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Female Intimate Partner Violence Perpetration: Stability and Predictors of Mutual and Non-Mutual Aggression Across the First Year of College

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Abstract

Cross-sectional and longitudinal predictors of mutual and non-mutual intimate partner violence perpetration (IPV) were identified in a sample of female college freshmen ($N = 499$). Using female reports, couples were classified as to whether the relationship included no IPV, female only IPV, or mutual IPV (male only IPV was too rare to analyze). Mutual IPV was more common than asymmetrical IPV, and women in mutually violent relationships perpetrated more frequent acts of physical aggression than those in female-only violent relationships. In cross-sectional analyses of IPV in the first semester of college, only partner antisocial behavior and psychological aggression distinguished female-only IPV from no IPV; witnessing mother to father aggression, higher psychological aggression, more frequent partner marijuana use, partner antisocial behavior, and, surprisingly, higher relationship satisfaction, discriminated mutual IPV from the no IPV. Contrary to hypothesis, first semester (T1) IPV did not predict having a new partner in the second semester (T2); however, women who reported more frequent heavy episodic drinking and lower relationship satisfaction at T1 were more likely to be in a different relationship at T2. Prospective prediction of T2 IPV category failed to support the hypothesis that female-only IPV would escalate to mutual IPV. The majority of couples with female-only IPV reported no IPV at T2. After accounting for T1 IPV, the only significant predictor of T2 IPV category was T1 psychological aggression, suggesting that this may be an appropriate target for IPV prevention efforts among college dating couples.

Women, like men, perpetrate acts of physical aggression toward their intimate partners. Using act-based measures of physical aggression such as the CTS, rates of female-to-male intimate partner violence (IPV) are slightly higher than comparable rates of male-to-female IPV, particularly among younger, dating, and student samples (Archer, 2000). Within college samples, approximately one third of men and women report perpetrating IPV toward a dating partner within the past year, both in US (Arias, Samios, & O'Leary, 1987; Gover, Kaukinen, & Fox, 2008; White & Koss, 1991) and international samples (Straus, 2004). Perpetration by one partner is the strongest predictor of perpetration by the other partner (e.g., Baker & Stith, 2008; Harned, 2002) and the majority of violence in dating couples is mutual (Stets & Straus, 1989). However, in some couples, IPV is perpetrated by only one partner. Among samples of college students and other young adults in dating relationships, it

is more common to find couples in which the female but not the male is violent compared to the reverse (Orcutt, Garcia, & Pickett, 2005; Straus, 2008; Whitaker, Haileyesus, Swahn, & Saltzman, 2007). This pattern, coupled with studies indicating that women are more likely than men to initiate violence (Capaldi, Kim, & Shortt, 2004) and failing to support self-defense as a unique predictor of female IPV perpetration (Flynn & Graham, 2010; Hettrich & O'Leary, 2007) suggests the importance of identifying factors contributing to female aggression.

Research on the predictors and development of female perpetrated aggression has lagged behind research on male perpetrated aggression, particularly in the case of dating as opposed to married couples (Shorey, Cornelius, & Bell, 2008). Much of this research has been limited to cross-sectional designs and has rarely considered partner characteristics, despite the interactional nature of couple conflict and aggression. The current study considered predictors of female-perpetrated IPV within a college sample. Because this developmental period is marked by increasing substance use (White et al, 2006) and high prevalence of problems associated with alcohol use, including physical fights (Perkins, 2002), we considered the impact of the substance use of both partners on female-perpetrated IPV, cross-sectionally and prospectively. In addition, the availability of prospective data allowed us to examine other variables as predictors of changes in IPV over time.

Substance Use and Other Individual Level Predictors of IPV

Cross-sectional studies of IPV in college and late adolescent samples have identified several individual level predictors of both male and female IPV perpetration. These predictors, which tend to be consistent for male and female perpetration, include witnessing or experiencing parental violence (Schwartz, Hage, Bush, & Burns, 2006); antisocial personality (Andrews, Foster, Capaldi, & Hops, 2000); and stress (Medeiros & Straus, 2006). Alcohol intoxication has also been positively associated with perpetration of violence, with evidence pointing toward alcohol-induced cognitive impairment as a likely mechanism (Leonard, 2008). A recent meta-analysis found a small effect of women's drinking on IPV perpetration compared to a medium effect for men's; however the women's effect size was based on a much smaller number of studies (Foran & O'Leary, 2008). Similarly, laboratory studies suggest that alcohol has a larger effect on male aggression compared to female aggression (Giancola et al, 2009). Some studies of college students show that alcohol use is positively associated with IPV perpetration among both men and women (Hines & Straus, 2007; Hove, Parkhill, Neighbors, McConchie, & Fossos, 2010; Luthra & Gidycz, 2006; Simons, Gwin, Brown, & Gross, 2008). However, others suggest that the relationship is a moderated rather than direct (Fossos, Neighbors, Kaysen, & Hove, 2007; Gallagher & Parrott, 2010) or find the relationship only for males (Follingstad, Bradley, Laughlin, & Burke, 1999; Medeiros & Straus, 2006).

A few studies have considered whether alcohol use has a prospective influence on later dating violence (e.g., Foshee, Linder, MacDougall, & Bangdiwala, 2001; Magdol, Moffitt, Caspi, & Silva, 1998); however, to our knowledge only one study has considered the prospective association between alcohol use and IPV within a college dating sample. In that study, Stappenbeck and Fromme (2010) found a positive effect of alcohol consumption on later IPV among women, from Year 2 to Year 3. For men, there was a cross-sectional association at one time point but no prospective relationship. In this study, IPV was defined as either victimization or perpetration and identity of the partner was not considered.

Marijuana and other drugs have also been positively associated with IPV, based on the National Household survey on Drug Abuse (N = 19,000, Stalans & Ritchie, 2008) and a recent meta-analytic review (Moore et al, 2009). However, few studies have examined drug

use and IPV in college populations. In two recent studies with young adult participants, marijuana use was longitudinally associated with IPV perpetration for men but not women (Feingold, Kerr, & Capaldi, 2008; Nabors, 2010). The positive association of marijuana and aggression is curious given that marijuana's pharmacological effects are thought to reduce aggression (Boles & Miotto, 2003; Myerscough & Taylor, 1985). However, marijuana use has been prospectively associated with poorer intimate relationship functioning (Brook, Pahl, & Cohen, 2008) and has been associated with IPV perpetration via its relationship to ASPD and alcohol problems (Feingold et al, 2008). Hence, there may be a distal association with relationship aggression through these factors.

Development of IPV within Relationships

Because IPV occurs within couples, individual risk factors are not sufficient to account for the level of aggression within a relationship. Numerous studies reveal that the best predictor of IPV perpetration is that person's experience of victimization within the relationship (Anderson, 2002; Baker & Stith, 2008; Edwards, Desai, Gidycz & VanWynsberghe, 2009; Magdol et al, 1997), a pattern consistent with studies showing that most intimate partner violence is mutual. Nonetheless, there is little consensus as to how mutual aggression might develop within a relationship. For example, mutual violence might occur because of assortative mating, as people affiliate with partners who are similarly prone to violence or poor at conflict resolution or communication. It is also possible that a more dynamic process is at work. For example, psychological aggression predicts physical aggression not only cross-sectionally (Edwards et al, 2009); but also longitudinally (Schumacher & Leonard, 2005), suggesting an escalation from verbal to physical aggression over time. It is also plausible that once physical aggression is initiated by one partner, the other partner tends to respond in kind, either within the incident, or gradually over time. Accordingly, mutually violent couples exhibit the highest frequency of violent acts relative to couples in which only one partner is aggressive (Gray & Foshee, 1997; Orcutt et al, 2005). Studies of college student samples suggest that women are more likely than men to initiate aggression (Hines & Saudino, 2003) and rarely attribute their aggression to self-defense (Hettrich & O'Leary, 2007). However, an unanswered question is whether couples in which one partner is aggressive escalate to mutual violence over time and if so, what variables make this escalation more likely.

A limited number of studies have examined IPV over time among dating or college samples (see Williams, Ghandour, & Kub, 2008 for a review). Graves, Sechrist, White, and Paradise (2005) examined women's experiences of victimization and perpetration over 4 years of college. They found the expected cross-sectional associations between IPV perpetration and victimization at each time point; however, contrary to predictions, women who experienced physical victimization at one point in time were not more likely to perpetrate violence at the next time point; rather, two of the three cross-lagged associations were negative. Probing revealed that this effect was due to decreased IPV perpetration among women in violent relationships, rather than an increase for women in non-violent relationships. The effect may reflect desistance over time; however, because the study did not consider the identity of the partner, it is plausible that women in violent relationships ended them by the next time point (see Rhatigan & Street, 2005; Testa, Livingston, & Leonard, 2003). Because college students tend to have multiple relationships of short duration (Cooper, 2002; Corbin & Fromme, 2002), it is critical to consider partner identity in studying IPV over time.

A few longitudinal studies of dating violence have considered partner change over time. Capaldi, Shortt, and Crosby (2003) found, not surprisingly, greater stability in IPV perpetration over time (2.5 years) for young men (ages 15.6 – 27.4) who remained in the same relationship compared to those who changed relationships. However, they also found

increases in IPV over time for stable relationships. On the other hand, IPV increased the likelihood of subsequent relationship dissolution over time within this sample (Shortt, Capaldi, Kim, & Owen, 2006). Fritz and Slep (2009) examined physical and psychological dating aggression in a sample of 664 high school students followed over one year. They found increases in psychological but not physical aggression associated with relationship continuity over time. This finding is consistent with cross-sectional findings that longer, more committed relationships are more likely to include partner aggression (see Lewis & Fremouw, 2001 for a review). As expected, and consistent with Capaldi et al, the correlation of IPV perpetration at an earlier time point with IPV perpetration at a later time point was significantly higher for continuous relationships (range, .40 – .71) compared to new relationships (.09 – .38). However, the modest correlations in IPV perpetration across new relationships suggests some consistency in an individual's propensity toward aggression apart from his or her partner's aggression.

In another longitudinal study of adolescent dating violence, Herrera, Wiersma, and Cleveland (2008) considered the impact of relationship continuity and characteristics of both partners as predictors of IPV perpetration. They found that IPV within a relationship was a function both of an individual's own violent tendencies as well as experiences of victimization specific to the relationship. For women, their own violent tendencies resulted in IPV perpetration when they were in relationships with violent men; however, when partnered with non-violent men, violent tendencies did not predict relationship violence. Also supporting the role of one partner's characteristics in IPV, higher levels of antisocial personality and depressive symptoms among female partners were longitudinally predictive of perpetration by the male partner (Kim, Laurent, Capaldi, & Feingold, 2008).

The Present Study

The current study was designed to test several hypothesis regarding cross-sectional and prospective predictors of female-perpetrated and mutual IPV across the first year of college. First, we tested the hypothesis that mutual IPV would be more common than female-perpetrated (or male-perpetrated) IPV and would include a higher frequency of psychological and physical aggression compared to asymmetric IPV. Next, we identified cross-sectional predictors of first semester (T1) IPV perpetration, testing the hypothesis that both partners' alcohol and marijuana use would be positively associated with IPV perpetration.

The availability of data from two semesters allowed us to consider prospective predictors of mutual and asymmetric IPV as well. Because intimate relationships are fluid during the college years, prior to conducting prospective analyses we determined whether women changed relationships from the first to second semester and examined whether higher levels of T1 substance use and IPV predict having a new partner at T2. We expected that there would be more continuity in the level of IPV perpetration for women who remained in the same relationships compared to those who began new relationships. For couples who remained together, we examined whether T1 IPV category, T1 psychological aggression, and T1 substance use predicted T2 IPV category. Specifically, we examined whether IPV by one partner at T1 would escalate to mutual violence at T2.

Method

Participants and Recruitment

Participants consisted of 499 female college freshmen who were recruited from households in Erie County NY at the time of high school graduation. They were part of a larger study (N = 978) that tested the impact of a parent-based intervention designed to reduce college heavy

episodic drinking and sexual assault (see Testa, Hoffman, Livingston, & Turrisi, 2010). The subsample used in the current study consisted of women from the 2005, 2006, and 2007 cohorts who reported having a boyfriend during the first semester of college; IPV perpetration was not assessed in the 2004 cohort.

Graduating female high school seniors were selected at random from yearbook photos from several schools. They were located using public telephone directories, contacted by telephone just prior to high school graduation, and offered the opportunity to participate in a 3-wave longitudinal study of transition to college. To be eligible, the graduating senior had to be planning to enter a 2- or 4- year college in the fall, residing with her mother (or a mother figure), and both mother and daughter had to be fluent in English and agree to participate. Written informed consent (or assent for daughters under age 18) was obtained. Students were primarily Caucasian (93%) and from two-parent households (86%), with a median household income of \$75,000. In the fall semester, 79% attended 4-year colleges and 20% attended 2-year colleges, approximately half of them located in Western New York.

Procedures

Just prior to high school graduation, mother and daughter were sent separate baseline (T0) questionnaire booklets to complete at home and return in postage-paid envelopes. After completed baseline measures were returned, the pair was randomized to intervention condition: 1) alcohol only intervention, 2) enhanced (alcohol + relationships) intervention, or 3) no intervention (see Testa, Hoffman, Livingston & Turrisi, 2010 for more information). In early July, mothers in the intervention conditions were sent an intervention handbook and instructed to read it and talk to their daughters about its contents prior to the start of the fall semester. The alcohol only handbook, nearly identical to that used by Turrisi, Jaccard, Taki, Dunnam, and Grimes (2001), emphasized the importance of talking about alcohol prior to the start of college and continued communication and monitoring during college. The enhanced handbook, designed to reduce sexual victimization, contained the alcohol content plus additional content on dating, sexual assertiveness, and partner selectivity. Although the enhanced handbook discussed physical and sexual victimization from a boyfriend, it was not designed to prevent IPV perpetration. Prior to conducting substantive analyses, the three intervention groups were compared on all of the T1 variables presented in Table 1. Because intervention condition was not associated with differences on any variables, it was not considered in subsequent analyses.

Participants completed mailed follow-up assessments, similar to the baseline assessment, at the end of the first (T1) and second semesters (T2) of college. They were compensated \$30 for baseline and \$50 for follow-up questionnaires. Mothers also completed intervention evaluations and an additional assessment in the fall semester; however, these are not relevant to the current analyses. All procedures were approved by the Social and Behavioral Sciences IRB at the University at Buffalo.

Measures

Individual Measures

Stress: At baseline (T0), women completed the 10-item Perceived Stress Scale (Cohen, Karmach, & Mermelstein, 1983), consisting of 10 items rated on 5 point scales ($\alpha = .89$). Items include “in the last month how often have you been angered because of things that were outside of your control?” and “In the last month how often have you felt that you were unable to control the important things in your life?”

Witnessing parental violence: At T0, two items asked how often they had ever seen their mother hit their father and their father hit their mother, using a 5-point scale ranging from ‘never’ to ‘daily’. Because of skewness, these were transformed to dichotomous variables, indicating whether any violence was observed.

Heavy episodic drinking (HED): At each wave, women responded to a series of questions about their alcohol use within the past 90 days, including two items assessing HED. These were: “How often would you say you consumed 4 or more drinks in a row on a single occasion?” and “...you consumed enough alcohol to feel drunk or intoxicated?”, both rated on 6 point scales ranging from 0 (*never*) to 5 (*5 or more days per week*). Because the two items were highly correlated ($r = .91$ at T1) they were averaged to form a single measure of frequency of HED.

Marijuana use: At each wave, women were asked how many days in the past 90 days they had used marijuana. To reduce skewness and make the measure consistent with the scale used to assess partner marijuana, frequency was transformed to a 6 point scale, ranging from 0 (‘never’) to 5 (‘5 or more days per week’).

Relationship Specific Measures—At T0 (high school graduation), participants were asked whether they were currently in a relationship with a boyfriend. If so, they were asked to record his initials and when the relationship began before answering a series of questions about him (e.g., his substance use, antisocial behavior) and specific to their relationship (e.g., satisfaction, IPV). At follow-ups, women were asked whether they were still in a relationship with the previous semester’s boyfriend (initials provided) and if not, whether they were currently in a different relationship. Women with a current boyfriend answered a series of questions specific to that relationship for the current semester. We also determined whether there were other intimate relationships during the semester and assessed similar partner-specific and relationship-specific information for any other relationships, whether current or completed. For each relationship, we also computed its length (in months), based on the date the relationship began and either the current date or the date it ended.

Although the majority of women reported only one intimate partner during each semester, they could provide information on up to 3 separate intimate relationships per semester. We used the following hierarchy to select the target partner: 1) a current relationship, 2) if no current relationship, a new relationship that started and ended within the semester, or 3) a former relationship with the previous semester’s boyfriend, as long as it ended sometime within the semester. At T1 (end of first semester), 408 were currently in a relationship, and 91 were not currently in a relationship but had been at some point during the semester, either with a new partner ($N = 62$) or with their T0 (high school) partner ($N = 29$).

Partner Substance Use: At each wave, women reported on each identified partner’s substance use over the past semester. This included his heavy episodic drinking (HED), using the same two items used to assess their own HED, and frequency of marijuana use, assessed on a 6 point scale ranging from 0 (*never*) to 5 (*5 or more days per week*).

Partner Antisocial Behaviors: For each identified partner, women reported whether or not he engaged in a series of 28 antisocial behaviors drawn from the DSM-IV criteria (e.g., driven recklessly, gotten into physical fights). Positive responses were summed to create a continuous measure ($\alpha = .86$).

Partner Psychological and Physical Aggression: For each relationship reported at T1 and T2, psychological and physical aggression in the past semester were assessed using the psychological (8 items), minor violence (5 items) and severe violence (6 items, burned/

scalded was not included) subscales from the Revised Conflict Tactics Scales (CTS-2, Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Each item was asked twice to assess both perpetration (e.g., I slapped my partner) and victimization (e.g., my partner slapped me). Frequency of aggressive acts in the past semester was assessed using the following scale: never (0), once (1), twice (2), 3–5 times (3), 6–10 times (4), 11–20 times (5), and more than 20 times (6). Following standard scoring procedures (Straus et al., 1996), these values were converted to number of acts based on the midpoints of each category: 0, 1, 2, 4, 8, 15, and 25. The number of acts were then summed to create separate perpetration and victimization subscales for psychological and physical aggression. Because severe violence was quite infrequent, we opted to combine minor and severe items into a single physical aggression (IPV) score. To reduce skewness, the resulting variables were Winsorized by recoding values in the top 5% to the 95th percentile value (Reifman & Kayton, 2010).

Relationship Satisfaction: At T1, women rated their overall satisfaction with the relationship, from 1 (*not at all satisfied*) to 5 (*extremely satisfied*). They also responded to a series of 9 items regarding how their relationship made them feel, including loved, respected or valued, anxious or worried (reverse scored), rated on 7 point scales (*not at all to very much so*). Because all 10 items were highly intercorrelated we created a mean relationship satisfaction score after weighting the global satisfaction item ($\alpha = .87$)¹.

Results

T1 IPV Perpetration versus Victimization Frequency

Using continuous measures of IPV frequency, women's reports of their own and their partner's physical and psychological aggression at T1 were highly correlated, ($r = .83$ and $.89$, respectively). However, women reported more physical perpetration ($M = 2.10$, $SD = 4.49$) than victimization from male partners ($M = 0.91$, $SD = 2.31$), $t(497) = 9.13$, $p < .001$, as well as more psychological perpetration ($M = 8.99$, $SD = 12.93$) compared to psychological victimization ($M = 6.82$, $SD = 10.23$), $t(497) = 7.94$, $p < .001$. Even within the 99 mutually violent couples, 68 (68.7%) reported more frequent female to male physical aggression, 24 (24.2%) reported equal amounts, and only 7 (7.1%) reported higher levels of male to female aggression.

Cross-Sectional Predictors of T1 Mutual and Asymmetric IPV

To test hypotheses regarding predictors of mutual versus asymmetric IPV, we classified women into four groups according to whether they had perpetrated and/or been victimized by physical IPV during the first semester: no IPV ($N = 323$), female only IPV perpetration ($N = 71$), mutual IPV perpetration ($N = 99$), and male only IPV perpetration ($N = 5$). Because there were only 5 cases of male only physical aggression (and 2 of these relationships had ended prior to the end of the semester), univariate group comparisons (oneway ANOVA, followed by Tukey HSD) were performed using only the first three groups. Means for the male only violence group are provided for illustrative purposes in Table 1.

As hypothesized, the mutual IPV group exhibited significantly more frequent psychological and physical aggression compared to couples in which only the female was violent, who in turn reported significantly more psychological aggression than non-violent couples. There were significant differences among the groups on several other variables: witnessing

¹Relationship satisfaction was not assessed for 29 high school relationships that had ended prior to T1. These women are included in Table 1. However, they are not included in multivariate analyses predicting T1 or T2 IPV since they had no other relationships, nor are they included in analyses of relationship change or dissolution.

violence, stress, partner ASPD, marijuana use, and partner marijuana use, although HED did not differ. In all cases of significant group differences, the mutually violent group reported the highest levels of these putative risk factors.

Multinomial logistic regression was then used to identify unique cross-sectional predictors of female only violent and mutually violent relationships, using the non-violent group as the reference category. All of the variables in Table 1 were included in the analysis with a few exceptions: continuous measures of IPV were not used since these were used to create IPV groups and same boyfriend was not included because it was redundant with length of relationship. The high correlation between psychological aggression perpetration and victimization ($r = .89$) resulted in multicollinearity these variables were entered simultaneously. To avoid this, we created a composite score consisting of the sum of psychological perpetration and victimization for use in the analysis. Results are shown in Table 2. The female-only IPV group differed from the non-violent group in their higher levels of psychological aggression and partner antisocial behavior. Witnessing mother hit father, higher psychological aggression, more frequent partner marijuana use, more partner antisocial behavior, and, surprisingly, higher relationship satisfaction discriminated the mutually violent group from the nonviolent group.

Predicting Relationship Continuity

Because the likelihood of T2 IPV was expected to be influenced by the characteristics of the T2 partner, prior to conducting prospective analyses, we examined whether women remained with the same partners from T1 to T2. Of 479 women who completed the T2 assessment, the majority (71.2%) remained in a relationship with their T1 boyfriend for all ($N = 284$) or part ($N = 57$) of the second semester; 101 had a new relationship at some time during the second semester. An additional 37 had broken up with their T1 boyfriend prior to the start of the second semester but had no new relationships during the semester, hence they were not used in analyses predicting T2 IPV. Logistic regression was conducted to predict whether the woman was in a new relationship at T2, using T1 individual and relationship variables as predictors. As shown in Table 3, higher levels of female heavy episodic drinking and lower levels of relationship satisfaction both increased the odds of having a new partner at T2. However, contrary to hypotheses, neither T1 female only IPV nor T1 mutual IPV increased the likelihood of having a new partner at T2. We performed a similar analysis predicting relationship dissolution (“breaking up”), coding those who reported at T2 that they were currently in the same relationship as at T1 ($N = 284$) as ‘0’ and those who broke up prior to T2 ($N = 195$) as ‘1’. Logistic regression using the same T1 predictor variables revealed a similar pattern of results: more frequent HED, lower relationship satisfaction and also shorter relationship length predicted relationship dissolution; IPV did not².

Stability of IPV over Time

Using continuous measures of IPV perpetration, the correlation between T1 and T2 perpetration was .62 ($N = 340$, $p < .001$) for women who remained in the same relationship compared to .18 ($N = 101$, $p = .076$) for those in new relationships. The difference between these correlations, as expected, was highly significant ($z = 4.80$, $p < .001$). Women who entered a new relationship reported significant declines from T1 to T2 in total psychological aggression ($M = 15.25$, $SD = 22.01$ at T1 versus $M = 5.99$, $SD = 14.28$ at T2, $t(100) = 4.43$, $p < .001$), physical aggression perpetration, ($M = 1.97$, $SD = 4.29$ at T1 versus $M = 0.36$, $SD = 1.09$ at T2, $t[100] = 3.83$, $p < .001$), and physical victimization ($M = 0.87$, $SD = 2.45$ at

²We had speculated previously that the effect of HED on relationship discontinuity reflects socializing in contexts in which it is possible to meet new partners (see Testa et al., 2003). Consistent with this hypothesis, exploratory analyses indicated that the effect of HED on having a new partner or breaking up was explained by higher numbers of first semester “hook-ups” among heavier drinkers.

T1 versus $M = 0.22$, $SD = 1.07$ at T2, $t [100] = 2.66$, $p = .009$). For women who remained in the same relationship, there was a significant decrease from T1 to T2 in physical aggression perpetration, ($M = 2.29$, $SD = 4.73$ at T1 versus $M = 1.61$, $SD = 3.49$ at T2, $t [339] = 3.35$, $p = .001$), but no significant changes from T1 to T2 in total psychological aggression, $t (339) = 0.47$, $p = .64$, or physical victimization, $t (339) = 0.82$, $p = .42$.

Prospective Predictors of T2 IPV

The final step was to determine which variables predicted second semester IPV category for women who remained with the same partner from T1 to T2. For example, do couples in which there is asymmetric violence at T1 escalate to mutual violence by T2, and what variables make escalation more likely? Table 4 displays T2 IPV category (none, female only, mutual) as a function of T1 IPV category (none, female only, mutual). Although T1 IPV category was a strong and significant predictor of T2 IPV category, $\chi^2(4) = 83.810$, $p < .001$, categories were not completely consistent across time. Of note, of the 48 couples classified as female only IPV at T1, 29 (60.4%) reported no IPV at T2³.

Multinomial regression was then used to predict T2 IPV category based on T1 variables. Results are shown in Table 5. On the first step, we entered T1 IPV category, which was highly significant. On the next step, we entered all of the remaining predictor variables listed in Table 2. The only variable that made an additional contribution to prediction of T2 IPV category was psychological aggression; couples with high levels of psychological aggression tended to exhibit physical aggression over time. Contrary to the hypothesis that asymmetrical aggression would escalate to mutual aggression over time, T1 female-only IPV did not increase the odds of mutual IPV at T2, after taking account of the other predictors⁴.

Discussion

The study provides additional evidence that mutual aggression is more common than asymmetrical aggression among college dating couples (e.g., Stets & Straus, 1989). Moreover, aggressive acts are more frequent when one's partner is also aggressive (e.g., Orcutt et al, 2005), suggesting that reciprocity contributes to escalation and maintenance of violence. However, also consistent with previous studies (e.g., Straus, 2008; Whitaker et al., 2007), there were many more couples characterized by female only aggression compared to male only aggression, which was quite rare in this sample. Categories were formed based on female reports, making it unlikely that classification was biased by traditional social desirability explanations (e.g., downplaying one's own perpetration). Rather, findings add to a growing body of work confirming that female physical aggression exists in many college dating relationships even in the absence of any male physical aggression.

The current study, by separating asymmetrical from mutual violence, sought to identify unique features of the former and examine changes in aggression perpetration over time. We failed to identify any unique predictors of asymmetrical IPV and failed to support the hypothesis that asymmetrically violent couples would escalate from T1 female only IPV to mutual IPV at T2. Rather, a majority of T1 female-only IPV couples reported no violence at T2. The lower frequency of aggression in these asymmetrically aggressive couples as well as the high likelihood of desistance from T1 to T2 suggests that their classification may have

³An additional eight participants, not shown in Table 4, reported male-only IPV at T2. Seven of these couples had been classified as no IPV at T1, one as mutual IPV. Of the five couples classified as male-only IPV at T1, three broke up prior to T2 and the other two were classified as no IPV at T2. Thus, male-only IPV appeared unstable over time.

⁴We repeated the multinomial regression reported in Table 5 combining male-only aggressive couples with female-only aggressive couples as an "asymmetrical aggression" category. The pattern of results was unchanged.

reflected a single episode of aggression that did not re-occur within the relatively short span of the study. These findings suggest that escalation of violence is not an inevitable progression, at least among this sample of young, dating couples. Rather, physically aggressive actions may reflect developmental inexperience in dealing with conflicts and not necessarily an established pattern⁵. Although prior IPV predicted subsequent IPV, even among mutually violent couples there was a tendency toward decreased physical aggression over time.

Contrary to hypotheses and previous research (e.g., Testa et al, 2003), neither psychological nor physical aggression predicted ending or changing relationships. Moreover, low relationship satisfaction was not associated with IPV either cross-sectionally or longitudinally; in fact, there was a positive relationship at T1 between satisfaction and mutual IPV after controlling for other predictors. These somewhat surprising findings suggest that college students may accept IPV as a part of relationships or view it as largely independent of relationship quality. Consistent with Schumacher and Leonard (2005), it appears that psychological aggression, rather than relationship satisfaction, is a more important predictor of subsequent physical aggression. Although we are reluctant to conclude that the impact of physical aggression is trivial for relationship quality and stability, findings suggest that psychological aggression may be a more problematic feature of dating relationships.

Although heavy episodic drinking has been associated with perpetration of physical aggression (Foran & O'Leary, 2008; Leonard, 2008), neither men's nor women's drinking emerged as an independent predictor in this sample. However, consistent with Testa et al (2003), women who engaged in more frequent HED were more likely to change partners from first to second semester. Changing partners was indirectly associated with reduced IPV to the extent that newer, shorter relationships are less likely to include physical aggression. This effect should be kept in mind when examining longitudinal effects of HED on IPV, since ignoring partner identity may distort findings. Indeed, as expected, IPV was strongly correlated over time for couples who remained together but only minimally related for women who changed relationships.

In contrast to null findings regarding alcohol use, marijuana was positively associated with IPV, with partner's use emerging as an independent cross-sectional predictor of mutual violence. Given that marijuana has been negatively associated with physical aggression in laboratory studies (Boles & Miotto, 2003; Myerscough & Taylor, 1985), this effect may reflect poorer relationship functioning in these couples (Brook et al, 2008) or the association of marijuana use with antisocial personality (Feingold, et al 2008). Event-level studies are needed to determine whether episodes of marijuana use are temporally associated with acts of physical aggression.

Despite the strengths of the study, it is not without limitations. First, we were unable to consider long-term patterns in IPV change over time because analyses were limited to just two semesters. Second, all data were based solely on the reports of the female partner and may not accurately reflect the male partner's actual behavior. Because the study was designed primarily to test other hypotheses, we failed to collect data on several variables that are potentially important to consider, for example, the antisocial behavior of the female partner, which we would expect to be correlated with that of her male partner (Kim &

⁵It is possible that mutual aggression develops very quickly, perhaps within a single event, which we would not be able to capture with two assessments, five months apart. For example, there were 13 women who reported no IPV at T1 but mutual IPV at T2. We thank an anonymous reviewer for raising this possibility.

Capaldi, 2004) and with IPV (Kim et al, 2008). Finally, we have no event-level data on the potential role of substance use in episodes of IPV.

Nonetheless, this study is one of the few longitudinal investigations of college dating aggression that has considered the identity of partner. Findings confirm the importance of distinguishing between asymmetric and mutual IPV. Whereas the former appears unstable, less frequent, and at least as likely to desist as to escalate, mutual violence involves more frequent acts of aggression and is more likely to persist over time. The study also provides additional evidence for the importance of psychological aggression as a critical precursor to physical aggression and potentially an appropriate target when designing interventions to prevent intimate partner violence.

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Table 1
Comparison of Characteristics of Violence Perpetration Groups at T1 (N = 498)

Variable	No IPV (n = 323) M (SD)	Female-only IPV (n = 71) M (SD)	Mutual IPV (n = 99) M (SD)	Male-only IPV (n = 5) ^a M (SD)	F or χ^2_{ab}	p ^d
Saw Mother Hit Father (T0) (%)	4.7%	5.7%	14.1%	25.0%	10.94	.004
Saw Father (Hit Mother) (T0) (%)	6.6%	7.1%	13.1%	25.0%	4.45	.11
Stress (T0)	29.60(6.79) _a	30.18(6.22) _{ab}	32.04(6.71) _b	33.80(2.39)	5.05	.007
Same boyfriend as his/baseline (%)	38.1%	43.7%	58.6%	40.0%	13.01	.001
Relationship length (months) (T1)	11.38(12.29) _a	13.39(12.95) _{ab}	16.58(13.28) _b	10.55(9.77)	6.53	.001
HED (T1)	1.32(1.20)	1.49(1.16)	1.33(1.11)	2.50(1.12)	0.61	.54
Frequency of marijuana use (T1)	0.58(1.15) _a	0.87(1.42) _{ab}	1.14(1.62) _b	1.20(2.17)	7.46	.001
Partner's HED (T1)	1.44(1.23)	1.77(1.23)	1.62(1.15)	2.00(1.58)	2.54	.08
Partner's freq. of marijuana use (T1)	0.76(1.37) _a	1.20(1.71) _a	1.83(2.02) _b	1.00(1.73)	17.97	<.001
Partner antisocial behavior (T1)	2.39(3.03) _a	4.04(3.67) _b	5.44(4.62) _c	8.20(8.93)	31.15	<.001
Relationship satisfaction (T1)	58.92(9.34)	57.60(9.18)	56.70(10.22)	41.20(20.66)	2.18	.11
Frequency of psychological aggression perpetration (T1)	3.87(7.06) _a	13.86(13.23) _b	22.18(16.61) _c	9.60(9.45)	121.23	<.001

Variable	No IPV (<i>n</i> = 323) <i>M</i> (<i>SD</i>)	Female-only IPV (<i>n</i> = 71) <i>M</i> (<i>SD</i>)	Mutual IPV (<i>n</i> = 99) <i>M</i> (<i>SD</i>)	Male-only IPV (<i>n</i> = 5) ^a <i>M</i> (<i>SD</i>)	<i>F</i> or χ^2 ^a	<i>p</i> ^a
Frequency of psychological aggression victimization (T1)	3.31(6.74) _a	7.66(7.83) _b	17.46(13.17) _c	10.60(13.85)	104.03	<.001
Frequency of IPV perpetration (T1)	0.00(0.00) _a	3.04(3.61) _b	8.36(6.15) _c	0.00(0.00)	284.61	<.001
Frequency of IPV victimization (T1)	0.00(0.00) _a	0.00(0.00) _a	4.54(3.22) _b	1.20(0.45)	392.98	<.001

Note: Groups are based on IPV perpetration at T1. IPV = intimate partner violence; T0 = baseline (senior year in high school); T1 = first fall semester in college; HED = frequency of heavy episodic drinking. Within each row, means with different subscripts are statistically different at *p* < .05 according to the Tukey HSD procedure.

^aThe male-only IPV group is omitted from the statistical tests of group differences because of its small sample size (*n* = 5).

Table 2

Results of Multinomial Logistic Regression to Predict IPV Perpetration Groups at T1 (N = 450)

Predictor	IPV Perpetration Group			
	Female-only IPV (n = 65)		Mutual IPV (n = 94)	
	OR	95% CI	OR	95% CI
Ever Saw Mother Hit Father (T0) ^a	0.78	[0.18, 3.42]	3.28*	[1.04, 10.33]
Ever Saw Father Hit Mother (T0) ^a	0.72	[0.19, 2.77]	0.74	[0.23, 2.44]
Stress (T0)	0.99	[0.94, 1.04]	1.01	[0.97, 1.06]
Relationship length (months) (T1)	1.01	[0.98, 1.03]	1.01	[0.98, 1.03]
HED (T1)	0.98	[0.72, 1.24]	0.99	[0.69, 1.41]
Frequency of marijuana use (T1)	0.94	[0.72, 1.24]	0.93	[0.71, 1.21]
Partner's HED (T1)	1.22	[0.88, 1.68]	1.01	[0.72, 1.42]
Partner's freq. of marijuana use (T1)	1.11	[0.89, 1.39]	1.40**	[1.13, 1.73]
Partner antisocial behavior (T1)	1.10*	[1.00, 1.21]	1.11*	[1.01, 1.23]
Relationship satisfaction (T1)	1.02	[0.98, 1.05]	1.04*	[1.00, 1.09]
Frequency of psychological aggression (combined perpetration/victimization) (T1)	1.05***	[1.03, 1.07]	1.07***	[1.05, 1.09]

Note: Reference category for both IPV perpetration groups at T1 is No IPV (n = 291). OR = odds ratio; CI = confidence interval; IPV = intimate partner violence; T0 = baseline (senior year in high school); T1 = first fall semester in college; HED = frequency of heavy episodic drinking.

^a Dummy variable coded 1 for yes, 0 for no.

* p < .05

** p < .01

*** p < .001

Table 3

Results of Logistic Regression to Predict Having a New Partner at T2 from T1 Variables (N = 440)

Predictor variable at T1	OR	95% CI
Intimate partner relationship length (months)	0.98	[0.95, 1.00]
HED	1.42*	[1.07, 1.90]
Frequency of marijuana use	0.92	[0.73, 1.16]
Partner's HED	0.95	[0.73, 1.24]
Partner's frequency of marijuana use	0.94	[0.78, 1.14]
Partner antisocial behavior	1.06	[0.98, 1.15]
Relationship satisfaction	0.94***	[0.91, 0.96]
Frequency of psychological aggression (combined perpetration/ victimization)	1.00	[0.98, 1.02]
Female-only perpetration of IPV ^a	1.41	[0.69, 2.88]
Mutual IPV ^a	0.62	[0.25, 1.52]

Note: OR = odds ratio; CI = confidence interval; T1 = first fall semester in college; T2 = first spring semester in college; HED = heavy episodic drinking; IPV = intimate partner violence. $\chi^2(10) = 61.55, p < .001$.

^aReference group is No IPV.

*
 $p < .05$

 $p < .001$.

Table 4

Number of Women at T2 with the Same Intimate Partner from T1 in Three IPV Perpetration Groups at T1 and at T2 (N = 330)

IPV Perpetration Group at T1	IPV Perpetration Group at T2			
	No IPV	Female only IPV	Mutual IPV	Total
No IPV	number 178	19	13	210
	Row % 84.8%	9.0%	6.2%	100.0%
Female only IPV	number 29	12	7	48
	Row % 60.4%	25.0%	14.6%	100.0%
Mutual IPV	number 24	15	33	72
	Row % 33.3%	20.8%	45.8%	100.0%
Total	number 231	46	53	330
	Row % 70.0%	13.9%	16.1%	100.0%

Note: T1 = first fall semester in college; T2 = first spring semester in college; IPV = intimate partner violence. The table does not include 1 woman missing T2 CTS data and 8 women reporting male only IPV at T2.

Table 5
Results of Sequential Multinomial Logistic Regression to Predict IPV Perpetration Group at T2 Among Intimate Partners at T2 in a Relationship With the Same Partner from T1 (N = 322)

Predictor variable	$\Delta\chi^2$	IPV Perpetration Group at T2					
		Female-only IPV (<i>n</i> = 46)			Mutual IPV (<i>n</i> = 50)		
		Initial OR	Final OR	Final 95% CI	Initial OR	Final OR	Final 95% CI
Step 1: IPV perpetration group at T1	75.54***						
Female-only perpetration of IPV (T1) ^a		3.93***	2.61*	[1.07, 6.37]	3.11*	1.84	[0.60, 5.70]
Mutual IPV (T1) ^a		5.72***	3.15*	[1.19, 8.33]	19.33***	8.90***	[3.47, 22.84]
Step 2: All other predictors	31.75						
Ever Saw Mother Hit Father (T0) ^b		–	0.60	[0.11, 3.44]	–	0.56	[0.10, 3.11]
Ever Saw Father Hit Mother (T0) ^b		–	0.49	[0.09, 2.81]	–	1.29	[0.27, 6.12]
Stress (T0)		–	0.99	[0.93, 1.04]	–	0.99	[0.93, 1.04]
Relationship length (months) (T1)		–	1.01	[0.98, 1.03]	–	1.01	[0.98, 1.04]
HED (T1)		–	1.07	[0.71, 1.62]	–	0.98	[0.62, 1.57]
Frequency of marijuana use (T1)		–	1.29	[0.95, 1.75]	–	1.17	[0.84, 1.64]
Partner's HED (T1)		–	1.14	[0.75, 1.72]	–	1.09	[0.69, 1.71]
Partner's freq. of marijuana use (T1)		–	0.90	[0.69, 1.17]	–	0.87	[0.66, 1.16]
Partner antisocial behavior (T1)		–	1.03	[0.91, 1.17]	–	1.10	[0.98, 1.24]
Relationship satisfaction (T1)		–	1.00	[0.95, 1.06]	–	1.03	[0.97, 1.09]
Frequency of psychological aggression (combined perpetration / victimization) (T1)		–	1.02*	[1.01, 1.04]	–	1.03**	[1.01, 1.05]
Total χ^2	104.54***						

Note: Reference category for both IPV perpetration groups at T2 is No IPV ($n = 226$). OR = odds ratio; CI = confidence interval; IPV = intimate partner violence; T0 = baseline (senior year in high school); T1 = first fall semester in college; T2 = first spring semester in college; HED = heavy episodic drinking. N is reduced due to listwise deletion of cases missing data on one or more variables.

^aDummy variable; reference group is No IPV at T1.

^bDummy variable coded 1 for yes, 0 for no.

* $p < .05$.

** $p < .01$.

*** $p < .001$.