROI) approach using tract based spatial statistics (TBSS) in FSL was performed. We compared fractional anisotropy (FA), mean diffusivity (MD), parallel diffusivity (λ_{\parallel}) and perpendicular diffusivity (λ_{\perp}) in WM tracts of the frontal brain. A relationship of WM with aggression scores from the Buss & Perry Questionnaire was investigated. Mean scores for anger ($p < 0.001$), physical aggression ($p = 0.032$) and total aggression ($p = 0.021$) were significantly higher in the MA group relative to controls. ROI analysis showed increased MD ($U = 439.5, p = 0.001$) and λ_{\perp} ($U = 561.5, p = 0.021$) values in the genu of the corpus callosum, and increased MD ($U = 541.5, p = 0.012$) values in the right cingulum in MA dependence. None of the WM changes were significantly associated with aggression scores. This study provides evidence of frontal WM changes and increased levels of aggression in individuals with MA dependence. The lack of significant associations between WM and aggressive behaviour may reflect

methodological issues in measuring such behaviour, or may indicate that the neurobiology of aggression is not simply correlated with WM damage but is more complex.

Keywords Stimulants · Diffusion tensor imaging · Fractional anisotropy · Diffusivity · Microstructure

Introduction

Methamphetamine (MA) abuse states a serious problem for general and mental health (Darke et al. 2008; Panenka et al. 2013) and has previously been associated with anxiety, paranoia, and increased levels of aggressive behaviour (Boles and Miotto 2003; Cartier et al. 2006; Payer et al. 2011). A study by Sommers et al. (2006) found that half of their study participants, who abused MA and showed aggressive behaviour, had not committed an aggressive act prior to using MA. Also, animal studies have shown more fighting (Crowley 1972) and more aggressive and hostile behaviour (Sokolov et al. 2004) in MA exposed mice, supporting the theory that MA may directly cause aggression.

Previous research has shown a relationship between higher levels of self-report aggression scores and diminished frontal lobe WM integrity in psychiatric disorders, such as lower fractional anisotropy (FA) in the right inferior frontal WM in schizophrenia (Hoptman et al. 2002), increased mean diffusivity (MD) in inferior frontal WM in borderline personality disorder with comorbid attention deficit hyperactivity disorder (Ruesch et al. 2007), and lower FA values in the callosal genu and anterior commissure in bipolar disorder (Saxena et al. 2012) as well as decreased FA, increased radial diffusivity (RD), longitudinal diffusivity (LD) and MD in the fronto-temporal-subcortical network in healthy individuals (Peper et al. 2014). In MA abuse, it has been proposed that impaired

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emotional insight, based on inferior frontal gyrus dysfunction, may underlie MA-related aggression (Payer et al. 2011). According to Davidson et al. (2000) aggressive behaviour may stem from a dysregulation of the fronto-limbic circuitry. It may therefore be argued that diminished WM integrity in frontal executive areas and reduced connectivity to subcortical structures might be a risk factor for the development of aggression, warranting further investigation of white matter structure for a better understanding of the neural basis of aggression in MA dependence.

The frontal lobe was previously found to exhibit WM changes in MA-dependent individuals (Alicata et al. 2009; Tobias et al. 2010). Such pathological changes in WM structure may be mediated by a variety of MA-associated mechanisms, including chronic oxidative stress, nitric oxide formation, hyperthermia, inflammation, and altered cell metabolism (Krasnova and Cadet 2009; Yamamoto et al. 2010). Further, the neurotoxic effects of chronic MA use are exhibited on many molecular pathways, especially in the dopaminergic, serotonergic and glutamatergic systems which have been implicated in MA-associated neuronal damage, including axonal degeneration (Cadet et al. 2007).

An optimal tool to investigate WM changes is diffusion tensor imaging (DTI), which measures WM microstructure integrity in-vivo based on the diffusion of water molecules. This technique allows estimation of parameters that relate to axon diameter, the packing density of fibres, axon branching, myelination, and glial cell size and number. In anisotropic WM tissue, the main direction of water diffusion is represented by the largest diffusion value λ_1 , describing the parallel diffusivity (λ_{\parallel}) along the nerve fibre. The second and third eigenvalue λ_2 and λ_3 can be used to calculate the restricted perpendicular diffusivity (λ_{\perp}) of water molecules. Physiological or pathological changes to structural WM features may influence the magnitudes of the eigenvalues (Alexander et al. 2007). Fractional anisotropy (FA), a measure of the directionality of water diffusion in WM fibres, indicates microstructural fibre integrity (Hasan et al. 2004). Previously reported decreases in FA were interpreted as damages to the myelin sheet, axonal disorganisation, oedema, or inflammation (Cercignani et al. 2001), while FA increases have been related to growth of axons or increased myelination (Walhovd et al. 2014). Indeed, animal studies combining DTI and histological models, suggest on a structural cell level a relationship between FA and increased cellular organisation and axon/myelin packing (Blumenfeld-Katzir et al. 2011). Another measurement used to describe WM changes is mean diffusivity (MD), a direction independent measure of overall diffusion of water molecules in each voxel. Increases in MD might be related to a decrease in membrane density due to cell degeneration and therefore less restriction in water diffusion (Beaulieu 2002). However, although these DTI parameters have been shown to be sensitive to WM microstructure, they

do not relate to only one specific morphological feature and biological interpretations should be made carefully (Walhovd et al. 2014).

Based on the literature discussed above, the rationale of this study was to delineate the relationship between frontal lobe microstructural WM changes and aggression in individuals with MA dependence. Therefore, we compared WM integrity in individuals with MA dependence and a group of healthy control participants using DTI. We hypothesized that MA-dependent individuals show diminished frontal WM integrity (corresponding to lower FA and λ_{\parallel} values, as well as higher MD and λ_{\perp} values), compared to healthy controls. Furthermore, we expected significantly higher aggression scores in the MA group, and that these scores would be associated with frontal WM damage.

Methods

Participants

Forty participants with MA dependence and 40 healthy controls were included in the study. Recruitment of participants with MA dependence was undertaken in a number of drug counselling and rehabilitation facilities in Cape Town. Healthy control participants were recruited from the same communities as the individuals with MA dependence, through word of mouth and by means of flyers. Both participant groups were matched as close as possible in terms of gender, age, years of education, ethnicity, and social circumstances. All participants were right handed, fluent in English and between 18 and 40 years of age. Inclusion criteria for the MA group was diagnosis of MA dependence on the Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I) (First et al. 2002). Exclusion criteria for all participants were 1) substance dependence (except nicotine for all participants and MA for the MA group), 2) current or a history of a psychiatric disorder, 3) severe renal, hepatic, pulmonary or endocrine disease, and neurological illness or trauma including head injuries, epilepsy or meningitis, 4) a history of seropositive testing for HIV, 5) known brain imaging incompatibilities, such as metal implantations or claustrophobia.

To determine eligibility for participation according to the study's inclusion and exclusion criteria all participants underwent a psychiatric assessment. This was carried out by a trained clinician in the Department of Psychiatry and Mental Health using the SCID-I for DSM-IV-TR. Demographic details, including ethnicity, language, employment status, and years of schooling completed, were documented. Additionally, we kept a record of drug use measures, together with life-time use of all major drug types, MA use onset, duration of MA use, and duration of MA abstinence. Before individuals entered the study, all procedures were explained

and informed consent was obtained in writing. All procedures performed in this study were in accordance with the Declaration of Helsinki and its later amendments (World Medical Association 2013) and were approved by the Human Ethics Research Committee of the Faculty of Health Sciences at the University of Cape Town (HREC 395/2014).

Behavioural measure

The Buss & Perry aggression questionnaire (1992) was completed by all study participants except for four participants in the control group. The questionnaire measures four dimensions of aggression: physical aggression (9 items), verbal aggression (5 items), anger (7 items), and hostility (8 items). These are assessed by ranking the total 29 statements from “extremely uncharacteristic of me” to “extremely characteristic of me” on a 5-point scale. Scores range from 29 points to a maximum score of 145 points.

Diffusion tensor imaging acquisition

Brain imaging was conducted using a 3 T Siemens Magnetom Allegra at the Cape Universities Brain Imaging Centre. Full-brain diffusion tensor images were acquired with the following parameters: orientation = transversal; slices = 70; distance factor = 0; TR = 9500 ms; TE = 88 ms; FOV = 240 mm; voxel size = $2 \times 2 \times 2$ mm; slice thickness = 2 mm; diffusion weighted volumes in 30 directions with $b = 1000$ s/mm² and a single unweighted volume ($b = 0$ s/mm²). Each volume was acquired using a single-shot echo-planar imaging (EPI) sequence with isotropic ($2 \times 2 \times 2$ mm) voxels. The sequence (scan time = 5:33 min) was repeated three times.

Image processing

The Oxford Centre for Functional Magnetic Resonance Imaging of the Brain software library (FSL) (Smith et al. 2004) was used for the DTI data analysis. FA, MD and the eigenvalues (λ_1 , λ_2 , λ_3) were calculated. From the eigenvalues, the perpendicular diffusivity (λ_{\perp}) was calculated from the mean of the two perpendicular eigenvalues λ_2 and λ_3 , while λ_1 represents the parallel diffusivity (λ_{\parallel}).

An in-house script was used following the FSL pre-processing steps. This script embodied FSL analysis tools, specifically Eddy correction, brain extraction and DTIfit as explained below (Smith et al. 2004). Eddy correction was used to correct for head movement and distortion caused by eddy currents of the gradient coils. Afterwards, the three acquisitions were exported to Matlab R2013b and outlier data points were rejected by calculating the Z-values of the data distribution and discarding any points more than three standard deviations from the mean. The corrected acquisitions were affine registered to create a mean DTI image. Next,

images got brain-extracted using BET (Brain Extraction Tool) at the recommended threshold of 0.3. The script continues with fitting a tensor model to each voxel of the data using DTIfit within the FDT toolbox (Functional MRI of the Brain Diffusion Toolbox). From this data, FA and the eigenvalue images were derived.

Tract-based spatial statistics (TBSS) was used for carrying out whole brain voxelwise statistical analysis (Smith et al. 2006). First, all FA images were aligned into Montreal Neurological Institute-152 (MNI152) common space using the nonlinear registration tool FNIRT within FSL. Following, a mean FA image, from all the subjects FA images combined, was created. To check for effective registration, the mean FA image was inspected whether it was following all major WM tracts. Next, the mean FA image was thinned and skeletonised resulting in a mean FA-skeleton image, which represents the centres of all tracts common to all subjects. In the last step, the threshold for FA values was set at 0.2 to ensure that only voxels within WM were used in the next projection step (Smith et al. 2006). Now each single FA image was projected onto the mean FA-skeleton by choosing the FA value closest to the tract centre. The same projection onto the FA-skeleton was done for each eigenvalue.

Regions of interest

As previous research showed, WM changes in MA abuse as well as in aggressive behaviour are commonly found in frontal brain areas. Therefore, ROI masks for four predefined frontal WM regions of the left (LH) and right (RH) hemisphere (genu of the corpus callosum - 8851 voxels; cingulate gyrus - RH 2342 voxels, LH 2751 voxels; hippocampal section of the cingulum - RH 1236 voxels, LH 1155 voxels; and uncinate fasciculus - RH 380 voxels, LH 376 voxels), labelled by the JHU ICBM-DTI-81 white-matter labels atlas (Mori et al. 2008) were created in FSL (see Fig. 1). FA, MD, λ_{\parallel} and λ_{\perp} values, calculated per voxel as described above, were extracted for RH and LH respectively and averaged over each ROI.

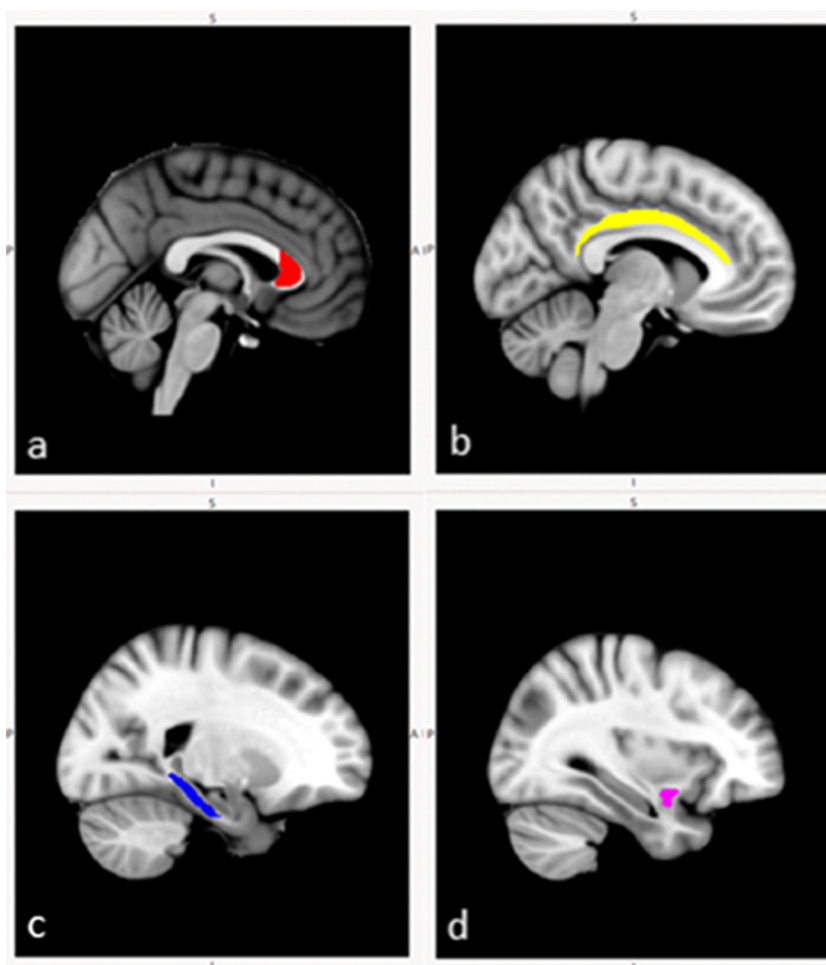
Genu of the corpus callosum (CC)

The CC, especially the genu as a connection of the prefrontal cortices of the hemispheres, plays an important role in regulating emotions (Nowicka and Tacokowski 2011; Schutter and Harmon-Jones 2013) and decreases in WM integrity in the genu of the CC has been found correlate with higher aggression levels (Saxena et al. 2012).

Cingulum (CgG + CgH)

The cingulum forms the WM core of the cingulate gyrus. It is an association bundle with long and short fibres carrying information from the cingulate gyrus to the hippocampus. It also

Fig. 1 Region of Interest masks as labelled by the JHU ICBM-DTI-81 white-matter labels atlas created in FSL for extraction of FA, MD, λ_{\perp} and λ_{\parallel} values in 40 MA and 40 CTRL individuals: **a** genu of the corpus callosum; **b** cingulate gyrus section of the cingulum; **c** hippocampal section of the cingulum; **d** uncinate fasciculus. All diffusion values were measured bilaterally, except for the genu of the corpus callosum



links the prefrontal and the parahippocampal cortices (Goldman-Rakic et al. 1984). The JHU ICBM-DTI-81 WM labels atlas divides the cingulum into a part adjacent to the CC (CgC), and a part reaching from the splenium of the CC inferior into the hippocampal area of the temporal lobe (CgH). A PET study by Sekine et al. (2006) showed a correlation between reduced serotonin transporter density in anterior cingulate areas and higher levels of aggression in former MA abusing individuals.

Uncinate fasciculus

The uncinate fasciculus connects the orbitofrontal cortex (OFC) with the hippocampus and amygdala in the anterior temporal lobe. Since OFC inhibitory control over the amygdala is relevant for emotion regulation, it is assumed that connectivity disruptions could play a role in aggression. However, previous studies showed heterogeneous results. Uncinate fasciculus WM integrity changes have been reported in a number of psychiatric disorders, characterized by patterns of aggressive behaviour and emotion regulation deficits (Craig et al. 2009; Passamonti et al. 2012; Sundram et al. 2012).

Statistical analyses

All statistical analyses were done in IBM SPSS (version 22) and statistical significance for all tests was set at $p < 0.05$ (2-tailed). All data was tested for normal distribution using the Shapiro-Wilk test. For group comparison of demographic data the Mann-Whitney-U test was used for non-normally distributed data and Pearson Chi-square test for categorical data. All Buss & Perry questionnaire data were normally distributed and a multivariate analysis of variance (MANOVA) was conducted to compare MA and CTRL groups on self-report aggression levels. Given a significant overall test, follow-up ANOVAs were performed to determine which subscale/dimension of aggression contributed significantly to the overall multivariate effect. Between-group differences of DTI measures were calculated with the Mann-Whitney-U test for non-normally distributed data (applied transformations did not achieve normal distribution). To correct for multiple comparison, we used the 2-staged linear step up procedure of the false discovery rate control (FDR) (Benjamini et al. 2006). To test whether expected differences in aggression between controls and MA-dependent individuals are mediated by changes in

white matter, multiple regression models were performed to assess the association of subject cohort with WM DTI indices (a-path), WM indices with total aggression and aggression subscales (b-path), and subject cohort with total aggression and aggression subscales (c-path). The SPSS INDIRECT macro designed by Preacher and Hayes (2008) was used here. Bootstrapping with bias-corrected confidence estimates were utilized (MacKinnon et al. 2004; Preacher and Hayes 2004). For this study, a confidence interval of 95 % and 5000 bootstrap resamples were used (Preacher and Hayes 2008). Additionally, multiple linear regression analysis was performed to investigate the association of WM change with duration of MA use and MA abstinence within the MA group. Age, gender and level of education were used as covariates in the model:

$$Y = \beta_0 + \beta_{\text{duration}} + \beta_{\text{abstinence}} + \beta_{\text{age}} + \beta_{\text{gender}} + \beta_{\text{education}} + \varepsilon$$

In this model Y represents the DTI index for each of the WM structures and β the regression coefficient for each predictor. β_0 and ε are the intercept and error terms respectively.

Results

Participants

Table 1 presents demographic data of the MA and control group. Participants did not differ significantly in gender, age, and alcohol or cannabis use. However, the MA group had fewer years of education ($p = 0.001$) and smoked more tobacco ($p = 0.007$) and methaqualone ($p = 0.026$) in the past year than the control group.

Table 1 Demographic and methamphetamine use measures

Demographic measures	MA <i>n</i> = 40	CTRL <i>n</i> = 40	Test for group difference
Male/female	29/11	29/11	$\chi^2(1) = 0.00, p = 1.0$
Age in years*	25.5 (18–38)	25 (18–38)	$U = 762.5, p = 0.721$
Level of education in years*	10 (8–15)	12 (9–14)	$U = 481.0, p = 0.001$
Tobacco smokers	34	22	$\chi^2(1) = 8.571, p = 0.007$
Alcohol consumers	21	17	$\chi^2(1) = 0.802, p = 0.502$
Cannabis users	9	14	$\chi^2(1) = 1.526, p = 0.323$
Methaqualone users	5	0	$\chi^2(1) = 5.475, p = 0.026$
MA use measures			
Age of onset in years*	17 (12–32)		
Duration in years*	6.5 (2–19)		
Abstinence in days*	21 (1–240)		

Statistically significant results are highlighted in bold

Continuous measures in *median (range)

MA methamphetamine-dependent group, CTRL control group

Behavioural measure

Multivariate analysis showed a significant overall difference in aggression scores between the MA group and controls ($F(5,70) = 5.842, p < 0.001$). Follow-up univariate tests revealed significantly higher scores for anger ($F(1,74) = 15.196, p < 0.001$), physical aggression ($F(1,74) = 4.775, p = 0.032$), and total aggression scores ($F(1,74) = 5.534, p = 0.021$) in the MA group (see Table 2). All group differences survived FDR correction. Study groups showed no significant differences in hostility or verbal aggression scores. To estimate the effects of education on aggression scores, we conducted a multivariate analysis of covariance (MANCOVA); Wilks' Lambda test showed no statistically significant effect ($F(5,69) = 0.698, p = 0.627$).

Region of interest analysis

Table 3 shows the median FA, MD, λ_{\perp} , and λ_{\parallel} values for the four WM regions of interest. MD ($U = 439.5, p < 0.001$) and λ_{\perp} ($U = 561.5, p = 0.021$) values in the genu of the CC were significantly higher in the MA group than in controls. We also found higher MD (RH: $U = 541.5, p = 0.012$; LH: $U = 550.5, p = 0.016$) values in MA users, compared to healthy controls, bilateral in the hippocampal region of the cingulum, but only the effects in the RH survived FDR correction. Additionally, FA ($U = 545.0, p = 0.014$) values were lower in the left cingulum (CgC) of individuals with MA dependence; however, this result did not survive FDR correction. There was no difference in the uncinate fasciculus between the two groups.

Table 2 Buss & Perry Questionnaire mean scores and group differences

Buss & Perry subscales	MA N = 40	CTRL N = 36	Test for group difference	Effect size
Physical aggression	26.63 ± 8.63	22.58 ± 7.36	F(1,74) = 2.19, p = 0.032	d = 0.25
Verbal aggression	16.30 ± 4.23	15.72 ± 3.44	F(1,74) = 0.65, p = 0.519	d = 0.08
Anger	20.88 ± 5.8	16.11 ± 4.73	F(1,74) = 3.90, p < 0.001	d = 0.41
Hostility	24.68 ± 7.18	22.14 ± 7.89	F(1,74) = 1.47, p = 0.147	d = 0.17
Total	88.48 ± 23.54	76.44 ± 20.75	F(1,74) = 2.35, p = 0.021	d = 0.26

Statistically significant results are highlighted in bold

Scores in mean ± standard deviation

MA methamphetamine-dependent group, CTRL control group

Mediation analysis of WM change and aggression in MA use

The multiple regression analyses demonstrated that absence of MA use was positively associated with left cingulum FA ($\beta = 0.01$, $t = 2.16$, $p = 0.03$) as well as negatively associated with corpus callosum genu MD ($\beta < 0.01$, $t = -3.36$, $p < 0.01$), λ_{\perp} ($\beta < 0.01$, $t = -2.22$, $p = 0.03$) and λ_{\parallel} ($\beta < 0.01$, $t = -2.72$, $p < 0.01$). In addition, absence of MA use was also negatively associated with physical aggression ($\beta = -5.83$, $t = -2.04$, $p = 0.04$), anger subscale ($\beta = -7.72$, $t = -4.14$, $p < 0.01$), hostility subscale ($\beta = -6.30$, $t = -2.55$, $p = 0.01$) and total aggression scores ($\beta = -21.52$, $t = -2.81$, $p < 0.01$). There were no significant associations of the proposed mediator, namely WM change, with any of the aggression scales (all $p > 0.05$).

Mediation analyses were performed to prove whether WM change is truly a mediator for the difference in aggression scores between MA users and controls. As confirmed by the absence of any significant associations of WM with aggression, the results of the mediator analysis confirmed that none of the WM regions displayed any mediating role on the different aggression scores.

Association of WM structure with duration of MA use and MA abstinence

Length of abstinence was positively associated with left ($\beta = 0.38$, $t = 2.51$, $p = 0.02$) and right ($\beta = 0.41$, $t = 2.86$, $p < 0.01$) cingulum MD, left ($\beta = 0.42$, $t = 2.79$, $p < 0.01$) and right ($\beta = 0.33$, $t = 2.13$, $p = 0.04$) cingulum λ_{\perp} and right cingulum λ_{\parallel} ($\beta = 0.32$, $t = 2.28$, $p = 0.03$). No significant association was found between WM structure and duration of MA use.

Discussion

The aim of this study was to delineate the relationship of aggressive behaviour and WM structural changes in MA

dependence. In line with our hypotheses, the present study showed elevated scores of aggression on the Buss & Perry questionnaire as well as diminished frontal WM integrity in individuals with MA dependence, compared to healthy controls. Using ROI analysis, we found significantly higher MD and λ_{\perp} values in the genu of the CC in individuals with MA dependence. MD values were also significantly higher in the right hippocampal region of the cingulum in MA. Contrary to our expectation, there was no statistically significant association of WM changes with aggressive behaviour.

Behavioural measures

In accordance with previous studies (Cartier et al. 2006; Payer et al. 2011; Plüddemann et al. 2010; Sommers and Baskin 2006) we found higher aggression levels in individuals with MA dependence, compared to controls. Especially on the anger and physical aggression subscales, individuals with MA dependence reached significantly higher scores. In previous studies, higher levels of physical aggression and anger in particular, have frequently been linked to substance abuse (Chermack et al. 2001; Fals-Stewart et al. 2002).

Nevertheless, no conclusive statements about causality can be made regarding these findings. Aggressive behaviours, especially physical aggression and anger, are multifactorial phenomena. The social and environmental context, childhood and family history of violence and abuse, in addition to the neurotoxic effects of MA, have to be taken into consideration. On the other hand, animal studies have indicated that MA has a direct effect on behaviour. Studies reported increased aggressive behaviour in mice after chronic administration of MA (Crowley 1972; Sokolov et al. 2004). In addition, Plüddemann et al. (2010) found in a cross sectional survey with 1561 students, that participants using MA are at a higher risk to show aggressive behaviour.

White matter changes

Our findings of WM changes in the genu of the CC are consistent with previous studies in MA dependence. Kim et al.

Table 3 Mean values and group differences of DTI measures in predefined regions of interest

Region of interest	DTI measure	MA Median (Range)	CTRL Median (Range)	Test for group difference	Effect size
CC Genu	FA	0.441 (0.331–0.495)	0.451 (0.322–0.513)		
	MD ^{a,b}	0.787 (0.753–0.897)	0.772 (0.659–0.849)	$U = 439.5, p < 0.001$	$d = 0.39$
	λ_{\perp} ^{a,b}	0.579 (0.536–0.728)	0.57 (0.481–0.675)	$U = 561.5, p = 0.021$	$d = 0.26$
	λ ^a	1.199 (1.107–1.336)	1.19 (1.014–1.259)		
Cingulum RH	FA	0.414 (0.304–0.473)	0.429 (0.366–0.492)		
	MD ^a	0.731 (0.709–0.777)	0.729 (0.69–0.0786)		
	λ_{\perp} ^a	0.558 (0.516–0.609)	0.549 (0.501–0.607)		
	λ ^a	1.086 (0.939–1.158)	1.1 (1.002–1.166)		
Cingulum LH	FA	0.407 (0.307–0.461)	0.423(0.359–0.478)	$U = 545.0, p = 0.014$	$d = -0.27$
	MD ^a	0.73 (0.73–0.784)	0.728 (0.682–0.795)		
	λ_{\perp} ^a	0.559 (0.518–0.616)	0.551 (0.499–0.615)		
	λ ^a	1.082 (0.93–1.144)	1.093 (0.98–1.156)		
Cingulum hippocampus RH	FA	0.447 (0.325–0.510)	0.448 (0.370–0.520)		
	MD ^{a,b}	0.7 (0.657–0.737)	0.683 (0.655–0.786)	$U = 541.5, p = 0.012$	$d = 0.28$
	λ_{\perp} ^a	0.51 (0.456–0.588)	0.501 (0.459–0.589)		
	λ ^a	1.071 (0.982–1.145)	1.052 (0.957–1.181)		
Cingulum hippocampus LH	FA	0.431 (0.294–0.505)	0.441 (0.316–0.514)		
	MD ^a	0.701 (0.644–0.82)	0.684 (0.649–0.831)	$U = 550.5, p = 0.016$	$d = 0.27$
	λ_{\perp} ^a	0.522 (0.476–0.642)	0.51 (0.463–0.654)		
	λ ^a	1.038 (0.925–1.176)	1.041 (0.944–1.184)		
Uncinate Fasciculus RH	FA	0.373 (0.230–0.436)	0.389 (0.223–0.477)		
	MD ^a	1.501 (1.237–2.006)	1.489 (1.176–2.322)		
	λ_{\perp} ^a	1.203 (0.937–1.818)	1.204 (0.885–2.1)		
	λ ^a	2.113 (1.708–2.382)	2.1 (1.698–2.766)		
Uncinate Fasciculus LH	FA	0.468 (0.326–0.540)	0.467 (0.360–0.536)		
	MD ^a	0.767 (0.719–0.97)	0.758 (0.67–0.919)		
	λ_{\perp} ^a	0.558 (0.505–0.803)	0.563 (0.447–0.735)		
	λ ^a	1.179 (1.06–1.368)	1.167 (1.081–1.286)		

FA fractional anisotropy, MD mean diffusivity, λ_{\perp} perpendicular diffusivity, λ parallel diffusivity, CTRL control group, MA methamphetamine-dependent group, RH right hemisphere, LH left hemisphere

^aMD, λ_{\perp} and λ_{\parallel} in $\times 10^{-3}$

^bSignificant differences between groups survive FDR correction

(2009) showed increased second and third eigenvalues in the genu of the CC in MA dependence, compared to controls. This is in line with our findings of higher λ_{\perp} , which is calculated as the mean of the second and third eigenvalues, as well as elevated MD, which presents the overall diffusivity in a voxel. These findings suggest a membrane or myelin defect in the genu of the CC resulting in less restricted water diffusion perpendicular to the nerve fibre (Beaulieu 2002). As the genu of the CC connects the prefrontal cortices (PFC), damages in this region have been shown to result in impairment in frontal executive function, cognitive control and conflict resolution in MA abusers (Kim et al. 2009; Salo et al. 2009; Tobias et al. 2010). Salo et al. (2009) stated that diminished WM connectivity between prefrontal regions could play a role in maladaptive decision making and reduced behavioural

regulation seen in individuals with MA dependence. Findings of altered WM integrity in the genu of the CC were also reported in other substance dependences like cocaine (Bell et al. 2011; Moeller et al. 2001). However, contrary to previous studies (Kim et al. 2009; Salo et al. 2009; Tobias et al. 2010) we could not detect decreased levels of FA in the CC.

To our best knowledge, this study is the first to show WM changes in the right hippocampal region of the cingulum (CgH) in MA dependence. The right CgH has been linked to substance related problems in maltreated children in a study by Huang et al. (2013). In their longitudinal study, they showed that adolescents who developed substance dependence had lower FA in the right CgH, compared to healthy control subjects. The CgH carries important connections between the PFC and the parahippocampal regions (Goldman-

Rakic et al. 1984). This projection plays a role in higher cognitive function and emotional control like self-regulation (Huang et al. 2013), which plays an important role in the ability to resist drugs. One might argue that damage to these WM tracts might be followed by less self-regulation and higher vulnerability to drug dependence.

Furthermore, Kim et al. (2011) showed in an fMRI study hyperactivation of the parahippocampal gyrus and posterior cingulum in an emotion-matching task in a group of individuals with MA use disorder, compared to controls. They outline the association of these regions with episodic memory. Since MA abuse is associated with more interpersonal violence, fearful faces may trigger emotional memories in MA users. The authors argued that altered interpersonal communication, due to misinterpreted facial expression as social clues, could lead to aggressive or hostile behaviour in MA abuse. In this regard, Payer et al. (2011) similarly showed that individuals with MA dependence demonstrate impaired interpretation of social clues, using a facial affect matching task as part of an fMRI study. Although they showed hyperactivity in the anterior cingulum and not in the posterior, it is interesting to note that these changes were accompanied by high self-ratings of hostility.

Previous studies showed impaired WM in the anterior cingulum, part of the CgC according to the JHU ICBM-DTI-81 atlas, throughout a number of different substance dependences, including cocaine and alcohol dependence (Bell et al. 2011; Harris et al. 2008). This is not surprising given its role in the reward system in the brain. The present study could detect lower FA values in the left CgC in the MA group relative to controls, but results did not survive correction for multiple comparison.

No WM differences between the two study groups were found in the uncinate fasciculus. Damage to this connection between the PFC and the amygdala has not been linked to MA dependence before, but impaired integrity of this WM tract has been noted in several psychiatric disorders with increased levels of aggressive behaviour (Craig et al. 2009; Passamonti et al. 2012; Sundram et al. 2012). On the other hand, Beyer et al. (2014) could not show a significant correlation between WM changes in the uncinate fasciculus and trait aggression in healthy participants.

The present study showed several impaired frontal WM structures and high levels of aggression in individuals with MA dependence. Nevertheless, we did not find a statistically significant association between the two. This might be due to imprecise aggression measures, i.e. self-report tools, given the complex nature of aggressive behaviour. Also, aggression may be regulated by a larger network of underlying brain structures, with altered functional connectivity of emotion regulating centres potentially playing a role in the reduced inhibitory control, impulsivity, and aggressive behaviour seen in MA dependence (Davidson et al. 2000; Geen 2001). Our findings include WM alterations in connections of the PFC and

limbic regions. The PFC executes complex cognitive control, which implicates control over behaviour and decision-making (Coutlee and Huettel 2012). In their review of PFC control and function, Coutlee and Huettel (2012) emphasize the importance of the PFC in self-control, and more specifically in response inhibition, delay of gratification, and thought suppression; all important factors in aggressive behaviour as well as in drug abuse. In contrast, the subcortical limbic structures are involved in impulsive, affective and reward orientated behaviour (Morgane et al. 2005). Thus, loss of regulatory control of the PFC over limbic structures may be a possible explanation for the disinhibited behaviour reported in MA dependence.

Limitations

The present study has a number of limitations. First, the measure for aggression levels used in this study is a self-report questionnaire. Although other studies have shown that self-report measures in substance-dependent participants tend to be valid (Darke 1998) a potential bias in evaluating one's own aggressive behaviour cannot be excluded. This might either be due to participants answering questions as they think it is socially desirable (Becker 2007) or simply because the perception of personal actions might differ from the actual behaviour. Second, variability in MA use measures may impact WM integrity. Different times of drug abstinence can have a substantial influence on WM integrity as shown by Bell et al. (2011). In our study, length of abstinence was associated with higher diffusivity measures in one WM structure, the cingulum. No significant association was found between DTI measures and MA use duration. As quantity of MA use is particularly difficult to assess, because participants themselves do often not know the exact amounts of MA taken over time, this measure could not be included in our analyses. The third limitation lies within the DTI analysis itself. In case of very small WM pathways, sometimes smaller than a voxel itself, it is difficult to determine whether a change in FA is due to WM integrity loss or if the voxel contains other brain tissue, which would alter the results (Smith et al. 2006). However, our ROI results in the CC and cingulum are likely due to an existent reduction in WM integrity, given that they are major WM tracts. Fourth, given the cross sectional design of our study it cannot be determined if changes in WM integrity may be a pre-existing phenomenon or a result of MA use. Finally, we found significant differences in levels of education, methaqualone and tobacco use in our two groups. These may be confounding factors potentially exerting an influence on white matter microstructure; however, previous studies reported divergent effects (Nenonen et al. 2015). To our best knowledge, there are no DTI studies in methaqualone use so far, but a possible impact on WM integrity should be taken into consideration when interpreting our results. However, only five out

of the 40 MA-dependent participants of this study were concurrently using methaqualone.

Conclusion

In conclusion, this study provides evidence for frontal WM microstructure differences between individuals with MA dependence and healthy controls. Moreover, MA dependence was associated with higher levels of aggressive behaviour. However, there was no statistically significant association between WM changes and aggression scores and further research to assess and improve understanding of underlying neural substrates of aggressive behaviour, particularly in MA dependence, is warranted.

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Compliance with ethical standards

Conflict of interest Dr. Stein has received research grants and/or consultancy honoraria from Abbott, ABMRF, Astrazeneca, Biocodex, Eli-Lilly, GlaxoSmithKline, Jazz Pharmaceuticals, Johnson & Johnson, Lundbeck, National Responsible Gambling Foundation, Novartis, Orion, Pfizer, Pharmacia, Roche, Servier, Solvay, Sumitomo, Sun, Takeda, Tikvah, and Wyeth. All other authors declare that they have no conflict of interest.

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