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Enduring Vulnerabilities, Relationship Attributions, and Couple Conflict: An Integrative Model of the Occurrence and Frequency of Intimate Partner Violence

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Abstract

We tested an integrative model of individual and dyadic variables contributing to intimate partner violence (IPV) perpetration. Based on the vulnerability-stress-adaptation (VSA) model, we hypothesized that three “enduring vulnerabilities” (i.e., antisocial behavior, hostility, and depressive symptoms) would be associated with a “maladaptive process” (i.e., negative relationship attributions) that would lead to difficulties in couple conflict resolution, thus leading to IPV. Among a community sample of 167 heterosexual couples who were expecting their first child, we used an actor-partner interdependence model to account for the dyadic nature of conflict and IPV, as well as a hurdle count model to improve upon prior methods for modeling IPV data. Study results provided general support for the integrative model, demonstrating the importance of considering couple conflict in the prediction of IPV and showing the relative importance of multiple predictor variables. Gender symmetry was observed for the prediction of IPV occurrence, with gender differences emerging in the prediction of IPV frequency. Relatively speaking, the prediction of IPV frequency appeared to be a function of enduring vulnerabilities among men, but a function of couple conflict among women. Results also revealed important cross-gender effects in the prediction of IPV, reflecting the inherently dyadic nature of IPV, particularly in the case of “common couple violence.” Future research using longitudinal designs is necessary to verify the conclusions suggested by the current results.

Keywords

partner abuse; depression; hostility; antisocial behavior; cognitions

More than one in five couples in the United States have experienced intimate partner violence (IPV) during the past year (Schafer, Caetano, & Clark, 1998). Most of this violence is of moderate severity (e.g., pushing, grabbing, shoving), which has been termed “common

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couple violence.” Common couple violence, in contrast to the more severe and instrumental “patriarchal terrorism,” arises largely as a function of relationship conflict (Johnson, 1995). Despite not being of the greatest severity, common couple violence frequently leads to serious negative consequences (Whitaker, Saltzman, Haileyesus, & Swahn, 2007). Thus, it is important to understand, predict, and ultimately prevent relationship conflict that sometimes leads to IPV.

In the vulnerability-stress-adaptation (VSA) model, Karney and Bradbury (1995) propose that individual differences in enduring vulnerabilities, such as psychopathology and personality characteristics, affect how individuals and couples adapt to stress, thus impacting how they handle conflict and disagreement. We propose that such enduring vulnerabilities lead to difficulties during attempts to resolve conflict, thus leading to IPV. Indeed, several individual characteristics have been independently associated with both couple conflict and IPV perpetration, and we focus on three that have been shown to be among the most important: depressive symptoms, antisocial personality characteristics, and trait hostility.

A vast empirical literature has substantiated the existence of a link between symptoms of depression and marital conflict. Although this relationship is undoubtedly bidirectional and reciprocal (e.g., Whisman, Uebelacker, & Weinstock, 2004), data suggest that the effect may be more strongly in the direction of depression leading to marital conflict (e.g., Atkins, Dimidjian, Bedics, & Christensen, 2009). Coyne (1976) argued that symptoms of depression lead to irritable and hostile communication behaviors that evoke negative reactions. In support of this view, depression has been associated with expressions of negativity (Schudlich, Papp, & Cummings, 2004) and tension (Kahn, Coyne, & Margolin, 1985), fewer positive conflict resolution strategies (Schudlich et al., 2004), and less problem solving (Biglan, 1985) during couple conflicts. Further, communication behaviors have been found to mediate the link between depression and marital distress (Heene, Buysse, & Van Oost, 2006). Although fewer studies have examined men’s than women’s depression, those that have included both men and women have often found that the link to marital conflict tends to be stronger for women than men (Whisman, 2001), but opposite results have been reported as well (e.g., Schudlich et al., 2004).

The link between depressive symptoms and IPV perpetration has been studied to a lesser extent, yet a clear relation has been established among men (Schumacher, Feldbau-Kohn, Slep, & Heyman, 2001) with more recent literature also demonstrating a relation among women (Vaeth, Ramisetty-Mikler, & Caetano, 2010). Kim and Capaldi (2004) examined whether depressive symptoms predict IPV perpetrated by oneself or one’s partner. Men’s depression was longitudinally associated with both men’s and women’s IPV perpetration, while women’s depression was cross-sectionally and longitudinally associated with men’s and women’s IPV perpetration.

Given the relation with aggression in general, it is not surprising that antisocial personality characteristics are strongly associated with IPV perpetration (e.g., Capaldi & Owen, 2001; Kim & Capaldi, 2004; Magdol et al., 1997). However, antisocial personality characteristics are also associated with relationship conflict (Humbad, Donnellan, Iacono, & Burt, 2010), psychological abuse perpetration (Kim & Capaldi, 2004), and divorce (Wymbs et al., 2008). It may be that individuals with elevated antisocial personality characteristics engage in coercive tactics during conflict, which lead to ineffective arguing, conflict escalation, and physical aggression (Capaldi & Owen, 2001). In contrast to common assumptions that antisocial personality characteristics are more relevant to men than women, gender differences in these effects rarely emerge (but see Magdol et al., 1997 for an exception).

Multiple literature reviews and meta-analyses have concluded that hostility is associated with IPV perpetration, at least among men (Norlander & Eckhardt, 2005; Schumacher et al., 2001). In addition, hostility has been associated with husbands' and wives' conflict and withdrawal during relationship problem discussions (Newton, Kiecolt-Glaser, Glaser, & Malarkey, 1995). We focus on hostility, as opposed to the closely aligned construct of anger, because hostility is considered a higher order construct that leads to anger, and anger can occur in a functional manner that is not destructive to a relationship. We define hostility as an attitudinal construct and a cognitive trait including cynicism, mistrust, and denigration of others (see Norlander & Eckhardt, 2005).

Within the VSA model, Karney and Bradbury (1995) additionally propose that adaptive (or maladaptive) processes can affect how enduring vulnerabilities are translated into marital distress or conflict. One such maladaptive process that has been previously linked to both marital conflict (Bradbury & Fincham, 1990; Fincham et al., 1997) and IPV (Costa & Babcock, 2008; Holtzworth-Munroe & Hutchinson, 1993; O'Leary, Slep, & O'Leary, 2007) is the tendency towards negative relationship (and partner) attributions. Thus, negative relationship attributions may serve as a mechanism linking psychopathology and personality characteristics to conflict that leads to IPV. Research has linked negative relationship attributions to depressive symptoms (e.g., Gordon, Friedman, Miller, & Gaertner, 2005), antisocial personality characteristics (e.g., Maccoon & Newman, 2006), and hostility (e.g., Wingrove & Bond, 1998). Moreover, negative relationship attributions have been found to mediate the link between individual characteristics and relationship conflict (e.g., Heene et al., 2006). Given their role as a potential mechanism linking individuals' enduring vulnerabilities to couple conflict and IPV, program developers and clinicians often make relationship attributions a target of change in cognitive behavioral couples therapy.

Proposed model and current study

The theoretical model we propose is depicted in Figure 1. Enduring vulnerabilities are considered the most "upstream" aspect of the model, with hypothesized influence on negative relationship attributions, which, in turn, influence couple conflict. Couple conflict is depicted as the proximal influence on IPV perpetration. We do not view negative relationship attributions as likely to fully mediate the influence of enduring vulnerabilities on couple conflict; hence, we include paths from enduring vulnerabilities directly to couple conflict and IPV. Similarly, we include paths from negative relationship attributions to IPV perpetration. Further, we allow for the possibility that the enduring vulnerabilities of one partner may influence negative relationship attributions of the other partner, as well as the possibility that enduring vulnerabilities and negative relationship attributions of one partner may influence IPV perpetrated by the other partner (i.e., cross-partner effects).

In the current study, we examine the proposed model among a sample of pregnant couples because this is a time of increased stress during which couple conflict and IPV increases (Belsky & Pensky, 1988; Straus & Stewart, 1999). We use path analysis with cross-sectional data to examine the model. The cross-sectional nature of the data limits our confidence in causality of relations, but we see this as an initial step in a program of research designed to lead to more direct causal models. Further, the enduring vulnerabilities that we focus on in this report (i.e., depression, antisocial behavior, and hostility) likely are not the only influences on negative relationship attributions, couple conflict, and IPV. However, we believe that our use of these variables will provide a reasonable, albeit not exhaustive, test of the influence of enduring vulnerabilities on the variables of interest.

Methodological advancements of the current work include the use of the actor-partner interdependence model (Cook & Kenny, 2005) to take into account the interactive nature of

the dyad, despite primary measurement of intra-individual variables. We also examine the data using a unique means of modeling IPV data that better accounts for the inherent positive skew of IPV data. Given this skew, researchers must often decide between two alternatives. First, one can examine variables associated with the presence vs. absence of IPV, simply dichotomizing data into individuals or couples who report none vs. one or more incidents of IPV (typically only measured during the past year). However, a great deal of information is lost using this method. Moreover, some couples may experience low levels of IPV only intermittently at times of especially high stress, such that they experience no IPV in some years and one or two incidents in other years. Given what we know about patterns of IPV, this could represent a substantial portion of couples, and we do not know if these couples are more similar to couples who have never engaged in IPV or those who more frequently engage in IPV. Thus, simply dichotomizing couples on the occurrence of IPV is not a fully satisfactory solution. Second, one can transform data to reduce skewness. However, for distributions where the modal response is zero, transformations will not result in a normally distributed outcome.

An alternative approach presented here is to utilize a count response model that more appropriately represents IPV as the primary outcome. Within the framework of the count response model, we sought to determine the best analytic structure from several alternatives: Poisson, negative binomial, and hurdle models. Although Poisson-based count models are the most commonly used and widely available through statistical software programs, they assume that the data correspond to a Poisson distribution, where the mean and variance are equivalent. Count models based on a negative binomial distribution are more appropriate where data have a much greater variance than mean (i.e., over-dispersed). Additionally, where data are characterized by a high number of zero counts (as is the case with IPV), zero-inflated models may be the best alternative. Model estimation involves separate model parameters that represent the likelihood for zero response (inflation) in addition to the estimation of the frequency of the outcome. Zero-inflated Poisson (ZIP) and zero-inflated negative binomial (ZINB) models both incorporate this extension within their distributional structure. Finally, hurdle models provide a similar structure to the zero-inflated models although, instead of separately modeling the inflation of zeroes in the data, these models incorporate both a prediction of the outcome frequency as well as prediction of whether a positive response occurred. The former part of this process involves a truncated count regression, which only considers non-zero responses; when modeling IPV, this part of the model would represent variability in IPV frequency only among those who committed violent acts. The latter part of the model involves estimating the likelihood that individuals are able to achieve a value of zero; when modeling IPV, this part of the model would represent individuals' likelihood of not being violent. More detail on various count models can be found elsewhere (e.g., Atkins & Gallop, 2007; Cox, West, & Aiken, 2009; Hilbe, 2007).

Methods

Participants

Participants included both members of 167 heterosexual cohabitating or married couples who were age 18 or older and expecting their first child. Couples resided in rural areas, towns, and small cities. Eighty-three percent of couples were married (compared to 67% of parents of all infants born in the U.S.) and the majority of participants (91% of women and 90% of men) were Non-Hispanic White. Median annual family income was \$65,000, ranging from \$2,500 to \$162,500 (the highest possible response on the survey). Average educational attainment was 15.0 ($SD = 1.8$) years for women and 14.5 ($SD = 2.2$) years for men; 84.8% of women and 68.9% of men had at least some post-secondary school education. Mean ages were 28.4 ($SD = 4.9$) years for women and 29.8 ($SD = 5.6$) years for

men. At the time of data collection, expectant mothers were an average of 22.4 ($SD = 5.3$; range: 9 to 36) weeks pregnant.

Procedures

Participants were taking part in a randomized study testing Family Foundations, a psychosocial prevention program for first-time parents (Feinberg, Jones, Kan, & Goslin, in press; Feinberg & Kan, 2008; Feinberg, Kan, & Goslin, in press). Because only pre-intervention data are included in the present study, the intervention will not be discussed further. Couples were primarily recruited from childbirth education programs at two hospitals located in small cities with nearby rural areas. After agreeing to participate and signing an informed consent form approved by the University Institutional Review Board, data were collected during a home visit.

Measures

Intimate Partner Violence (IPV)—To measure violence in the couple relationship during the past year, we used the Physical Assault subscale of the Revised Conflict Tactics Scales (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). The subscale includes eight items asking respondents to rate the past-year frequency (on a 7-point scale ranging from *0 times* to *more than 20 times*) of their own and their partner's violent behaviors toward one another. Items range from moderate severity (e.g., *threw something at my partner that could hurt*) to high severity (e.g., *used a knife or gun on my partner*). A total IPV frequency score was calculated by first scoring each response as the midpoint of the response category (e.g., *3 to 5 times in the past year* was scored as 4). Consistent with prior research (e.g., Gordis, Margolin, & Vickerman, 2005; Slep & O'Leary, 2005), to avoid possible underreporting, we combined partners' reports for each item by using the higher frequency reported by either partner. We then summed across the eight items to yield the total number of physical assaults perpetrated by each individual over the past year. Original assessment of the scale indicated a high level of internal consistency ($\alpha = .86$). Based on box plots, five extreme scores were truncated to a count of 30 in order to reduce the influence of outliers on analytic models.

Couple Conflict—Because conflict is inevitable among couples, and not all conflict manifestations are negative, we sought to assess unhealthy, chronic conflict that does not lead to productive resolution. The Ineffective Arguing Inventory (Kurdek, 1994) assesses couple conflict in which problems are not resolved and an ongoing sense of frustration and conflict is engendered. The scale employs eight items (e.g., *Our arguments are left hanging and unresolved*), with a 5-point Likert response scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Alpha coefficients were .89 for women and .87 for men. The within-dyad correlation between men and women on this measure was .52. We created an average score for each couple to represent relationship conflict at the couple-level.

Negative Relationship Attributions—The Relationship Attribution Measure (Fincham & Bradbury, 1992) asks respondents to consider hypothetical situations (e.g., *Your partner criticizes something you say*) then rate several possible attributions for the partners' behavior (e.g., *My partner criticized me on purpose rather than unintentionally*) using a 5-point Likert scale ranging from *disagree strongly* to *agree strongly*. A total negative relationship attributions score was created by averaging across 23 attributions based on four hypothetical situations. Alpha coefficients were .92 for women and .90 for men.

Antisocial Behavior—A four-item scale created for this study was used to measure antisocial behavior. The items inquired about the lifetime frequency of fighting, arrests, prison, and traffic violations. Items had a five-point response scale, ranging from *never* to

four or more times. As this scale is summative in nature, internal consistency was not examined. A log transformation was used to decrease positive skew.

Hostility—The Symptom Checklist 90-R (Derogatis & Cleary, 1977) six-item hostility subscale asks respondents to rate the degree to which they were distressed by certain feelings (e.g., *Having urges to break or smash things*) during the past seven days using a five-point response scale, ranging from *not at all* to *extremely*. Alpha coefficients were .72 for women and .81 for men. A log transformation was used to decrease positive skew.

Depressive symptoms—A seven-item version of the Center for Epidemiological Studies Depression (CES-D) scale asks respondents to indicate their feelings and outlook within the past week using a four-level scale ranging from *rarely/none of the time* to *always/most of the time* (Radloff, 1977). The average score of these seven items was used for the total score. Alpha coefficients were .86 for women and .83 for men.

Family Income—To measure family income, participants' reports on an ordinal scale were rescaled to the midpoint of the range (e.g., \$50,000–\$54,999 was recoded to be \$52,500) to create a continuous variable. Because reports of total family income were highly correlated across partners, we used the average of the two reports. Income was scaled in 1,000 dollar increments.

Statistical models

Analyses were conducted using the actor-partner interdependence model (Cook & Kenny, 2005), treating partners in heterosexual couples as distinguishable members of a dyad. As displayed in Figure 1, individuals' enduring vulnerabilities (i.e., antisocial behavior, hostility, depression) were modeled as predictors of three relationship outcomes: actor and partner negative relationship attributions, couple conflict, and actor and partner IPV. Individuals' negative relationship attributions were modeled as influencing couple conflict and both partners' IPV. Relationship conflict was modeled as influencing both partners' IPV. Family income was included as a control for IPV.

Although models of dyadic data can include partner-specific predictors and outcomes, in many cases a more parsimonious model will provide a better fit of the data; that is, partner-specific coefficients may not always be necessary. In each section of the path model, we tested constraints on parameters to determine the best fitting model. This primarily involved testing whether coefficients representing prediction of the outcomes (i.e., negative relationship attributions, conflict and IPV) should be equal between partners or free to vary. We also investigated whether cross-partner paths were necessary in the prediction of negative relationship attributions and IPV. All model comparisons were carried out using likelihood ratio (deviance) tests of nested models or comparison of Akaike Information Criterion (AIC) fit indices from alternative models for the prediction of couple conflict and IPV, respectively. As a first step in this process, we used AIC as a fit criterion to compare models from alternative count distribution specifications in order to determine the most appropriate statistical model. All analyses were executed in MPlus (Muthen & Muthen, 1998–2010).

Results

Table 1 provides descriptive statistics (means, standard deviations, ranges) and correlations among the variables used in the analytic models. Men reported more antisocial behavior than women ($t = 8.49, p < .001$), while women reported more depression ($t = -4.72, p < .001$), negative relationship attributions ($t = -2.97, p < .05$), and IPV perpetration ($t = -2.11,$

$p < .05$) than men. Among all couples, 17.4% of men and 29.9% of women reported having perpetrated IPV during the past year. Of those who reported perpetrating IPV, 26.0% of men and 24.1% of women reported having perpetrated more than 10 acts of IPV during the past year.

As a preliminary step of our model testing, we assessed the degree to which the partner dyad was distinguishable (see Kenny, Kashy, & Cook, 2006). Because the null hypothesis that these couples were indistinguishable was found to be false ($\chi^2(16) = 160.95; p = .000$), we considered models with partner-specific and cross-partner coefficients representing prediction of outcomes.

We next determined which count model would most appropriately represent IPV within these data. An initial model was specified with coefficients constrained to be equal between men and women in the prediction of all three outcomes in the path model (i.e., negative relationship attributions, couple conflict, and IPV), and cross-partner paths in the IPV section of the model constrained to be zero. Using this path structure, based on comparison of AIC values, the hurdle model (AIC = 2117.8) was found to provide a better fit for these data than the Poisson (AIC = 2518.3), ZIP (AIC = 2260.7), negative binomial (AIC = 2136.1), or ZINB (AIC = 2120.2) models. We proceeded to use the hurdle count model specification for our full model.

Figure 2 provides results of the actor-partner interdependence model, including regression coefficients for the prediction of negative relationship attributions and couple conflict, odds-ratios (ORs) for the prediction of IPV occurrence, and incidence rate ratios (IRRs) for the prediction of IPV frequency. Standardized coefficients are presented to ease comparisons among predictors with smaller and larger scales. ORs and IRRs were converted from standardized coefficients. Because the hurdle model normally provides estimates of the likelihood of achieving a value of zero (i.e., no IPV), we inverted coefficients for ease of interpretation so that coefficients now represent the likelihood of achieving values other than zero (i.e., the occurrence of IPV).

The first section of the model represents men's and women's enduring vulnerabilities (i.e., antisocial behavior, hostility, depression) as predictors of their own negative relationship attributions. A model with all men's and women's predictors of negative relationship attributions constrained to be equal provided a better fit than a model where predictors were allowed to vary across partners ($\chi^2(3) = 5.56; p = .13$). In addition, separate tests indicated that a more parsimonious model with cross-partner paths set to zero was appropriate such that enduring vulnerabilities should not predict partners' negative relationship attributions ($\chi^2(3) = 4.17; p = .24$). Results showed that antisocial behavior and depressive symptoms, but not hostility, positively predicted the degree of one's own negative relationship attributions (all $p < .05$).

The second section of the model represents negative relationship attributions and enduring vulnerabilities as predictors of average couple conflict. A test of model fit indicated that coefficients should be fixed between partners ($\chi^2(3) = 0.41; p = .938$). Results indicated that hostility, depressive symptoms, and negative relationship attributions, but not antisocial behavior, positively predicted couple conflict (all $p < .01$).

The third section of the model represents direct predictors of IPV. For the section of the hurdle model representing the likelihood of IPV occurrence, a simpler model provided better fit. All male-female predictors of likelihood of IPV perpetration were fixed to be equal instead of varying by gender ($\chi^2(6) = 9.47; p = .149$). In addition, all partner cross-paths predicting IPV occurrence were constrained at zero, with the exception of depression in which including cross-partner coefficients (varying across partners) improved model fit (χ^2

(2) = 12.45; $p = .002$). Specifically, men's depressive symptoms positively predicted the likelihood of women's IPV perpetration ($p < .01$); this same effect was not found in the prediction of men's IPV by women's depression. Results indicated a marginal, but statistically non-significant, positive association between negative relationship attributions and IPV occurrence ($p = .08$). Couple conflict positively predicted IPV occurrence ($p < .01$). Although not depicted in Figure 2, family income was negatively associated with IPV occurrence (OR = 0.77; $p < .01$).

For the section of the hurdle model representing prediction of IPV perpetration frequency among those who perpetrated IPV, a simpler specification was rejected indicating that all coefficients should be allowed to vary among men and women for predicting one's own IPV perpetration ($\chi^2(4) = 23.65$; $p = .000$). In addition, separate tests indicated that two cross-partner paths improved model fit: partner depression and partner antisocial behavior ($\chi^2(4) = 13.00$; $p = .011$). Results indicated that men's frequency of IPV perpetration was positively predicted by one's own hostility levels ($p < .01$) and one's partner's depressive symptoms ($p < .05$). Women's frequency of IPV perpetration was positively predicted by men's antisocial behavior ($p < .05$) and couple conflict ($p < .01$). A marginal, but statistically non-significant effect was noted for women's antisocial behavior predicting their IPV perpetration frequency ($p = .07$). Although not depicted in Figure 2, family income was negatively associated with men's frequency of IPV perpetration (IRR = 0.60, $p < .01$).

Discussion

Few strategies have been shown to be effective in preventing or reducing IPV (Babcock, Green, & Robie, 2004). One potential reason for the failure of preventive and treatment interventions may be our imperfect understanding of the factors triggering IPV. Other scholars have made important strides in understanding these factors (e.g., Holtzworth-Munroe & Hutchinson, 1993; Kim & Capaldi, 2004; Norlander & Eckhardt, 2005), and this paper builds on some of this work in seeking to develop a coherent model.

The results of the current study provide some support for the model we presented in Figure 1, which is based on the vulnerability-stress-adaptation (VSA) framework (Karney & Bradbury, 1995). For both men and women, the enduring vulnerabilities of antisocial behavior and depression were associated with one's own negative relationship attributions. In turn, men's and women's negative relationship attributions, as well as their depression and hostility, were associated with increased couple conflict. Finally, couple conflict was associated with the occurrence of men and women's IPV. These findings speak to the far-reaching consequences of enduring vulnerabilities, the role of individual and couple variables in the prediction of IPV, and the applicability of the VSA framework to men's and women's adverse relationship behaviors.

Although gender symmetry was found across most paths of the model, some gender differences were also observed. Specifically, men's (but not women's) hostility predicted the frequency of their IPV perpetration, while couple conflict predicted the frequency of women's (but not men's) IPV perpetration. These findings may reflect the relatively more individualized nature of men's IPV perpetration and the especially dyadic nature of women's IPV perpetration. That is, in comparison to men's IPV perpetration, women's IPV perpetration may be more likely to emerge as a direct function of couple conflict and self-protection than as a function of individual characteristics (Stuart, Moore, Hellmuth, Ramsey, & Kahler, 2006). These findings are consistent with findings that relations between hostility and IPV perpetration have only been reported among men (Norlander & Eckhardt, 2005; Schumacher et al., 2001). In addition, these findings stand in partial contrast to prior literature that has failed to find gender differences in predictors of IPV (Carney, Buttell, &

Dutton, 2007). Of course, the primary role of couple conflict and the limited role of one's own enduring vulnerabilities in women's IPV perpetration may be specific to couples who primarily engage in common couple violence, as appears to be the case for the current community sample.

It is notable that gender differences were exclusively observed in the prediction of IPV frequency. None of the examined within-person associations varied across genders when predicting the occurrence of IPV among all (i.e., violent and nonviolent) individuals. In contrast, when predicting IPV frequency among those who were violent, our model fitting procedures indicated that all coefficients should be allowed to vary across men and women, suggesting that the frequency of IPV perpetration may be a more gender-specific phenomenon. These findings may reflect a difference in the nature of IPV perpetrated at a low versus high frequency. That is, men and women may not differ in the factors leading to one or two acts of IPV perpetration, but the factors leading to more frequently perpetrated IPV do differ by gender. This finding can inform future research designed to examine gender differences in IPV perpetration, and may be important in effective prevention and treatment approaches targeting high-frequency couple violence.

We also found distinctions between the predictors of men's IPV occurrence and IPV frequency. Men's hostility did not predict the occurrence of their IPV perpetration, but among those who did perpetrate IPV, hostility predicted the frequency of violent behaviors. In contrast, couple conflict predicted the occurrence of men's IPV, but it did not predict IPV frequency among those who were violent. These findings may reflect the dangerous nature of intense couple conflict as it produces conditions in which "crossing the line" into the use of violence occurs more easily, as well as the functional role of hostility in the escalation of aggression (Norlander & Eckhardt, 2005).

The dyadic nature of the current study's design revealed interesting cross-gender predictors of IPV perpetration. Men's depression and antisocial behavior were associated with the occurrence and frequency of women's IPV perpetration, respectively, and women's depression was associated with the frequency of men's IPV perpetration. Using a different sample and methodology, these findings partially replicate the work of Kim and Capaldi (2004) in which women's depression was associated with the frequency of men's IPV perpetration. Moreover, as a whole, the results speak to the need to use couple-based methodologies to better understand IPV, which is inherently a dyadic process, particularly in the case of common couple violence.

The strongest direct predictors of IPV were those pathways most proximal to IPV perpetration, while more distal constructs in the model provided weaker direct prediction of IPV. Specifically, no enduring vulnerabilities directly predicted the occurrence of one's own IPV, men's hostility was the only enduring vulnerability to predict the frequency of one's own IPV, and negative relationship attributions only weakly (statistically nonsignificantly) predicted IPV occurrence. In contrast, couple conflict predicted the occurrence of men's and women's perpetration of IPV, as well as the frequency of women's IPV perpetration. Thus, the greater the level of ongoing, unresolved conflict among a couple, the more likely the couple is to have reported past-year IPV and the more often women's IPV is likely to have occurred. This finding supports the view that the type of IPV found in a community sample such as ours may be of the "common couple" variety, in which ineffective handling of conflictual interactions escalates into aggression between partners. Enduring vulnerabilities may primarily influence IPV through their influence on couple conflict.

We also found support for the link between negative relationship attributions and the level of chronic couple conflict, consistent with earlier findings (Bradley & Fincham, 1990;

Fincham et al., 1997) that have not, to our knowledge, been replicated by other researchers. In contrast to other studies (Costa & Babcock, 2008; Holtzworth-Munroe & Hutchinson, 1993; O’Leary et al., 2007), we only found a weak (statistically nonsignificant) direct link from negative relationship attributions to IPV occurrence and no relationship to IPV frequency. Although we did not formally test mediational paths, the pattern of findings from our models is consistent with the view that negative attributions are implicated in dysfunctional conflict, and that such conflict may then lead to IPV. Thus, the current study results advance prior work by suggesting how negative relationship attributions become translated into IPV.

A broad literature consistently demonstrates that depression, antisocial behavior, and hostility are three of the strongest individual factors associated with couple conflict and IPV, and additional research links these enduring vulnerabilities with negative relationship attributions. However, these vulnerabilities are typically examined separately. When examined simultaneously in the current study, each of these factors was not uniquely associated with negative relationship attributions, couple conflict, and IPV. As mentioned above, this may be due to cross-partner correlations among predictors. It may also be due to high intercorrelations among predictors. For example, in the current data, hostility and depression were moderately correlated within individuals for both men and women. Therefore, results for either variable may change if the other were excluded from our models. However, covariate correlations were low enough to avoid issues of multicollinearity on model stability.

A unique strength of the current study is the use of a hurdle count model to represent IPV in the actor-partner interdependence model. This distinction has important implications that typically are not adequately considered in the IPV literature. As discussed, couple conflict directly predicted the occurrence of men’s IPV, but men’s hostility directly predicted their IPV perpetration frequency. It may be that couple conflict creates conditions that facilitate “crossing the line” into IPV perpetration, and high levels of hostility increase the likelihood that one will cross the line given those conditions and/or the number of acts of IPV perpetrated when one engages in violence. Similarly, men’s depression was associated with the occurrence of women’s IPV perpetration, while women’s depression was associated with the frequency of men’s IPV perpetration. If only occurrence or frequency of IPV were examined in this study, we may have concluded that only one gender’s depression is an important predictor of IPV. However, through the use of the hurdle count model, we can begin to speculate about the role of depression in both partners, as well as a possible gender-specific function of depression on the nature of IPV perpetration. Indeed, depression is appraised differently based upon expectations of gender roles (Wisdom, Rees, Riley, & Weis, 2007), which may have implications for the nature of IPV perpetration.

Although the current study results are generally consistent with the hypothesized model, a weakness in the study design prevents us from making stronger claims in this initial examination of the model. Specifically, the cross-sectional nature of the data prevents us from further understanding the direction of effects. For example, because enduring vulnerabilities are not necessarily immutable, IPV perpetration may contribute to the persistence and severity of one’s enduring vulnerabilities. Similarly, IPV may lead to couple conflict. IPV may lead partners to experience higher levels of fear and anxiety on the one hand, and resentment, anger, and depression on the other. Both sets of feelings may reduce capacity and motivation for problem solving, consequently leading to increased unresolved conflict. Moreover, high levels of chronic, unresolved arguing may reinforce negative attributions while extinguishing positive sentiments. To address such questions, it will be important to continue examining this model, as well alternative models, using longitudinal data. In addition, it will be important to examine this model using distinct measurement

modalities. Self-report was used for all measures in the current study, so it will be important to use a multi-method framework to eliminate the possibility that some of the observed correlations may be due to a method effect. We also note that model comparison tests indicated that, in many cases, men's and women's coefficients were not statistically different, so we constrained certain parameters to be equal across men and women in the final models. It is possible that certain associations are distinguishable between genders, but the degree of this difference was not detectable given our sample size. Although it can be informative to examine gender differences throughout the actor-partner interdependence model structure by specifying distinguishable effects regardless of the degree of difference, we chose to present the most parsimonious model guided by significance testing.

One may view the restriction of the sample to couples expecting a first child as another limitation of study design. However, this restriction is also perhaps a strength. Understanding the interplay between individual characteristics and couple relations in predicting IPV is of particular importance among couples about to become parents as IPV and parent to child violence tend to co-occur in families (Slep & O'Leary, 2005). In addition, it may be that understanding such pathways requires a narrowing of investigative focus from all couples to a subset of couples based on important contextual characteristics such as economic resources, race/ethnicity, or—as here—the developmental stage of family life. Indeed, although presently conceptualized as a control variable, family income was associated with the occurrence of men's and women's IPV, as well as the frequency of men's IPV perpetration. These findings are consistent with prior literature demonstrating a relation between income level and men's IPV perpetration (Schumacher et al., 2001), and suggest that relatively low income and limited economic resources may be contextual variables deserving of focused investigation.

Despite the preliminary nature of the study design, this work adds to the literature in a number of important ways. We tested a comprehensive model that ties together prior research on enduring vulnerabilities, typically examined in relation to either couple conflict or IPV, but not both. Through simultaneous examination of multiple variables, the relative importance of each variable was revealed, including important gender differences and cross-gender effects. Indeed, most prior literature examining the current variables, particularly in reference to IPV, was focused on men. We also examined negative relationship attributions as one potential mechanism accounting for relations of interest. Analytically, use of the actor-partner interdependence model to account for dyadic nature of conflict and IPV, as well as use of the hurdle count model to improve upon prior methods for modeling IPV data, are particular strengths that we hope researchers will build on in the future. The current results, in addition to prior research, suggest that IPV prevention and treatment interventions may prove more effective if couple conflict and other malleable factors (e.g., depressive symptoms) are directly targeted for change.

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References

- Atkins DC, Dimidjian S, Bedics JD, Christensen A. Couple discord and depression in couples during couple therapy and in depressed individuals during depression treatment. *Journal of Consulting and Clinical Psychology*. 2009; 77:1089–1099. [PubMed: 19968385]

- Atkins DC, Gallop RJ. Rethinking how family researchers model infrequent outcomes: A tutorial on count regression and zero-inflated models. *Journal of Family Psychology*. 2007; 21:726–735. [PubMed: 18179344]
- Babcock JC, Green CE, Robie C. Does batterers' treatment work? A meta-analytic review of domestic violence treatment. *Clinical Psychology Review*. 2004; 23:1023–1053. [PubMed: 14729422]
- Belsky J, Pensky E. Marital change across the transition to parenthood. *Marriage and Family Review*. 1988; 12:4133–4156.
- Biglan A. Problem-solving interactions of depressed women and their husbands. *Behavior Therapy*. 1985; 16:431–451.
- Bradbury TN, Fincham FD. Attributions in marriage: Review and critique. *Psychological Bulletin*. 1990; 107:3–33. [PubMed: 2404292]
- Capaldi DM, Owen LD. Physical aggression in a community sample of at-risk young couples: Gender comparisons for high frequency, injury, and fear. *Journal of Family Psychology*. 2001; 15:425–440. [PubMed: 11584793]
- Cook WL, Kenny DA. The actor–partner interdependence model: A model of bidirectional effects in developmental studies. *International Journal of Behavioral Development*. 2005; 29:101–109.
- Carney M, Buttell F, Dutton D. Women who perpetrate intimate partner violence: A review of the literature with recommendations for treatment. *Aggression and Violent Behavior*. 2007; 12:108–115.
- Costa DM, Babcock JC. Articulated thoughts of intimate partner abusive men during anger arousal: Correlates with personality disorder features. *Journal of Family Violence*. 2008; 23:395–402.
- Coxe S, West SG, Aiken LS. The analysis of count data: A gentle introduction to Poisson regression and its alternatives. *Journal of Personality Assessment*. 2009; 91:121–136. [PubMed: 19205933]
- Coyne JC. Toward an interactional description of depression. *Psychiatry: Journal for the Study of Interpersonal Processes*. 1976; 39:28–40.
- Derogatis LR, Cleary PA. Confirmation of the dimensional structure of the SCL-90: A study in construct validation. *Journal of Clinical Psychology*. 1977; 33:981–989.
- Feinberg ME, Jones DE, Kan ML, Goslin MC. Long-term outcomes of prevention for couples at the transition of parenthood. *Prevention Science*. (in press).
- Feinberg ME, Kan ML. Establishing Family Foundations: Intervention effects on coparenting, parent/infant well-being, and parent-child relations. *Journal of Family Psychology*. 2008; 22:253–263. [PubMed: 18410212]
- Feinberg ME, Kan ML, Goslin M. Enhancing Coparenting, Parenting, and Child Self-Regulation at the Transition to Parenthood: Effects of Family Foundations One Year after Birth. *Prevention Science*. (in press).
- Fincham FD, Bradbury TN. Assessing attributions in marriage: The Relationship Attribution Measure. *Journal of Personality and Social Psychology*. 1992; 62:457–468. [PubMed: 1560337]
- Fincham FD, Bradbury TN, Arias I, Byrne CA, Karney BR. Marital violence, marital distress, and attributions. *Journal of Family Psychology*. 1997; 11:367–372.
- Gordis EB, Margolin G, Vickerman K. Communication and frightening behavior among couples with past and recent histories of physical marital aggression. *American Journal of Community Psychology*. 2005; 36:177–191. [PubMed: 16134053]
- Gordon KC, Friedman MA, Miller IW, Gaertner L. Marital attributions as moderators of marital discord-depression link. *Journal of Social and Clinical Psychology*. 2005; 24:876–893.
- Heene ELD, Buysse A, Van Oost P. Indirect pathways between depressive symptoms and marital distress: The role of conflict communication, attributions, and attachment style. *Family Process*. 2006; 44:413–440. [PubMed: 16433287]
- Hilbe, JM. *Negative Binomial Regression*. Cambridge, UK: Cambridge University Press; 2007.
- Holtzworth-Munroe A, Hutchinson G. Attributing negative intent to wife behavior: The attributions of maritally violent versus nonviolent men. *Journal of Abnormal Psychology*. 1993; 102:206–211. [PubMed: 8315133]

- Humbad MN, Donnellan MB, Iacono WG, Burt SA. Externalizing psychopathology and marital adjustment in long-term marriages: Results from a large combined sample of married couples. *Journal of Abnormal Psychology*. 2010; 119:151–162. [PubMed: 20141252]
- Johnson MP. Patriarchal terrorism and common couple violence: Two forms of violence against women. *Journal of Marriage and the Family*. 1995; 57:283–294.
- Kahn J, Coyne JC, Margolin G. Depression and marital disagreement: The social destruction of despair. *Journal of Social and Personal Relationships*. 1985; 2:447–462.
- Karney BR, Bradbury TN. The longitudinal course of marital quality and stability: A review of theory, method, and research. *Psychological Bulletin*. 1995; 118:3–34. [PubMed: 7644604]
- Kenny, DA.; Kashy, DA.; Cook, WL. *Dyadic Data Analysis*. New York: Guilford Press; 2006.
- Kim HK, Capaldi DM. The association of antisocial behavior and depressive symptoms between partners at risk for aggression in romantic relationships. *Journal of Family Psychology*. 2004; 18:82–96. [PubMed: 14992612]
- Kurdek L. Conflict resolution styles in gay, lesbian, heterosexual nonparent, and heterosexual parent couples. *Journal of Marriage and the Family*. 1994; 56:705–722.
- Maccoon DG, Newman JP. Content meets process: Using attributions and standards to inform cognitive vulnerability in psychopathy, antisocial personality disorder, and depression. *Journal of Social and Clinical Psychology*. 2006; 25:802–824.
- Magdol L, Moffitt TE, Caspi A, Newman D, Fagan J, Silva PA. Gender differences in partner violence in a birth cohort of 21-year-olds: Bridging the gap between clinical and epidemiological approaches. *Journal of Consulting and Clinical Psychology*. 1997; 65:68–78. [PubMed: 9103736]
- Muthén, LK.; Muthén, BO. *Mplus User's Guide*. Sixth Edition. Los Angeles, CA: Muthén & Muthén; 1998–2010.
- Newton TL, Kiecolt-Glaser JK, Glaser R, Malarkey WB. Conflict and withdrawal during marital interaction: The roles of hostility and defensiveness. *Personality and Social Psychology Bulletin*. 1995; 21:512–524.
- Norlander B, Eckhardt C. Anger, hostility, and male perpetrators of intimate partner violence: A meta-analytic review. *Clinical Psychology Review*. 2005; 25:119–152. [PubMed: 15642644]
- O'Leary KD, Slep AMS, O'Leary SG. Multivariate models of men's and women's partner aggression. *Journal of Consulting and Clinical Psychology*. 2007; 75:752–764. [PubMed: 17907857]
- Radloff LS. The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 1:385–401.
- Schafer J, Caetano R, Clark CL. Rates of intimate partner violence in the United States. *American Journal of Public Health*. 1998; 88:1702–1704. [PubMed: 9807541]
- Schudlich TDR, Papp LM, Cummings EM. Relations of husbands' and wives' dysphoria to marital conflict resolution strategies. *Journal of Family Psychology*. 2004; 18:171–183. [PubMed: 14992619]
- Schumacher JA, Feldbau-Kohn S, Slep AMS, Heyman RE. Risk factors for male-to-female partner physical abuse. *Aggression and Violent Behavior*. 2001; 6:281–352.
- Slep AM, O'Leary SG. Parent and partner violence in families with young children: Rates, patterns, and connections. *Journal of Consulting and Clinical Psychology*. 2005; 73:435–444. [PubMed: 15982141]
- Straus MA, Hamby SL, Boney-McCoy S, Sugarman DB. The Revised Conflict Tactics Scales (CTS2): Development and preliminary psychometric data. *Journal of Family Issues*. 1996; 17:283–316.
- Straus MA, Stewart JH. Corporal punishment by American parents: National data on prevalence, chronicity, severity, and duration, in relation to child and family characteristics. *Clinical Child and Family Psychology Review*. 1999; 2:55–70. [PubMed: 11225932]
- Stuart GL, Moore TM, Hellmuth JC, Ramsey SE, Kahler CW. Reasons for intimate partner violence perpetration among arrested women. *Violence Against Women*. 2006; 12:609–621. [PubMed: 16777948]
- Vaeth PAC, Ramisetty-Mikler S, Caetano R. Depression among couples in the United States in the context of intimate partner violence. *Journal of Interpersonal Violence*. 2010; 25:771–790. [PubMed: 19520969]

- Whisman MA. Marital adjustment and outcome following treatments for depression. *Journal of Consulting and Clinical Psychology*. 2001; 69:125–129. [PubMed: 11302269]
- Whisman MA, Uebelacker LA, Weinstock LM. Psychopathology and marital satisfaction: The importance of evaluating both partners. *Journal of Consulting and Clinical Psychology*. 2004; 72:830–838. [PubMed: 15482041]
- Whitaker DJ, Saltzman LS, Haileyesus T, Swahn M. Differences in frequency of violence and reported injury between relationship with reciprocal and nonreciprocal intimate partner violence. *American Journal of Public Health*. 2007; 97:941–947. [PubMed: 17395835]
- Wingrove J, Bond AJ. Angry reactions to failure on a cooperative computer game: The effect of trait hostility, behavioural inhibition, and behavioural activation. *Aggressive Behavior*. 1998; 24:27–36.
- Wisdom JP, Rees AM, Riley KJ, Weis TR. Adolescents' perceptions of the gendered context of depression: "Tough" boys and objectified girls. *Journal of Mental Health Counseling*. 2007; 29:144–162.
- Wymbs BT, Pelham WE, Molina BSG, Gnagy EM, Wilson TK, Greenhouse JB. Rate and predictors of divorce among parents of youths with ADHD. *Journal of Consulting and Clinical Psychology*. 2008; 76:735–744. [PubMed: 18837591]

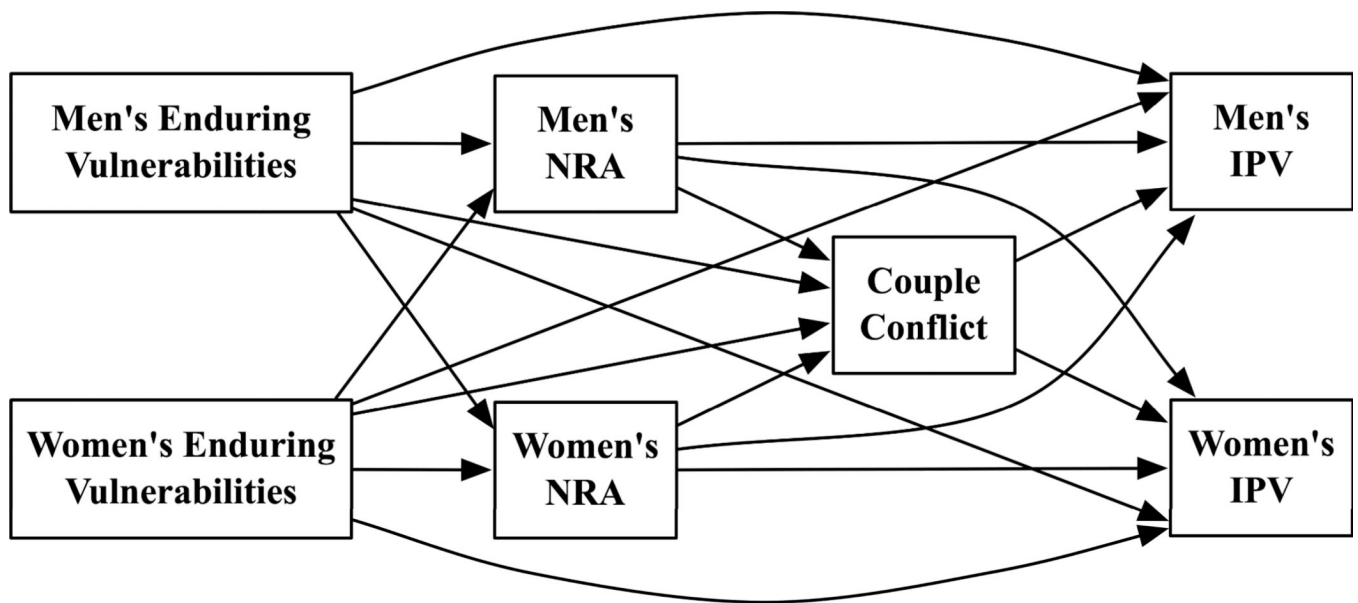


Figure 1. Proposed theoretical model for the actor-partner interdependence path analysis model. “Enduring vulnerabilities” include antisocial behavior, hostility, and depression. IPV = intimate partner violence; NRA = negative relationship attributions.

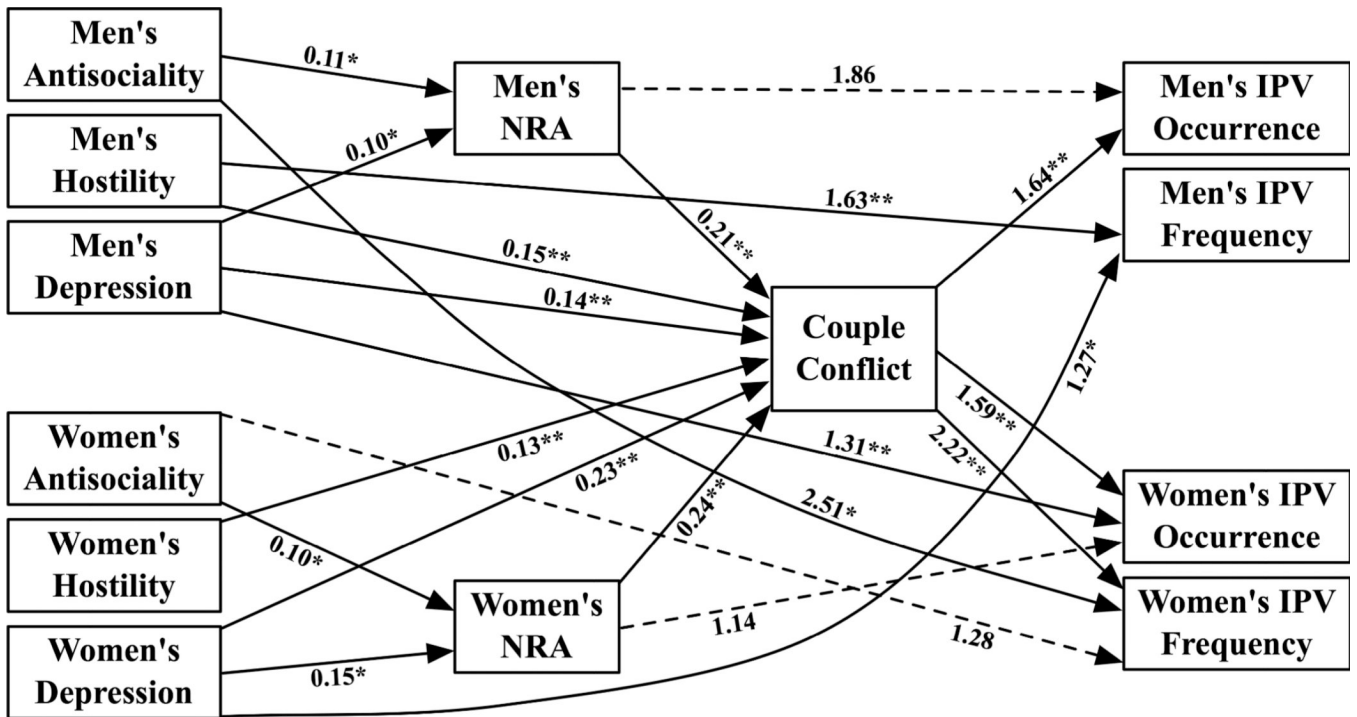


Figure 2. Results of the actor-partner interdependence path/hurdle models. All predictors of NRA and IPV were tested for cross-partner paths. Values provided are regression coefficients for the prediction of NRA and couple conflict, odds ratios for the prediction of IPV occurrence, and incidence rate ratios for the prediction of IPV frequency. IPV = intimate partner violence; NRA = negative relationship attributions.
* $p < .05$. ** $p < .01$.

Table 1

Descriptive statistics and correlations among study variables.

Variable	Mean (SD)	Range	1	2	3	4	5	6	7
Mean (SD)	--	--	64.49 (34.24)	18.24 (5.12)	2.07 (1.88)	0.53 (0.46)	0.47 [#] (0.49)	2.78 [#] (0.66)	2.23 [#] (5.97)
Range	--	--	2.5 – 162.5	8.5 – 32	0 – 9	0 – 2.17	0 – 2.86	1 – 4.26	0 – 30
1. Family income	64.49 (34.24)	2.5 – 162.5	--	-.14 [†]	.04	-.30 ^{**}	-.26 ^{**}	.13	-.27 ^{**}
2. Couple conflict	18.24 (5.12)	8.5 – 32	-.14 [†]	--	.08	.45 ^{**}	.41 ^{**}	.33 ^{**}	.48 ^{**}
3. Antisocial behavior	4.46 [#] (3.08)	0 – 14	-.18 [*]	.24 ^{**}	.05	.03	.03	.03	.03
4. Hostility	0.59 (0.61)	0 – 3.17	-.26 ^{**}	.14 [†]	.13	.31 ^{**}	.57 ^{**}	.17 [*]	.36 ^{**}
5. Depression	0.27 (0.31)	0 – 1.43	-.20 [*]	.26 ^{**}	.25 ^{**}	.35 ^{**}	.08	.17 [*]	.28 ^{**}
6. NRA	2.64 (0.59)	1 – 3.74	.12	.28 ^{**}	.10	-.13 [†]	.02	.19 [*]	.04
7. IPV perpetration	1.46 (4.91)	0 – 30	-.25 ^{**}	.36 ^{**}	.21 ^{**}	.24 ^{**}	.13 [†]	.14 [†]	.66 ^{**}

Notes: Data for women are above the diagonal and data for men are below the diagonal; inter-partner correlations are along the diagonal. Family income (reported in thousands) and couple conflict are the average of partner reports, hence the data is the same for each partner. IPV = intimate partner violence; NRA = negative relationship attributions;

mean value is significantly higher than partner ($p < .05$);

[†] $p < .10$.

* $p < .05$.

** $p < .01$.