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Relationships among Women's Use of Aggression, Their Victimization, and Substance Use Problems: A Test of the Moderating Effects of Race/Ethnicity

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Abstract

This study examined whether relationships among women's aggression, their victimization, and substance use problems were moderated by race/ethnicity. Four hundred and twelve community women (150 African Americans, 150 Latinas, and 112 Whites) who recently were aggressive against a male partner completed a 2-hour computer-assisted interview. ANOVA and path analysis revealed that (a) for all women, victimization and aggression were strongly related; (b) race/ethnicity moderated the relationships between victimization and alcohol and drug use problems; and (c) no groups evidenced a relationship between alcohol or drug use problems and aggression. Findings suggest that it is essential to develop culturally relevant, gender-specific interventions to reduce both women's aggression and victimization, as well as related negative behaviors such as alcohol and drug use.

Keywords

domestic violence; victimization; aggression; alcohol and drug use problems; race/ethnicity; moderation; women

Physical intimate partner violence (IPV) is most often bidirectional such that women both experience victimization and act aggressively toward their partners (Caetano, Ramisetty-Mikler, & Field, 2005; Field & Caetano, 2005; Sullivan, Meese, Swan, Mazure, & Snow,

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2005). Further, women's victimization and aggression often co-occur with their use of substances (for a review of the literature, see Schafer, Caetano, & Cunradi, 2004). Evidence regarding the co-occurrence suggests that women use alcohol and drugs to cope with victimization (Kaysen et al., 2007; Martino, Collins, & Ellickson, 2005) and that women's alcohol and drug use is a risk factor for their aggressive behavior (Conradi, Geffner, Hamberger, & Lawson, in press; Schafer et al., 2004; Stuart, Meehan et al., 2006). The notion of using alcohol and drugs to cope with victimization is consistent with tension reduction theory (Conger, 1956) and the more contemporary self medication hypothesis (Khantzian, 1997), which posit that individuals use alcohol or drugs to manage negative affective and mood states such as those resulting from IPV (e.g., anxiety and fear; Foa, Cascardi, Zoellner, & Feeny, 2000; Swan & Snow, 2003). The concept of alcohol and drug use as a risk factor for aggression is consistent with the proximal effects model, which encompasses both psychopharmacological and expectancy theories (Chermack & Taylor, 1995; Critchlow, 1983; Hoaken & Stewart, 2003; Leonard & Quigley, 1999). Psychopharmacological theory posits that a substance's psychopharmacological properties facilitate aggressive behavior whereas expectancy theory posits that aggression following substance use is a learned behavior. Further, relationships among women's physical victimization, their use of aggression, and substance use problems appear to vary by race/ethnicity (Field & Caetano, 2004; U.S. Department of Health and Human Services, 2003).

Although theory suggests and studies consistently find that women who are victimized are more likely to use substances and that women's substance use is a risk factor for their aggression, few studies have integrated this information to examine the complex relationships among all of these variables. To date, most studies have separately analyzed relationships between pairs of variables. Analyzing victimization and aggression separately in relation to their precursors and correlates, such as women's substance use, may lead to erroneous conclusions about their relative associations. For example, Sullivan and colleagues (2005) demonstrated that when women's aggression and victimization were analyzed simultaneously in relation to psychological symptoms, aggression was unrelated to symptoms; however, when victimization was deleted from the analysis, it was concluded in error that women's aggression was directly related to psychological symptoms. Similarly, Anderson (2002) found that after accounting for the relationships between victimization and alcohol/drug problems, the once significant relationships between women's alcohol/drug problems and aggression became nonsignificant. Finally, there is a dearth of information about how these relationships may operate differently for African American, Latina, and White women. An investigation such as this is needed if culturally relevant programs are to be developed that address domestic violence and/or alcohol and drug use problems.

Co-occurring Aggression and Victimization

Although women recruited from community settings use physical aggression in intimate relationships at rates equal to or greater than men (Archer, 2000; Dutton, Nicholls, & Spidel, 2005), women who use aggression but who are not victimized are the exception rather than the rule (Sullivan et al., 2005). Findings from a meta-analytic study indicated a large effect size between women's victimization and their use of aggression (Stith, Smith, Penn, Ward, & Tritt, 2004). This finding is concerning since bidirectional physical IPV has been found to be more severe than male-to-female or female-to-male physical IPV alone and may be more difficult to prevent and treat (Caetano et al., 2005). Further, while the temporal order between women's victimization and aggression has not been clearly established and no single theory can explain women's use of aggression (Graham-Kevan & Archer, 2005), there is increasing evidence that women are aggressive in response to men's aggression (Downs, Rindels, & Atkinson, 2007; Swan & Snow, 2002) to defend themselves against intimates, out of fear of physical victimization, to protect their children, to establish control (Caldwell, Swan, Allen, Sullivan,

& Snow, in press; Leisring, in press), and for retribution (Babcock, Miller, & Siard, 2003; Stuart, Moore et al., 2006; Swan & Snow, 2003, 2006).

Substance Use Correlates

A substantial body of literature has linked women's victimization and use of aggression with their drinking, use of drugs, and related substance use disorders (Bonomi et al., 2006; Caetano et al., 2005; Chermack, Walton, Fuller, & Blow, 2001; Cunradi, Caetano, Clark, & Schafer, 1999; Martino et al., 2005; Schafer et al., 2004; Stith et al., 2004; Stuart, Meehan et al., 2006). However, the majority of these studies have examined women's substance use in relation to victimization and aggression in separate analyses. As previously mentioned, results of analyses that separately examine the relationship between substance use and victimization or substance use and aggression may be confounded by the strong intercorrelation between victimization and aggression. What appears to be a correlation between aggression and substance use may, in fact, be a function of the relationship between victimization and substance use (Anderson, 2002; Sullivan et al., 2005).

To date, only four studies have investigated women's victimization and use of aggression simultaneously with their substance use (Anderson, 2002; Martino et al., 2005; Schafer et al., 2004; Stuart, Meehan et al., 2006). Two of these studies (Anderson, 2002; Martino et al., 2005) suggest that women's substance use problems are related to their victimization but not to their use of aggression. After controlling for the significant relationships of victimization to substance use problems, Anderson (2002) found that the relationships between women's substance use problems and aggression disappeared. Results of a longitudinal study by Martino et al. (2005) found women's victimization to be associated with their subsequent heavy drinking (but not recreational drug use); neither women's alcohol use nor their drug use were associated with women's subsequent use of aggression. These studies, along with others of victimized women, provide support for the tension reduction theory (Conger, 1956) and the self-medication hypothesis (Khantzian, 1997), which suggest that women use alcohol and drugs to cope with the adverse consequences of victimization (Hien, Cohen, & Campbell, 2005; Kaysen et al., 2007; Khantzian, 1997).

There are several theories that can explain the relationship between substance use and aggression, many of which are consistent with the proximal effects model (Leonard & Quigley, 1999), which has received the most empirical support (Klostermann & Fals-Stewart, 2006). The proximal effects model posits that alcohol intoxication facilitates aggression and further, that the alcohol-aggression relationship may be mediated by a person's expectancies about alcohol (Critchlow, 1983) and/or the pharmacological effects of alcohol, which impair cognitive processing (Chermack & Taylor, 1995). Many studies have provided empirical support for the proximal effects model among men (e.g., Fals-Stewart, 2003; Fals-Stewart, Golden, & Schumacher, 2003; Fals-Stewart, Leonard, & Birchler, 2005). Few studies have provided support for this model among women (Schafer et al., 2004; Stuart, Meehan et al., 2006).

Of the four aforementioned studies that examined women's victimization and their use of aggression simultaneously with substance use, the final two studies to note found women's alcohol use problems to be a risk factor for their use of aggression (Schafer et al., 2004; Stuart, Meehan et al., 2006); however, the strength of this relationship was small in one study (Stuart, Meehan et al., 2006) and not reported in another (Schafer et al., 2004). Therefore, while the proximal effects model and some research suggests that women's substance use and use of aggression are related, we contend that it is unlikely that the proximal effects model would be supported among women. It is not clear that women's substance use serves the same function as it does for men and consequently, women's substance use may not be related to their use of

aggression. That is, women often use aggression in response to men's aggression against them (Downs et al., 2007; Hamberger & Guse, 2005) and therefore, we reason that substance use problems may not be related to women's use of aggression but rather, may be related exclusively to their victimization.

Race/ethnicity as a Moderator of Victimization, Substance Use, and Aggression

Accumulating research by Caetano, Schafer, Cunradi, Field, and colleagues suggests that the relationships between women's (a) victimization and use of aggression, (b) victimization and substance use problems, and (c) substance use problems and use of aggression vary by race/ethnicity (Caetano et al., 2005; Field & Caetano, 2005; Schafer et al., 2004). For example, in a cross-sectional study, Blacks were found to have higher rates of bidirectional physical partner aggression than Hispanics or Whites (Caetano et al., 2005). Findings from a longitudinal study suggest Blacks and Hispanics have comparable and higher rates of bidirectional physical aggression than Whites. However, only Black ethnicity was an independent predictor of bidirectional aggression above and beyond education, income, employment status, alcohol problems, and history of aggression in one's family of origin (Caetano et al., 2005). For Black couples, consistent evidence links women's alcohol use problems to their victimization. For White couples, the literature is contradictory. For Hispanic couples, there is no evidence for the relationship between alcohol use problems and victimization. Findings are not entirely consistent about the relationships among specific groups.

To our knowledge, only one study has examined whether race/ethnicity moderated the relationships among women's victimization, aggression, and alcohol use problems (Schafer et al., 2004). Specifically, Schafer et al. showed that for African American women, alcohol use problems were significantly associated with their victimization and use of aggression in intimate relationships. No such relationships emerged for White or Hispanic women. While the Schafer et al. study permitted an examination of the relationship between alcohol use problems and victimization/aggression by racial/ethnic group, it did not investigate the co-occurrence of victimization and aggression or the relationship of these variables to drug use problems.

Based on these considerations, the current study aimed to test the extent to which the relationships among women's victimization, alcohol and drug use problems, and use of aggression are moderated by racial/ethnic group. The hypotheses to be tested are as follows. First, women's victimization will be positively related to their use of aggression. Second, women's victimization will be positively related to alcohol and drug use problems. Third, given the lack of evidence, no prediction is made regarding the relationship between alcohol and drug use problems and use of aggression. Fourth, it is hypothesized that race/ethnicity will moderate the relationships among women's victimization, alcohol and drug use problems, and use of aggression.

Method

Sample

Recruitment flyers advertising the Women's Relationship Study were posted in four urban-area primary care clinics and emergency departments. Recruitment materials also were posted in local businesses such as grocery stores, laundromats, and shops, as well as selected state offices such as the Department of Employment. Eligibility was determined via a phone-screen and was based on the following inclusion criteria: (a) female sex, (b) current involvement in a heterosexual intimate relationship of at least six months duration, (c) a woman's commission

of at least one act of physical aggression against her male partner within the past six months, (d) age 18 to 64, (e) residency in the greater urban area, and (f) household income of less than \$50,000 (determined a priori to methodologically control for the differential resources associated with higher income). The sample of 412 women was stratified by racial/ethnic group (150 women of African descent, 150 Latina women, and 112 non-Latina White women).

Overall, the sample was largely comprised of high school-educated ($n = 284$; 69%), unemployed ($n = 171$; 66%) women with low levels of annual income (mode < \$10,000; 43%). The majority of women lived with their partners ($n = 259$; 63%) and had been in their relationships for 1-5 years ($n = 171$; 42%); an additional 22% had been with their partners for 5-10 years and 23% for 10-20 years. Regarding the Latina subsample, 96% were born outside of the United States, with the mean number of years living in the United States being 15.3 ($SD = 12.08$). Over half (53%) were Puerto Rican, followed by 11% Mexican, 7% Columbian, 5% Venezuelan, with the remaining 24% from various other nations. Over three-quarters of the Latina sample (85%) reported that their partners also were Latino.

Procedures

To screen specifically for women's use of physical aggression, items from the Conflict Tactics Scale-2 (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) were used. In order not to reveal the specific interest in women's use of physical aggression as the main inclusion criterion, both victimization and aggression items from the negotiation, psychological aggression, and physical assault scales were included.

Eligible participants met with a trained female interviewer of the same race/ethnicity who administered one 2-hour protocol via computer-assisted interviewing (NOVA Research Company, 2003) conducted in English or Spanish. Approximately half of the Latina participants (i.e., 49%) elected to have the protocol administered in Spanish. All study materials were translated into Spanish. If an established Spanish version of a measure did not exist, a bilingual member of the research team translated the instrument. The translated version was reviewed by a bilingual consultant and back-translated into English to ensure accurate translation (Brislin, 1970). All data were self-reported by the participant. At the conclusion of the interview, participants were debriefed, remunerated \$50, and provided with a list of community resources for food, employment, housing and benefits assistance, mental health and substance use treatment, and IPV-related services.

Measures

Physical aggression and physical victimization—Women's aggression and their victimization were assessed on three dimensions: physical, sexual, and psychological IPV. Only the 12 items from the CTS2 (Straus et al., 1996) physical assault scales were the focus of the present study. A referent time period of six months was used to assess a participant's commission of an aggressive behavior toward her partner and the partner's commission of each behavior toward her. The response scale ranged from *never*, *once*, *twice*, *3-5 times*, *6 - 10 times*, to *more than 10 times in the past six months*. The two response categories presented as a range were recoded so that the midpoint of each range was the variable's value (i.e., 3 - 5 = 4; 6 - 10 = 8); more than 10 times was conservatively recoded to a value of 11. Two scores, women's physical aggression and their physical victimization, were created by summing the 12 items for each of these subscales. The reliability of the items for women's physical aggression was $\alpha = .87$ and for women's physical victimization was $\alpha = .91$.

Alcohol use problems—The Alcohol Use Disorder Identification Test (AUDIT; Babor & Grant, 1989) is a 10-item measure used to screen for those at high risk for alcohol use problems within the past six months. The measure has been used internationally and has high and well-

established sensitivity and specificity (Allen, Litten, Fertig, & Babor, 1997) and test-retest reliability (Selin, 2003). By summing participants' responses to questions about the frequency and quantity of drinking behaviors, as well as problems related to their drinking, the AUDIT produces a total score that is used to determine if an individual screens positively for problematic alcohol use. The total score is used in the analytic models. Typically, a cut-off score equal to or greater than 8 is used to classify individuals as problem drinkers (Babor & Grant, 1989). However, a more recent study of the general population (Selin, 2003) showed that the optimal cutoff for women is 6. Based on this gender-specific cutoff of 6, 26% of the sample was classified as having a drinking problem. Internal consistency in the current sample was $\alpha = .89$.

Drug use problems—The Drug Abuse Screening Test (DAST; Skinner, 1982) is a measure widely used to screen for drug use problems over the past six months. The DAST yields a quantitative index of the degree of drug use problems or consequences by summing participants' responses (i.e., *no* = 0, *yes* = 1). The 20-item version (Skinner, 1982) was used in this study. Both a total score and a score that classifies participants with drug use problems akin to Diagnostic and Statistical Manual of Mental Disorders-IV (American Psychiatric Association, 1994) substance abuse or dependence can be calculated. A score of 0 indicates no drug-related problems or consequences (55% of the total sample), 1 to 5 indicates low levels of problems or consequences (25% of the total sample), and a score equal to or greater than 6 indicates that the participant likely meets the criteria for a drug use problem (29% of the total sample). For the purposes of the analyses, the drug use problems variable was a total score created by summing all 20 items. Internal consistency in the current sample was $\alpha = .86$.

Data Analysis

The first step in data analysis was to examine data for skew. All four variables (i.e., physical victimization, alcohol use problems, drug use problems, and use of physical aggression) demonstrated skew for at least one of the three racial/ethnic groups. Transformations were based on recommendations of Tabachnick and Fidell (2007). The log10 transformation was the best method for normalizing data for the four variables across groups.

The rationale for multigroup path analysis is to determine if the relationships among variables in a given model vary across groups (Kline, 2005); in other words, does the grouping variable (i.e., racial/ethnic group) serve to moderate relationships among model variables? In order to determine if path coefficients differ among groups for any given relationship between two variables, critical ratios of the differences between parameters are inspected. If the path coefficients are not significantly different between any two groups or across all three groups, the relevant parameters are constrained to be equal (i.e., a cross-group equality constraint is imposed for that path).

The AMOS 7.0 statistical program (SPSS Inc, 2006), which uses Full Information Maximum Likelihood to deal with missing data, was employed to analyze the path models, obtain maximum-likelihood estimates of model parameters, and provide goodness-of-fit indices. The percentage of missing data for each variable in any group was less than 1%. To obtain the most parsimonious model, (a) the initial model, with no cross-group equality constraints imposed, was modified by a one-by-one addition of cross-group equality constraints and then, (b) this alternative model was compared to the previous model (e.g. initial model or model with an additional constraint imposed) using the chi-square difference statistic ($\Delta\chi^2$) to determine if there was a decrement in model fit. If the chi-square difference statistic showed that there was not a decrement in fit of the alternative model (i.e., the alternative model was not "worse"), this model was accepted. Because the dispersion of variables differs across groups, the unstandardized estimates should be used to compare parameter estimates (e.g., path

coefficients) across groups. Standardized estimates can be viewed to compare parameters within a group; these estimates are reported in the text (Kline, 2005).

Results

Mean Racial/Ethnic Group Differences

Intercorrelations, means, standard deviations, and ranges for each group are included in Table 1. For all groups, the strongest correlations were evidenced between victimization and aggression and between alcohol and drug use problems.

ANOVA tests revealed statistically significant differences for victimization, alcohol and drug use problems, and use of aggression scores among the three racial/ethnic groups, $F(2,409) = 3.82, p < .05$; $F(2,403) = 34.44, p < .001$; $F(2, 408) = 25.28, p < .001$; and $F(2, 409) = 14.87, p < .001$, respectively (see Table 2). Post-hoc comparisons (see Figure 1) using the Tukey HSD test, and the Games Howell test when the homogeneity of variances assumption was violated, indicated that alcohol use problems was the only variable to differ significantly among all three groups. African Americans reported the highest alcohol use problems scores and Latinas the lowest. For drug use problems, both White and African American women's mean scores were significantly higher than Latinas' but not different from each other's. Regarding experiences of victimization, the only significant difference was between African American and Latina women's means scores, with African Americans reporting more victimization. Regarding women's use of aggression, African American and Latina women's mean scores did not differ from each other, but each group had significantly higher scores than White women.

Path Models

In order to test for moderation, the data first must have good fit to the initial model (Kline, 2005). A preliminary model included a test of the path between drug use problems and aggression since bivariate correlations showed a significant relationship between these variables for African American women. Results of this preliminary model showed that this path was non-significant for all groups. To avoid a saturated model whereby fit statistics are not provided, the path between drug use problems and aggression was dropped from the model. The unconstrained, initial model provided excellent fit to the data, with a non-significant Chi-square, $\chi^2(3, N = 412) = 2.71, p = .44$, a $\chi^2/df = .91$, and an RMSEA = .00, a confidence interval of .00 to .08, and a p for test of close fit of .77. None of the groups significantly differed from one another regarding the paths between victimization and aggression and between alcohol use problems and aggression. As a result, cross-group equality constraints were imposed across all three groups for each of these parameters. A constraint also was imposed for the path between victimization and alcohol use problems for African Americans and Latinas because the relationship between these variables did not differ for these groups. However, the path between victimization and alcohol use problems for African Americans and Latinas each differed from the path for White women. Therefore, the parameters between African American and White women and between Latinas and White women were free to vary.

With the constraints imposed as described above, the final model provided an excellent fit to the data, with a non-significant Chi-square, $\chi^2(8, N = 412) = 6.61, p = .58$, a $\chi^2/df = .83$, and an RMSEA = .00, a confidence interval of .00 to .05, and a p for test of close fit of .95 (see Figure 2). The non-significant Chi-square difference, $\Delta\chi^2 = .73 (p = .39)$ indicated that the more parsimonious model, with cross-group equality constraints imposed, did not show a decrement in fit compared to previous models and therefore, is preferred as the final model. Each model explained a sizable amount of variance in women's use of aggression, ranging from 16% for White women, 19% for African American women, to 25% for Latinas.

As hypothesized, victimization was strongly and positively related to women's aggression for African American ($\beta = .42, p < .001$), Latina ($\beta = .49, p < .001$), and White ($\beta = .40, p < .001$) women. This was the only path that was significant across all groups. For African Americans and Latinas, findings supported the hypothesis that victimization was related to substance use problems: higher levels of victimization were related to greater alcohol use problems ($\beta = .17, p < .001$ and $\beta = .22, p < .001$, respectively) and drug use problems ($\beta = .25, p < .001$ and $\beta = .20, p < .05$, respectively). This hypothesis was not supported among White women. No groups evidenced a relationship between alcohol use problems and women's aggression. In summary, race/ethnicity was shown to moderate the relationships between victimization and both alcohol and drug use problems. However, race/ethnicity did not moderate the relationships between victimization and aggression or between alcohol use problems and aggression.

Discussion

Among women who recently were aggressive against their intimate partners, important differences among racial/ethnic groups emerged regarding level of victimization, number of alcohol and drug use problems, and use of aggressive behavior. Furthermore, race/ethnicity moderated relationships between victimization and both alcohol and drug use problems.

Racial/ethnic groups differed in their use of aggression as well as in their experiences of victimization. African American and White women had comparable and higher levels of victimization than Latina women, while African American and Latina women had comparable and higher levels of aggression than White women. Furthermore, differences were evident regarding substance use problems with African American women having the greatest number of alcohol use problems, while African American and White women had comparable and higher numbers of drug use problems than Latina women. Regarding model findings, only one significant relationship between variables existed for all groups – women's victimization was strongly related to their use of aggression, a finding that is in line with previous research (Stith et al., 2004; Sullivan et al., 2005). The relationships between victimization and substance use problems were moderated by racial/ethnic group: African American and Latina women's victimization was related to both their alcohol and drug use problems, while White women's victimization was unrelated to either their alcohol or drug use problems.

Culturally specific norms and attitudes may elucidate some of the study findings. Swan and Snow (2006), in their development of a theory of women's use of violence, suggested that cultural norms may make it more acceptable for women from some racial/ethnic groups to use aggression compared to other groups. For example, these authors noted that African American women are expected to be strong, able to manage adversity independently, and to be involved in egalitarian relationships – expectations that may influence African American women's use of aggressive behavior, particularly in the context of their victimization. For Latinas, acculturation to a more egalitarian and "socially progressive environment that supports [Latinas] opinions and encourages them... to challenge their partners and families" (Adames & Campbell, 2005, p. 1359) might help to explain their higher rates of aggressive behavior. Further, the higher rates of aggression demonstrated by African American and Latina women may be due, in part, to the fact that they are less likely to use community resources and interventions (Department of Health and Human Services: U.S. Public Health Service, 2001; Wells, Klap, Koike, & Sherbourne, 2001). Similarly, cultural factors including norms and attitudes about alcohol use may account for racial/ethnic differences in alcohol use problems (Galvan & Caetano, 2003); factors that may account for the higher numbers of drug use problems for African American and White women are not clear.

Contrary to expectations, tension reduction theory (Conger, 1956) and the self-medication hypothesis (Khantzian, 1997) do not seem to apply unilaterally – they seem only to be supported

among African American and Latina women. Women from both groups with greater experiences of victimization exhibited a higher number of alcohol and drug use problems. However, none of these relationships was significant for White women. These findings are consistent with the results of Schafer et al. (2004), but the reason for the findings is not entirely clear. Some scholars (Collins & McNair, 2002; Schafer & Caetano, 2002) suggested that the lower rates of treatment utilization among ethnic-minorities may contribute to the differential patterns of substance use and related problems. While this may offer a partial explanation, it is highly likely that each group has different mechanisms of action operating on the relationship between victimization and substance use problems. For example, Collins and McNair (2002) found that with respect to alcohol use patterns, religiosity is more relevant for African American women while acculturation is more influential for Latinas. In summary, attempting to explain the findings between victimization and substance use problems for each racial/ethnic group with the same theory is likely too simplistic.

Finally, for all women, alcohol and drug use problems were unrelated to their use of aggression. These results are contrary to findings of studies of men whereby men's substance use is related to their aggressive behavior (Fals-Stewart, 2003; Fals-Stewart et al., 2003; Snow, Sullivan, Swan, Tate, & Klein, 2006). These results also are contrary to Schafer et al.'s (2004) findings that the relationship between women's alcohol problems and their use of aggression against intimate partners varied by racial/ethnic group. It is possible that other studies have erroneously concluded that women's aggression is related to their substance use because those studies did not simultaneously examine women's victimization. Perhaps the current study's findings are the result of including victimization as a predictor of women's use of aggression and therefore, reflect that after accounting for the relationship of victimization to aggression, no relationship exists between substance use and aggression. The current study's non-significant findings call into question whether or not the proximal effects model, whereby substance use precedes the use of aggression, applies to women as it does to men. One plausible explanation for this gender difference is that women may not have learned to expect that their substance use will lead to their use of aggression.

Limitations

A number of limitations are worthy of note. First, data collection relied on self-report. It is possible that women's partners might have reported different frequencies of women's experiences of victimization or use of aggression. However, research shows that women's self-reports of victimization and aggression are reliable (Magdol, Moffitt, Caspi, & Silva, 1998). Second, the data were cross-sectional in nature. Therefore, alternative models whereby women's aggression contributes to their victimization or women's substance use problems contribute to their victimization are plausible. Third, the sample size limited the number of variables that could be included in the model. Examining variables such as childhood abuse, coping strategies, motivations for substance use, as well as motivations for, meaning of, and impact of aggression might shed more light on the relationships among variables. Additionally, covarying for key demographic differences such as income, level of education, and age is needed to determine whether or not they affect the relationships investigated here. Fourth, the generalizability of findings are limited to African American, Latina, and White urban women with low levels of income who are able to attend and complete study interviews; therefore, it is highly likely that the most severely abused women are not represented in this sample. Fifth, Latinas were examined as a homogenous group and as such, findings should be interpreted with caution since there may be differences among subgroups of Latinas. Finally, the coding scheme for the CTS2 (Straus et al., 1996) may have allowed for the under- or over-representation of the frequencies of physical victimization and aggression.

Directions for Future Research and Implications

Findings have direct implications for research on women's IPV and substance use. Given that the majority of research on women's victimization and their substance use supports tension reduction theory (Conger, 1956) and the self medication hypothesis (Khantzian, 1997), the current study's lack of support for these theories among White women is unexpected and thus warrants further research. Similarly, the lack of support for the proximal effects model warrants further research given the inconsistent findings in the extant literature among women (Martino et al., 2005; Schafer et al., 2004; Stuart, Meehan et al., 2006). To determine the temporal relationships of victimization, aggression, and substance use among women, longitudinal studies are needed to examine event-level data that would allow for the identification of patterns of relationships among these variables both within events as well as within women over time. Finally, the complex relationships among victimization, aggression, and substance use can be further elucidated by the examination of potential correlates that may be specific to a given racial/ethnic group, such as religiosity among African Americans or level of acculturation among Latinas.

Findings of the current study can inform the development and/or refinement of programs that address women's aggression, victimization, or substance use. Based on study findings, it is essential to develop culturally relevant, gender specific interventions to reduce both women's aggressive behavior and their experiences of victimization, as well as related negative behaviors such as substance use. Programs developed to reduce women's aggression in intimate relationships need to attend to co-occurring victimization regardless of women's race/ethnicity. In victimization-focused services, there needs to be greater attention to substance use problems in general and among minority women in particular. In substance use programs, it is especially important to attend to victimization for African American and Latina women. Further, within a substance abuse prevention framework, it could be productive to inform African American and Latina women of the resources available to address potential substance use problems and, as necessary, to develop and provide services that are culturally relevant.

In summary, this study identified that regardless of race/ethnicity, women's victimization was strongly related to their use of aggression in intimate relationships. Further, race/ethnicity was identified as an important moderator of the relationships between victimization and both alcohol and drug use problems, which underscores the need to understand what factors contribute to these important subgroup differences. Findings of future research aimed at elucidating (a) the relationships between women's victimization and their aggression and (b) the relationships between victimization and substance use problems have the potential to significantly impact the prevention and treatment of both IPV and substance abuse or dependence.

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Note. Bars with the same superscripts denote that means between the two groups for each variable are not significantly different according to Tukey HSD or Games-Howell PostHoc tests.

Figure 1.
Post Hoc Comparisons for Victimization, Alcohol and Drug Problems, and Use of Aggression.

* $p < .05$, ** $p < .01$, *** $p < .001$, † $p < .10$

Standardized estimates should be used to compare parameters within groups (and are noted preceding the slash) while unstandardized estimates should be used to compare parameters across groups (and are noted following the slash).

Figure 2.
Path Model for African American, Latina, and White Women's Use of Aggression

Table 1
Intercorrelations, Means, Standard Deviations, and Ranges of Study Variables (N=412)

Variable	1	2	3	4	M	SD	Range
<u>African American (n = 150)</u>							
1. Physical Victimization	--				22.63	26.40	0 - 111
2. Alcohol Use Problems	.23***	--			6.98	7.78	0 - 36
3. Drug Use Problems	.27***	.46***	--		3.46	4.28	0 - 16
4. Physical Aggression	.45***	.24***	.20*	--	23.75	22.08	1 - 104
<u>Latina (n = 150)</u>							
1. Physical Victimization	--				15.20	20.42	0 - 95
2. Alcohol Use Problems	.18*	--			2.01	3.83	0 - 28
3. Drug Use Problems	.19*	.33***	--		.85	2.46	0 - 18
4. Physical Aggression	.46***	.12	.16†	--	16.67	16.96	1 - 87
<u>White (n = 112)</u>							
1. Physical Victimization	--				15.68	20.34	0 - 108
2. Alcohol Use Problems	-.10	--			4.58	4.05	0 - 32
3. Drug Use Problems	-.05	.35***	--		3.23	4.67	0 - 16
4. Physical Aggression	.44***	-.07	.09	--	12.50	15.65	1 - 103

Note: Means, standard deviations, and ranges are for untransformed scores. Correlations are based on transformed scores.

*
p < .05

p < .001

Table 2

Analysis of Variance for Victimization, Alcohol and Drug Use Problems, and Use of Aggression by Racial/Ethnic Group

Source	df	SS	MS	F
Victimization				
Between groups	2	2.24	1.12	3.82*
Within group	409	120.14	.29	
Total	411	122.39		
Alcohol Use Problems				
Between groups	2	10.75	5.38	31.44***
Within group	403	68.92	.17	
Total	405	79.68		
Drug Use Problems				
Between groups	2	7.52	3.76	25.28***
Within group	408	60.71	.15	
Total	410	68.23		
Use of Aggression				
Between groups	2	4.06	2.30	14.87***
Within group	409	63.28	.16	
Total	411	67.89		

Note. ANOVAs were performed with transformed scores.

* $p < .05$

** $p < .01$

*** $p < .001$

Table 3

Maximum Likelihood Parameter Estimates for Analysis of a Path Model of Victimization, Substance Use, and Aggression across Samples of African American, Latina, and White Women

Parameter	African American			Latina			White		
	Unstandard	SE	Standard	Unstandard	SE	Standard	Unstandard	SE	Standard
Unconstrained estimates									
<u>Direct effects</u>									
Phys Vic → DrgProbs	.19	.06	.25***	.10	.04	.20*	-.04	.09	-.05
AlcProbs → PhysAggrs	.06	.04	.06	.06	.04	.06	.06	.04	.06
<u>Disturbance variances</u>									
D _{AlcProbs}	.20	.02	.97	.12	.01	.95	.19	.03	.99
D _{DrgProbs}	.17	.02	.94	.07	.01	.96	.20	.03	100
D _{PhysAggrs}	.15	.02	.81	.09	.01	.75	.13	.02	.84
Equality-constrained estimates									
<u>Direct effects</u>									
Phys Vic → PhysAggrs	.32	.03	.42***	.32	.03	.49***	.32	.03	.40***
Phys Vic → AlcProbs ^a	.14	.04	.17***	.14	.04	.22***	-.09	.08	-.10

Note. Standardized estimates for disturbances are proportions of unexplained variance.

^aEquality constraint imposed between African Americans and Latinas only.

*
p < .10

**
p < .01

p < .001