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Claire Sontheimer April 9, 2018

Non-concordance in reports of intimate partner violence: Psychological and psychosocial correlates in young adult heterosexual couples

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Abstract

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Physical intimate partner violence affects women around the globe daily, and is associated with numerous long- and short-term negative outcomes. Therefore, it is critically important to examine what factors may improve or worsen outcomes for women affected. The current study investigates inter-partner disagreement about the occurrence of male-to-female physical violence, and how this aspect of partner violence impacts couple relationship satisfaction, couple social isolation, and women's depression and anxiety. A total of 237 young adult heterosexual couples in Australia took part in this study. Independent reports on the Conflict Tactics Scale (CTS) were used to measure non-concordance between partners. As demonstrated in previous studies, rates of agreement were fair to moderate. Couple relationship satisfaction, measured using the Dyadic Adjustment Scale, was negatively related to non-concordance between partners generally, and male under-reporting relative to his female partner specifically. Couple social isolation, measured using the Young Adult Self Report, was not related to non-concordance generally, but was related to male under-reporting relative to his female partner. Women's anxiety measured concurrently, and depression measured concurrently and five years later were related to male under-reporting. Implications of these findings and future directions are discussed.

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Violence against women is an epidemic in the United States and around the world. A large 2010 study conducted by the Centers for Disease Control and Prevention found that 24.3% of American women experience severe physical intimate partner violence (IPV) in their lifetime (Breiding, Chen, & Black, 2014), and The World Health Organization estimates that the global lifetime prevalence of intimate partner violence is about 30% for women (World Health Organization, 2016). Intimate partner violence victimization has been clearly associated with serious negative outcomes such as depression, chronic illness, and injury or death (Campbell, 2002; Coker et al., 2002). Certain factors such as female gender (Tjaden & Thoennes, 2000) and lack of support resources (Mcfarlane et al., 2005) predict worse outcomes. Indeed, it is critically important to understand what factors predict more severe outcomes for victims in order to more effectively intervene. Some evidence suggests that victims experiencing minimization or denial of the violence being perpetrated against them, from the person perpetrating it, may have more negative affective outcomes than victims who feel that their abusers acknowledge their violence (Langrichsen-Rohling & Vivian, 1994).

Violence denial or minimization may be investigated by studies of reporting concordance between partners in relationships characterized by intimate partner violence. Studies of intimate partner violence reporting concordance use data collected from both partners in a couple to determine whether they agree about the occurrence and/or frequency of violence in their relationship. This research spans multiple forms of intimate partner violence, including physical, emotional, and sexual abuse. The current study will focus on IPV reporting concordance in heterosexual partnerships characterized by male-perpetrated physical abuse.

The evidence that physical IPV concordance rates are low (or moderate at best) is robust. When partners agree that no violence is occurring in their relationship, concordance rates can appear to be relatively high (i.e. 88%; Szinovacz & Egley, 1995). This is referred to as agreement due to non-occurrence. However, among couples where at least one partner has endorsed violence in a self-report, the agreement rates are much worse. A large survey study of 1,635 couples conducted in the United States in 2004 found that concordance among these couples was "generally poor," and further that "approximately 50% more couples disagree than agree about the occurrence" of IPV (Schafer, Caetano, & Cunradi, 2004). An additional large survey study using data from the National Survey of Families and Households found that when at least one partner reported violence, only about 29% of couples agreed on whether or not the male partner had hit the female partner, and only 17% agreed on whether there had been any injuries due to violence (Szinovacz & Egley, 1995). In 2006, researchers calculated agreement rates in 16 IPV concordance studies conducted between 1985 and 2005 and found that percentage agreement rates for the occurrence of male physical aggression ranged from 27%-57%, averaging to a 43% occurrence agreement (Panuzio et al., 2006). These low numbers are further supported in smaller studies with clinical populations, such as couples with the male partner in treatment for substance abuse (Freeman, Schumacher, & Coffey, 2014) and couples in therapy (Jouriles & O'Leary, 1985).

Some researchers frame non-concordance through 'lower-bound' and 'upper-bound' estimates. Lower bound estimates consider that violence happened only when both partners report it. In contrast, upper bound estimates only require one partner to report violence. The differences between lower and upper bound estimates can be quite revealing. A study of White, Black, and Hispanic couples found that about 80% of physical aggression was only reported by

one partner (Caetano, Field, Ramisetty-Mikler, & Lipsky, 2008), and therefore would not have been discovered if data had been taken from only one member of the couple. A study of 897 blue collar couples found that the occurrence of male-to-female physical violence had a lower bound estimate of 6.7% and an upper bound estimate of 21.1%, meaning that 14.4% of the couples in the study reported some physical violence in their relationship that may not have been considered if they had not taken data from both partners (Cunradi, Bersamin, & Ames, 2008). An additional study of 50 university students found very high rates of physical violence in general and a large amount of disagreement about it within couples, with a lower bound estimate of 28% and an upper bound estimate of 60% (Perry & Fromuth, 2005).

These findings regarding physical intimate partner violence reporting concordance are important to both researchers and clinicians. Researchers have more than just cause to be concerned about the accuracy of single partner IPV self-reports. Self-report data about the occurrence of IPV may be inaccurate, and that may have a serious effect on the findings of research. Likewise, clinicians who interact with people affected by IPV should be aware of the issue of non-concordance, as self-reports may not accurately reflect the violence occurring in a relationship. Further or different action may be needed at times. In addition, batterer programs often use self-reports as measures of participant success, but they may not reflect reality (Heckert & Gondolf, 2000a). Because non-concordance in IPV self-reports could have such a large impact on both research and clinical intervention, many researchers have attempted to investigate the causes and predictors of low concordance rates.

Predictors of non-concordance. The first predictors of IPV report non-concordance that researchers examined were gender and victim vs. perpetrator status. The issue of whether gender can predict under- or over- reporting (and therefore cause non-concordance) is unresolved. Some

have proposed that men or women might simply report more violence in general. One study found that women report significantly more violence than men overall (as both perpetrators and victims; Schafer, Caetano, & Cunradi, 2004), but another found the exact opposite—that men report more violence in general than women (Cunradi, Bersamin, & Ames, 2008). Other studies have found that gender is not consistently associated with reporting concordance at all (i.e. Marshall, Panuzio, Makin-Byrd, Taft, & Holtzworth-Munroe, 2011).

Victim vs. perpetrator status as a predictor of under- or over- reporting relative to one's partner is a similarly murky issue. The same study that found that gender was not associated with reporting concordance also found that victim vs. perpetrator status was not predictive either (Marshall, Panuzio, Makin-Byrd, Taft, & Holtzworth-Munroe, 2011). On the other hand, a study of married couples with children found that both men and women reported less IPV perpetration—and injury resulting from IPV perpetration—than their partners reported about them (Williams & O'Leary, 2006). An additional study in 2005 also provides evidence for this view, finding that both men and women claimed that they were less aggressive than reported by their partners, although the effect was slightly stronger for male perpetrators (Simpson & Christensen, 2005). However, a different study using police reports as an independent verification found that relative to the police reports, both male perpetrators and female victims under-reported the violence that was actually occurring (Heckert & Gondolf, 2000a).

Studies investigating only men as perpetrators do not isolate the two variables of gender and victim/perpetrator status, making it impossible to know which of these variables is causing the effect. However, these studies have most often found that males who are perpetrators under-report their own violence relative to their partners. A 2006 study of men in treatment for substance abuse found that their female partners reported experiencing higher rates of physical

aggression than the men claimed they had perpetrated (Panuzio et al., 2006). The authors of a 2016 study of men attending treatment for perpetration of intimate partner violence noted that "when disagreement was found, this resulted from men attending IPV treatment reporting less violence than their partners" (Strandmoen, Askeland, Tjersland, Wentzel-Larsen, & Heir, 2016). Another study found that female partners reported significantly more violence victimization than their male partners described, and the opposite pattern (male reports of higher female perpetration) was not seen (Browning & Dutton, 1986). Finally, a 1994 study found that "most of the incongruence for levels of aggression resulted from the perpetrator underreporting" (279), but not all, as 35% of the incongruence in their sample resulted from husbands who over-reported their perpetration relative to their wives (Langhinrichsen-Rohling and Vivian, 1994). Interestingly, veterans seem to be the exception to this trend in the research. Two studies of male veterans have found that they are likely to significantly over-report their own perpetration of violence relative to the reports of their female partners (Lamotte, Taft, Weatherill, Scott, & Eckhardt, 2014; Lamotte, Taft, Reardon, & Miller, 2014). Only one study of a non-veteran sample found a similar pattern—that men claimed perpetration more than women claimed victimization within a partnership (Caetano, Field, Ramisetty-Mikler, & Lipsky, 2008).

Some studies have also suggested that the severity of the violence in question might have an effect on self-report concordance. In one study, severe physical assault by a male significantly increased agreement (Caetano, Field, Ramisetty-Mikler, & Lipsky, 2008) relative to other forms of violence. This was replicated in another study, where agreement was lower about less physically dangerous and more frequent forms of violence (for example, pushing) in comparison to more severe forms of violence such as beating a partner up (Browning & Dutton, 1986). On the other hand, a study using police reports as validation found that male perpetrators were much

more likely to minimize the severity of their attacks than their female victims (Heckert & Gondolf, 2000a).

Some researchers have also begun to move away from the effect of gender and perpetrator vs. victim status in order to investigate the effects of individual characteristics as predictors of non-concordance. Interestingly, certain personality disorders, specifically antisocial personality disorder and narcissistic personality disorder, have been associated with higher rates of concordance. Some evidence suggests that perpetrators with these disorders are less likely to under-report relative to their partners (Panuzio et al., 2006; Heckert & Gondolf 2000b). Investigations of substance use as a possible correlate of lower partner agreement have largely revealed non-significant associations (Freeman, Schumacher, & Coffey, 2014; Panuzio et al., 2006), although a study of memory ability in polysubstance abusing couples found that "men and women's memory ability, problem solving, disinhibition, and verbal ability are significantly related to disagreement about the most recent IPV episode" (Medina, Schafer, Shear, & Armstrong, 2004). The influence of social desirability has also been cited as an important factor in IPV reporting, and a potential explanatory factor for non-concordance (Heckert & Gondolf 2000b; Arias & Beach, 1987; Sugarman & Hotaling, 1997), but a more recent study found that the social desirability constructs of self-deceptive enhancement and impression management did not significantly predict the under-reporting of male physical violence relative to partner reports (although it did predict the under-reporting of male sexual violence; Freeman, Schumacher, & Coffey, 2014). However, it is important to note that a large survey study found that spouses were significantly more likely to deny IPV perpetration face to face as opposed to on a questionnaire, which suggests that social desirability may indeed play an important role (Szinovacz & Egley, 1995). In addition, certain demographic features such as age or race have occasionally been

identified as significant correlates of non-concordance (Heckert and Goldolf, 2000b; Caetano, Field, Ramisetty-Mikler, & Lipsky, 2008).

Still other researchers have investigated the relationship dynamics between two partners as a predictor of IPV reporting non-concordance. Evidence suggests that relationship satisfaction may have a significant association with agreement. In a study of veterans, higher relationship satisfaction was associated with reporting less IPV perpetrated by one's partner relative to what one's partner reported for himself (Lamotte, Taft, Reardon, & Miller, 2014). This pattern was found once again in a 2011 study of non-veterans (Marshall, Panuzio, Makin-Byrd, Taft, & Holtzworth-Munroe, 2011). On the other hand, a 2005 study of married couples seeking couple's therapy found that marital satisfaction was not significantly associated with concordance (Simpson & Christensen, 2005), suggesting mixed findings for this predictor. However, these previous studies have used small sample sizes or clinical populations. Indeed, many studies of concordance predictors have used small or clinical samples, likely affecting the data obtained. Larger and more generalizable samples, such as that of the current study, may help to clarify often inconclusive and even contradictory results.

An additional variable that may predict IPV reporting non-concordance is social isolation. Although this relationship has never been investigated, many studies have demonstrated the meaningful role of social isolation in intimate partner violence in general (Outlaw, 2009). Social isolation can be conceptualized as an outcome or predictor of experiencing IPV (Anderson, 2004). A social network may have an impact on perpetrators' and victims' experiences, perceptions, and understandings of the violence. For this reason, social isolation may be an important factor predicting reporting non-concordance.

Non-concordance and victim outcomes. Although much of the literature is inconclusive, there is some evidence that certain individual and relationship factors do have an effect on IPV reporting concordance. What is less clear is how disagreement about the occurrence of IPV might affect a relationship and the individuals within it. To the author's knowledge, only two studies have attempted to investigate how non-concordance might have an effect on individual and relationship outcomes.

In 1991, Waltz et al. found that when husbands reported less violence against their wives than their wives claimed to be experiencing, wives had lower marital satisfaction than wives whose husbands' reports were more congruent with theirs. In addition, they were more likely to identify their relationships as emotionally abusive than wives of men who were physically violent, but reported it more congruently with their partners (as cited in Langhinrichsen-Rohling & Vivian, 1994). In 1994, researchers Langhinrichsen-Rohling and Vivian followed up on this study by examining depression, anger, and relationship satisfaction and impairment in incongruent couples. They found that women in partnerships displaying non-concordance about IPV were significantly more likely to report symptoms of depression, and negative affective functioning in general, than women in more congruent partnerships. Likewise, partners that were incongruent reported more relationship impairment.

Langhinrichsen-Rohling and Vivian argued that all of these results were likely to be the result of the incongruence itself, rather than causes of the incongruence. Women in relationships that were incongruent due to male under-reporting were significantly more likely to report impairments in relationship functioning than women in relationships that were incongruent due to male over-reporting. Analyses of affective measures (including depression) for female partners of male under-reporters compared to male over-reporters did not reach significance,

although they were in the expected direction. The researchers suggested that these findings may be a symptom of perpetrator denial and minimization (Langhinrichsen-Rohling & Vivian, 1994); in other words, the denial and minimization of violence may have a negative effect on relationships and the people in them that goes beyond the violence itself. Outcomes for the partners of violent 'minimizers' may be more negative than the outcomes for partners of perpetrators who more readily admit to the violence they have committed.

The results of both of these studies are compelling. In particular, Langhinrichsen-Rohling and Vivian (1994) consider critical questions about mental health outcomes for victims of intimate partner violence. However, there are significant limitations of that study. First of all, the study is cross-sectional. It examines outcomes potentially related to concordance only at one timepoint, which makes it impossible to establish whether non-concordance may be associated with long-term changes in victim mental health. Determining whether there may be an association between non-concordance and the mental health of IPV victims in both the present and the future will be critical in further elucidating the importance of concordance as a clinical construct. Second, the Langhinrichsen-Rohling & Vivian (1994) study is drawn from a clinical sample of couples seeking marital therapy. It is unclear if the results will be replicable in a non-clinical population. Finally, the study examines depression and anger as possible correlates of non-concordance, but not anxiety, despite much evidence suggesting that many victims of IPV experience anxiety (Pico-Alfonso et al., 2006). With a larger and more generalizable sample, as well as longitudinal data on victim mental health, the present study aims to address these limitations and expand the limited literature on the issue of IPV reporting non-concordance and victim outcomes.

Hypotheses. Given the inconclusive nature of much of the literature on IPV reporting concordance, the current study will attempt to answer multiple questions. First, the study will examine rates of male perpetrated physical IPV concordance in the sample. Next, the study will attempt to clarify mixed previous findings regarding the role of relationship satisfaction in concordance. It will also explore an additional potential predictive factor—social isolation. No previous studies have examined the relationship between social isolation and reporting concordance. Finally, the study will investigate how non-concordance might affect victim short and long-term mental health outcomes. Hypotheses are as follows:

1. We hypothesize that rates of physical IPV concordance in a community sample of young adults will be fair to moderate according to established guidelines for interpreting statistics of agreement.
2. We hypothesize that greater couple relationship satisfaction will be associated with higher concordance about the occurrence of physical IPV.
3. We hypothesize that greater couple social isolation will be associated with lower concordance about the occurrence of physical IPV.
4. We hypothesize that male under-reporting of the occurrence of physical IPV relative to his female partner will be correlated with higher victim anxiety concurrently.
5. We hypothesize that male under-reporting of the occurrence of physical IPV relative to his female partner will be correlated with higher victim depression concurrently and predictively.

Method

Participants

The current sample was drawn from a longitudinal study of children (born 1981-1984 in Brisbane, Australia) who were selected for follow up due to varying levels of exposure to maternal depression during early childhood (Hammen & Brennan, 2003). Initial data collection with mothers occurred at their first prenatal clinical visit, and follow-up data collection occurred with the mother when the child was a newborn, 6 months and five years of age. Further follow-ups of both the mother and the child took place at child age 13, age 15, and age 20. Finally, the youth was followed up independently at approximately 25 years of age. A total of 815 youths were sampled at the age-15 time point, and 706 individuals were sampled at the age-20 time point. At the age 20 follow up, a subsample of youth also nominated their romantic partners to participate in the study with them. Inclusion criteria for the current study was youth and heterosexual romantic partner participation in the age 20 follow up; a total of 237 youth qualified for inclusion.

The 237 age-20 youths included in the current study did not differ from the 815 youths sampled at age 15 in their ethnicity $\chi 2(3)=2.902$, $p=.407$, maternal depression symptoms at the 15-year data collection $\chi 2(1)=.274$, $p=.601$, youth depression and anxiety symptoms at the 15-year data collection $t(805)=1.123$, $p=.262$, parental income $t(764)=.947$, $p=.344$, parent's education level $t(805)=.980$, $p=.328$, or number of siblings $t(810)=1.177$, $p=.239$. More women were retained than men $\chi 2(1)=8.420$, $p=.004$, and mothers of retained youths were younger at their birth $t(813)=2.425$, $p=.016$.

Procedure

Youth participant data was collected in the homes by two trained MA or PhD level psychologists. Youth participants completed interviews and self-report questionnaires, and were compensated for their time. At the time of the interview, the age-20 participants had the option to nominate their romantic partner or a friend to participate in the study. Participants could give their romantic partner or friend the study packet directly or the packet could be mailed to them. Partners and friends were asked to complete the questionnaire packet and return it in a provided stamped envelope, and were compensated for their time. The study was approved by IRBs at The University of Queensland, The University of California Los Angeles, and Emory University.

Measures

Physical IPV inter-partner reporting concordance. Physical intimate partner violence was assessed using a modified version of the Conflict Tactics Scale (CTS; Straus, 1979). The CTS is commonly used in research on inter-partner violence reporting concordance. The modified version used in the current study is based on the work of Pan, Neidig, & O'Leary (1994), who added the items "tried to control spouse physically (held down, etc.)," "physically forced spouse to have sex," and "choked or strangled spouse" to Straus' original 1979 Conflict Tactics Scale's physical violence subscale. The item "physically forced spouse to have sex" was omitted from the scale used in the current study, as previous research has shown that inter-partner reporting concordance may be different in the case of sexual violence (Caetano, Field, Ramisetty-Mikler, & Lipsky, 2008). Pan, Neidig, & O'Leary's scale (1994) also omits "hit or tried to hit with something" from Straus' 1979 CTS as it overlaps with an existing item. In total, the current study's modified CTS includes nine items (see appendix A). Internal reliability was

good for age 20 participants perpetrating violence (α = .79) and having violence perpetrated against them (α =.80). It was also high for partners perpetrating violence (α =.73) and partners having violence perpetrated against them (α =.74).

The CTS uses a four-point response scale for each item, ranging from "never" to "three or more times" in the past year. However, because we were investigating violence occurrence or non-occurrence, as opposed to violence frequency, participant answers were recoded to 0 for "never occurred" or 1 for "occurred one or more times." Items were then summed to create a variable representing the number of violent events reported as having "occurred" by the woman in the relationship (M = .507, SD = 1.288), and a separate variable representing the number of events indicated as having "occurred" by the man in the relationship (M = .448, SD = 1.181). If all CTS items were left blank by either the age 20 participant, their partner, or both, the participant and their partner were excluded from further data analyses. 26 couples were excluded in this manner.

Directional concordance was calculated by creating a difference variable representing men's total occurrence scores subtracted from women's total occurrence scores, ranging from -9 to +9. A difference score above zero indicated disagreement due to male under-reporting relative to their female partners, while a difference score below zero indicated disagreement due to male over-reporting relative to their female partners. A score of zero indicated that the couple agreed completely on either the number of items occurred or non-occurrence of physical violence in their relationship. Finally, a non-directional difference variable (not indicating whether the difference was due to male under-reporting or over-reporting relative to women) was created using the absolute value of the original difference variable, with scores ranging from zero to nine.

Relationship satisfaction. Relationship satisfaction was assessed using the Dyadic Satisfaction subscale of the Dyadic Adjustment Scale (Spanier, 1976). A five-point scale was used instead of the original six-point scale, consisting of "never," rarely," "some of the time," "most of the time," and "all of the time." In the current study, the internal reliability of the scale was high for age-20 participants (α =.82) and their partners (α =.82). Variables representing female relationship satisfaction and male relationship satisfaction were created. A variable representing couple satisfaction was created by calculating the mean of the woman's satisfaction score and the man's satisfaction score.

Social isolation. Social isolation was assessed using the Young Adult Self-Report for Ages 18-30 (Achenbach, 1997). Subsection I, "Friends," consists of four questions about an individual's number of friends, the quality of those friendships, and how much time he or she spends with friends. These items were combined to form a scale which had low internal reliability for participants (α =.59) and their partners (α =.53). Variables representing female social isolation and male social isolation were created. Within couples, men's social isolation scores and women's social isolation scores were averaged to create a variable representing couple social isolation.

Female anxiety. Women's anxiety was calculated using six items from the DSM-oriented anxiety problems subscale (Achenbach, Dumenci, & Rescorla, 2003) of the Young Adult Self-Report for Ages 18-30 (Achenbach, 1997). Items were summed to calculate a total anxiety score. Cronbach's alpha for age-20 participant anxiety was α =.74. Cronbach's alpha for partners was α =.67.

Female depression. Women's depression at participant age 20 was calculated using fourteen items from the DSM-oriented depressive problems subscale (Achenbach, Dumenci, &

Rescorla, 2003) of the Young Adult Self-Report for Ages 18-30 (Achenbach, 1997). Items were summed to calculate a total depression score. Cronbach's alpha for age-20 participant depression was α =.83. Cronbach's alpha for partners was α =.78. Women's depression at participant age 25 was calculated for a subsample of female participants (N=95) using the 21-item Beck Depression Inventory (Beck, 1961). Items were summed to create a total depression at participant age 25 score. Cronbach's alpha was α =.93.

Descriptive statistics of all variables are presented in Table 1.

Results

Prior to performing hypothesis testing, correlations were run between all variables of interest and four potential confounds: parent education level, parent income at child's birth, ethnicity, and maternal diagnosis of depression at youth age 15. Results of these analyses are presented in Table 2. When significantly associated with the outcome, these variables were controlled for in analyses examining that outcome.

Reporting concordance. Our first hypothesis was that rates of concordance would be fair to moderate according to established guidelines for interpreting Cohen's Kappa (Cohen, 1960) and Yule's Y (Yule, 1912) statistics. Agreement statistics are reported for the occurrence of individual items and for the occurrence of any physical violence. Percentage agreements are also presented. Results of analyses including all couples are presented in Table 3. Results of analyses including only couples in which at least one partner reported *that particular* form of violence (excluding agreement due to non-occurrence for each item) are presented in Table 4.

Relationship satisfaction. Second, we hypothesized that greater agreement about the occurrence of physical IPV would be related to greater relationship satisfaction. To test sthis

hypothesis, two partial correlations were conducted between couple relationship satisfaction and non-directional and directional difference scores, controlling for maternal history of depression at youth age 15 and parent income at birth. Couple relationship satisfaction and non-directional difference scores were significantly correlated, $r=-.280$, $p < .001$, such that relationship satisfaction decreases as agreement decreases. Couple relationship satisfaction and directional difference scores were also significantly correlated, $r=-.142$, $p < .05$, such that male under-reporting relative to his female partner increases as couple satisfaction decreases. Four additional partial correlations were conducted between male and female individual relationship satisfaction and non-directional and directional difference scores, controlling for maternal history of depression at youth age 15 and parent income at birth. Male relationship satisfaction and non-directional difference scores were significantly correlated, $r=-.185$, $p < .01$, such that male relationship satisfaction decreases as agreement decreases. Male relationship satisfaction and directional difference scores were not significantly correlated, $r=-.021$, $p = .766$. Female relationship satisfaction and non-directional difference scores were significantly correlated, $r=-.290$, $p < .001$, such that female relationship satisfaction decreases as agreement decreases. Female relationship satisfaction and directional difference scores were significantly correlated, $r=-.218$, $p < .01$, such that male under-reporting relative to his female partner increases as female relationship satisfaction decreases.

Social isolation. Next we tested our hypothesis that greater agreement about the occurrence of physical IPV would be related to decreased social isolation. Bivariate correlations were conducted between couple social isolation and non-directional and directional difference scores. No significant correlation was found between social isolation and non-directional difference scores, $r=-.034$, $p=.620$. However, a significant correlation was found between social

isolation and directional difference scores, r=-.152, p < .05, such that increased couple social isolation was associated with male under-reporting relative to his female partner. Four additional bivariate correlations were conducted between male and female individual social isolation and non-directional and directional difference scores. Male social isolation was not significantly correlated with non-directional difference scores (r=-.020, p = .781) or directional difference scores (r=-.043, p = .542). Female social isolation and non-directional difference scores were not significantly correlated (r=-.026, p=.706), but female social isolation and directional difference scores were significantly correlated, r=-.185, p < .01, such that male under-reporting relative to his female partner increases as female social isolation increases.

Female anxiety. To test our hypothesis that male under-reporting relative to his female partner would be associated with increased anxiety for women, a linear regression was performed with the female partner's anxiety as the dependent variable and directional reporting difference scores as the independent variable. Results indicated that increased non-concordance in IPV reporting was significantly associated with increased female anxiety (see Table 5). A separate regression analysis was then performed with agreement due to non-occurrence excluded, and similar results were noted (see Table 6).

Female depression. Finally, we examined associations between male under-reporting of IPV and women's increased self-reported depression. A hierarchical multiple regression was conducted with concurrent female depression as the dependent variable and maternal diagnosis of depression at youth age 15 and directional reporting difference scores as independent variables. Increased non-concordance in reporting was significantly associated with increased female depression both with agreement due to non-occurrence included and excluded (see Tables

5 and 6). In order to examine non-concordance as a predictor for future depression, a hierarchical linear regression was performed with participant age 25 depression as the dependent variable and participant age 20 directional difference scores and female depression as independent variables. Results indicate that non-concordance at participant age 20 is still associated with symptoms of depression at participant age 25, but it is not associated with increasing depression over time (see Table 5). Similar results were found when agreement due to non-occurrence was removed (see Table 6).

Discussion

The results of this study suggest that high levels of physical IPV reporting non-concordance have numerous negative impacts on heterosexual couples. Specifically, men's under-reporting relative to their female partners is related to decreased couple relationship satisfaction, increased couple social isolation, and increased symptoms of depression and anxiety in female victims. Multiple authors have suggested that non-concordance may represent a perpetrator's minimization or denial of violence (i.e. Heckert & Gondolf, 2000a)—a difficult thing to study given its very nature. However, research suggests that male perpetrators of IPV commonly use minimization and denial, along with attributions of blame to their partner's behavior or character, as tactics to avoid being held responsible for violence (Henning & Holdford, 2006; Dutton & Hemphill, 1992). Henning & Holdford found that one out of five men arrested for IPV denied even having an argument with their partner just before they were arrested. More than half of the men in the study denied physically assaulting their partner (2006). Even when male perpetrators do admit to violence, it has been demonstrated that they often

minimize its severity (Heckert & Gondolf, 2000a). Langhinrichsen-Rohling and Vivian write about non-concordance as a proxy for these practices of minimization and denial, noting that "it has been assumed that when spouses disagree about marital aggression, it is almost universally in the direction of underreporting by the aggressive spouse" (1994). Likewise, Heckert and Gondolf claim that there is "consistent underreporting among a group of 'deniers'" (2000b). While it is impossible to argue that perpetrator minimization and denial are the cause of all of the disagreement found in the current study (due to the presence of male over-reporters of violence relative to their female partners), the frequency with which previous studies have found minimization and denial suggest that it is likely that they play a large role in creating reporting non-concordance.

A great deal of non-concordance in IPV reporting was found in this sample. Previous literature has suggested that Cohen's Kappa (Cohen, 1960) and Yule's Y (Yule, 1912) may both be interpreted such that values less than 0 indicate poor agreement; values 0-0.2, slight agreement; values 0.2-0.4, fair agreement, values 0.4-0.6, moderate agreement, values 0.6-0.8, substantial agreement, and values 0.8-1, high agreement (Landis & Koch, 1977; Hoffman & Ninonuevo, 1994). Under these guidelines, our data indicate that concordance between partners is slight to moderate. Agreement between partners that any physical violence happened at all (although not necessarily the same type of violence) was fair to moderate. When agreement due to non-occurrence was removed from analyses, and agreement was examined only among couples in which at least one partner reported that a particular form of violence had occurred, the resulting negative Cohen's Kappa values indicate that there was very low agreement or possibly more disagreement than agreement. These findings are in accord with previous research, which has consistently found low to moderate levels of reporting concordance for physical violence in

heterosexual partnerships (Panuzio et al., 2006). These consistent findings of low concordance rates are notable, particularly as specific types of physical violence may be less open to 'interpretation' than other forms of partner disagreements such as psychological aggression. Perpetrator minimization and denial may be one cause of these low rates of agreement.

Results of our analysis concerning relationship satisfaction suggest that those couples who are more satisfied in their relationships are less likely to disagree about the occurrence of male-to-female physical IPV. Gender-specific analyses suggest that women are driving the relationship between directional concordance and relationship satisfaction, but men and women alike demonstrate lower relationship satisfaction when there is disagreement about physical violence generally. Previous research on this association has been contradictory, with certain studies finding a significant relationship (Marshall, Panuzio, Makin-Byrd, Taft, & Holtzworth-Munroe, 2011; Lamotte, Taft, Reardon, & Miller, 2014) and others finding none (Simpson & Christensen, 2005). The current study provides further support for the hypothesis that relationship satisfaction is related to IPV reporting concordance. However, we also analyzed relationship satisfaction in relation to the direction of non-concordance, and found that couples in which women under-report IPV relative to their male partners are significantly more satisfied in their relationships than couples in which women over-report IPV relative to their male partners. Given that the relationship satisfaction variable used in this study reflects the satisfaction of both partners in the couple, this finding suggests a disproportionate impact of the women's perceptions of experiencing violence on the happiness of the couple. In other words, it is not only disagreement in general which is related to relationship dissatisfaction, it is also a particular type of disagreement in which the victim of violence is the one perceiving and/or reporting more violence. This finding is in line with previous research. For example, Waltz et al. demonstrated

that increased over-reporting by women relative to their husbands is associated with less marital satisfaction for those women (as cited in Langhinrichsen-Rohling & Vivian, 1994). One interpretation of these findings is that men who over-report violence (relative to their female partner's report) may be particularly conscientious or empathetic, attributes which have been shown to increase relationship satisfaction (Davis & Outhout, 1987). Alternatively, it is possible that satisfaction in a relationship leads women who are experiencing violence at the hands of their male partner not to report it, as suggested by Marshall, Panuzio, Makin-Byrd, Taft, & Holtzworth-Munroe (2011). Broadly, if non-concordance is at least partially a proxy for perpetrator minimization and denial, then our results suggest that these tactics—coupled with a victim's continued persistence in acknowledging the violence—are related to decreased relationship satisfaction.

An additional correlate of IPV non-concordance that we examined was social isolation. No significant relationship was found between the social isolation of the couple and non-directional disagreement, possibly due to the low reliability of the scale used to measure social isolation. However, a significant relationship was found between social isolation and directional non-concordance: women who over-report violence relative to their male partners are more likely to be part of a more socially isolated couple. Gender-specific analyses indicate that women are driving this relationship. Since it has been extensively demonstrated that perpetrators of IPV often attempt to separate their victims from social support (Outlaw, 2009), this finding may simply reflect that tactic. However, it is also possible that an active social network serves as a moderating influence for perpetrators, or serves to hold them accountable for their behavior by reducing their ability to minimize or deny. This 'community' approach is taken by education programs such as Men Stopping Violence's Community Restoration Program, which works to

get male members of communities to address women's safety (Douglas, Bathrick, & Perry, 2008). To the author's knowledge, no previous studies have examined the relationship between social isolation and non-concordance, but the results of the current study suggest that a couple's social isolation from friends may be related to male perpetrator under-reporting.

Finally, the current study analyzed directional non-concordance as a predictor for negative psychological outcomes among female victims of physical IPV, including symptoms of depression and symptoms of anxiety. Generally, IPV victimization is associated with higher rates of depression and anxiety (Pico-Alfonso et al., 2006). The current study sought to examine whether disagreement within a couple about the occurrence of physical IPV might also be associated with increased levels of depression and anxiety for victims. The hypotheses that increased female over-reporting relative to their male partner would be associated with increased female depression and anxiety were supported in the sample as a whole, as well as in the subsample of couples where at least one partner reported some violence. Tests examining the relationship between non-concordance of IPV reporting at participant age 20 and depression at participant age 25 indicate that while non-concordance does not seem to be associated with increasing levels of victim depression over time, non-concordance at participant age 20 is still associated with victim depression at participant age 25. To our knowledge, only one previous study has investigated the relationship between non-concordance and victim depression (none have investigated anxiety), and while it found that disagreement about violence occurrence in general was associated with higher female depression, it did not find significant results to suggest that male under-reporting relative to his female partner was associated with increased depression. Even within the group of couples who reported that violence had happened in their relationship, the results of the current study demonstrate that male under-reporting relative to

women is associated with symptoms of depression and anxiety in female victims of IPV. Overall the findings of this study suggest that women may experience increased feelings of helplessness, fear, or frustration if they feel that their reality is invalidated by their intimate partner's refusal to acknowledge violence.

However, given that most of the associations noted are cross-sectional, there is another possible interpretation of these findings. Women who experience higher levels of depression or anxiety might be more likely to over-report violence relative to their partners as a result of illness symptoms. Previous studies have demonstrated that symptoms of depression and anxiety may include negative cognitive biases or a greater tendency to think of things in absolutes (Krantz & Hammen, 1979; Joormann & Siemer, 2011; Dohr, Rush, and Bernstein, 1989). However, the current study attempts to mitigate this as a possible confound through our use of 'occurrence' rather than 'frequency' data. While it could be argued that a negative cognitive bias may result in someone remembering a particular type of violence (i.e. a slap) as happening more frequently, it is less likely that an individual experiencing depression or anxiety would make up an event entirely. In addition, the fact that non-concordance measures in this study were also associated with the couple's perception of their relationship and social isolation (not just the woman's perception) suggest that reporting bias is unlikely to explain the results noted in this study.

Implications

Clinically, the implications of our results are broad. First, clinicians and community workers engaged in work with women in heterosexual partnerships characterized by physical IPV should be aware that non-concordance may be associated with increased symptoms of depression and anxiety for victims, as well as decreased social support. Further screening or

intervention may be called for in cases where disagreement about violence is evident. Second, programs for perpetrators of IPV may benefit from initiatives designed to decrease perpetrator minimization and denial. Previous studies on the concordance of couples with men in batterer programs have found conflicting information: some have found that male under-reporting decreases relative to their female partners after program completion (Edieson and Brygger, 1986), while others have found that under-reporting actually increases (Heckert & Gondolf, 2000a). Given that the current study has found that male under-reporting of violence is associated with increased depression and anxiety in female victims, it is important for these programs to investigate the most effective ways to influence men to acknowledge and take responsibility for violence perpetration.

The results of the current study also have implications for researchers. First, given the relatively low rates of agreement about violence, it is clear that individual self-report questionnaires such as the CTS may not capture all of the violence that may be occurring in a relationship. Rates of violence occurrence register as much lower when only one partner is polled. Second, researchers examining outcomes or interventions for victims of physical IPV should consider partner concordance, or perpetrator minimization or denial, as relevant factors.

Strengths and Limitations

There are a number of limitations to the generalizability of this study due to its sample, which comes from a cohort born and raised in Australia. Given the research suggesting that violence (and attitudes toward it) are greatly influenced by culture (Vandello & Cohen, 2003), it is unclear whether the results of the current study are applicable in different cultural contexts. Importantly, the sample was selected from a birth cohort and weighted to be high risk for mother depression. Because maternal depression is associated with an increased risk of child depression

(Goodman et al., 2010), depression may be more prevalent in this sample than in the general population. In addition, the sample is largely homogenous in the racial and ethnic groups represented. Given the fact that individuals identifying as White are disproportionately represented in this sample (93.2%), it is unclear whether the patterns discovered would be generalizable to other races. Third, the data used in the current study was collected more than 15 years ago. As culture changes, behavior may change in response, and so older data may no longer reflect today's realities. Current dialogue around intimate partner violence, such as the #metoo movement, may be changing base rates of non-concordance or the relationship of non-concordance to other variables of interest.

This study is also limited by its methods of collecting data from the partners of members of the birth cohort. Participants' relationships to their partners took multiple forms: dating, cohabitation, marriage, or otherwise. Factors such as the length of the relationship or cohabitation may have differential impacts on non-concordance of IPV reports that were not controlled for in this study. All longitudinal data collected prior to the age 20 follow up, such as maternal history of depression, was available only for participants, not for their partners. Participants voluntarily nominated their partners, and they also had the option to bring in a friend or no one at all. As a result, the relationships represented in this study may already be self-selected for factors such as satisfaction or the absence of IPV.

However, there are also a number of notable strengths in the current study. First, it provides data from a community cohort as opposed to a clinical sample. Many previous studies of non-concordance of IPV reports (including the only previous study investigating the relationship between concordance and depression; Langhinrichsen-Rohling & Vivian, 1994) have utilized clinical samples. Studies using data from couples in treatment for substance abuse

(Freeman, Schumacher, & Coffey, 2014) or in marital therapy (Jouriles & O'Leary, 1985) may not necessarily provide information about how this construct works in the general population. Additionally, the current study used both directional and non-directional non-concordance variables, and, as demonstrated, which partner over-reports relative to the other may matter a great deal.

Future directions

It has been well established that rates of concordance between partners about the occurrence and frequency of violence are fairly low, particularly when agreement due to non-occurrence is excluded. Given our findings that male under-reporting of violence relative to their female partners is associated with worse victim outcomes, it may be worthwhile for future research to examine in more detail other relationship characteristics and dynamics that are associated with non-concordance. In particular, researchers may want to examine how well measures of non-concordance reflect the couple's perceived beliefs about disagreement in their relationships. Because couples do not necessarily talk to each other about IPV, they may not actually know that they are in disagreement about violence, or victims may not realize that their partners are denying or minimizing violence perpetration. Thus, non-concordance does not necessarily represent an individual's beliefs about whether or not disagreement is happening within the couple. In order to understand exactly what non-concordance represents and why it may be associated with worse outcomes for victims, it may be helpful to identify how individuals interpret disagreement and how it affects their beliefs and behaviors.

In addition, more research is necessary to investigate perpetrator minimization and denial directly, both in its relation to IPV reporting concordance and as an independent construct. To

the author's knowledge, no previous studies have investigated how victims' *perceptions* of perpetrator minimization and denial are related to their mental health. Examining victims' perception of minimization and denial, as opposed to using report agreement as a representation of actual minimization and denial, will allow researchers to more accurately pinpoint this issue.

Researchers should also examine the hypotheses set out in the current study in relation to other forms of intimate partner violence. It is unclear whether psychological or sexual violence has the same relationship to mental health and relationship factors as physical violence does. Relatedly, researchers should continue to examine how disagreement about the occurrence of violence may be associated with worsened outcomes for victims. Important issues to explore include the likelihood of experiencing long term injury due to a partner's violence, subjective access to personal and professional support resources, and symptoms of post-traumatic stress disorder. It is critical to understand what factors may be related to worse outcomes for victims of IPV in order to better address their needs.

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Table 1
Descriptive statistics for variables of interest

	Mean	Standard Deviation
Directional concordance	0.024	1.378
Non-directional concordance	0.526	1.274
Couple relationship satisfaction	0.018	0.603
Couple social isolation	-0.019	0.553
Female depression at participant age 20	6.504	4.441
Female depression at participant age 25	7.066	7.990
Female anxiety	3.896	2.595

Table 2
Correlations between variables of interest and potential confounds

	Maternal history of depression	Parent income at birth	Parent education level	Ethnicity
Relationship satisfaction	-.195*	.138*	.006	.108
Social isolation	-.118	.115	.033	-.051
Participant age 20 female depression	.140*	-.042	.025	-.119
Participant age 25 female depression	.100	-.049	-.062	.047
Participant age 20 female anxiety	.116	-.081	.017	-.010
Non-directional difference score	-.022	.032	.080	.068
Directional difference score	.034	-.118	-.060	.037

Note. * $p<.05$

Table 3
Analyses of reporting concordance in all couples

	Cohen's Kappa	Yule's Y	Percentage agreement
Occurrence of any physical violence (N=211)	0.4	0.47	80.5
Tried to control physically (N=211)	0.42	0.57	88.2
Threw something at (N=210)	0.39	0.61	91.4
Pushed, grabbed, shoved (N=211)	0.27	0.39	82.5
Slapped (N=211)	0.19	0.48	93.3
Kicked, bit, or hit with a fist (211)	0.24	0.58	94.7
Choked or strangled (N=211)	0.24	0.65	97.2
Beat up (N=211)	-0.01	N/A	97.6
Threatened with knife or gun (N=211)	0.5	N/A	99.1
Used a knife or gun (N=209)	-0.01	N/A	98.1

Table 4
Analyses of reporting concordance in couples experiencing violence

	Cohen's Kappa	Yule's Y	Percentage agreement
Occurrence of any physical violence (N=63)	-0.482	N/A	34.9
Tried to control physically (N=37)	-0.51	N/A	32.4
Threw something at (N=25)	-0.52	N/A	28
Pushed, grabbed, shoved (N=48)	-0.62	N/A	22.9
Slapped (N=16)	-0.75	N/A	12.5
Kicked, bit, or hit with a fist (N=13)	-0.64	N/A	15.4
Choked or strangled (N=7)	-0.75	N/A	14.3
Beat up (N=5)	-0.923	N/A	0
Threatened with knife or gun (N=3)	N/A	N/A	33.3
Used a knife or gun (N=4)	N/A	N/A	0

Table 5
Regression analyses for relative male under-reporting as a predictor of female partner psychopathology in all couples

	Variables	β	*t*	*p*	r^2 change
Participant age 20 depression (N=209)	Model 1				0.018
	Maternal depression at youth age 15	0.133	1.928	0.055	
	Model 2				0.034
	Maternal depression at youth age 15	0.127	1.864	0.064	
	Directional reporting difference	0.184	2.706	0.007*	
Participant age 25 depression (N=95)	Model 1				0.042
	Directional reporting difference	0.206	2.030	0.045*	
	Model 2				0.202
	Directional reporting difference	0.100	1.072	0.287	
	Depression at age 20	0.462	4.959	0.000*	
Participant age 20 anxiety (N=209)	Directional reporting difference	0.233	3.453	0.001*	0.054

Note. * $p<.05$

Table 6
Regression analyses for relative male under-reporting as a predictor of female partner psychopathology in couples experiencing violence

	Variables	β	*t*	*p*	r^2 change
Participant age 20 depression (N=63)	Model 1				0
	Maternal depression at youth age 15	-0.017	-0.132	0.896	
	Model 2				0.13
	Maternal depression at youth age 15	-0.038	-0.311	0.757	
	Directional reporting difference	0.361	2.992	0.004*	
Participant age 25 depression (N=28)	Model 1				0.170
	Directional reporting difference	0.413	2.310	0.029*	
	Model 2				0.089
	Directional reporting difference	0.245	1.242	0.226	
	Depression at age 20	0.342	1.729	0.096	
Participant age 20 anxiety (N=63)	Directional reporting difference	0.408	3.487	0.001*	0.166

Note. * $p<.05$

Appendix A
Item List: Modified Conflict Tactics Scale

How often did you do this to your partner in the past year?
1) Tried to control your partner physically (held down, etc.)
2) Threw something at your partner
3) Pushed, grabbed, or shoved your partner
4) Slapped your partner
5) Kicked, bit, or hit your partner with a fist
6) Choked or strangled your partner
7) Beat up your partner
8) Threatened your partner with a knife or gun
9) Used a knife or gun

OR

How often did your partner do this in the past year?
1) Tried to control you physically (held you down, etc.)
2) Threw something at you
3) Pushed, grabbed, or shoved you
4) Slapped you
5) Kicked, bit, or hit you with a fist
6) Choked or strangled you
7) Beat you up
8) Threatened you with a knife or gun
9) Used a knife or gun