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ORIGINAL ARTICLE

Aggressive Cognitions of Violent Versus Nonviolent Spouses

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Abstract This study extends previous research on the relationship between aggressive cognition and intimate partner violence (IPV) perpetration by comparing the aggressive cognitions of both husbands and wives (not just husbands) in an actual (not hypothetical) relationship problem discussions across three groups of couples—bi-directionally violent (V), nonviolent but maritally distressed (NVD), and nonviolent and nondistressed (NVND). Further extending previous work, across these groups, we also compared spouses' inferences of aggressive cognitions in their partners' thoughts and objective observers' inferences of aggressive cognitions. Violent spouses, whether male or female, had significantly more aggressive cognitions than NVD and NVND spouses. Findings are discussed in relation to how they extend past research and their clinical implications.

Keywords Intimate partner violence · Aggressive cognitions

Introduction

Intimate partner violence (IPV) is a serious problem in this country. Each year, 12–14% of married couples experience husband physical aggression and nearly two million women are severely assaulted by their male partners (Shafer, Caetano, & Clark, 2002; Straus & Gelles, 1990). Relationship violence has a variety of serious negative consequences, including physical injury and psychological harm, for both partners and children in violent homes (e.g., Holtzworth-Munroe, Smutzler, & Sandin, 1997). Researchers have examined individual difference correlates of male IPV, seeking to identify variables, ideally derived from theory, that distinguish violent from nonviolent husbands. Such factors might be risk markers for violence, or variables that cause or

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precipitate violence, or factors that could lead to reduction in violent behavior if targeted in clinical interventions.

Historically, several theoretical models suggest a relationship between aggressive cognitions and aggressive behavior, with aggressive cognitions being viewed as a link between angry emotions and aggressive behavior. For example, the frustration-aggression theory posited that the nonfulfillment of an expected gratification leads to frustration, which can, in turn, instigate aggression (Dollard et al., 1939). In a modification of this theory, Averill (1982) and Weiner (1985) proposed that the response (i.e., whether it is aggressive or not) to a frustrating event depends on such cognitive processes as the appraisal of that event and the interpretation of its cause. Ellis (1962, 1977, 1994) argued that individuals' emotional reactions emerge from their interpretations of a given situation. While rational interpretations of events yield appropriate emotional reactions, irrational interpretations, that magnify and distort perceptions of reality, yield overly intense, dysfunctional emotional reactions. Similarly, Beck and his colleagues (Beck, 1976, 1999; Beck, Rush, Shaw, & Emery, 1979) targeted distorted interpretations of, and negative overreactions to, the self, others, and the environment as a source of anger and hostility. According to Beck, greater negative distortions of reality yield more intense negative reactions. In turn, greater emotional disturbance leads to more intense cognitive distortions and more cognitive rehearsal of the biased interpretations; this process results in aggressive cognitions becoming more automatic.

Several theories of aggression have expanded earlier cognitive models of anger to include emotional and behavioral precipitants of anger and have proposed that anger arousal functions as a motivating, or energizing response, facilitating aggression (e.g., Berkowitz, 1969; Feshbach, 1964; Bandura, 1973). For example, Berkowitz's (1989, 1990, 2003) cognitive neoassociation (CNA) theory posits that aversive situations lead to negative affect (such as anger or other negative emotions), which automatically activates associated memory structures for aggressive cognitions, emotions, and behaviors. Although aggressive cognitions are not necessary to produce aggression, CNA theory suggests that as the activation of associated memory structures automatically spreads to related concepts in the cognitive network, the more closely anger is associated with aggressive cognitions, the more likely anger is to facilitate aggressive thoughts and vice versa. However, CNA theory also suggests that interpretations and deliberate appraisals of a situation may moderate an individual's behavior. Thus, aggressive cognitions may increase the likelihood of aggression while nonaggressive appraisals (e.g., recognition of mitigating factors that caused the angering event, appraisals highlighting the consequences of aggression, personal values that oppose aggression) may suppress aggressive behaviors.

Anderson and his colleagues proposed the general aggression model (GAM) as a framework to understand the link between individual, situational, cognitive, affective, and arousal factors and aggression (for a review, see Anderson & Bushman, 2002). GAM underscores the role of associated cognitions, affect, and arousal that are related to aggression and their potential to prime knowledge structures in semantic memory that are related to aggression. According to GAM, the likelihood that a person will respond to an aversive situation with aggression is mediated by cognition, affect, and arousal. For example, priming hostile thoughts increases the likelihood of an aggressive response. Arousal may facilitate aggression, for example by energizing the ''dominant action tendency,'' which may be aggression. In addition, GAM posits that negative affect, such as pain or anger, is related to hostility and influences aggressive responses. Anger may facilitate aggression by reducing inhibitions against aggression, increasing

the cognitive processing of the anger inducing event, facilitating hostile interpretations of ambiguous situations, priming aggressive cognitions, and increasing arousal.

Anger, aggressive cognitions, and male intimate partner violence

The association between anger, aggressive cognitions, and violence has been adapted to models explaining male perpetrated IPV (for a review, see Holtzworth-Munroe & Clements, 2006).[1] For example, consistent with cognitive models of anger, the social information processing model of IPV (Holtzworth-Munroe, 2000) suggests that anger can inhibit ''rational'' cognitive processing and result in cognitive biases (e.g., hostile attributions) that may escalate a marital conflict toward violence. Indeed, existing empirical evidence indicates that anger and hostility are predictive of male IPV, both concurrently (see reviews in Eckhardt et al., 2004; Holtzworth-Munroe & Clements, 2006) and longitudinally (e.g., Leanard & Senchak, 1996; O'Leary, Malone, & Tyree, 1994).

Among males, the link between increased levels of anger and hostility and the perpetration of relationship violence has been demonstrated in several types of research. These include studies using questionnaire measures of men's self-reported anger and hostility (e.g., see reviews in Eckhardt et al., 2004; Holtzworth-Munroe & Clements, 2006). In addition, researchers have directly observed angry and hostile behavior in couples' laboratory discussions of relationship problems. For example, in an early study, Margolin, John, and Gleberman (1988) studied the marital interaction behavior of conflictual couples (i.e., physically aggressive, verbally aggressive, and withdrawing) and a comparison group of nonviolent and nondistressed (NVND) couples. Physically aggressive men expressed more offensive negative behaviors (e.g., threatening) and more negative voice tone (e.g., angry) than husbands in the other groups. As another example, examining couples' discussions of relationship problems, Jacobson and his colleagues found that, compared to distressed/nonviolent or happily married couples, violent couples displayed more aversive negative behavior (Cordova et al., 1993) and violent husbands displayed more anger (Jacobson et al., 1994).

Considering aggressive cognitions, previous studies suggest that, relative to nonviolent men, violent husbands report more aggressive cognitions in general and more spouse-specific (i.e., wife-directed) aggressive cognitions in particular (e.g., Holtzworth-Munroe, Rehman & Herron, 2000). For example, Schweinle, Ickes, and Bernstein (2002) used the empathic accuracy paradigm to examine aggressive husbands' interpretations of the thoughts and feelings of female strangers who were discussing marital problems. By comparing the females' self-reported thoughts and feelings with

[1] When considering the relationship between anger, hostility, and IPV, an important issue isthe theoretical difference between anger and hostility. Anger usually refers to a subjective,phenomenological, emotional state, while hostility refers to aggressive cognitions involving anattitude that includes dislike and negative evaluation of others, cynicism, and mistrust (e.g., seediscussion of this distinction by Eckhardt, Barbour, & Stuart, 2007; Eckhardt, Norlander, &Deffenbacher, 2004). However, many available measures assess both constructs, without cleardifferentiation between them, and not much data exist regarding the independence of theseconstructs (Eckhardt et al.,2004). Similarly, many IPV researchers have included measures of bothanger and hostility, without differentiating between these constructs, in their studies. Thus, despitetheoretical differences between anger and hostility, at the current time, available data do not allow aclear determination of whether one of these constructs is more useful in understanding IPV than theother. In addition, most of the available research findings do not differentiate between theoreticallydifferent dimensions of anger (e.g., physiological, cognitive, phenomenological, and behavioralaspects of anger; see Eckhardt et al., 2004). Thus, at this time, it is difficult to draw definitiveconclusions regarding whether certain dimensions of anger, but not others, are related to IPV.

the men's inferences about the women's thoughts and feelings, the authors found that the greater the men's bias to overly infer criticism and rejection in the female strangers' comments about their husbands, the more verbal aggression the men had perpetrated in their own relationship. In addition, some IPV researchers have investigated relationship-specific aggressive cognitions by presenting men with standardized vignettes of simulated relationship situations. For example, Holtzworth-Munroe and Hutchinson (1993) found that, relative to nonviolent men, violent husbands endorsed more hostile attributions for hypothetical negative wife behaviors.

Eckhardt, Barbour, and Davison (1998) compared the aggressive cognitions of maritally violent men to those of nonviolent but maritally distressed (NVD) or nonviolent and maritally nondistressed husbands. While listening to hypothetical marital problem scenarios, the men were prompted to voice their thoughts and feelings as if they were in the situation. These thoughts and feelings were coded for the presence of aggressive cognitions (e.g., awfulizing, magnification). Maritally violent men expressed more aggressive cognitive biases and irrational beliefs than both groups of nonviolent men. In sum, the existing data support a link between male perpetrated IPV and increased levels of male anger, hostility, and aggressive cognitions. Yet, few, if any studies, have directly compared violent and nonviolent men's aggressive cognitions in actual marital interactions.

Anger, aggressive cognitions, and female perpetrated intimate partner violence

Most previous studies of IPV have focused on characteristics of violent men, as the majority of existing data demonstrate that male aggression has more negative consequences than female aggression, including higher rates of injury, fear, and other psychological consequences, such as depression and marital dissatisfaction (see reviews in Archer, 2000; Holtzworth-Munroe, Smutzler, & Bates, 1997). Nonetheless, it is the case that rates of male and female violence are equivalent among community samples (see Archer, 2000 for review), and IPV occurs within the context of intimate relationship conflict. Thus, although the issue of female-to-male IPV is politically sensitive (for a brief discussion of this controversy, see Holtzworth-Munroe, 2005), we believe that it is important to understand female aggression. As researchers begin to study female relationship aggression, it is necessary to establish whether models that help to explain husband violence are directly applicable to female violence, or whether male and female violence have differing correlates and causes (Holtzworth-Munroe, 2005).

Unfortunately, however, researchers have not systematically examined whether women who perpetrate physical aggression against their male intimate partners are more angry and hostile than women who are nonviolent in their intimate relationships. For example, in the behavioral observation studies of couples' conflict communication reviewed above, researchers often examined wives' behavior, but these samples were usually recruited for the presence of husband (not wife) violence. Interestingly, many of these studies revealed that both spouses in husband violent relationships engage in more angry and hostile behavior than spouses in nonviolent relationships. In addition, little, if any, research has compared the aggressive cognitions of violent and nonviolent women.

The present study

The present study was designed to extend the Eckhardt et al. (1998) study by comparing violent and nonviolent husbands' aggressive cognitions in response to actual relationship

problem discussions with their own wives, rather than in response to hypothetical situation vignettes. Discussion of one's own relationship problems can be used to test whether the Eckhardt et al. finding are generalizable to real life situations. In addition, it is important to understand the potential relationship between aggressive cognitions and female perpetration of IPV. To do so in the present study, we examined aggressive cognitions among bi-directionally violent couples (i.e., couples in which *both* spouses are violent), as compared to nonviolent couples.

Past studies in this area have generally examined only the perpetrator's self-reported aggressive cognitions. However, given the dynamic nature of marital interactions, we believed that it was also important to examine each spouses' inferences about their partners' aggressive cognitions. In other words, another form of dysfunctional cognition, potentially related to violence, might be the tendency to interpret one's spouse as being angry or hostile. Thus, using a modified version of the empathic accuracy paradigm, this study also expands upon previous work by examining spouses' perceptions of aggressive cognitions in their inferences about their partners' thoughts. Given previous findings that violent spouses do display more angry behavior than nonviolent spouses in marital interactions, perhaps violent spouses would infer more aggressive cognitions among their partners because their partners are providing behavioral cues that they are, indeed, angry, and hostile. In fact, violent versus nonviolent group differences in inferences about one's partner's thoughts could be due to group differences in spouse's aggressive cognitions (e.g., violent spouses over-perceive aggressive cognitions in their partners), or the partner's behavioral cues (e.g., violent partners display more anger and hostility than nonviolent partners), or to ''insider'' information that the couple shares based on their relationship history (e.g., previous discussions regarding what they think about the issue). For these reasons, we believed that it also was important to obtain an ''objective'' reading of each partner's aggressive cognitions. Thus, in another expansion upon existing research, we asked objective observers to report their inferences of aggressive cognitions in the thoughts of both spouses. When considering the results of this part of the study, it is important to keep in mind that the distinction between biased and accurate appraisals may not be necessary to understand aggressive cognitions as a risk for aggressive behavior. While early theoretical models of anger and aggression suggested that inappropriately intense anger and aggression result from distorted interpretations of events, more recent models of aggression (e.g., Berkowitz's CNA model and Anderson's GAM) suggest that cognitions can result in anger and aggression even if they are accurate.

The present study also extends our own investigation of the empathic accuracy of violent and nonviolent spouses. In a previous study involving the same sample of couples in the current research (Clements, Holtzworth-Munroe, Schweinle, & Ickes, in press), our focus was on overall level of empathic accuracy, across all types of thoughts and feelings; no attention was given to specific types of thoughts and feeling. Importantly, aggressive cognitions were not examined. In that study, we found that V men had significantly lower empathic accuracy for their wives' thoughts and feelings than did NVND men. No significant group differences were found among wives.

In sum, the present study expands upon previous studies by examining: (1) both husbands' and wives' self-reported aggressive cognitions, in the context of couples' actual marital interactions (rather than in response to hypothetical marital situations); (2) spouses' inferences about their partners' aggressive cognitions; and (3) objective observers' inferences about both spouses' aggressive cognitions. First, we predicted that both violent husbands and violent wives would self-report more aggressive cognitions

than nonviolent spouses. Second, we expected that violent spouses would infer more aggressive cognitions in their partners' thoughts and feelings than would nonviolent spouses. Finally, we did not offer a firm hypothesis regarding the objective observers' inferences about violent versus nonviolent spouses' aggressive cognitions. On the one hand, observational research has shown that violent spouses display more angry and hostile behavior than nonviolent spouses, suggesting that objective observers, seeing this behavior, might attribute more aggressive cognitions to violent than nonviolent spouses. On the other hand, some theoretical models and past research assumes that the aggressive cognitions of violent spouses are distortions or biases, suggesting that while violent spouses would infer more aggressive cognitions in their partners' thoughts/feelings than nonviolent spouses, objective observers would not.

Methods

Participants and recruitment

Participants were 71 couples recruited from a Mid-western metropolitan area using flyers and newspaper advertisements stating that we were seeking a wide range of couples (e.g., happy, unhappy, emotionally distant, having serious or violent arguments, considering divorce) for "a study of marriage." Both partners participated in a phone screening interview. They were asked to complete this interview when they had privacy from their partner (preferably when their partner was not nearby or at home), as we wanted to obtain their independent answers. To qualify for study participation, spouses had to report being married or living together as if married in a heterosexual relationship. Also, both partners had to be willing to participate in the study and had to report being comfortable reading and writing English.[2]

During the phone screening interview, potential participants completed questionnaires used to place couples into one of three groups: (1) experiencing both male and female perpetrated relationship physical violence (V); (2) NVD; and (3) NVND. The screening measures were as follows:

Demographics questions were used to gather descriptive information about the sample such as age, ethnicity, years of education, income, length of marriage, and number of children.

Conflict tactics scale (form N)

The CTS (Straus, 1979; Straus & Gelles, 1990) is the most widely used measure of relationship violence. On it, participants indicate whether they or their partner have ever engaged in a series of behaviors and, if so, how often they have done so in the past

[2] We received phone messages from 265 individuals expressing an interest in the study. Of these, 68 couples never completed the phone screening interview. Among couples who did complete the interview, 102 were ineligible for the study (e.g., were not married or cohabiting, did not meet our criteria for either the violent or the nonviolent groups). Twenty-four couples completed the screening interview and met study inclusion criteria but declined to participate, could not be contacted to schedule an appointment, could not find time to come to lab, or did not attend their lab appointment. Twenty-five couples attended only one assessment session, in part due to scheduling and technical difficulty (n=9) and in part due to attrition between the first and second lab sessions (n=16).

year, from ''0 times'' to ''more than 20 times.'' The CTS lists 18 behaviors, beginning with behaviors that do not represent physical violence (e.g., ''discussed the issue calmly,'' ''cried'') and progressing to physically violent behaviors (e.g., ''pushed, grabbed, or shoved,'' ''beat up''). For the present study, physical aggression was defined as endorsement of any of the CTS items listing physically aggressive behavior, starting with item 12 (''pushed, grabbed, or shoved''). Cronbach alphas for reports (on the violence subscale) of husband violence in the past year were 0.83 for husbands' reports and 0.83 for wives' reports; for reports of wife violence in the past year, alphas were 0.88 for husbands' reports and 0.80 for wives' reports.

Couples were placed in the physically violent (V) group if, on the CTS, both the male and female partner had perpetrated any physical aggression in the past year, as reported by either partner.[3] Couples were included in one of the nonviolent comparison groups if both partners reported no male or female physical aggression.

Short marital adjustment test

The SMAT (Locke & Wallace, 1959) is a standard measure of marital distress that includes 15 items regarding marital satisfaction, areas of disagreement, and activities. Item phrasing was modified to make the measure applicable to cohabiting, not just married, relationships (e.g., ''partner''). Cronbach alphas were 0.78 for husbands and 0.81 for wives. We used criteria from Holtzworth-Munroe et al. (2000) to categorize nonviolent couples into the maritally distressed (NVD) or nondistressed (NVND) group. Couples were included in the NVD group if both partners scored below 100 or if one partner scored below 80 (i.e., indicating more severe marital distress). To be included in the NVND group, both partners had to score above 100.

Study participant groups

The physically violent (V) group included 38 couples. According to the highest report of violence from either spouse, men in this group had perpetrated from 1 to 119 acts of relationship violence in the past year (M = 13.05, SD = 22.56; Md = 5.00), and women in the V group had perpetrated from 1 to 109 acts of violence in the past year (M = 15.53, SD = 25.10; Md = 4.50). Using the CTS criteria to differentiate minor from

[3] There is potentially much heterogeneity in the violence experiences of couples recruited in the manner used in the present study (i.e., including all couples who experienced any physical violence in the past year in the V group). One concern is that there may be inherent differences between couples experiencing only husband violence and couples experiencing bi-directional, or mutual, physical aggression. Thus, in the present study, we only included couples experiencing bi-directional violence in our V group, dropping five couples in which only the husband had perpetrated physical aggression and six couples in which only the wife had been violent. Another concern is that severity level of violence may be an important differentiator of violence experiences. To explore this possibility in our sample, we conducted a series of ANOVAs comparing the couples who had experienced only minor levels of relationship violence in the past year to the couples who had experienced severe levels of violence in the past year on each of study dependent variables (e.g., self-reports of aggressive cognitions). In the first set of analyses, we used standard CTS definitions of minor versus severe violence (see Straus & Gelles, 1990) to form our groups. The group effect did not reach statistical significance for any study variable. In the second set of analyses, we compared couples who experienced minor versus severe violence, using a median split to define minor and severe levels of violence. Again, the group effect did not reach statistical significance for any study variable. Although the lack of minor versus servere violence group differences could be due to the small sample sizes, none of the group effects showed even a trend toward statistical significance.

severe violence (Straus & Gelles, 1990; i.e., ''pushed, grabbed, or shoved'' and ''slapped'' are minor violence; other physically violent CTS acts are severe), 16 of the husbands and 15 of the wives in the V group had perpetrated only acts of minor violence in the past year. Among the nonviolent couples in the sample, 14 couples were classified as nonviolent and maritally distressed (NVD), and 19 couples were classified as NVND.

Laboratory assessment

Qualified couples were invited into the lab to complete two sessions, each lasting up to 3.5 h. During the first session, couples completed informed consent procedures and measures not relevant to the present study. The procedures for the present study took place during the second session and are described below. At the end of each session, spouses independently completed procedures to ensure that they did not feel unsafe leaving together. Each spouse was compensated $85 per session.

For the present study, spouses were asked to discuss a problem in their relationship while being videotaped. Each spouse independently listed problems that both partners would be willing to discuss and that both would identify as a problem; they ranked their problem list in order of importance. A research assistant discussed each spouse's list with him/her in private, to clarify the meaning of the topics and to ensure that they did not feel unsafe discussing the topics. The research assistant then selected the topic ranked as most important among the topics identified by both spouses, independently informed each spouse of the chosen topic, and confirmed that the spouses would not feel unsafe discussing it. No participant refused to discuss the chosen topic. Spouses were then reunited and discussed the issue for 10 min. Two videotapes of the discussion were recorded.

The husband and wife were then taken to separate rooms to independently view the videotaped discussion. First, they were asked to view the tape while attempting to recall any thoughts or feelings they had experienced during the discussion. Each spouse was asked to stop the tape each time they recalled having had a specific thought or feeling, use the displayed time-stamp to record the time during the discussion when the thought or feeling had occurred, and write down the specific content of the thought or feeling, in as much detail as possible. Next, spouses independently viewed the taped discussion a second time. During this viewing, they were instructed to infer the thoughts and feelings that their partner had experienced during the discussion. For each spouse, a research assistant (sitting in the back of the room) used a remote control to stop the tape at each point where the partner had indicated having experienced a thought or feeling. Spouses were instructed to write down the time of the stop point and the content, in as much detail as possible, of what they believed their partner had been thinking or feeling at that point in the discussion.

Objective observers' inferences for spouses

Ten undergraduate research assistants viewed the tapes of spouses' discussions and recorded their inferences about what the spouses had been thinking and feeling. The objective observers were not informed of the study hypotheses nor of the couples' marital violence or distress classifications. They stopped the tape each time the spouse had indicated having had a thought or feeling, recorded the time, and wrote down what

they believed the spouse had been thinking or feeling at that point in the discussion. To maintain comparable perceiver perspectives with regard to gender, five male research assistants watched the wives and inferred wives' thoughts and feelings, while five female research assistants watched husbands and inferred husbands' thoughts and feelings.

Aggressive cognition coding

Spouses' self-reported thoughts and feelings, spouses' inferences about their partners' thoughts and feelings, and objective observers' inferences about the participants' thoughts and feelings were transcribed and coded by undergraduate research assistants,[4] using Eckhardt et al.'s (1998) coding system. Weekly coding meetings were held. About 8–15 undergraduate coders independently viewed and rated each of the listed thoughts (the differing number of raters reflects the number of coders available across the three semesters of coding).

Using a modified version of Eckhardt et al.'s (1998) coding system, coders were trained to focus on one thought/feeling at a time and to evaluate each thought/feeling on two global dimensions of aggressive cognitions: irrational beliefs and cognitive biases. To make these ratings, coders were asked to consider four types of irrational beliefs and six types of cognitive biases.[5] Considering these subcategories, coders made two global ratings for each thought/feeling—one regarding how much irrationality was present and one regarding how much bias was present; each of these two ratings was on a scale from 0 = ''not at all present'' to 7 = ''very irrational (or biased).'' Inter-rater reliability for

[4] Coders for the present study were different individuals than the empathic accuracy coders in Clements et al. (in press). For the present study, undergraduate research assistants were trained to use the coding system for 5–8 weeks. During the training period, coders met individually each week, for 1–2 h, with the first author to discuss questions and problems and receive feedback. In addition, coders met for a 2-hour weekly supervision meeting with the first author to discuss any questions or difficulties that may have arisen. During training, research assistants practiced using the coding system by coding ''fake'' thoughts/feelings (written by the authors) and the thoughts/feelings of pilot study participants (whose data was not included in the main study).

[5] These global ratings were an adaptation of Eckhardt et al (1998)'s coding system. Eckhardt had coders rate each of the four types of irrational beliefs and six types of cognitive biases individually, whereas coders in the present study were instructed to consider all of the subcategories to make one irrational beliefs global score rating and one cognitive bias global score rating. Based on Ellis and Dryden (1987), Eckhardt's coding manual outlined four types of irrational beliefs: (1) awfulizing/terriblizing/horriblizing (labeling an event as ''the worst that could possibly happen''); (2) low frustration tolerance (a severe intolerance for discomfort and strong desire to avoid pain, discomfort, and inconvenience); (3) demandingness (rigid ''beliefs that certain things must or must not happen and that conditions such as success or approval are necessary''); and (4) self-other ratings (labeling the negative ''total value or worth'' of oneself or another person ''based a specific behavior or attribute'', such as ''worthless'' or ''jerk''). Eckhardt's coding manual also outlined six types of cognitive biases, as described by Beck et al. (Beck, 1976; Beck, et al., 1979): (1) causal thinking/ arbitrary inferences (drawing negative conclusions in absence of supporting evidence and assuming others' distressing behaviors are intentionally malevolent); (2) overgeneralization (constructing a general rule based on a isolated incidents; ''always,'' ''never''); (3) magnification (''overestimating the significance of an event and reacting incongruously to the present situation''); (4) personalization (self-referent thinking in situations that have little or nothing do to with the self and vigilantly scrutinizing the motives of others for evidence that one may be a target); (5) demandingness (similar to the demanding subcategory in irrational beliefs, but for demanding cognitive bias code,words such as ''must,'' ''should'' could be inferred); and (6) absolutistic/dichotomous thinking (all-or-none thinking).

the global ratings, measured with Cronbach alphas, ranged from 0.64 to 0.82 ($M = 0.76$).[6]

The two global ratings (i.e., irrationality and bias) were correlated with one another: $r = 0.70$ for husbands' self-reported thoughts/feelings; $r = 0.58$ for wives' self-reported thoughts/feelings; $r = 0.58$ for husbands' inferences about wives' thoughts/feelings; $r = 0.57$ for wives' inferences about husbands' thoughts/feeling; $r = 0.66$ for objective observers' inferences about husbands' thoughts/feelings; and $r = 0.73$ for objective observers' inferences about wives' thoughts/feelings. Given these correlations and the fact that we did have hypotheses specific to irrational beliefs versus cognitive biases, we formed one ''aggressive cognition'' composite score by averaging ratings for irrational beliefs and cognitive biases for each thought/feeling. Then, the average composite aggressive cognition score was computed across each set of thoughts/feelings (e.g., all of a husband's self-reported thoughts/feelings) for the data analyses.

Results[7]

Preliminary analyses

Demographic variables and marital satisfaction

ANOVAs and chi-square analyses were conducted to determine if there were significant differences across the V, NVD, and NVND groups on demographic variables. See Table 1 for group means and standard deviations. The groups did not differ significantly on these variables: husbands' age, $F(2, 68) = 3.03$, ns; husbands' monthly income, $F(2, 64) = 0.81$, ns; husbands' years of education, $F(2, 68) = 1.51$, ns; the couples' length of time living together, $F(2, 67) = 1.88$, ns; the couples' number of children together, $F(2, 67) = 1.99$, ns; the ethnicity of husbands, $\chi^2(2) = 2.82$, ns; the ethnicity of wives, $\chi^2(2) = 0.36$, ns; or the proportion of couples married versus cohabiting, $\chi^2(2) = 0.96$, ns.

Significant group differences emerged for wives' age, $F(2, 68) = 3.17$, $p < 0.05$; wives' monthly income, $F(2, 68) = 3.89$, $p < 0.05$; and wives' years of education, $F(2, 68) = 4.38$, $p < 0.05$. Post hoc Tukey's HSD tests revealed that NVD wives were older than NVND wives, NVD wives earned more than NVND and V wives, and NVD wives had completed more years of education than V wives. The demographic variables on which there were significant group differences (e.g., wife age) were correlated with the relevant study dependent variables (e.g., wives' self-reports and wives' inferences about husbands). Wives' age and income did not significantly correlate with relevant study dependent variables, suggesting that group differences on these demographic variables

[6] Cronbach alphas for the global irrational beliefs ratings were .78 for husbands' self-reports, .82 for wives' self-reports, .78 for wives' inferences regarding husbands' thoughts/feelings, .80 for husbands' inferences regarding wives' thoughts/feeling, .72 for objective observers' inferences regarding husbands' thoughts/feelings, and .64 for objective observers' inferences regarding wives' thoughts/feelings. Cronbach alphas for the global cognitive biases ratings were .79 for husbands' self-reports, .83 for wives' self-reports, .76 for wives' inferences regarding husbands' thoughts/feelings, .80 for husbands' inferences regarding wives' thoughts/feeling, .74 for objective observers' inferences regarding husbands' thoughts/feelings, and .66 for objective observers' inferences regarding wives' thoughts/feelings.

[7] Due to videotape problems (i.e., observers were unable to hear the wife), objective observers were unable to code the tapes of three wives (1 NVND and 2 NVD wives). In addition, an occasional study participant did not answer specific questions (e.g., a few couples would not provide income information). For these reasons, there are varying degrees of freedom across the analyses in this study.

Table 1 Demographic and descriptive variables

	NVND		NVD		V	
	M	SD	M	SD	M	SD
Husbands, age (years)	32.11	7.85	40.50	13.05	36.87	9.49
Wives' age (years)	29.95	7.72	37.71	10.73	33.82	8.56
Husbands' monthly ($)	1,852	1,303	1,900	1,373	2,499	2,448
Wives' monthly income ($)	880	833	1,982	1,315	1,089	1,286
Husbands' years of education	13.47	1.93	13.50	2.10	12.53	2.56
Wives' years of education	14.16	2.12	15.50	2.03	13.24	2.77
Time living together (years)	5.34	6.67	8.86	9.17	8.97	6.13
Number of children	0.79	1.03	0.86	0.86	1.42	1.90
Marital adjustment						
Husbands	125.37	15.80	84.14	23.08	83.18	29.88
Wives	128.58	14.17	73.50	26.79	81.13	30.02
Relationship status						
Married and living together (%)	79.9		78.6		81.6	
Not married and living together (%)	20.1		21.4		18.4	
Husbands' ethnicity						
White/Caucasian (%)	84.2		64.3		73.7	
Black/African American (%)	10.5		28.6		15.8	
Other (%)	5.3		7.1		10.5	
Wives' ethnicity						
White/Caucasian (%)	84.2		71.4		73.7	
Black/African American (%)	10.5		28.6		26.3	
Other (%)	5.3		0.0		0.0	

Marital adjustment was measured with the Short Marital Adjustment Test (SMAT; Locke & Wallace, 1959)

NVND = nonviolent but maritally distressed, *NVD* = nonviolent and nondistressed, *V* = violent

were unlikely to affect the study findings. However, there was a statistically significant negative correlation between wives' years of education and wives' inferences about their husbands' aggressive cognitions, $r = -0.28$, $p < 0.05$. Thus, for analyses of wives' inferences for their husbands' thoughts/feelings, wives' years of education was included as a covariate.

The SMAT scores are reported in Table 1. There were significant group differences for both husbands, $F(2, 68) = 18.72$, $p < 0.001$, and wives, $F(2, 68) = 25.49$, $p < 0.001$. As required by subject group inclusion criteria, NVND partners reported significantly greater marital satisfaction than NVD and V partners. Importantly, however, the scores of the NVD and V groups did not differ significantly, suggesting that any V versus NVD group differences in the study dependent variables were not due to group differences in level of marital distress.

Self-reported aggressive cognitions

To examine participants' aggressive cognitions in their self-reported thoughts/feelings, we conducted a group (V, NVD, NVND) × gender (husbands, wives) repeated measures ANOVA. Gender was a within subjects factor, as husbands and wives are not independent from one another and had participated in the same discussion (see Table 2). There was a significant main effect of group, $F(2, 68) = 24.98$, $p < 0.001$, $\eta^2 = 0.42$. Consistent with hypotheses, post hoc Tukey's HSD tests revealed that V spouses scored significantly higher than both NVD and NVND spouses. In addition,

Table 2 Aggressive cognitions: group by gender repeated measures analyses

	NVND			NVD			V		
	N	M	SD	(*N*)	M	SD	(*N*)	M	SD
Self-reports									
Husbands	(19)	1.63	0.47	(14)	2.04	0.68	(38)	2.56	0.63
Wives	(19)	1.60	0.61	(14)	2.29	0.56	(38)	2.74	0.76
Inferences about spouse									
Husbands	(19)	1.71	0.63	(14)	1.88	0.41	(38)	2.18	0.61
Wives	(19)	1.71	0.42	(14)	1.99	0.55	(38)	2.37	0.50
Objective observer inferences									
Regarding husbands	(17)	2.83	0.68	(12)	2.72	0.59	(38)	3.39	0.71
Regarding wives	(19)	1.71	0.42	(14)	1.99	0.55	(38)	2.37	0.50

NVND = nonviolent maritally nondistressed, *NVD* = nonviolent distressed, *V* = violent

NVD spouses scored significantly higher than NVND spouses. There was no significant main effect of gender, $F(1, 68) = 0.1.85$ ns, and no significant interaction effect, $F(2, 68) = 0.70$ ns.

Participants' inferences about their partners' aggressive cognitions

To examine spouses' inferences about one another's aggressive cognitions, we conducted a group (V, NVD, NVND) × gender (husbands, wives) repeated measures ANCOVA. Gender was a within subjects factor, and wives' years of education was a covariate (see Table 2). There was a significant main effect of group, $F(2, 67) = 10.34$, $p < 0.001$, $\eta^2 = 0.24$. As hypothesized, V spouses scored significantly higher than NVD and NVND spouses, but NVND and NVD couples did not differ significantly from one another. There was also a significant main effect of gender, $F(1, 67) = 7.55$. $p < 0.01$, $\eta^2 = 0.10$, indicating wives inferred significantly higher levels of aggressive cognitions in their husbands' thoughts/feelings than husbands inferred in their wives' thoughts/feelings. There was no significant interaction effect, $F(2, 67) = 0.49$ ns.

Objective observers' inferences about participants' aggressive cognitions

To examine objective observers' inferences about study participants' aggressive cognitions, we conducted a group (V, NVD, NVND) × gender (husbands' versus wives' thoughts/feelings) repeated measures ANOVA; gender was a within subjects factor (see Table 2). There was a significant main effect of group, $F(2, 64) = 9.09$, $p < 0.001$, $\eta^2 = 0.22$. Post hoc Tukey's HSD tests revealed that objective observers inferred significantly higher levels of aggressive cognitions in the thoughts/feelings of V couples than in those of NVD and NVND couples, but NVND couples did not differ significantly from NVD couples. There was not a significant main effect of gender, $F(1, 64) = 0.63$ ns., nor a significant interaction effect, $F(2, 64) = 0.58$ ns.

Husbands' aggressive cognitions: comparing reports from selves (husbands), wives, and objective observers

We conducted a group (V, NVD, NVND) × viewer (husbands' self-reported thoughts/feelings, wives' inferences about husbands' thoughts/feelings, objective observers' inferences about husbands' thoughts/feelings) repeated measure ANCOVA on men's

aggressive cognition scores. Viewer was a within subjects factor, and wives' years of education was the covariate (see Table 3). There was a significant main effect of group, $F(2, 64) = 13.61$, $p < 0.001$, $\eta^2 = 0.34$; V husbands scored higher than NVD husbands and NVND husbands, but NVD and NVND men did not differ significantly. There was a main effect of viewer, $F(2, 63) = 11.23$, $p < 0.01$, $\eta^2 = 0.12$. Post hoc Tukey's HSD tests indicated that objective observers' inferences of the level of aggressive cognitions in husbands' thoughts/feelings were significantly higher than the level of aggressive cognitions in husbands' self-reports and in wives' inferences about their husbands' thoughts/feelings. Husbands' self-reports and wives' inferences about their husbands did not differ significantly. There was no significant interaction effect, $F(4, 128) = 1.48$, ns.

Wives' aggressive cognitions: comparing reports from selves (wives), husbands, and objective observers

We conducted a group (V, NVD, NVND) × viewer (wives' self-reports, husbands' inferences about wives, objective observers' inferences about wives) repeated measures ANOVA on wives' aggressive cognition scores; viewer was a within subjects factor (see Table 3). There was a significant main effect of group indicating that the V group was significantly greater than the NVD and NVND groups, but the NVD and NVND groups did not differ significantly from one another, $F(2, 66) = 14.04$, $p < 0.001$, $\eta^2 = 0.30$. There was a significant a main effect of viewer indicating that the inferences made by objective observers were rated significantly higher than women's self-reports, and that women's self-reports were rated significantly higher than inferences made by male partners, $F(2, 65) = 42.25$, $p < 0.001$, $\eta^2 = 0.39$ There was also a significant group × viewer interaction effect, $F(4, 130) = 2.52$, $p < 0.05$, $\eta^2 = 0.12$. Post hoc Tukey's HSD tests indicated that, for all three groups, the level of objective observers' inferences of aggressive cognitions for wives was significantly higher than both the level of aggressive cognitions in wives' self-reports and in husbands' inferences about their wives' thoughts/feelings. In addition, among V couples, husbands inferred less aggressive cognitions for their wives than their wives self-reported.

Exploratory analyses of difference scores for self-reports versus inferences

To examine the similarity between spouses' level of aggressive cognitions in self-reported thoughts/feelings and their partner's inferences regarding levels of aggressive

Table 3 Aggressive cognitions: analyses of self-reports, partner inferences, and objective observer inferences

	NVND			NVD			V		
	(*N*)	*M*	*SD*	(*N*)	*M*	*SD*	(*N*)	*M*	*SD*
Husbands									
Self-reports	(18)	1.65	0.48	(12)	1.91	0.60	(38)	2.56	0.63
Wives inferences	(18)	1.73	0.42	(12)	1.88	0.51	(38)	2.36	0.50
Object observer inferences	(18)	2.82	0.67	(12)	2.72	0.59	(38)	3.39	0.71
Wives									
Self-reports	(17)	1.60	0.63	(14)	2.29	0.56	(38)	2.74	0.76
Husbands inferences	(17)	1.76	0.65	(14)	1.88	0.41	(38)	2.18	0.61
Object observer inferences	(17)	2.59	0.92	(14)	2.89	0.42	(38)	3.23	0.74

NVND = nonviolent maritally nondistressed, *NVD* = nonviolent distressed, *V* = violent

cognitions in those same thoughts and feelings, we calculated difference scores for ratings of each thought/feeling, for each spouse. Specifically, from the rating of level of aggressive cognition in each spouse's thought/feeling, we subtracted the rating of level of aggressive cognition in his/her partner's inference about that particular thought/feeling. We then calculated a mean difference score, across all the thought/feelings, for each spouse. Using these difference scores, we conducted a group (V, NVD, NVND) by perceiver (difference scores for husbands' self-reports versus wives' inferences regarding husbands' thoughts/feelings; difference scores for wives' self-reports versus husbands' inferences regarding wives' thoughts/feelings) repeated measure ANCOVA. Group was the between subjects variable; perceiver was the within subjects variable (as husbands and wives were not independent); and wives' years of education was the covariate (see Table 4). There was a no significant main effect of group, $F(1, 66) = 1.26$, ns., or viewer, $F(21\ 66) = 0.15$, ns. The interaction effect also did not reach statistical significance, $F(2, 66) = 2.29$.

Discussion

Eckhardt et al.'s (1998) previous research examined violent husbands' aggressive cognitions in response to hypothetical marital situations, showing that violent men reported more aggressive irrational beliefs and cognitive biases than nonviolent men. The present study expands on the Eckhardt et al. study by comparing both violent husbands and wives, not just husbands, to nonviolent comparison subjects, and by doing so in respond to actual, not hypothetical, marital interactions. We also extended previous research by examining not only participants' self-reported aggressive cognitions but also their inferences about their partner's cognitions. Finally, we examined group differences in couples' aggressive cognitions by comparing objective observers' inferences about spouses' thoughts/feelings.

Consistent with Eckhardt et al.'s (1998) findings, other previous research on the cognitive biases of violent husbands (for reviews see Eckhardt et al., 2004; Holtzworth-Munroe, 2000; Holtzworth-Munroe & Clements, 2006), and models of the role of aggressive cognition in husband violence, we predicted that V husbands would have more aggressive cognitions than NVD and NVND husbands. This hypothesis was confirmed, not only in analyses of husbands' self-reported thoughts/feelings, but also in inferences made regarding what husbands had been thinking/feeling by the men's wives and by objective observers. In addition, to our knowledge, this is the first study to compare the aggressive cognitions of violent and nonviolent wives. Consistent with previous findings regarding violent men and our hypothesis, the aggressive cognitions of violent wives were greater than those of wives in NVD and NVND marriages. As with

Table 4 Difference scores: spouse's self-reports minus partner's inferences

	NVND			NVD			V		
	(*N*)	*M*	*SD*	(*N*)	*M*	*SD*	(*N*)	*M*	*SD*
Difference scores:									
Husband self-report minus wives inferences:	(18)	0.05	.70	(12)	0.37	.68	(38)	0.08	.78
Wives' self-report minus husbands' inferences:	(18)	0.11	.65	(12)	0.06	.88	(38)	–0.27	.80

NVND = nonviolent maritally nondistressed, NVD = nonviolent distressed, V = violent

findings for husbands, for wives, violent versus nonviolent wife group difference emerged using not only wives' self-reported thoughts/feelings, but also inferences about wives' thoughts/feelings made by their husbands and by objective observers. Consistent with some models of marital violence, these findings suggest that violent individuals (whether male or female) are more likely than nonviolent individuals to have aggressive cognitions, which may put them at risk for further conflict and violence perpetration.

At first glance, the findings regarding participants' inferences about their spouses' thoughts/feelings appear to be consistent with the idea of cognitive distortions or biases among violent spouses—relative to nonviolent spouses, violent spouses were more likely to report that their spouses were experiencing aggressive cognitions. However, other findings lead us to conclude that the violent participants' inferences about their partner's thoughts/feelings are not inaccurate. First, when considering husbands' cognitions, levels of aggressive cognitions in husbands' self-reports and in wives' inferences regarding husbands' thoughts/feelings did not differ significantly, suggesting that wives were accurately perceiving their husbands' level of aggressive cognition. Second, objective observers' inferences also revealed violent versus nonviolent group differences in levels of aggressive cognitions, suggesting that violent spouses are somehow conveying their higher levels of aggressive thoughts to objective observers (and spouses). Third, using difference scores to compare the level of aggressive cognitions in spouses' self-reported thoughts/feelings versus in their partners' inferences about those thoughts/feelings, group differences did not reach statistical significance. This suggests that when spouses self-reported aggressive cognitions, their partners (even violent partners) accurately perceived these aggressive cognition.

The fact that violent spouses do not seem to be distorting or over-perceiving aggression in their spouses' thoughts/feelings could be due to the level of anger or hostility expressed by the partner (i.e., behavioral cues that apparently were observable even to outside observers) or to the fact that they were discussing a problem in their relationship with which they might be familiar (e.g., perhaps they have previously shared their thoughts and feelings about the problem with one another). It remains possible that violent spouses would be less accurate in understanding their partners' thoughts and feelings in other situations, such as when discussing a new problem or when the partner's behavior is ambiguous. In such situations, violent spouses may apply any existing cognitive biases to their interpretation of partner behavior. Thus, future researchers should continue to investigate how violent, versus nonviolent spouses, interpret their partner's thoughts and feelings in a variety of situations. In addition, to understand the types of cognitions that may put aggressive spouses at risk for violence, it may be more important to consider whether such cognitions are adaptive or functional, rather than whether or not they are accurate.

While Eckhardt et al. (1998) found only violent versus nonviolent group differences, some of the present study findings (i.e., spouses' self-reports) suggest that, in addition, NVD spouses may have higher levels of aggressive cognition than NVND spouses. Perhaps this maritally distressed versus nondistressed group difference emerged in the present study because we examined thoughts in response to actual, not hypothetical, marital problem discussions, which may have aroused anger and hostility even among NVD spouses. Such findings are certainly consistent with cognitive models of marital distress, which suggest that unhappily married spouses have dysfunctional cognitions that exacerbate, or perhaps even cause, their marital dissatisfaction (see review in Bradbury, Fincham, & Beach, 2000). In the present study, unfortunately, we did not examine adaptive thoughts and feelings that may ''de-escalate'' conflict. It is possible

that although nonviolent couples, particularly NVND spouses, experience anger and hostility during marital conflict, they may also experience relatively more adaptive cognitions (e.g., attempting to understand the causes of an angering situation from alternative perspectives, considering the consequences of aggressive behaviors, or conscious efforts to use self-soothing statements). Consistent with GAM and CNA models of aggression, such nonaggressive cognitions may prevent negative emotions or aggressive cognitions from escalating into aggressive behaviors.

It is interesting that across groups and gender, objective observers inferred more aggressive cognitions than spouses self-reported or inferred in their partners. One possible interpretation of these findings is that spouses have grown accustomed to the levels of negativity expressed in their own conflict discussions and thus their typical expressions of negativity are expected and less salient to themselves than to outside observers, to whom such expressions are more noticeable. This may particularly be the case with the present study coders, as undergraduate research assistants may lack familiarity with the level of negativity expressed during couples' discussions of relationship problems. A similar issue is that the objective observers' higher ratings of aggressive cognitions for V couples, compared to the two nonviolent groups, may reflect their lack of experience with IPV. It would be potentially interesting for future researchers to examine this issue, for example by asking married individuals with varying levels of relationship aggression and distress (rather than undergraduates) to serve as coders of aggressive cognitions.

Some remaining questions will require longitudinal research. For example, do aggressive cognitive thoughts precede marital arguments and expressed angry and hostile behavior in marital discussions, consistent with models suggesting that aggressive cognitions may result in marital distress and violence? Or do these cognitions follow the onset of marital conflict, distress, and violence, being a reaction to one's own, and one's partner's, hostile (and possibly abusive) behavior and thoughts?

It also is important to also ask whether modifying such thoughts is necessary to reduce marital conflict and violence. On the one hand, regardless of when or how such thoughts began, it is likely that they will continue to lead to further marital dysfunction and could be used to justify IPV. Thus, helping violent spouses to have less aggressive thoughts should lead to less violence. Certainly this is the assumption if such thoughts are biases and distortions. But even if such thoughts are accurate reflections and reactions to one's partner's angry and hostile behavior and thoughts, cognitive restructuring might still be useful. For example, learning not to catastrophize should be helpful even in very negative marriages (e.g., learning to think ''I can deal with this situation, even though it is unpleasant'' should help prevent violent behavior). Indeed, in their discussion of treating abusive partners, Murphy and Eckhardt (2005) suggest that while therapists may be tempted to focus on challenging the accuracy of their client's perceptions, clients may be more willing to explore the utility of their attitudes, whether accurate or not. Thus, it may be more fruitful to begin by challenging the practical or functional aspects of a client's assumptions rather than the accuracy versus inaccuracy of those beliefs. For example, consider a client who becomes angry when he believes that his partner is trying to be manipulative (generally assumed to be a hostile attributional ''bias''; e.g., Holtzworth-Munroe & Hutchinson, 1993). Consistent with the present study findings, Murphy and Eckhardt acknowledge that the client's perceptions of his partner's behaviors may, in fact, be accurate (i.e., the client's wife may actually do things to be manipulative); in such cases, challenging the accuracy of the clients' assumptions would not be an appropriate. Instead, they suggest that it may be beneficial

to assist the client in understanding how his angry reaction can lead to further distress. For example, the therapist might challenge the reasons why the wife's behavior is upsetting to the client or brainstorm more appropriate reactions for the client to try in such situations.

As with all research, this study had limitations. First, we cannot assume that spouses accurately reported their own thoughts and feelings. Spouses may be unaware of, or may inaccurately recall, important thoughts and feelings. Social desirability may dissuade spouses from reporting honestly; unfortunately, we did not include a measure of social desirability. Second, the present study provided no direct measure of couples' anger or other negative emotions. Without such measures, it is unclear if differing levels of couples' aggressive cognitions were related to anger, other negative emotions, or some other variable. The CNA model aggression suggests that negative affect facilitates aggression; future IPV researchers should directly examine the relationship between aggressive cognitions and various emotional states. A third limitation of the present study is that we have not yet coded the behavior of spouses during the marital interactions. Doing so might eventually allow us to see what potentially angry or hostile behaviors objective observers (and spouses) were observing when inferring aggressive cognitions in the violent study participants. However, we know, from past research, that the violent spouses were likely displaying more hostile behavior (e.g., contempt) and possibly more anger. The present study now informs us that while acting in such a manner, the violent spouses were likely also experiencing more aggressive cognitions.

Despite limitations, the present study findings generally supports models of the potentially important role of aggressive cognition in understanding IPV. Violent spouses report higher levels of aggressive cognitions for themselves and their partners, and this difference between violent and nonviolent couples is perceived by outside observers. How such cognitions function in violent relationships and whether changing them can lead to decreases in violence remains the subject of future research.

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