Test of a Conceptual Model of Partner Aggression Among Women Entering Substance Use Disorder Treatment*

JEREMIAH A. SCHUMM, PH.D.,[†] TIMOTHY J. O'FARRELL, PH.D.,[†] CHRISTOPHER M. MURPHY, PH.D.,[†] MARIE MURPHY, PH.D.,[†] AND PATRICE MUCHOWSKI, SC.D.[†]

Cincinnati VA Medical Center, PTSD and Anxiety Disorders Division, 1000 South Fort Thomas Avenue, Fort Thomas, Kentucky 41075

ABSTRACT. Objective: Despite extensive intimate partner violence (IPV) among women in substance use disorder treatment, few studies have investigated IPV risk factors within this population. Conceptual models, which have received support in other populations, propose that antisociality and generalized violence, alcohol and drug use, and relationship adjustment may be interrelated pathways that influence IPV. The purpose of this study was to test a conceptual model that integrates these individual and relationship pathways to explain IPV among women entering substance use disorder treatment. **Method:** Women entering substance use disorder treatment ($N = 277$) who had a male relationship partner completed measures of the following domains about themselves and their male partners: antisociality/generalized violence, heavy alcohol use, drug use, relationship adjustment, and psychological and physical IPV. **Results:** Structural equation modeling analyses showed that the antisociality/generalized violence of each partner had direct and

indirect effects on IPV. Each partner's antisociality/generalized violence was directly related to her or his physical IPV. Female antisociality/generalized violence was indirectly related to female physical IPV via female drug use and female psychological IPV. Male antisociality/generalized violence was indirectly associated with male physical IPV via male drinking, relationship adjustment, and male psychological IPV. A reciprocal relationship was found between partners' psychological IPV but not physical IPV. When accounting for other individual and relational IPV predictors, male partners' physical IPV influenced women's physical IPV, but women's physical IPV did not influence their male partner's physical IPV. **Conclusions:** Both partners' antisociality/generalized violence, substance use, and overall relationship adjustment are important in understanding IPV among women entering substance use disorder treatment. (*J. Stud. Alcohol Drugs*, 72, 933–942, 2011)

INTIMATE PARTNER VIOLENCE (IPV) is a major problem among heterosexual women entering treatment for substance use disorders (SUDs). In various independent studies, women's past-year prevalence of physical IPV victimization, as reported at the outset of SUD treatment, was in the 50%–65% range (Burnette et al., 2008; Chase et al., 2003; Chermack et al., 2001; Drapkin et al., 2005). These studies also found that about two thirds of women entering SUD treatment had perpetrated physical IPV toward their partners within the past year. These rates of IPV among women entering SUD treatment far exceed the rates observed in community members without substance use problems (Schumm et al., 2009) as well as those in the community who exhibit substance use problems but have not chosen to seek treatment in the past year (Lipsky and Caetano, 2008).

Despite the high levels of IPV victimization and perpetration among women entering SUD treatment, very little work has been done to develop and test conceptual models

to explain IPV within this population. Two prior studies have had the specific purpose of exploring IPV risk correlates among women entering SUD treatment (Chase et al., 2003; Chermack et al., 2001). However, neither of these studies used an integrated conceptual model to test the multivariate pathways that may lead to IPV. Greater understanding of the multiple factors involved in IPV among women seeking SUD treatment may have both practical and theoretical implications, particularly given that IPV is believed to significantly interfere with these women's abilities to engage in and benefit from SUD treatment (Miller et al., 2000). Further, research on the comorbidity patterns for IPV and SUDs among women may have both theoretical and practical implications, providing a more coherent understanding of these overlapping problem areas.

Existing conceptual models propose that antisociality and generalized violence together comprise an important distal risk factor for IPV (Holtzworth-Munroe and Stuart, 1994; Stuart et al., 2006; Taft et al., 2010). Empirical studies of community and psychiatric samples provide consistent sup-

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[†]Correspondence may be sent to Jeremiah A. Schumm at the above address or via email at: Jeremiah.Schumm@va.gov. Jeremiah A. Schumm is

also with the University of Cincinnati, Cincinnati, OH. Timothy J. O'Farrell is with the VA Boston Healthcare System, Families and Addictions Program, Harvard Medical School, Brockton, MA. Christopher M. Murphy is with the University of Maryland, Baltimore County, Baltimore, MD. Marie Murphy is with the Harvard Medical School, VA Boston Healthcare System, Brockton, MA. Patrice Muchowski is with Adcare Hospital of Worcester, Inc., Worcester, MA.

port for this hypothesis (Holtzworth-Munroe et al., 2000; Walsh et al., 2010). Studies of men in SUD treatment have likewise shown that antisociality/generalized violence is a risk factor for their perpetration of IPV (Murphy and O'Farrell, 1994; Murphy et al., 2001; Taft et al., 2010). However, no studies to date have examined whether these findings translate to women with SUDs. Hence, one goal of the current study was to test the hypothesis that among women entering SUD treatment and their male partners, each partner's antisociality/generalized violence is a risk factor for her or his IPV perpetration.

Excessive substance use may partially account for the link between antisociality/generalized violence and IPV. Studies have shown that individuals with antisociality/generalized violence traits are prone to SUD problems (Holtzworth-Munroe et al., 2000; Leonard and Homish, 2008; Walsh et al., 2010). This may be because those with higher levels of antisociality/generalized violence are more likely to engage in a broad range of socially deviant behaviors, including heavy drinking and other drug use. Among women arrested for IPV but not specifically selected for the presence of SUDs, Stuart et al. (2006) found that women with higher antisociality/generalized violence traits exhibited higher problematic alcohol use, which, in turn, predicted higher IPV. These findings are in line with considerable evidence from male samples in demonstrating a link between heavy drinking and alcohol problems with IPV (Foran and O'Leary, 2008). However, findings for women in SUD treatment have been mixed, with some (Drapkin et al., 2005) but not others (Chase et al., 2003; Chermack et al., 2001) showing a relationship between women's heavy drinking and their perpetration of IPV. In addition, only two studies of women with SUDs have examined male partner heavy drinking, with neither finding a significant association between male partners' heavy drinking and their IPV perpetration (Chase et al., 2003; Drapkin et al., 2005). Finally, no studies to date of women with SUDs have investigated Stuart et al.'s (2006) conceptual model to see whether alcohol use behaviors mediate the relationship between antisociality/generalized violence and IPV. Therefore, we sought to test the hypothesis that heavy drinking would partially account for the relationship between antisociality/generalized violence and IPV among women with SUDs and their male partners.

Drug use may be another pathway through which antisociality/generalized violence influences IPV among women with SUDs and their partners. A meta-analysis by Moore et al. (2008) found a small to medium effect size relationship between drug use and psychological and physical IPV, with similar effect sizes across genders. These findings are in line with studies of women in SUD treatment, which have shown an association between women's drug use and their perpetration of IPV (Chase et al., 2003; Chermack et al., 2001). Only one study of women with SUDs has examined the role of male partner drug use in IPV, and this study did not find that male

partner drug use was related to his IPV behaviors (Chase et al., 2003). Because the Chase et al. sample was exclusively composed of women with SUDs and their male partners seeking couples-based treatment, it is unclear whether these results generalize to women seeking SUD treatment that is not exclusively couples-based counseling. The current study seeks to expand Stuart et al.'s (2006) conceptual model by examining the hypothesis that drug use behaviors are an additional pathway through which antisociality/generalized violence affects IPV among women entering SUD treatment.

Heavy alcohol use and other drug use may also indirectly accentuate risk for IPV by increasing relationship problems. A large body of research shows that heavy drinking and drug use is associated with couples' poorer relationship functioning (Marshall, 2003; Vargas-Carmona et al., 2002). Heavy alcohol and drug use may contribute to relationship problems by increasing disagreements while decreasing the couple's ability to effectively communicate and solve problems (Chase et al., 2003; Leonard and Roberts, 1998; Murphy et al., 2005). In turn, such relationship problems may increase the chances for psychological aggression that escalates into physical violence. The few prior studies of women seeking SUD treatment show an association between poorer relationship adjustment and higher IPV (Chase et al., 2003; Drapkin et al., 2005). Thus, we hypothesize that the relationship of heavy drinking and drug use with IPV will be partially explained by difficulties in relationship adjustment.

Antisociality/generalized violence may also independently contribute to poor relationship adjustment. South et al. (2008) found that higher self-report and partner ratings of personality disorder characteristics, including antisocial traits, were associated with lower marital satisfaction. The authors concluded that these findings may be attributable to individuals with personality disorder traits being generally rigid and inflexible while lacking insight into the consequences of their dysfunctional behavior on their relationship with their partner. Following this rationale, we hypothesize that antisociality/generalized violence will exhibit a direct negative association with relationship adjustment, along with an indirect association with relationship adjustment via excessive alcohol and drug use.

Finally, the current study seeks to expand on prior research by including both verbal and physical aggression and examining whether one partner's aggression influences that of the other partner while accounting for other pathways. Although there is evidence from community couples and from individuals arrested for IPV that psychological IPV positively predicts physical IPV (Schumacher and Leonard, 2005; Stuart et al., 2006), studies have not examined whether psychological IPV is a pathway to physical IPV among women seeking SUD treatment. Therefore, we will investigate whether findings from other populations generalize to women in SUD treatment by determining whether psychological aggression is a pathway to

explaining physical aggression. We will also follow Stuart et al.'s (2006) conceptual model by hypothesizing that a bi-directional relationship will exist between partner IPV behaviors, and this bi-directional influence will be independent of each partner's own individual risk factors and the couple's relationship functioning.

Multivariate dyadic models of IPV can provide novel contributions to our understanding of mutual influence patterns but have not yet been applied to examine IPV among women with SUDs. The extent to which women's relationship aggression is predictable from their own personal characteristics and substance use versus being predictable from their partner's aggressive behavior remains a vexing conceptual issue in the field (e.g., Johnson, 2010; Langhinrichsen-Rohling, 2010). Unfortunately, the debates thus far have been almost exclusively conceptual in nature and not well informed by multivariate analysis of structural models that simultaneously examine both partners' IPV.

Method

Institutional review boards at Harvard Medical School and at VA Boston approved this study.

Participants

Participants were 277 women who were entering SUD treatment at a large SUD treatment center in the northeastern United States. The eligibility criteria for participation were as follows: (1) woman was between 18 and 49 years of age; (2) woman met the criteria within the past 6 months for diagnosis of an SUD according to the Structured Clinical Interview for the DSM-IV (SCID; First et al., 1996); (3) woman had consumed alcohol or illicit drugs in the 6 weeks before treatment admission; and (4) female participant and male relationship partner had been married or living together for at least 1 year, with no more than 6 months living apart in the past year. Male partners did not take part in the study. Information about the male partner was gathered from the female study participant.

Participants averaged 39 years of age, 13 years of education, and yearly income in the \$10,000–\$15,000 range. Female participants were mostly White (88.4%), and the remainder were African American (5.8%), Hispanic or Latina (4.0%), or of another racial category (1.8%). The percentage of participants who met lifetime diagnostic criteria for dependence on the following substances were as follows: alcohol (82.5%); cocaine (52.0%); opiates (37.2%); cannabis (23.1%); sedatives, hypnotics, or anxiolytics (19.9%); and stimulants (11.9%). Their male partners had an average age of 41 years, had 13 years of education, and had yearly incomes of \$35,000–\$40,000. The racial composition of male partners was as follows: White (82.2%), African American (9.4%), Hispanic or Latino (5.4%), and other (3.0%).

Procedure

Women were approached by a research assistant and asked to participate in a study about how couple relationship factors affect the process of a woman's recovery from SUDs. From April 2003 to February 2006, 583 potentially eligible female patients were identified from a self-report screening questionnaire completed as part of routine clinical assessment on admission to the treatment program. Those whose questionnaire responses showed they were women in the study age range and married or living with a male partner were considered potentially eligible for the study. Study staff attempted to speak with potentially eligible women to explain the study and conduct a detailed study screening interview. Research staff were unable to contact 168 (29%) of the 583 potentially eligible women. Of the 415 women research staff were able to contact, 112 (27%) declined to participate and 303 (63%) signed an informed consent form. Of the 303 women who signed the informed consent form, 12 (4%) were determined to be ineligible, 14 (5%) dropped out before completing the baseline assessment, and 277 (91%) completed a 3–4-hour baseline assessment consisting of questionnaires and a structured interview in a private location with a study research assistant. This study sample was not biased against inclusion of women reporting IPV. In fact, qualified women who enrolled in the study were more likely than qualified women who did not enroll in the study to report female IPV (27% vs. 16%; $\chi^2 = 6.81, p < .01$) or male IPV (26% vs. 16%; $\chi^2 = 5.69, p < .05$) as recorded on the project screening questionnaire.

Measures

Antisociality/generalized violence. The Structured Clinical Interview for DSM-IV Personality Disorders was used to assess women's total adulthood antisocial personality disorder (APD) criteria (SCID-II; First et al., 1997). To eliminate overlap with assessing IPV, the irritability and aggressiveness criterion was not included in the APD total. Other measures of female antisociality/generalized violence were the socialization scale of the California Personality Inventory (Gough, 1994) and the physical aggression scale from the Buss-Durkee Aggression Questionnaire (Buss and Perry, 1992). Finally, the General Violence Conflict Tactics Scale (Stuart et al., 2006) was used to assess past-6-month physical assault frequency toward nonpartners, and this scale was inversely transformed within the models to reduce skewness.

Women responded to the SCID-II (First et al., 1997) in reporting the total APD adulthood criteria for their male partners. The APD irritability/aggressiveness criterion was not included to avoid overlap with IPV assessment. Other female-reported measures of male partner antisociality/generalized violence included items assessing past-6-month generalized violence toward nonpartners or non-family

members and frequency of arrests for these behaviors (0 = *never* through 3 = *always*). Studies have found moderate correlations between self-reports and collateral reports of personality disorder measures, with relatively higher concordance on assessment of APD (Klonsky and Oltmanns, 2002) and among intimate partners (Connelly and Ones, 2010).

Heavy drinking. Women's reports on the Timeline Follow-back Interview (TLFB; Sobell and Sobell, 1996) were used to calculate the number of days of heavy drinking during the past 6 months by the woman (four or more standard drinks) and her male partner (six or more standard drinks). In addition, a modified version of the quantity–frequency scale (Calahan et al., 1969) was used to assess the total number of standard drinks consumed and the frequency of drinking until intoxication (0 = *never* through 7 = *every day*) among women and their partners in the past 6 months. Studies show large, robust correlations between individuals' self-reports and collateral reports of their substance use behaviors, with no difference in the magnitude of correlations between those with and without SUDs (Achenbach et al., 2005). To reduce skewness, inverse transformations were made for all male alcohol use variables and the female quantity–frequency scale total consumption variable.

Other drug use. The TLFB was used to assess the number of days in the past 6 months the woman and her male partner used drugs other than alcohol (Sobell and Sobell, 1996). Square root transformation was used to reduce skewness on these TLFB variables. In addition, a brief drug use measure was used to assess the total frequency and variety of drugs that women and their male partners used in the past 6 months (O'Farrell et al., 2003). Good agreement has been found between partners in reporting drug use behaviors (O'Farrell et al., 2003). This is consistent with the considerable evidence for high concordance in self-ratings and other ratings of substance use behaviors (Achenbach et al., 2005). Variables from the brief drug use measure were inversely transformed to improve their distributions.

Relationship adjustment. Women completed the Dyadic Adjustment Scale (Spanier, 1976), which is a widely used 32-item measure of overall relationship adjustment. The Positive Feelings Questionnaire was also completed to assess positive emotions within the relationship (O'Leary et al., 1983). In addition, women completed a 4-item Perceived Criticism Scale (Hooley and Teasdale, 1989) to rate themselves and their partners on the degree of partner criticism (0 = *not at all* through 10 = *very critical*) and being upset by partner criticism (0 = *not at all* through 10 = *very upset*). Finally, participants completed two items from the Sexual Adjustment Questionnaire (O'Farrell et al., 1997) to assess the degree of women's and their report on their partners' sexual satisfaction (0 = *extremely unsatisfactory* to 6 = *extremely satisfactory*).

Intimate partner violence. Past-6-month psychological and physical IPV was measured by the Revised Conflict

Tactics Scales (CTS2; Straus et al., 1996). The CTS2 is a widely used instrument that demonstrates acceptable internal reliability and factor and criterion validity (Straus et al.). Following Straus et al.'s scoring procedures, the weighted frequency scores on the psychological aggression and physical assault subscales of the CTS2 were used to assess psychological and physical IPV, respectively, for each partner. Using the original version of the Conflict Tactics Scales, Chase et al. (2003) found good levels of agreement between women in SUD treatment and their partners in reporting IPV. To reduce skewness, psychological aggression scores were square root transformed, and physical assault scores were inversely transformed.

Analyses

Using the Mplus program (Muthén & Muthén, 2010), a multistep structural equation modeling (SEM) method was used to test the hypothesized models. The models included seven latent predictor variables (female and male antisociality/generalized violence, female and male alcohol use, female and male drug use, relationship adjustment) and four observed IPV outcomes (female and male psychological aggression, female and male physical aggression). First, a measurement model was tested to assess whether the hypothesized latent variables appropriately explained the underlying observed data. Second, bivariate relationships were examined among the SEM variables. Third, a structural model was used to test the hypothesized pathways from latent predictor variables to IPV outcomes. As previously described, appropriate transformations were used to correct for model variable non-normality; hence, the maximum likelihood estimator was used in all SEM analyses. Because the inverse transformations result in a valence opposite that of the original scale, we reversed the reported valence of inversely transformed variables to improve interpretation. To account for missing data (6.5% of cases), model pathways were calculated using the full information maximum likelihood method. Because model parsimony is desirable, nonsignificant pathways were trimmed from the structural model and model fit indices were compared between structural models to ensure that model trimming did not significantly deteriorate the model fit. Finally, indirect effects of the various model pathways were computed within Mplus to examine viable indirect pathways to explaining IPV.

Results

SEM measurement model. The initial SEM measurement model showed a borderline acceptable fit. The chi-square test was significant, $\chi^2(275, N = 277) = 608.29, p < .001$, which suggested that the hypothesized model deviated from the underlying observed data. In addition, the comparative fit index (CFI) was .94, which is slightly below the suggested

TABLE 1. Standardized factor loadings for observed indicators onto corresponding latent predictor variables

Latent variable	Observed indicator (factor loading)
Female antisociality/generalized violence	SCID adult APD criteria (.61) CPI-soc. (-.67) Buss-Durkee (.70) General violence CTS (.53)
Male antisociality/generalized violence	SCID adult APD criteria (.84) Frequency nonpartner violence (.62) Arrests for nonpartner violence (.53)
Female heavy drinking	TLFB days heavy drinking (.80) Q-F intoxication (.93) Q-F total consumption (.55)
Male heavy drinking	TLFB days heavy drinking (.92) Q-F intoxication (.94) Q-F total consumption (.66)
Female drug use	TLFB days drug use (.82) BDU total frequency all drugs (1.0) BDU variety of drugs used (.96)
Male drug use	TLFB days drug use (.88) BDU total frequency all drugs (1.0) BDU variety of drugs used (.97)
Relationship adjustment	Dyadic Adjustment Scale (.96) Positive Feelings Questionnaire (.87) Perceived Criticism Scale (-.55) Sexual Adjustment Questionnaire (.47)

Notes: SCID adult APD criteria = Number of antisocial personality disorder adulthood criteria met, excluding irritability/aggressiveness, from the Structured Clinical Interview for DSM-IV Personality Disorders module. CPI-soc. = socialization scale of the California Personality Inventory. Buss-Durkee = Buss-Durkee Aggression Questionnaire. CTS = Conflict Tactics Scale. TLFB = Timeline Followback interview. Q-F intoxication = quantity–frequency scale frequency of drinking until intoxication. Q-F total consumption = quantity–frequency scale total number of standard drinks consumed. BDU = brief drug use measure.

CFI minimum of .95 (Hu and Bentler, 1999). The root mean square error of approximation (RMSEA) was .07, which is higher than the recommendation of .06 or less to indicate a well-fitting model. Model modification indices suggested that the model fit could be further improved by allowing the residuals for the following observed variables to correlate: past-6-month frequency of male partner violence toward nonfamily or nonpartners with frequency of arrests for these behaviors, and the Positive Feelings Questionnaire with Sexual Adjustment Questionnaire. Because these variables loaded onto the same latent construct and correlating the residuals would not be inconsistent with the theoretical model, we freed these parameters and reran the measurement model.

The chi-square difference test showed that these revisions significantly improved the model fit, $\Delta\chi^2(2, N = 277) = 47.37, p < .001$. Although the chi-square test remained significant in the revised measurement model, $\chi^2(273, N = 277) = 560.92, p < .001$, the CFI = .95 and RMSEA = .06 were both within a range suggestive of a well-fitting model (Hu and Bentler, 1999). Finally, the applicability of the revised measurement model was supported by the finding that each of the observed variables significantly loaded onto its corresponding hypothesized latent factor (Table 1). Based on these findings, the revised measurement model was used as the foundation for constructing the structural model.

Correlations among model variables. Before examining the hypothesized multivariate structural model, bivariate correlations among latent model predictors and IPV outcomes were examined. Most of the bivariate correlations were consistent with our hypotheses (Table 2). Female antisociality/generalized violence had significant correlations in the hypothesized direction with all model variables except female heavy drinking, which was not significantly related to female antisociality/generalized violence. Male antisociality/generalized violence was significantly correlated with all model variables and in the hypothesized direction. The least consistent relationships involved female heavy drinking, which was positively correlated with male heavy drinking, negatively correlated with relationship adjustment, and unrelated to partner aggression variables. In addition, female heavy drinking was negatively correlated with female drug use, suggesting that the more women engaged in heavy drinking, the less they tended to use other drugs. All other relationships involving male heavy drinking, male drug use, relationship adjustment, and IPV variables were significant and in the hypothesized direction (Table 2).

SEM structural model. The initial structural model provided a generally adequate fit to the data, $\chi^2(294, N = 277) = 605.49, p < .001$, CFI = .94, RMSEA = .06. Although support was found for some hypothesized relationships,

TABLE 2. Correlations among latent study predictor variables and IPV outcomes

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Female AGV	—	.50***	-.06	.17**	.40***	.09	-.25***	.39***	.24***	.43***	.25***
2. Male AGV		—	-.06	.35***	.24***	.41***	-.34***	.24***	.42***	.34***	.42***
3. Female heavy drinking			—	.22***	-.25***	-.05	-.15*	.10	.04	.09	.01
4. Male heavy drinking				—	.13*	.41***	-.23***	.24***	.34***	.24***	.30***
5. Female drug use					—	.34***	-.12*	.22***	.21***	.07	.14*
6. Male drug use						—	-.07	.13*	.24***	.18**	.23***
7. Relationship adjustment							—	-.45***	-.51***	.21***	.35***
8. Female psych. IPV								—	.75***	.51***	.38***
9. Male psych. IPV									—	.48***	.57***
10. Female physical IPV										—	.59***
11. Male physical IPV											—

Notes: IPV = intimate partner violence; AGV = antisociality and generalized violence; psych. = psychological.

* $p < .05$; ** $p < .01$; *** $p < .001$.

other hypothesized model pathways were nonsignificant and were therefore removed from the structural model to improve model parsimony. Removing these model pathways did not significantly deteriorate model fit, $\Delta\chi^2(9, N = 277) = 12.94$, $p > .10$, and the revised structural model exhibited adequate fit to the data, $\chi^2(303, N = 277) = 618.43$, $p < .001$, CFI = .94, RMSEA = .06.

Results from the revised structural model revealed mixed support for the hypothesized model pathways. As shown in Figure 1, hypotheses were supported in showing that each partner's antisociality/generalized violence characteristics had a direct positive association with her or his own perpetration of IPV. In addition, the hypothesized negative association was supported between relationship adjustment

FIGURE 1. Standardized structural model showing pathways to female and male intimate partner violence (IPV) outcomes. AGV = antisociality and generalized violence; psych. = psychological; phys. = physical.

* $p < .05$; ** $p < .01$; *** $p < .001$.

and both partners' psychological IPV. Support was mixed for the hypothesized associations between alcohol and drug use behaviors with IPV. Female drug use exhibited a positive relationship with female physical IPV, whereas male heavy drinking had a positive relationship with male psychological IPV. Counter to the hypotheses, women's heavy alcohol use was not directly related to IPV, and men's drug use was not related to relationship adjustment or IPV. Regarding the interrelationship of IPV variables, support was found for the hypothesized relationship between a given partner's psychological IPV and his or her own physical IPV. In addition, findings supported the hypothesized bi-directional relationship between female and male psychological IPV. However, the relationship between partners' physical IPV was found to be unidirectional, such that men's partner physical IPV predicted women's partner physical IPV but not vice versa (Figure 1).

In addition to the direct effects shown in Figure 1, additional tests were conducted to examine indirect pathways to IPV. As hypothesized, female heavy drinking was shown to exhibit an indirect effect on female psychological IPV via relationship functioning (standardized indirect effect = .04, $p < .01$). Female heavy drinking also exhibited an indirect effect on female physical IPV via the pathway involving relationship functioning to psychological IPV (standardized indirect effect = .03, $p < .01$). Consistent with the hypotheses, an indirect effect of female antisociality/generalized violence on female physical IPV was found via female drug use (standardized indirect effect = .03, $p < .01$). Turning to male IPV, multiple indirect effects were supported. As hypothesized, indirect effects were found from male antisociality/generalized violence to male psychological IPV via relationship functioning (standardized indirect effect = .13, $p < .001$) and also through male heavy drinking (standardized indirect effect = .05, $p < .05$). In addition, multiple indirect effects were found from male antisociality/generalized violence to male physical IPV, including through male psychological IPV (standardized indirect effect = .22, $p < .001$), male heavy drinking to male psychological IPV (standardized indirect effect = .03, $p < .05$), and relationship functioning to male psychological IPV (standardized indirect effect = .07, $p < .001$).

Discussion

This is the first study of which we are aware to investigate antisociality/generalized violence among women entering SUD treatment and their male relationship partners. Our findings are novel in demonstrating that antisociality/generalized violence traits exhibited by women in SUD treatment and their male partners may be key factors in understanding IPV within this population. These findings are consistent with results from other populations, including men in SUD treatment (Murphy and O'Farrell, 1994; Murphy et al., 2001;

Taft et al., 2010), and provide further support for antisociality/generalized violence as a robust risk factor for IPV.

Results from our multivariate SEM models show both direct and indirect effects of antisociality/generalized violence on IPV. These findings indicate that antisociality/generalized violence may both directly elevate risk for IPV while also contributing to a cascade of behaviors and relationship problems that ultimately lead to IPV. The direct influence of antisociality/generalized violence on IPV may be explained by a tendency for individuals who exhibit higher antisociality/generalized violence to disregard societal norms against IPV and generally react to conflict with aggression, regardless of their relationship with the victim. An implication of these results is that SUD programs should consider assessing antisociality/generalized violence among both women with SUD and their male partners as a method of identifying couples who might have a higher likelihood of IPV.

Hypotheses were partially supported in showing indirect effects of female antisociality/generalized violence on female IPV. Higher female antisociality/generalized violence traits were found to be indirectly related to female physical IPV via higher female drug use but not through female heavy drinking. This result differs from Stuart et al.'s (2006) results showing that among women arrested for IPV, alcohol problems mediated the relationship between antisociality/generalized violence and IPV. However, our results are consistent with previous research on women seeking SUD treatment in showing that factors other than women's heavy drinking or alcohol problems may better explain IPV within this population (Chase et al., 2003; Chermack et al., 2001). These findings are important in the context of the larger body of literature, which suggests that the direct association between alcohol use and IPV may be weaker for women than for men (Foran and O'Leary, 2008).

Our model also deviated from the findings of Stuart et al. (2006), in that we found the link between women's heavy drinking and IPV was mediated by lower relationship adjustment. This difference may be attributable to the fact that our sample comprised women seeking help for SUDs, whereas women in the Stuart et al. (2006) study were court-referred for IPV. It is possible that heavy alcohol use has more of a detrimental role on relationship functioning among women seeking SUD treatment versus those who are not engaged in SUD treatment. Our findings are consistent with other studies of individuals seeking SUD treatment in suggesting that heavy alcohol use may contribute to relationship maladjustment, and this may elevate risk for IPV (Chase et al., 2003; O'Farrell et al., 2004).

In comparison with the indirect effects of women's antisociality/generalized violence on their own perpetration of IPV, the SEM results supported different indirect pathways for men. Consistent with South et al.'s (2008) findings from a community sample, women's ratings of their partners' antisociality/generalized violence were inversely associated with

relationship adjustment. Our findings are novel in showing that this pathway, in turn, explained the link between male partner antisociality/generalized violence and male partner IPV. This suggests that women who have male partners with higher antisociality/generalized violence are prone to experience worse relationship functioning, and this, in turn, may predispose them to experience male partner aggression. Our hypothesized model was also supported in showing that the relationship between male antisociality/generalized violence and IPV was partially accounted for by male heavy drinking. This finding is consistent with the larger body of research showing a clear link between men's heavy drinking behaviors and their IPV perpetration (Foran and O'Leary, 2008). Rather than focusing exclusively on reducing the substance use of women who are presenting for SUD treatment, these findings suggest that it may also be necessary to engage and intervene with male partners of women with SUDs to successfully reduce IPV.

Findings from this study were consistent with prior research in suggesting that psychological IPV may be a precipitating factor in explaining physical IPV (Schumacher and Leonard, 2005; Stuart et al., 2006). Psychological IPV was found to partially account for the relationship between several distal predictors within the model and both partners' engaging in physical IPV. This finding is important because it suggests that helping couples to reduce psychological aggression, for example, through building effective conflict management skills, may be an important way to prevent disagreements from escalating to violence.

Our study partially replicated the findings from Stuart et al. (2006) regarding the reciprocal nature of IPV. As with the Stuart et al. (2006) study, we found a reciprocal influence between partners' psychological IPV behaviors. This suggests that independent of other individual and relationship risk factors, one partner's psychological aggression exhibits an influence on the opposite partner's psychological aggression. However, our results differed from those of Stuart et al. (2006) in that the relationship between female and male physical IPV was not found to be bi-directional. Our model showed that although men's physical IPV influenced women's physical IPV, women's physical IPV did not influence men's physical IPV. This finding suggests that men's physical aggression is not well explained as a direct result of, or reaction to, women's physical aggression but was instead better explained by men's individual traits and substance use behaviors as well as the couple's overall relationship adjustment. These findings suggest that to reduce IPV victimization among women in SUD treatment, it may be crucial to include intervention components that address male partner antisociality/generalized violence and substance use behaviors, and as well as couples' relationship adjustment.

The study has several notable strengths. First, the relatively large sample is nearly twice the size of prior studies of women entering SUD treatment (Chase et al., 2003; Cher-

mack et al., 2001; Drapkin et al., 2005). Second, because this study did not restrict the sample to women receiving a specific form of SUD treatment, the results may be more generalizable than prior studies that only included women in couples-based SUD treatment (Chase et al., 2003; Drapkin et al., 2005). Third, the study is the first to use SEM analyses to examine theoretical predictions about the multiple pathways that may explain IPV among women with SUDs.

A number of limitations should also be noted. First, our initial SEM measurement model was just below the suggested threshold for acceptable model fit and required that we free residual error terms among theoretically consistent variables to achieve a well-fitting model. This suggests that the underlying data were not an ideal match to the initial measurement model, and alternative models may also explain the data. Second, although our model findings are consistent with longitudinal research on IPV among men with SUDs and their partners (O'Farrell et al., 2000; Taft et al., 2010), longitudinal research is needed to understand the prospective relationship between risk variables and IPV among women in SUD treatment. Third, women's reports of IPV may be different from the reports that would have otherwise been provided by male partners. Although prior research has shown good agreement among women in SUD treatment and their partners on overall IPV occurrence (Chase et al., 2003), studies of larger-scale, nationally representative samples have shown less consistent agreement between partners' reports of IPV, with women reporting more IPV than men (Armstrong et al., 2002; Schafer et al., 2002). Given these findings, Armstrong et al. and Shafer et al. have advocated that IPV reports be obtained from both partners and for studies to examine mechanisms that may explain differences in partners' reports of IPV.

Although studies show that individuals are able to provide reliable data on their partners antisociality/generalized violence traits, substance use behaviors, and IPV behaviors (Achenbach et al., 2005; Chase et al., 2003; Connelly and Ones, 2010; Klonsky and Oltmanns 2002; Moffitt et al., 1997), this and prior studies of women have been limited by not including male partners in the study. Future studies should seek to obtain a fuller understanding from both partners' perspectives by directly assessing male partners' traits and characteristics. Although we attempted to use as many parallel instruments as possible across partners, because of practical constraints in gathering data from female clients only, some measures of antisociality/generalized violence and drug use were not parallel. It remains possible that these measurement differences influenced model results.

A final limitation is the inability of the CTS2 to provide detailed assessment of how violent encounters unfold between women and their partners, despite this measure being well researched and widely used. Hence, although general patterns of relationship aggression were predictable from key study variables, it remains unclear whether specific in-

stances and acts of violence were in reaction to the partner's behavior or perpetrated in self-defense. It is also important to note that proximal factors that may contribute to IPV in specific violent situations, such as the role of acute intoxication and the tendency to argue about substance use, were not examined within the current models.

In summary, the findings provide empirical support for a multivariate theoretical framework of IPV among women entering SUD treatment. Understanding pathways to IPV is important given the high rates of partner violence in this population. Our findings highlight the importance of individual characteristics of both women and their partners, along with couples' relationship functioning, in understanding IPV risk. Results also support a clear need for violence assessment and interventions that address the individual and relational risk factors among women presenting for SUD treatment. Additional research is needed to determine the extent to which various risk domains are longitudinally associated with IPV occurrence among women receiving SUD treatment and the proximal influences that may help to explain specific instances of aggression.

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