[Article in press, *Journal of Comparative Psychology*, May 2016]

Female-Directed Violence as a Form of Sexual Coercion in Humans *(Homo sapiens)*

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Abstract

Male-perpetrated female-directed violence may be associated with greater sexual access to a female. Accordingly, female-directed violence is expected to be associated with greater copulation frequency. Research on nonhuman primates affirms this hypothesis, but no previous research has investigated this relationship in humans. The current research tests the hypothesis that female-directed violence is associated with in-pair copulation frequency and, thus, may function as a form of sexual coercion. It was predicted that men who perpetrate female-directed violence will secure more in-pair copulations than men who do not perpetrate violence (Prediction 1a), and that average monthly rates of female-directed violence would positively correlate with in-pair copulation frequency (Prediction 1b). Male participants (n = 355) completed a survey, reporting limited demographic information (e.g., age, relationship length), in-pair copulation frequency, and history of physical violence perpetration. As predicted, violent men secured more in-pair copulations, on average, than nonviolent men, and monthly rates of violence positively correlated with in-pair copulation frequency. In humans, as in nonhuman primates, female-directed violence by males may facilitate greater sexual access to a female. We discuss the implications of the current research for an evolutionary perspective on partner violence, and draw on research on nonhuman primates to highlight profitable avenues of research on female-directed violence in humans.

Keywords: Intimate partner violence; sexual coercion; in-pair copulation; violence against women; reproductive strategies; evolutionary psychology.

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Sexual conflict occurs when the reproductive interests of males and females differ (Parker, 2006). Sexual conflict is common in mating situations because of the differences in size and energy costs for developing sperm and ova. In humans, females invest considerably more time and energy than males in reproduction and rearing offspring (Trivers, 1972). The minimum obligatory parental investment for men can end with a single copulation and ejaculate. For women, however, parental investment requires at least nine months of pregnancy. In most sexually reproducing organisms, including humans, the reproductive success of males is limited by the number of matings with fertile females. For females, in contrast, reproductive success is limited by the time and energy required to rear offspring (Bateman, 1948; Trivers, 1972).

Because male reproductive success is limited by sexual access to females, selection may have favored male traits that facilitate sexual access by using force to overcome female sexual resistance (Muller, Kahlenberg, & Wrangham, 2009)—a behavior termed "sexual coercion" (Smuts & Smuts, 1993). Sexual coercion is described as the use of *male force* to secure and maintain *sexual access* to a female (Smuts & Smuts, 1993). Males are hypothesized to use aggression strategically to secure sexual access to females.

Sexual coercion is the predominant explanation for female-directed violence in nonhuman primates (Muller & Wrangham, 2009). That is, female-directed violence functions to increase a male's sexual access to a female. For female-directed violence to qualify as a form of sexual coercion within the framework provided by Smuts and Smuts (1993), female-directed violence should be associated with greater copulation frequency with the female at a time when she is likely to be fertile (Muller, Kahlenberg & Wrangham, 2009). The "sexual coercion" hypothesis has also been proposed as an explanation for female-directed violence in humans (Camilleri & Quinsey, 2012), but this hypothesis has not yet been tested empirically in humans. The current research addresses this empirical gap in the literature, and investigates whether female-directed violence functions as a form of sexual coercion in humans, as has been documented in nonhuman primates.

Research in nonhuman primates documents a positive relationship between female-directed violence and male mating success. That is, violent male behavior against a female functions as a form of sexual coercion (Muller & Wrangham, 2009). In Japanese macaques (*Macaca fuscata fuscata*), dyads in which a male perpetrated violence against a fertile female had higher copulation rates than dyads in which a male did not perpetrate violence against a fertile female (Soltis, Mitsunaga, Shimizu, Yanagihara, & Nozaki, 1997). Similarly, research on chimpanzees (*Pan troglodytes schweinfurthii*) documented a positive relationship between the frequency of violence against fertile females—operationalized as charging displays, chases, and contact aggression—and the number of copulations the perpetrating male secured with those females. Additionally, individual males secured more frequent copulations with females against whom they were more (vs. less) violent (Muller, Kahlenberg, Thompson, & Wrangham, 2007).

Compared to nonhuman primates, humans display several unique characteristics. Although women are less promiscuous than some other nonhuman primate females, mated women can secure genetic and non-genetic benefits from extra-pair copulations (Gangestad & Thornhill, 2004). Men and women also form pair-bonds in the context of multi-male, multi-female groups, but pair-bonded men and women sometimes spend extended periods of time physically apart—providing opportunities for women to secure extra-pair copulations surreptitiously. Additionally, ovulation is relatively concealed in humans (Thornhill & Gangestad, 2008). In humans, female-directed violence is not necessarily constrained to times of high fertility, but rather women of reproductive age are at greater risk of male violence than nonreproductive-age women (Peters, Shackelford, & Buss, 2002). Because men often invest substantially in their putative offspring, a partner's infidelity places men at risk for incurring substantial costs (Daly & Wilson, 1988; Smuts, 1992), such as cuckoldry (i.e., unwitting investment in offspring to whom a man is not genetically related; Buss & Shackelford, 1997). This unique combination of features may render male sexual coercion especially likely to occur in humans (Smuts, 1992; Muller et al., 2009).

Previous research has identified several factors that may motivate female-directed violence in humans, including aggressive and hostile male personality characteristics (Carrado, George, Loxam,

Jones, & Templar, 1996; Hill et al., 2013; Malamuth & Thornhill, 1994), alcohol consumption by both sexes (Caetano, McGrath, Ramisetty-Mikler, & Field, 2005), and the expression of dominance and control by men over an intimate partner (Stuart et al., 2006). An evolutionary psychological perspective suggests that men's violence against their partner may be, ultimately, sexually motivated, and may facilitate exclusive sexual access to a partner. Consistent with this hypothesis, research has demonstrated that men who perceive a greater risk of partner infidelity perpetrate more frequent partner-directed violence (Kaighobadi et al., 2009). Men's accusations of their partner's sexual infidelity predict men's violence against their partner (Kaighobadi, Starratt, Shackelford, & Popp, 2008). Cross-culturally, male sexual jealousy (resulting from actual or imagined partner infidelity) is a leading cause of female-directed violence and homicide (Daly, Wilson, & Weghorst, 1982; Buss, 2000; see also Puente & Cohen, 2003; Archer, 2006).

Smuts and Smuts (1993) offer a functional definition of sexual coercion: The use of male force against a female to secure sexual access to that female. Importantly, this definition specifies the conditions under which female-directed violence can be interpreted as a form of sexual coercion (Muller et al., 2007). These conditions include female-directed violence intensifying in reproductive contexts (e.g., in humans, committed relationships), female-directed violence being targeted at fertile females (e.g., in humans, reproductive age women), and higher rates of female-directed violence being associated with higher copulation rates with that female (Smuts & Smuts, 1993). Previous research in humans, however, has not investigated whether female-directed violence is associated with more frequent sexual access to the female victim (i.e., higher in-pair copulation frequency).

The current research addresses whether female-directed violence functions as a form of sexual coercion in accordance with the definition provided by Smuts and Smuts (1993; see also, Camilleri & Quinsey, 2012; Muller & Wrangham, 2009). We hypothesize that female-directed violence will be associated with more frequent sexual access to a man's in-pair partner. The current research tests this hypothesis in two ways. First, we compare in-pair copulation frequency for men who have perpetrated violence against their partner with in-pair copulation frequency for men who have not perpetrated

violence against their partner. We predict that men who perpetrate female-directed violence will secure more in-pair copulations than men who do not perpetrate violence (Prediction 1a). Second, we investigate the relationship between rates of female-directed violence and in-pair copulation frequency. We predict that average monthly rates of female-directed violence will positively correlate with in-pair copulation frequency (Prediction 1b). We secured self-report data from men in heterosexual, committed relationships to investigate whether, as in several nonhuman primates, female-directed violence may function as a form of sexual coercion in humans.

Method

Participants

Participants were 355 men in a committed, heterosexual, sexual relationship for at least one month. The mean age of participants was 22.8 years (*SD* = 5.1), the mean age of men's partners was 21.5 years (*SD* = 4.0), and the mean relationship length was 27.5 months (*SD* = 28.1). Participants were recruited from the university at which the research was conducted and from the surrounding community. However, specific information regarding what proportion of participants were university students and community members was not collected. Because of the sensitive nature of the data collected in the current study, we were allowed to collect minimal demographic information from participants (e.g., age, relationship length), and were not able to obtain reports from the men's partners, or information regarding the socioeconomic status of either partner. Different subsets of these data have been used to conduct different analyses designed to test different hypotheses (e.g., Kaighobadi & Shackelford, 2008).

Procedure

Prospective participants who met the following criteria were eligible to participate: (1) male, (2) at least 18 years old, (3) currently in a committed, heterosexual, sexual relationship for at least one month, and (4) had a female partner between the ages of 18 and 35 years. Prospective participants arrived at a specified location and read a consent form. Participants who met the criteria and agreed to participate were provided a survey, reporting limited demographic information, in-pair copulation frequency, and physical violence perpetration, and returned the completed survey to the researcher in a sealed envelope.

Measures

Participants recorded limited demographic information, including their age, their partner's age, and the length of their current heterosexual, committed relationship. To assess *in-pair copulation frequency*, men reported a whole number in response to the question, "How frequently do you and your partner have sexual intercourse in an average or typical week (7 days)?"

Female-directed violence was assessed with the Violence Assessment Index (VAI; Dobash, Dobash, Cavanagh, and Lewis, 1995, 1996). The VAI includes 24 items; however, the current research is focused on *physical* violence inflicted on the partner. Eight items in the VAI do not assess female-directed violence as operationalized in the current research (e.g., "Threatened to kill yourself") and, therefore, responses to these items were excluded from analyses. Additionally, one item explicitly refers to forced sexual activity (i.e., "Forced partner to have sex or some kind of sexual activity"). Responses to this item were excluded from analyses to avoid confounding the relationship between physical violence and in-pair copulation frequency. The modified VAI measure included 15 items (see Table 1) assessing physically violent acts directed at a female partner (e.g., "Punched partner in the face"). Research by Dobash and colleagues (1995, 1996) has demonstrated adequate reliability and validity of the full-scale VAI. The reliability of the modified VAI used in the current research was less than ideal (Cronbach's alpha = .52), but defensibly adequate to proceed with tests of the research hypotheses.

Participants responded to each statement of the VAI twice. First, they were instructed to indicate with a checkmark whether they had perpetrated each physically violent act in the previous one month. Participants who indicated that they had perpetrated at least one act of physical violence in the previous one month were placed in the *female-directed violence (FDV) in past month* group. Participants who indicated that they had not perpetrated any act of physical violence in the past month were included in the *no FDV in past month* group. Sixteen percent of men (n = 56) reported perpetrating physical violence against their partner in the previous one month.

Participants were then instructed to indicate how often they perpetrated each violent act throughout the duration of the relationship with their partner, on a 6-point scale (0 = *act never occurred*; 1

= *act occurred 1 time*; 2 = *act occurred 2 times*; 3 = *act occurred 3 to 5 times*; 4 = *act occurred 6 to 10 times*; 5 = *act occurred 11 or more times*). Responses to each statement were recoded as the midpoint of the response category the participant reported. For example, if the participant reported an act occurring "3-5 times in this relationship," the response was recoded as occurring 4 times in the relationship. Responses indicating "act occurred 11 or more times" were recoded as occurring 15 times in the relationship. Composite scores for the female-directed violence frequency were calculated by summing the recoded response category midpoints.

Results

Results of a bivariate correlational analysis revealed a positive relationship between frequency of female-directed violence and relationship length ($r = .10$, $p < .05$); however, the VAI assesses frequency of female-directed violence throughout the relationship and, thus, men who have been in a relationship for a longer period of time have more opportunities to inflict violence upon their partner. Therefore, we calculated average monthly rates of female-directed violence by dividing summed female-directed violence scores by the relationship length ($M = 0.13$, $SD = 0.39$; range 0-4.6 physically violent acts per month), to control for differences in relationship length. Thirty-six percent of men ($n = 127$) had non-zero monthly rates of female-directed violence, which is consistent with rates identified in previous research on similar samples (e.g., Bélanger, Mathieu, Dugal, & Courchesne, 2015; Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006; McHugh & Frieze, 2006).

Prediction 1a was tested by conducting an independent-samples *t*-test comparing the means for in-pair copulation frequency between the two violence groups. Men in the *FDV in past month* group ($M = 4.39$, $SD = 3.26$) secured more in-pair copulations per week, on average, than men in the *no FDV in past month* group ($M = 3.28$, $SD = 2.42$), with a mean difference of 1.11 in-pair copulations per week ($t = 2.96$, $p < .01$; 95% CI [.37, 1.85]; see *Figure 1*). Prediction 1b was tested with bivariate correlation analysis. Results indicated that monthly rates of female-directed violence positively correlated with in-pair copulation frequency ($r = .20$, $p < .001$). Men who more frequently perpetrated violence against their partner secured more in-pair copulations per week, on average.

Discussion

The current research investigated whether female-directed violence in humans functions as a coercive strategy to secure more frequent sexual access to an in-pair partner. Men who perpetrated physical violence against their partners in the past one month secured more in-pair copulations per week than men who did not perpetrate violence against their partners in the past one month (Prediction 1a). Additionally, average monthly rates of female-directed violence were positively correlated with in-pair copulation frequency (Prediction 1b). These results provide initial evidence that female-directed violence in humans, as in several nonhuman primates, may be a form of sexual coercion (Smuts & Smuts, 1993; Muller & Wrangham, 2009).

The current study corroborates previous research addressing the sexual correlates of female-directed violence in humans (e.g., Peters, Shackelford, & Buss, 2002; Kaighobadi et al., 2009) and nonhuman primates (e.g., Soltis et al., 1997; Muller et al., 2007). Although previous research documents that men may be motivated to perpetrate violence against their partner to secure sexual access (Goetz, Shackelford, Romero, Kaighobadi, & Miner, 2008; Figueredo, Gladden, & Beck, 2012), previous research has not directly tested the sexual coercion hypothesis in humans. The results of the current research provide initial confirmation that men who perpetrate violence against their partner secure more frequent sexual access to their partner, and that rates of partner violence are positively associated with in-pair copulation frequency. Female-directed violence, then, may function as a form of sexual coercion in humans (Smuts & Smuts, 1993; Muller & Wrangham, 2009).

The sexual coercion framework provided by Smuts and Smuts (1993) classifies sexual coercion in nonhuman primates into two types: Direct coercion and indirect coercion. The results of the current research provide support for the hypothesis that female-directed violence functions as a form of direct sexual coercion in humans, in that physical violence is associated with in-pair copulation frequency. More generally, there is a lack of research addressing the ultimate function of physical violence in *human* relationships (both direct and indirect coercion). Camilleri and Quinsey (2012) argue that, in human relationships, physical violence may function as direct coercion by increasing the probability of

copulating with an in-pair partner, or it may function as indirect coercion by decreasing the probability of a woman's extra-pair mating or of the woman leaving her current mate—or both. For example, Hill and colleagues (2013) showed that traits associated with male-male competition (e.g., dominance) predicted men's mating success, whereas traits favored by female choice (e.g., attractiveness) did not predict men's mating success. This is suggestive of dominant men being more successful in mate guarding their partner and, thereby, securing greater sexual access to their in-pair partner—supporting the indirect coercion hypothesis. It is important to note, however, that physical violence can function as both direct and indirect coercion, and research should further investigate the potential multi-functional nature of female-directed violence. Future research could profitably employ a longitudinal design to investigate whether physical violence in relationships is associated with decreases in a woman's future extra-pair mating, and the likelihood of a woman leaving her partner.

Results of the current research corroborate findings reported by Muller et al. (2007) and Soltis et al. (1997), who documented a positive relationship between rates of female-directed violence and copulation frequency in chimpanzees and Japanese macaques, respectively. However, there are important differences in the mating systems of humans and nonhuman primates that should be considered when interpreting the results of the current research. Humans often form long-term pair bonds, whereas many nonhuman primates, such as chimpanzees, mate promiscuously. Muller et al. (2007) showed that males had greater copulation rates with females against whom they were more (vs. less) aggressive. Male chimpanzees copulate with multiple females and, thus, comparing one male's rate of aggression with copulation frequencies with multiple females affords control of individual differences in male aggression and social status. Participants in the current research, however, were in committed relationships. Comparing in-pair copulation frequency of physically violent men and nonviolent men does not afford the same control of individual differences in male aggression as can be achieved in research with nonhuman primates.

Future research exploring the relationship between female-directed violence in humans could benefit from securing measures of men's general propensity for aggressive behavior, testosterone titers, or

overall mate value. The same traits that predispose men to be aggressive also may facilitate greater sexual access to women, more generally. Controlling for individual differences in men's propensity for aggression could provide stronger evidence for the relationship between female-directed violence and in-pair copulation frequency. Future research might also test the current research hypothesis in polygamous human relationships in which one man is in consensual non-monogamous relationships with at least two women. Securing measures of male-perpetrated violent behavior and copulation frequency with multiple female partners would afford closer methodological replication of Muller et al (2007) and Soltis et al. (1997).

Alternatively, female choice may account for the relationship between female-directed violence and in-pair copulation frequency (but see Muller, Thompson, Kahlenberg, & Wrangham, 2011). Cross-culturally, women prefer as partners men that are dominant (Conroy-Beam, Buss, Pham & Shackelford, 2015) and, thus, it may be that dominant men or men that express more masculine personality traits are also more aggressive, have more frequent (non-coercive) in-pair copulations, or both. Moreover, research has shown that women prefer dominant men in the context of male-male competition (i.e., as a demonstration of the male's ability to protect her from rival males; Snyder, Kirkpatrick, & Barrett, 2008)—but women do not prefer as partners men who demonstrate aggressive behavior toward women (Li et al., 2014). Instead, research has shown that women prefer as long-term romantic partners men that are lower in dominance but high in prestige (Snyder, Kirkpatrick, & Barrett, 2008). Further, for normally cycling women, women's preferences for dominant men, specifically, are stronger during high-fertility periods in their menstrual cycle (Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen, 2004).

Given that intimate partner violence research typically focuses on female-directed violence in committed relationships, future research investigating the role of female choice on the relationship between female-directed violence and in-pair copulation frequency could benefit by differentiating dominance and prestige, and track preference changes across the menstrual cycle. That is, under certain conditions, women may select dominant and coercive (or prestigious) partners and, therefore, may be more likely to produce dominant and coercive sons, or daughters that express preferences for dominant

and coercive men—a version of the "sexy sons" hypothesis (Fisher, 1958). Future research can explore these possibilities in heterosexual couples by obtaining self-reports (from men) and partner-reports (from women) of a man's dominance and prestige.

It is important to note that the results of the current research are correlational in nature and strong causal claims are not defensible. Future research could employ a longitudinal design to investigate whether men's use of violent behaviors against an in-pair partner increases future in-pair copulation frequency. Additionally, longitudinal studies could elucidate whether female-directed violence in relationships decreases instances of future partner infidelity or, alternatively, increases the likelihood of a woman ending a relationship with an abusive partner.

It is also important to acknowledge that the reliability of the VAI used in the current research was less than ideal. The relatively low Cronbach's alpha may be due to some VAI items having zero-variance across participants and, thus, prevents calculation of inter-item correlations. Additionally, the VAI was originally developed with men convicted of partner-directed violence or seeking treatment for partner-directed violence. The difference in study samples may account for the lower than expected internal reliability. However, the frequency of female-directed violence documented in the current sample is in accordance with the frequency of female-directed violence documented in other community samples utilizing different violence measures (e.g., Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006; McHugh & Frieze, 2006). Moreover, other research with community samples (Shackelford & Goetz, 2004) has demonstrated good construct validity of the VAI, showing a positive relationship between physical violence perpetration frequency and other forms of intimate partner aggression. Future research should replicate these findings utilizing different physical violence measures.

As noted above, due to the sensitive nature of the data collected in the current study, we were allowed to collect minimal demographic information from participants (e.g., age, relationship length), and were not able to obtain reports from the men's partners. Therefore, the current study did not control for potential demographic confounds, such as socioeconomic status or level of education of both partners in the relationship, and neither did we examine the dyadic processes that might influence the relationship

between physical violence and in-pair copulation frequency. Further research in this area could also collect information concerning whether individuals have children with their current partner, or from a previous partner—which has been shown to be a risk factor for domestic violence (Burch & Gallup, 2004; Daly & Wilson, 1988). To be clear, given the results of the current study, we are in no way condoning the use of physical violence as a means to engage in in-pair copulation. The hypothesis tested in the current study is derived from evolutionary meta-theory and supported by comparative research in nonhuman primates.

The current research investigated whether female-directed violence may function as a form of sexual coercion in humans, as has been documented in several nonhuman primates. We tested whether, in humans, female-directed violence was associated with in-pair copulation frequency and, therefore, functions as sexual coercion in accordance with Smuts and Smuts (1993) and Muller et al. (2009). The results of the current research provide initial evidence that partner-violence can be understood as a form of sexual coercion deployed by men to secure more frequent sexual access to their partner. Specifically, we showed that physically violent men secure more in-pair copulations per week than nonviolent men, and that the average monthly rate of female-directed violence is positively correlated with in-pair copulation frequency. The current research adds to the literature addressing intimate partner violence from an evolutionary perspective, and suggests several avenues for future research investigating the functions of female-directed violence (Smuts & Smuts, 1993).

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Table 1. Items denoting physical violence toward a female partner from the Violence Assessment Index (VAI) used in analyses.

Original Item Number	Item
1	Restrained partner from moving or leaving the room
2	Chocked partner or held your hand over partner's mouth
3	Punched partner in the face
4	Forced partner to do something against her will
5	Slapped partner on the face, body, arms, or legs
6	Punched, grabbed, or shoved partner
8	Punched partner on the body, arms, or legs
9	Used object to hurt partner
10	Threw things at partner
14	Tried to smother or drown partner
15	Kicked partner in the body, arms, or legs
18	Kicked partner in the face
21	Twisted partner's arm
22	Dragged or pulled partner by the hair
24	Kicked or punched partner in the stomach when pregnant

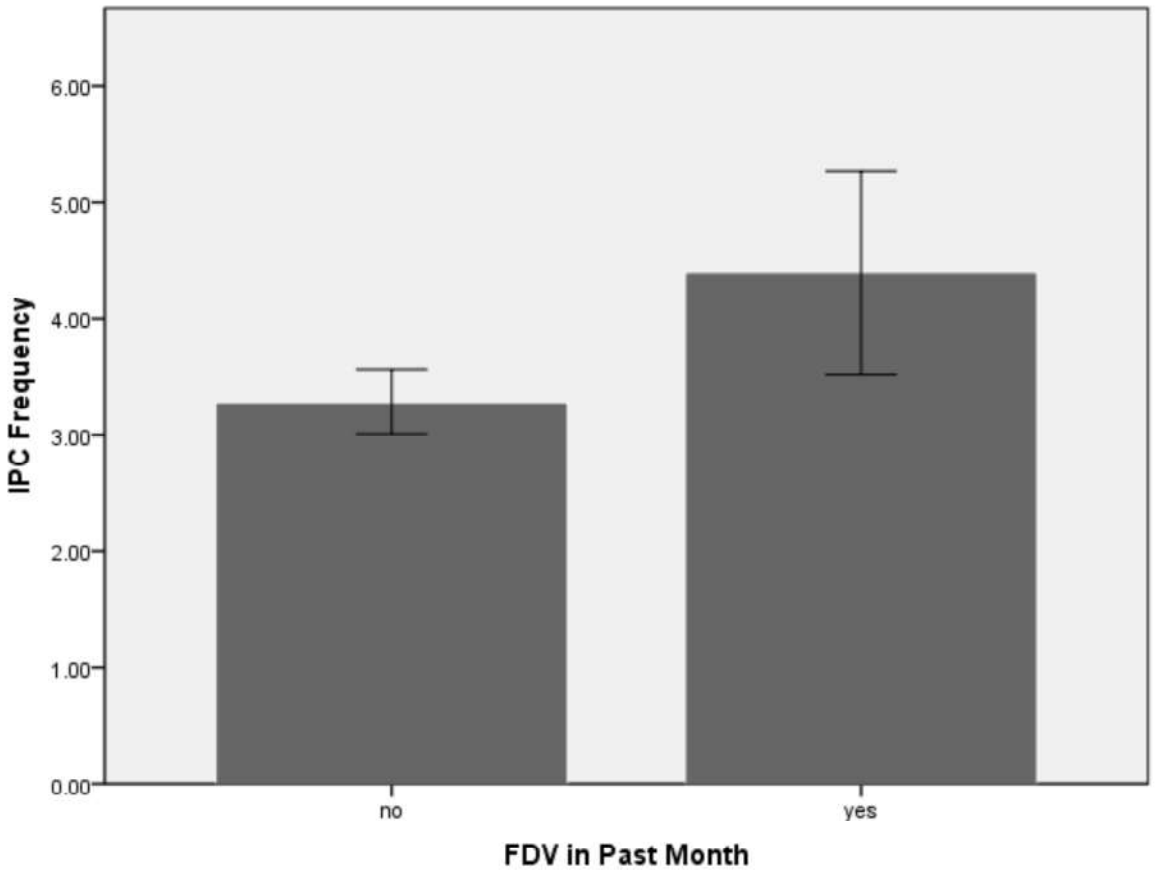

Figure 1. Mean differences in in-pair copulation (IPC) frequency per week as a function of female-directed violence (FDV) perpetration in the past one month. IPC frequency means are significantly different at $p < .01$. Error bars represent 95% confidence intervals.