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Recognition of Wives' Emotional Expressions: A Mechanism in the Relationship Between Psychopathology and Intimate Partner Violence Perpetration

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Abstract

Among a community sample of 88 couples, husbands' emotion recognition skills were examined as a mechanism accounting for the relationships between two dimensions of psychopathology that commonly describe violent husbands (i.e., borderline/dysphoric and psychopathic personality characteristics) and their perpetration of intimate partner violence (IPV). Husbands' diminished sensitivity to their wives' expressions of happiness partially mediated the relationship between their borderline/dysphoric characteristics and their IPV perpetration, supporting Dutton's (1995) theory of IPV. These relationships were specific to expressions displayed by husbands' wives (as opposed to unfamiliar men and women), demonstrating the significance of the intimate relationship. Partial support was found for Blair's (1995) violence inhibition mechanism model, such that husbands' IPV was associated with their diminished sensitivity to expressions of fear and their psychopathy was associated with misidentifying fearful expressions as neutral. However, the strength of husbands' diminished sensitivity to fear as a mediator of the psychopathy–IPV relationship was suboptimal. Moreover, sensitivity to wives' expressions of happiness also mediated the psychopathy–IPV relationship, potentially because of overlap in psychopathology constructs or inadequate examination of the temporal specificity of the two theories tested.

Keywords

psychopathy; borderline personality; depression; dysphoria; partner abuse

Each year, approximately 14% of U.S. couples report the occurrence of male to female intimate partner violence (IPV; i.e., physical force directed at an intimate partner's body for the apparent purpose of inflicting injury or control; Schafer, Caetano, & Clark, 1998). Female victims of IPV frequently sustain physical injuries and serious physical and psychological health consequences (Campbell, 2002; Golding, 1999). In the study of IPV, one promising line of research, in terms of its theoretical base and implications for cognitive– behavioral therapies, is the examination of violent husbands' social information processing (Holtzworth-Munroe, 2000).

Compared with nonviolent husbands, violent husbands are more likely to feel angry and react in a hostile manner in response to a wide variety of wife statements, which is interpreted as

suggesting that violent husbands may possess a deficit in their ability to recognize their wives' emotions (Holtzworth-Munroe & Smutzler, 1996). In fact, Babcock, Green, and Webb (2008) found that violent husbands made more errors than nonviolent husbands in recognizing standardized neutral and disgust facial expressions. However, the groups did not differ in response to sad, angry, fearful, happy, surprise, or total expressions, despite the prediction of more pervasive deficits among violent husbands. These findings can be considered in light of the fact that many violent husbands limit their violence to the family context (Holtzworth-Munroe, Meehan, Herron, Rehman, & Stuart, 2000, 2003); thus, their emotion recognition deficits may be more pronounced in response to their wives and less evident in response to standardized stimuli.

The present study is designed to examine husbands' ability to recognize their wives' and unfamiliar men's and women's facial expressions of emotions. Following Babcock et al.'s (2008) recommendation, husbands' emotion recognition skills are examined in relation to a dimensional conceptualization of their psychopathological heterogeneity. Holtzworth-Munroe and colleagues (2001, 2003) indicate that violent husbands can be conceptualized along two dimensions of psychopathology and personality disorder characteristics: (1) a construct labeled "borderline/dysphoria" that is related to depressive symptomatology, borderline and dependent personality characteristics, and fearful and preoccupied attachment, and (2) antisocial and psychopathic personality characteristics. We examine husbands' emotion recognition deficits as mediators of the expected relationships between these characteristics and their IPV perpetration.

Dutton (1995) proposes that the perception of wife rejection or abandonment by husbands high in borderline/dysphoria may increase their frustration or negative affect, leading to violence. We expect that mistaking their wives' positive affect (i.e., happiness) as negatively valenced may be an emotion recognition deficit that signifies wife rejection or abandonment to husbands high in borderline/dysphoria. In fact, depression is consistently associated with diminished sensitivity to expressions of happiness (e.g., Joorman & Gotlib, 2007). Wagner and Linehan (1999) also found that borderline personality disorder (BPD) patients possess a deficit in the recognition of happy expressions, although three other studies did not find consistent relationships between emotion recognition skills and BPD (Bland, Williams, Scharer, & Manning, 2004; Levine, Marziali, & Hood, 1997; Lynch et al., 2006). Because the key predictor of affective hyperarousal and emotional reactivity among BPD patients is the personal relevance of the stimuli, individually relevant stimuli are necessary when examining BPD patients' emotional responses (Herpertz et al., 2001). Therefore, the inconsistency of results across these studies, as well as Babcock et al.'s (2008) failure to detect emotion recognition deficits among violent husbands high in BPD symptoms, may be because of the use of facial expressions of persons unknown to the participants. Based on this literature, we expect that husbands' IPV and borderline/dysphoric characteristics will be associated with a diminished sensitivity to their wives' expressions of happiness (including misidentifying happiness as negatively valenced emotions). Furthermore, we expect husbands' diminished sensitivity to their wives' expressions of happiness to mediate the expected relationship between their borderline/dysphoric characteristics and IPV perpetration.

In regards to the second dimension of psychopathology that describes violent husbands (i.e., antisocial and psychopathic personality characteristics), Blair's (1995) violence inhibition mechanism (VIM) model posits that recognition of distress cues, such as expressions of fear and sadness, normally leads to an increase in autonomic arousal, initiating a withdrawal response that inhibits ongoing behavior and serving as punishment for acts that cause distress expressions in others (e.g., violence). Individuals with a diminished sensitivity to fearful and sad expressions will be less punished by them and less likely to learn to avoid engaging in violence. Blair (1995) proposes that individuals high in psychopathic personality

characteristics are most likely to possess a diminished sensitivity to distress cues, which leads to their use of violence.

Blair and colleagues have found that children high in psychopathy possess a diminished ability to recognize fearful and sad facial expressions (e.g., Blair, Colledge, Murray, & Mitchell, 2001), but this deficit is specific to expressions of fear among adults high in psychopathy (e.g., Montagne et al., 2005). In contrast, Babcock et al. (2008) found that husbands classified based on high levels of psychopathy, IPV, and extramarital violence had deficits in the recognition of anger, happiness, surprise, and neutral expressions, but not other expressions. However, their results may have been confounded by the inclusion of violence perpetration in the construction of participant groups. A stronger test of Blair's (1995) VIM model would be an examination of the mediating role of fear recognition deficits in the relationship between psychopathy and violence perpetration. Although psychopathy is thought to be associated with a universally diminished ability to recognize fear, it is also important to demonstrate a diminished sensitivity to fear displayed by the specific person against whom violence is directed. Therefore, we expect that husbands' psychopathy will be associated with a diminished sensitivity to all actors' expressions of fear (including misidentifying fear as happiness and neutral). We also expect that husbands' diminished sensitivity to expressions of fear displayed by their wives (including misidentifying these expressions as happiness and neutral) will be associated with their IPV, and a diminished sensitivity to their wives' expressions of fear will partially mediate the relationship between husbands' psychopathy and IPV perpetration. We do not expect any of our predicted findings to change when taking into account the effect of husbands' general intelligence.

Method

Participants

Eighty-eight heterosexual cohabitating couples were recruited from a Midwestern metropolitan area. (Although nearly 20% of couples were unmarried, participants will be referred to as "husbands" and "wives" for the sake of brevity.) Mean age was 37.1 years ($SD = 9.4$) for husbands and 34.3 years ($SD = 8.6$) for wives. Most participants self-identified as Caucasian (80% of husbands; 81% of wives) or African American (17% of husbands; 18% of wives). Average monthly income was \$2,248 ($SD = \$1,939$) for husbands and \$1,205 ($SD = \$1,039$) for wives. Husbands had an average of 13.0 ($SD = 2.3$) years of education; wives averaged 14.1 ($SD = 2.4$) years. Couples' relationship lengths averaged 9.7 years ($SD = 7.1$), and they had an average of 1.1 ($SD = 1.5$) children together. All participants were able to read and write English.

Forty husbands had not perpetrated IPV during at least the past 5 years, and 48 husbands perpetrated IPV during the past year, ranging from 1 to 250 past-year violent acts (median = 50.0, $M = 73.9$, $SD = 70.0$). Twenty-nine husbands (60% of those who were violent during the past year) perpetrated severe IPV, defined as having kicked, punched, or hit their partner with something that could hurt, or having engaged in a more severely violent act.

In addition to the 88 couples who completed the study, another 147 couples contacted our lab but did not participate in the study. Of these, 55 were not interested after receiving further information regarding study procedures, 36 did not meet demographic requirements (e.g., living together or married, English-speaking, between ages 18 and 70), and 19 provided faulty contact information. One couple did not attend both lab sessions. In addition, some couples did not meet definitions used to form martially distressed versus nondistressed ($n = 18$) or violent versus nonviolent participant groups ($n = 18$) for a portion of the larger study not included in the current report.

Measures and Materials

Intimate partner violence

Revised Conflict Tactics Scale (CTS2): On the CTS2 (Straus, Hamby, Boney-McCoy, & Sugarman, 1996), participants indicated how many times during the past year (from *never* to *more than 20 times*) they or their partner engaged in each of 39 behaviors. Severity weights representing the potential for injury were multiplied by frequency of occurrence scores for each of the 11 physical assault items (ranging from *twisted my partner's arm or hair* to *used a knife or gun on my partner*) and two items from the sexual abuse subscale that include physical force. Severity weighted frequency items were summed to create a total score (Straus, 2004). Alpha coefficients for this 13-item husband IPV scale were .77 for husbands' report and .82 for wives' report. The couples' highest report (i.e., either husband or wife report) of husband IPV was used to avoid underreporting, which has been found to occur among both husbands and wives. Similar to other studies, partners' concordance of reports for husband IPV was only moderate in this sample (Marshall, Panuzio, Makin-Byrd, Taft, & Holtzworth-Munroe, 2009).

Psychopathology and personality characteristics of the borderline/dysphoric dimension

—To measure violent husbands' borderline/dysphoric characteristics, we constructed a composite score by calculating the mean of the standardized values of the following three scales. Intercorrelations among the scales ranged from $r = .46$ ($p < .001$) to $r = .55$ ($p < .001$).

Beck Depression Inventory, 2nd Edition (BDI-II): The BDI-II (Beck, Steer, & Brown, 1996) includes 21 items evaluating depressive symptoms, experienced in the prior two weeks, among clinical and nonclinical samples. Each item includes four self-report statements scored on a 0 to 3 scale that are summed to yield a total score. The alpha coefficient for husbands' reports was .92.

Fear of Abandonment Subscale (Holtzworth-Munroe et al., 2000, 2003) of the Millon Clinical Multiaxial Inventory, 2nd Edition (MCMI-II; Choca & Van Denburg, 1996): Holtzworth-Munroe et al. (2000) constructed a scale from MCMI-II items intended to capture psychological processes relevant to violent husbands who are high on the borderline/dysphoria psychopathology dimension. This scale includes two items from the MCMI-II borderline personality scale (e.g., *I'll do something desperate to prevent a person I love from abandoning me*) and three items from the dependent personality scale (e.g., *I worry a great deal about being left alone and having to take care of myself*). As in Holtzworth-Munroe et al. (2003), participants were asked to rate each item on a modified 5-point response scale, ranging from *"not at all like me"* to *"very much like me."* The alpha coefficient for husbands' reports was .76.

Relationship Scales Questionnaire (RSQ): Derived from attachment theory and applied to romantic relationships, the RSQ (Griffin & Bartholomew, 1994) includes secure, dismissing, fearful, and preoccupied attachment subscales. Participants rated each of 30 items on a five-point scale from *"not at all like me"* to *"very much like me."* We used the eight items representing the fearful and preoccupied attachment scales. The alpha coefficient for husbands' reports was .74.

Psychopathology and personality characteristics of the psychopathy dimension

Self-Report of Psychopathy (SRP): The SRP (Hare, 1985) assesses psychopathic personality characteristics and behaviors using 29 self-descriptive items rated on a 5-point scale ranging from *"strongly disagree"* to *"strongly agree."* A revised version of the SRP was found to

include four factors: interpersonal manipulation, erratic lifestyle, callous affect, and criminal tendencies (Williams, Paulhus, & Hare, 2007). To solely measure psychopathic personality characteristics, rather than antisocial behavior, we excluded nine items representing the criminal tendencies factor (i.e., antisocial behavior). The alpha coefficient for husbands' reports was .86.

General intelligence

Shipley Institute of Living Scale (SILS): The SILS (Shipley, 1940) is designed to assess general intellectual functioning. The SILS consists of 40 multiple-choice verbal reasoning items and 20 series completion inductive reasoning items. The SILS demonstrates convergent validity with standardized intelligence tests (e.g., Hays, Emmons, Wagner, & Stallings, 1997).

Emotional expressions stimuli

Wives' emotional expressions: Each wife was trained to produce facial expressions of six emotions (i.e., fear, sadness, anger, disgust, happiness, surprise) according to instructions derived from the Facial Affect Coding System (FACS; Ekman & Friesen, 1978) and the minimum muscular movements for each emotion recommended by Parke and Waters (1996). Wives were informed of the target emotion and the expression was demonstrated; then they were coached to move each muscle included in the expression. To make the stimuli representative of naturalistic expressions, expressions were obtained at four intensity levels. Wives displayed the highest intensity expression, then slowly relaxed their facial muscles while photographs were taken. This process was repeated until four separate intensity levels were obtained, each judged by the first author to provide an accurate portrayal of the target emotion. One photograph of each wife displaying a neutral expression (i.e., no muscular movements) was also taken. Photographs were transformed to gray-scale, cropped around the face, and increased in brightness, if necessary.

Unfamiliar male and female actors' emotional expressions: Male and female actors, assumingly unknown to the husbands, were recruited from the community using flyers. Their photographs were developed using the same method of expression elicitation used with the wives. Actors varied in age ($M = 34.3$, range = 20–62) and ethnicity, including six Caucasian men, three African American men, eight Caucasian women, and three African American women.

Procedures—Couples were recruited using newspaper ads and flyers targeted towards couples experiencing a wide range of marital satisfaction and husband IPV (e.g., ads asked for “happy and unhappy couples,” “couples experiencing problems and severe arguments,” “couples considering divorce”) into a larger study of husbands' social information processing (Clements & Holtzworth-Munroe, 2008; Clements, Holtzworth-Munroe, Schweinle, & Ickes, 2007). Each partner completed a telephone interview regarding demographics, IPV, and relationship distress. Couples who accepted an invitation to complete the study attended two assessment sessions, with self-report measures completed during the first session. During the second session, wives were trained to display facial expressions of emotions, husbands completed the Facial Affect Classification Exercise, and each partner rated the validity of the wives' photographs.

Facial Affect Classification Exercise (FACE): Husbands were asked to view a series of photographs of their wives and two unfamiliar people (one male, one female) on a computer. The two unfamiliar actors were chosen to match each husband's wife's ethnicity and approximate age. The left and right control keys of a computer keyboard were labeled as two possible emotions (e.g., fear on the left and happiness on the right). Husbands were asked to

indicate, as quickly and accurately as possible, which emotional expression was depicted in each photograph by pressing one of the two keys. Reaction time was measured, and the computer advanced to the next photograph as soon as the husband responded or 4 s after the photograph was displayed if no response was provided. No response was provided on less than 2% of the trials.

Husbands were first administered 15 practice trials that included three actors' (i.e., one's wife, an unfamiliar female, and an unfamiliar male) expressions of surprise displayed at four intensity levels, as well as a neutral photograph of each actor. Surprise and neutral were provided as response options. Expressions of surprise were used for these practice trials only.

During the testing phase of the FACE, photographs of the same three actors were used. Photographs were displayed in a series of 15 blocks, with breaks offered between each block. Each block contained a different dichotomous response option (e.g., sadness vs. anger in one block; happiness vs. disgust in another block). The first ten blocks included each of the possible two-emotion combinations of the five emotions (i.e., fear, sadness, anger, disgust, and happiness). Each of these blocks consisted of 72 trials, comprised of two emotions expressed at four intensity levels by each of the three actors, with each photograph displayed three times. The order of these ten blocks was randomized. The last five blocks included each of the five emotions in combination with neutral (e.g., happiness vs. neutral in one block; fear vs. neutral in another block). Each of these blocks consisted of 45 trials, with each block comprised of neutral expressions and one emotion expressed at four intensity levels by each of the three actors, with each photograph displayed three times. The order of these five blocks was randomized. Throughout, the order of the photographs within each block, and the placement of the response options (i.e., left vs. right side of the keyboard) for each block, was randomized.

Expression validation: Following the FACE, the four photographs that depicted the wife's expressions of each emotion were displayed to husbands and wives. Participants chose one photograph that best represents how the wife typically displays each emotion. For the chosen photograph, participants reported how similar the photograph is to how the wife typically displays the emotion, using a ten-point scale ranging from "very dissimilar" to "very similar."

Following data collection, untrained undergraduate research assistants completed the FACE in the same manner as that of the husbands. Photographs of each wife were coded by at least one male and two female assistants from a total group of six male and 13 female assistants.

Results

Data Reduction

Data from the FACE were summarized according to signal detection theory (Macmillan & Creelman, 1991), using a measure of sensitivity (i.e., d') representing one's ability to discriminate the presence and absence of an emotion. To construct this measure, we calculated husbands' hit rate (i.e., the probability of correctly identifying the emotion) and false alarm rate (i.e., the probability of incorrectly identifying an emotion as present) for each emotion displayed by each actor. Hit rates were calculated by dividing the number of correctly identified emotions by the total number of trials for the indicated emotion. False alarm rates were calculated by dividing the number of incorrectly identified emotions by the total number of opportunities participants had to identify such emotions. These scores were then standardized. Hit rates of 1.00 (i.e., perfect scores) were assigned standardized scores of 2.51 and false alarm rates of 0.00 (i.e., no false alarms) were assigned standardized scores of -2.51 (indicating two standard deviations from the mean). We subtracted husbands' standardized false alarm rate from their standardized hit rate to yield d' . Scores can range from -5.02 to 5.02, with higher scores indicating greater sensitivity to the emotion. For example, a husband who correctly

identified all of his wife's fear expressions (standardized hit rate of 2.51) and never misidentified another one of her expressions as fear (standardized false alarm rate of -2.51) would have a d' score of 5.02 for wife fear.

To examine which emotions husbands perceived when the expressions were of happiness, we calculated the conditional probabilities of responding with each emotion when the displayed expression was of happiness. That is, for each actor's expressions of happiness, we divided the number of times husbands incorrectly responded with each other emotion (e.g., disgust) by the number of times husbands had the indicated emotion available as a response option when happiness was displayed. Similar calculations were made for displays of fearful expressions.

Manipulation Checks

To examine whether associations between husbands' IPV and emotion recognition skills may be attributed to systematic variation in wives' ability to display emotional expressions, we correlated independent coders' sensitivity to wives' emotional expressions with husbands' IPV perpetration. All correlations were nonsignificant, ranging from $r = -.15$, *ns*, to $r = .16$, *ns*. We also correlated husbands' IPV with husbands' and wives' ratings of how realistic the wives' emotional expressions were. All correlations were positive and of low magnitude, ranging from $r = .02$, *ns*, to $r = .21$, *ns*, for husbands' ratings and from $r = .14$, *ns*, to $r = .27$, $p < .05$, for wives' ratings, suggesting that wives' increased experience of IPV may be related to displaying more realistic emotional expressions, thus providing a more conservative test of our hypotheses.

To examine whether diminished sensitivity scores were indicative of increased impulsive responding or a greater desire to finish the task quickly, we correlated husbands' sensitivity scores for each of the five emotional expressions displayed by each of the three actors with their reaction time for the same actor's emotional expressions. All 15 correlations were negative, and ranged from $r = -.09$, *ns*, to $r = -.35$, $p < .01$, indicating that lower sensitivity to the expressions was related to a longer latency to respond, not to more impulsive or faster responding.

Descriptive Statistics and Associations Among Study Variables

Table 1 includes descriptive statistics for hit and false alarm rates across actors and emotions. Variable intercorrelations are displayed in Table 2. We only interpret correlations that remain significant after using Hochberg's (1988) Bonferroni-derived step-up method of rank-ordering p values as a moderately conservative means of avoiding inflation of the Type I error rate. Correlations that are no longer significant after using this correction are labeled as such (*nsc*). As predicted, husbands' IPV perpetration was correlated with their borderline/dysphoria ($r = .31$, $p < .01$) and psychopathy ($r = .28$, $p < .01$), as well as their sensitivity to wives' expressions of happiness ($r = -.41$, $p < .001$) and fear ($r = -.26$, $p < .05$). Possibly because of the overlap between husbands' IPV and psychopathy, husbands' IPV was also correlated with their sensitivity to female expressions of fear ($r = -.27$, $p < .01$). As expected, husbands' borderline/dysphoria was correlated with sensitivity to their wives' expressions of happiness ($r = -.23$, $p < .05$). Unexpectedly, husbands' psychopathy was not correlated with sensitivity to expressions of fear displayed by their wives ($r = -.22$, *nsc*), females ($r = -.22$, *nsc*), or males ($r = -.03$, *ns*). Husbands' psychopathy was unexpectedly correlated with sensitivity to their wives' expressions of happiness ($r = -.28$, $p < .05$), potentially because of the significant overlap between husbands' borderline/dysphoria and psychopathy ($r = .33$, $p < .01$).

To examine whether husbands' IPV and borderline/dysphoria were associated with the misidentification of wives' expressions of happiness as negatively valenced emotions, we correlated these variables with the conditional probabilities for the presentation of wife

happiness (i.e., the probability of responding with each emotion or neutral when the displayed emotion was their wives' expressions of happiness). As expected, husbands' IPV was not correlated with the conditional probability of perceiving a neutral expression when presented with their wives' expressions of happiness ($r = .10, ns$) and it was correlated with the conditional probabilities of responding with most of the negatively valenced emotions when presented with their wives' expressions of happiness (i.e., $r = .32, p < .01$ for Fear | Happy; $r = .28, p < .01$ for Sad | Happy; $r = .26, p < .05$ for Anger | Happy; $r = .21, ns$ for Disgust | Happy). Also as expected, husbands' borderline/dysphoria was not correlated with the conditional probability of wife Neutral | Happy ($r = .10, ns$) and it was correlated with the conditional probability of wife Disgust | Happy ($r = .26, p < .05$). However, husbands' borderline/dysphoria was unexpectedly not correlated with wife Fear | Happy ($r = .17, ns$), Sad | Happy ($r = .10, ns$), or Anger | Happy ($r = .11, ns$).

To examine whether husbands' IPV was associated with the misidentification of their wives' expressions of fear as happiness and neutral, we correlated husbands' IPV with the conditional probabilities for the presentation of wife fear. As expected, husbands' IPV was correlated with wife Happiness | Fear ($r = .40, p < .001$) and Neutral | Fear ($r = .32, p < .01$), while it was not correlated with wife Sad | Fear ($r = .19, ns$) or Anger | Fear ($r = -.04, ns$). Husbands' IPV was unexpectedly correlated with wife Disgust | Fear ($r = .26, p < .05$). To examine whether husbands' psychopathy was associated with the misidentification of fear as happiness and neutral, we correlated husbands' psychopathy with the conditional probabilities for the presentation of wife and female fear. As expected, husbands' psychopathy was correlated with the conditional probability of wife ($r = .25, p < .05$) and female ($r = .25, p < .05$) Neutral | Fear; however, it was unexpectedly not correlated with wife ($r = .16, ns$) or female ($r = .16, ns$) Happy | Fear. As expected, husbands' psychopathy was not correlated with wife ($r = .18, ns$) or female ($r = -.07, ns$) Sad | Fear, wife ($r = .07, ns$) or female ($r = -.04, ns$) Anger | Fear, or wife ($r = .14, ns$) or female ($r = .16, ns$) Disgust | Fear.

Mediating Effect of Sensitivity to Happiness on the Borderline/Dysphoria–IPV Relationship

To test the hypothesis that husbands' diminished sensitivity to their wives' expressions of happiness will partially mediate the relationship between husbands' borderline/dysphoria and their IPV perpetration, we conducted mediation analyses, including Preacher and Hayes' (2004) procedures for conducting a bootstrap analysis of the sampling distribution of the indirect effect. As displayed in Figure 1A, the direct effect of husbands' borderline/dysphoria on sensitivity to their wives' expressions of happiness was statistically significant ($\beta = -.23, p < .05$), the direct effect of husbands' sensitivity to their wives' expressions of happiness on their IPV perpetration was statistically significant ($\beta = -.41, p < .001$), and the direct effect of husbands' borderline/dysphoria on their IPV perpetration was statistically significant ($\beta = .31, p < .01$). In addition, the effect of husbands' borderline/dysphoria on their IPV perpetration, when accounting for the effect of sensitivity to their wives' expressions of happiness, was reduced ($\beta = .23, p < .05$) compared with the direct effect of husbands' borderline/dysphoria on their IPV perpetration. Results of the bootstrap analysis indicate that partial mediation was present ($M = 17.12, SE = 12.41$; 95% confidence interval [CI] = 2.04 to 50.02). When accounting for husbands' general intelligence, the direct effects remained significant and the bootstrap analysis continued to indicate the presence of partial mediation ($M = 16.46, SE = 12.26$; 95% CI = 1.90 to 50.88).

Mediating Effect of Sensitivity to Fear on the Psychopathy–IPV Relationship

To test the hypothesis that husbands' diminished sensitivity to their wives' expressions of fear will partially mediate the relationship between husbands' psychopathy and IPV perpetration, we conducted similar mediation analyses as outlined above. As displayed in Figure 1B, the direct effect of husbands' psychopathy on sensitivity to their wives' expressions of fear was

statistically significant ($\beta = -.22, p < .05$), the direct effect of husbands' sensitivity to their wives' expression of fear on their IPV perpetration was statistically significant ($\beta = -.26, p < .05$), and the direct effect of husbands' psychopathy on their IPV perpetration was statistically significant ($\beta = .28, p < .01$). In addition, the effect of husbands' psychopathy on their IPV perpetration, when accounting for the effect of sensitivity to their wives' expressions of fear, was reduced ($\beta = .24, p < .05$) compared with the direct effect of psychopathy on IPV perpetration. However, results of the bootstrap analysis indicate that partial mediation was not present ($M = 0.97, SE = 0.89$; 95% CI = -0.01 to 3.73). When accounting for husbands' general intelligence, the direct effects remained significant or approached statistical significance and the bootstrap analysis again indicated that partial mediation was not present ($M = 0.95, SE = 0.83$; 95% CI = -0.09 to 3.04).

Because sensitivity to female expressions of fear was correlated with IPV perpetration, we explored the possibility that a diminished sensitivity to female expressions of fear will partially mediate the relationship between husbands' psychopathy and IPV perpetration. As displayed in Figure 1C, the direct effect of husbands' psychopathy on their sensitivity to female expressions of fear was statistically significant ($\beta = -.22, p < .05$), the direct effect of husbands' sensitivity to female fear on their IPV perpetration was statistically significant ($\beta = -.27, p < .05$), and the direct effect of husbands' psychopathy on their IPV perpetration was statistically significant ($\beta = .28, p < .01$). In addition, the effect of husbands' psychopathy on their IPV perpetration, when accounting for the effect of sensitivity to female fear, was reduced ($\beta = .24, p < .05$) compared with the direct effect of psychopathy on IPV perpetration. Results of the bootstrap analysis indicate that partial mediation was present ($M = 0.99, SE = 0.71$; 95% CI = 0.01 to 2.97). When accounting for husbands' general intelligence, the direct effects remained significant or approached statistical significance, but the bootstrap analysis indicated that partial mediation was not present ($M = 0.92, SE = 0.79$; 95% CI = -0.02 to 3.41).

Mediating Effect of Sensitivity to Happiness on the Psychopathy–IPV Relationship

Given the unexpected finding that husbands' sensitivity to their wives' expressions of happiness was significantly correlated with psychopathy, we explored the possibility that a diminished sensitivity to their wives' expressions of happiness will partially mediate the relationship between husbands' psychopathy and IPV perpetration. As displayed in Figure 1D, the direct effect of husbands' psychopathy on their sensitivity to their wives' expressions of happiness was statistically significant ($\beta = -.28, p < .01$), the direct effect of husbands' sensitivity to their wives' expressions of happiness on their IPV perpetration was statistically significant ($\beta = -.41, p < .001$), and the direct effect of husbands' psychopathy on their IPV perpetration was statistically significant ($\beta = .28, p < .01$). In addition, the effect of husbands' psychopathy on their IPV perpetration, when accounting for the effect of sensitivity to their wives' expressions of happiness, was reduced to nonsignificance ($\beta = .19, ns$). Results of the bootstrap analysis indicate that mediation was present ($M = 2.07, SE = 1.21$; 95% CI = 0.30 to 4.94). When accounting for husbands' general intelligence, the direct effects remained significant, the indirect effect remained nonsignificant, and the bootstrap analysis indicated that mediation remained present ($M = 2.09, SE = 1.24$; 95% CI = 0.34 to 5.50).

We also examined mediation models that included wives' expressions while covarying couples' ratings of how similar wife expressions of fear and happiness were to how she typically displays the emotions. Results remained unchanged, except that, when accounting for sensitivity to their wives' expressions of happiness, the effect of husbands' borderline/dysphoria on their IPV perpetration was reduced to nonsignificance, suggesting full, rather than partial, mediation.

Discussion

We examined husbands' emotion recognition deficits as a potential mechanism accounting for the relationship between two dimensions of psychopathology and personality characteristics that commonly describe violent husbands (i.e., borderline/dysphoria and psychopathy) and their IPV perpetration. As hypothesized, husbands' diminished sensitivity to their wives' expressions of happiness partially mediated the relationship between husbands' borderline/dysphoria and IPV, even when accounting for husbands' general intelligence. This finding supports Dutton's (1995) theory of IPV, which suggests that men high in borderline/dysphoria become violent following perceived wife rejection or abandonment. Misperceiving their wives' positive affect as negatively valenced may lead husbands to assume discontent on the part of their wives, contributing to their use of violence. In fact, husbands' IPV was associated with misidentifying their wives' happiness as most negatively valenced emotions, but not as neutral. Interestingly, husbands' misidentification of their wives' happiness as disgust was the only misidentification significantly associated with husbands' borderline/dysphoria. It may be that expressions of disgust best represent potential rejection or abandonment, the concerns Dutton proposes to be most relevant to the use of IPV among such men. In addition, husbands' IPV was associated with misidentifying their wives' expressions of fear as disgust, further supporting the important role of perceived wife disgust. Finally, husbands' IPV perpetration and borderline/dysphoria were not related to a diminished sensitivity to expressions of happiness displayed by unfamiliar men and women. These findings speak to the particular significance of the intimate relationship, especially among men high in borderline/dysphoria.

Husbands' diminished sensitivity to expressions of fear displayed by their wives and unfamiliar women was associated with their perpetration of IPV, providing the first known demonstration of an association between deficits in fear recognition and violence perpetration. In addition, husbands' psychopathy was associated with their misidentification of wife and female fear as neutral, but not as any other emotion. These findings are consistent with Blair's (1995) violence inhibition mechanism (VIM) model, which proposes that, among adults high in psychopathy, violence stems from the inability to recognize fear, not from the misidentification of expressions of fear as other distress cues (e.g., sadness) or negative valenced emotions. However, husbands' psychopathic characteristics were not directly associated with a diminished sensitivity to expressions of fear after correcting for the inflated Type I error rate, thus raising questions regarding the magnitude of the relationship between psychopathy and fear recognition.

The mediation analyses also did not provide strong support for Blair's (1995) VIM model. Specifically, the effect of husbands' diminished sensitivity to their wives' expressions of fear on the relationship between their psychopathy and IPV perpetration only approached statistical significance. Diminished sensitivity to female expressions of fear partially mediated the psychopathy-IPV relationship, but not when accounting for husbands' general intelligence. Moreover, husbands' diminished sensitivity to wives' expressions of happiness also mediated the psychopathy-IPV relationship. These findings suggest that diminished fear recognition may play a role in the psychopathy-IPV relationship, but it likely does not play a particularly strong or specific role. However, these relationships may become stronger and more specific when examining the temporal impact of emotion recognition deficits during the unfolding of violent episodes. Dutton (1995) would suggest that a diminished sensitivity to wife happiness leads to the initiation of IPV following perceived rejection, while Blair (1995) would suggest that a diminished sensitivity to wife fear leads to the continuation and escalation of violence. Therefore, these hypotheses may be best tested by examining the number of conflicts that result in IPV and the degree of violence escalation within each conflict.

Another potential explanation for the lack of specificity of the relationship between husbands' psychopathy and sensitivity to their wives' expressions of fear is that husbands in this sample possessed a wide range of psychopathic personality characteristics and the VIM model may only be applicable to a taxometrically distinct group of psychopaths. However, current research indicates that psychopathy does not represent a latent taxon (Edens, Marcus, Lilienfeld, & Poytheress, 2006). Instead, as has previously been found (Huss & Langhinrichesen-Rohling, 2006), the interpersonal/affective factor of psychopathy may have little predictive utility among samples of IPV perpetrators. In addition, the VIM model may be most applicable to violence perpetrated against multiple people, and our application of the model specifically to IPV may not have provided an adequate test of the model. Thus, future researchers should examine whether specificity of the hypothesized relationships exists among violent husbands who are recruited on the basis of their perpetration of both IPV and general (non-intimate) violence.

By examining theories of violence perpetration among couples, we were able to increase the study's external validity in a number of ways. First, we demonstrated the utility of examining emotion recognition skills in reference to personally relevant stimuli (i.e., photographs of one's wife), a suggestion that has consistently been made in the borderline personality disorder literature (e.g., Herpertz et al., 2001). Second, we were able to construct stimuli that varied in intensity level, making the stimuli more representative of naturalistic expressions than the high-intensity stimuli frequently used in studies of emotion recognition. Finally, using a couples-based methodology allowed us to examine sensitivity to expressions displayed by the specific person against whom violence is perpetrated, extending prior studies in a clinically meaningful way. Despite these external validity strengths, it is important to recognize that the current study includes a relatively small and non-representative sample, thus limiting generalizability.

The current study extends prior investigations of social information processing among violent husbands by integrating an examination of husbands' psychopathological heterogeneity and by examining a more basic level of information processing while accounting for general intelligence. We demonstrated that, as suggested by Holtzworth-Munroe and Smutzler (1996), violent husbands' common misinterpretation of wife behaviors and statements may be because of difficulties at an early stage of information processing, namely emotion recognition. It will be important for future researchers to systematically account for emotion recognition skills when examining violent husbands' later stages of information processing (e.g., attributional biases).

The current study moved beyond a descriptive level to begin examining potential mechanisms responsible for how two dimensions of psychopathology may be differentially related to IPV perpetration. However, conclusions are limited by the use of a cross-sectional, rather than longitudinal, design. In addition, the borderline/dysphoria and psychopathy dimensions were not fully separable constructs, which may be why husbands' sensitivity to their wives' expressions of happiness was similarly correlated with borderline/dysphoria and psychopathy. Psychopathy has frequently been found to correlate with constructs similar to borderline/dysphoria (e.g., borderline personality disorder; Widiger & Corbitt, 1997), potentially because of meaningful overlap between the two constructs (e.g., high impulsivity). However, the correlation between these two constructs may also be because of our use of self-report measures, rather than clinical interviews. It will be important for researchers to further explicate the core features of each construct and develop a psychometrically sound borderline/dysphoria measure with discriminant validity from self-report and interview-based measures of psychopathy.

With a more thorough understanding of the role of emotion recognition deficits in the perpetration of IPV, therapeutic interventions may be enhanced by the integration of emotion

recognition skills training. In fact, treatment providers have begun to teach violent husbands to accurately label emotional expressions (Babcock & La Taillade, 2000). Given the relatively small reduction in the effect of psychopathology on IPV perpetration by emotion recognition skills, such intervention techniques must be only one of many approaches taken to eliminate violence. It is hoped that the current study lends support to the testing of such techniques.

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Figure 1.

Mediating effects of husbands' emotion recognition skills on the relationships between their psychopathology and IPV perpetration. The coefficients shown in parentheses represent the effect of the indicated form of psychopathology on IPV when accounting for the effect of the mediator. The 95% confidence interval (CI) was obtained using Preacher and Hayes' (2004) bootstrapping methods. CIs that do not overlap zero are statistically significant. IPV = intimate partner violence; d' = sensitivity to the indicated emotional expression; β = standardized beta. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 1
Means and SDs for Hit and False Alarm Rates Across Actors and Emotions

	Hit rate			False alarm rate		
	Wife	Female	Male	Wife	Female	Male
Happiness	.94 (.08)	.93 (.12)	.93 (.12)	.06 (.10)	.06 (.07)	.09 (.11)
Fear	.86 (.14)	.86 (.12)	.83 (.12)	.06 (.08)	.07 (.07)	.09 (.09)
Sadness	.87 (.12)	.83 (.21)	.81 (.15)	.13 (.12)	.13 (.10)	.13 (.11)
Anger	.87 (.14)	.85 (.12)	.85 (.14)	.13 (.12)	.13 (.10)	.14 (.11)
Disgust	.88 (.11)	.87 (.16)	.88 (.09)	.11 (.11)	.13 (.10)	.16 (.12)

Table 2

Intercorrelations Among Study Variables

Variable	1	2	3	4	5	6	7	8	9	10
1. Intimate partner violence	—									
2. Borderline/dysphoria	.31**	—								
3. Psychopathy	.28**	.33**	—							
4. Intellectual functioning	-.15	-.14	-.11	—						
5. Wife happiness <i>d'</i>	-.41***	-.23*	-.28*	.35***	—					
6. Female happiness <i>d'</i>	-.25 ^{nsc}	-.21	-.18	.21	.45***	—				
7. Male happiness <i>d'</i>	-.20	.02	-.06	.29**	.45***	.22	—			
8. Wife fear <i>d'</i>	-.26*	-.03	-.22 ^{nsc}	.37***	.54***	.29**	.32**	—		
9. Female fear <i>d'</i>	-.27**	-.14	-.22 ^{nsc}	.33**	.56***	.55***	.34**	.55***	—	
10. Male fear <i>d'</i>	-.22 ^{nsc}	.04	-.03	.43***	.44***	.27**	.48***	.54***	.59***	—

Note. *d'* = sensitivity to the indicated emotional expression;

^{nsc} = nonsignificant after correcting for an inflated Type I error rate.

*
p < .05.

**
p < .01.

p < .001.