Drinking Style and Dating Violence in a Sample of Urban, Alcohol-Using Youth*

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ABSTRACT. Objective: This study examined childhood abuse, problem behavior, drinking style, and dating violence (DV). Our goal was to assess whether (a) alcohol use–related beliefs and behaviors ("drinking style") would be associated with DV perpetration and victimization, (b) drinking style would mediate the relationship between childhood abuse and DV, and (c) the drinking style–DV relationship would be attributable to propensity for problem behavior. **Method:** Cross-sectional survey data were collected from 456 youth ages 14–21 years who were patients in an urban emergency department. Participants were eligible if they were unmarried and reported past-month alcohol use and dating in the past year. By design, the sample was 50% female. Data were analyzed using structural equation modeling. **Results:** For both males and females, past-year DV was associated with a more risky drinking style, characterized by more frequent alcohol use, alcohol-aggression expectancies, drinking to cope, and beliefs that alcohol is disinhibiting and that being drunk provides a "time-out" from behavioral expectations. Drinking style mediated the childhood victimization–DV relationship for males and females. However, when propensity for problem behavior was included in the model, the effect of drinking style on DV was no longer significant. Substantial path differences for males and females were observed. **Conclusions:** The current study examined adolescent drinking style as a potential mediator between childhood victimization and DV. Drinking style was associated with DV for males and females and mediated the relationship between childhood victimization and DV. The relationship between drinking style and DV appeared to reflect adolescents' propensity for problem behavior. Variations in males' and females' pathways to DV were observed. The implications of these findings are discussed. (*J. Stud. Alcohol Drugs, 72,* 555–566, 2011)

THE PERPETRATION OF ADOLESCENT dating violence (DV) is widespread. Estimates suggest that 12%–32% of youth have physically assaulted a dating or sexual partner in the past year (Foshee et al., 2009; Rothman et al., 2010; Simon et al., 2010; Whitaker et al., 2007). A recent analysis of nationally representative data on U.S. young adults ages 18–28 years old found that almost 24% of heterosexual romantic relationships were physically violent (Whitaker et al., 2007). The consequences of DV can be severe and long lasting and may include death, injuries, and mental health disorders (Amar and Gennaro, 2005; Brown et al., 2009; Fletcher, 2010; Whitaker et al., 2007). For these reasons, research on the etiology of DV and the development of interventions to prevent it are public health priorities.

Several causal risk factors for DV perpetration have been identified through longitudinal studies, including experiencing physical and/or sexual abuse victimization in the home (Fang and Corso, 2007, 2008; O'Donnell et al., 2006), witnessing interparental partner abuse (O'Donnell et al., 2006), propensity for physical fighting (Cleveland et al., 2003), and generally aggressive behavior (O'Leary and Smith Slep, 2003). Independent studies have also detected deleterious relationships between childhood abuse victimization and adolescent alcohol use (Shin et al., 2009) and between the frequency and volume of early adolescent alcohol use and subsequent physical fighting (Swahn and Donovan, 2005). Taken together, these findings suggest that alcohol may play an important role in the pathway from childhood abuse victimization to DV perpetration.

Alcohol and partner violence perpetration in adults and adolescents

Whether alcohol is a contributing causal factor in youth DV perpetration is currently unknown. There is a substantial body of literature documenting the contributing role of alcohol use in *adult* partner violence perpetration incidents (Caetano et al., 2005; Fals-Stewart et al., 2003, 2005; Leonard, 2005; Stuart et al., 2009), and at least 14 studies have found that overall patterns in the frequency and quantity of alcohol consumption are associated with DV perpetration among college students or other emerging adult populations (Banyard et al., 2006; DuRant et al., 2007; Lundeberg et al., 2004; Luthra and Gidycz, 2006; Muñoz-Rivas et al., 2010; O'Keefe, 1997; Rapoza and Baker, 2008; Roudsari et al., 2009; Shook et al., 2000; Stappenbeck and Fromme, 2010; Stets and Henderson, 1991; Swahn et al., 2008; Wiersma et

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al., 2010; Williams and Smith, 1994). On the basis of this accumulating evidence, researchers now postulate that there could be a causal alcohol–youth partner violence perpetration link, although this has yet to be established (Wiersma et al., 2010).

Several mechanisms for a direct alcohol–violence link have been proposed, including the suggestion that alcohol impairs cognition (Grant and Macdonald, 2005) and frontal lobe activity (Lyvers and Tobias-Webb, 2010). There are alternate, less proximal, possible explanations as well. Individuals may use alcohol as a "time-out" from usual social expectations and assume that they will not be held culpable for their behavior if they can use drunkenness as an excuse (MacAndrew and Edgerton, 1969). Youths' behavior while intoxicated may also reflect their alcohol–aggression expectancies—that is, they may have developed a belief that alcohol increases aggression and, therefore, when drinking, act out this expectancy (McMurran et al., 2006). Finally, it is possible that the connection between alcohol use and violent behavior may be spurious and reflect other factors that underlie both. For example, youths who were maltreated as children may be more prone both to use alcohol and to abuse dating partners. Each of these hypothesized mechanisms may explain some of the relationship between alcohol use and DV perpetration. Research that investigates the possible linkages among childhood abuse, alcohol use, and youth DV will help determine whether alcohol is an important explanatory component of DV perpetration.

Explanatory theories for dating violence

Although the field lacks a comprehensive, unifying framework to explain DV, there are three prevailing theories about why it occurs, which have been summarized by Shorey and colleagues (2008). These include (a) a "background-situational" model based on social learning and conflict theory, which holds that adolescents' relationship behavior is both modeled on their parents' or guardians' and influenced by situational events such as conflicts with partners and impairment due to alcohol use; (b) feminist theory, which views DV as a manifestation of gender-based power inequities in society; and (c) attachment theory, which contends that mistreatment in childhood leads to abusive partnership behavior because affected individuals have become accustomed to labile relationships (Riggs and O'Leary, 1996; Shorey et al., 2008). Although some degree of empirical support has been found for each of these three theories, each also has faced contradictive evidence, and thus there is a continuing need to improve them (Luthra and Gidycz, 2006; Shorey et al., 2008). Notably, multiple studies have found different typologies of DV perpetration for males and females, suggesting that there may be etiological differences by gender (Fang and Corso, 2008; Foshee et al., 2009; Luthra and Gidycz, 2006; Miller et al., 2009).

Reciprocity in physically violent youth dating relationships

An important facet of youth DV is that the majority of it is reciprocal—that is, most youth who have perpetrated DV also report being the recipient of DV by their partners. An analysis of National Longitudinal Study of Adolescent Health data revealed that 50% of violent young adult partnerships are mutually violent (Whitaker et al., 2007), and a review of seven studies by Gray and Foshee (1997) found that 43%–72% of violent dating relationships are mutually violent. For this reason, exploration and consideration of the correlation between victimization and perpetration are needed.

Development of a new model to examine the role of alcohol use–related factor and dating violence perpetration

To develop effective interventions to reduce the perpetration of DV, it is essential to understand as fully as possible which modifiable factors are influencing DV and whether the relationships are the same for both males and females. Prior research suggests that males and females have different motivations for perpetrating DV and that the consequences of perpetration may differ by the gender of the perpetrator (Foshee et al., 2007). Moreover, of the 14 studies that have assessed the alcohol–DV perpetration relationship in youth by gender, two thirds ($n = 9$) have found significantly different results in that relationship for males and females (Cogan and Ballinger, 2006; Foo and Margolin, 1995; Foshee et al., 2001; Lysova and Hines, 2008; McDonell et al., 2010; Rivera-Rivera et al., 2007; Shook et al., 2000; Stappenbeck and Fromme, 2010). For these reasons, it seems important to investigate the alcohol–DV relationship using a gender-stratified approach.

Furthermore, given that there has been a call for "targeted and culturally sensitive interventions in settings other than schools," developing and testing a new model with urban, primarily non-college-attending youth also are priorities (Whitaker et al., 2006, p. 164). The present study sought to extend previous work by drawing on existing theory and identified correlates of DV and examining the relationships among childhood abuse victimization, propensity for problem behavior, and a set of alcohol-related variables representing "drinking style." Of particular interest was exploring whether there was a significant relationship between drinking style and DV when childhood abuse victimization factors and problem behavior were held constant. Additionally, rather than conceptualizing DV as an "either/or" experience, we selected to build a model in which the covariation between perpetration and victimization was estimated.

This study addressed three hypotheses. First, it was hypothesized that drinking style would be directly associated with DV perpetration and victimization for both males and females, in a model where DV perpetration and victimization

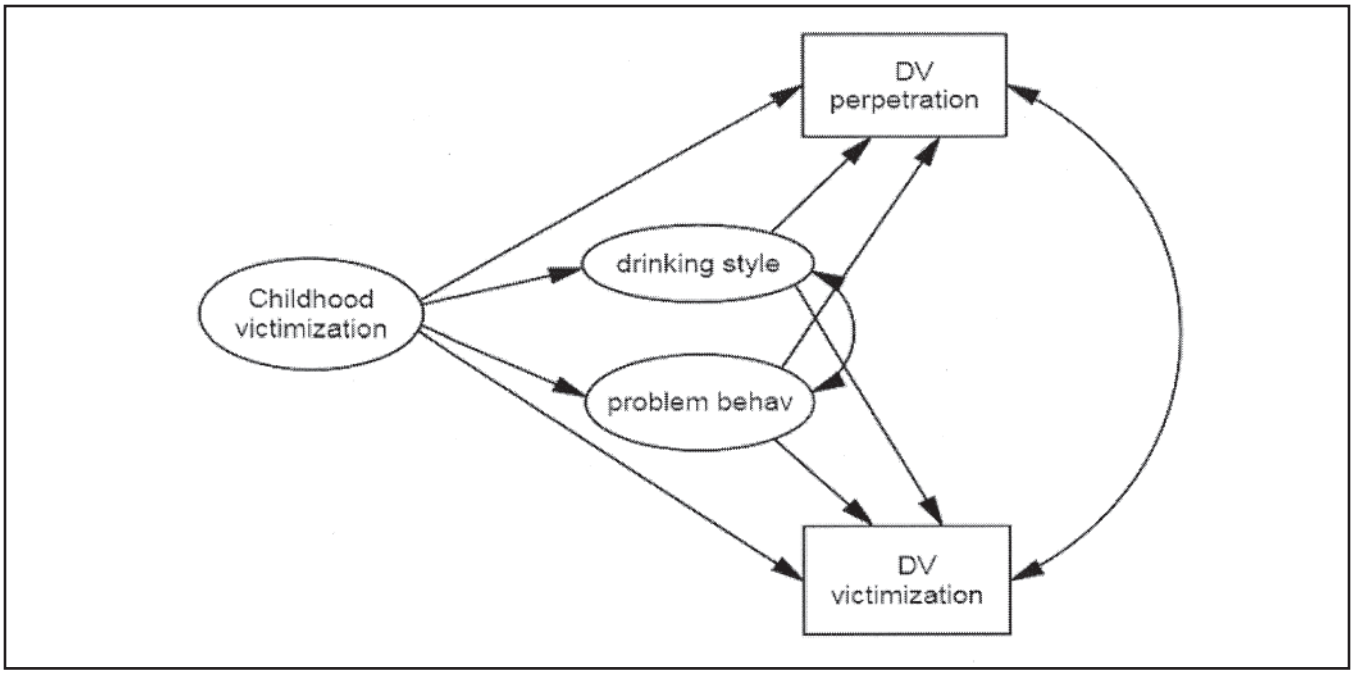

FIGURE 1. Hypothesized structural equation model predicting the effect of drinking style on adolescent dating violence (DV) perpetration and victimization. Behav = behavior.

were allowed to be freely correlated. Second, drinking style would mediate the relationship between childhood abuse and DV. Third, when drinking style and problem behavior were predictors of DV perpetration and victimization and conditioned on childhood victimization factors, the relationship between drinking style and DV would be attenuated. The model pertaining to the third hypothesis is shown in Figure 1.

Method

Participants

Participants were 456 pediatric emergency department patients at the Boston University Medical Center (BUMC) hospital between July 2009 and June 2010. BUMC is the largest safety net hospital in New England; approximately 50% of patients are uninsured or on Medicaid. We screened 1,118 patients, of whom 60% were eligible based on age, dating, and alcohol use history. Those who had not had a dating partner in the past year (n = 125) or a drink of alcohol in the past month (n = 314), were not comfortable reading English (n = 9), or were married (n = 9) were ineligible. Of those eligible, 71% enrolled. Our sample participants were between 14 and 21 years old (M_{age} = 19.1 years). Approximately 55% were Black, 14% were Hispanic, 15% were White, and 15% were multiracial or another race/ethnicity; 15% reported that they had dropped out of high school, and 18% were parents. All study protocols were reviewed and approved by the BUMC Institutional Review Board.

Measures

Dating violence. DV victimization and perpetration were each assessed using a modified version of the Safe Dates physical violence scale (Foshee et al., 1998, 2009). For perpetration, the scale asked respondents to indicate the number of times in the past year they had done each of 24 items to a dating or sexual partner, and for victimization, it asked them to indicate how many times in the past year each one had been done to them. For perpetration, the instruction specified, "Only include it when you did it first. In other words, don't count it if you did it in self-defense. You will not get in trouble—please be honest." To the original 18 items, we added 6 psychological violence items, including "Made them feel afraid" and "Threatened to kill them." There were four response options for each item, including *never, 1 to 3 times, 4 to 9 times,* and *10 or more times.* For the present analysis, DV victimization and perpetration were treated as continuous variables that ranged from 0 (*no past-year experiences of adolescent DV*) to 72 (*experienced each item 10 or more times*). In our sample, the victimization scale had excellent reliability with both males and females (α = .90 and .93, respectively), as did the perpetration scale (α = .90 for males and α = .87 for females).

Childhood victimization. Participants completed a modified version of the Adverse Childhood Experiences (ACE) scale (Felitti et al., 1998). Our modified version of the scale comprised 9 of the original 10 items that assessed individuals' lifetime exposure to parent-to-child physical abuse and/or emotional abuse, sexual abuse perpetrated by anyone 5 or

TABLE 1. Factor loadings for latent variables in the model

Variable	Raw estimate *B*	*SE*	Pseudo *z* score	Standardized estimate β
Childhood victimization				
Adverse childhood experiences	5.94	0.75	7.88	.94
Physical child abuse victimization[a]	1.00[b]	N.A.	N.A.	.90
Problem behavior				
Diagnosis (conduct disorder, ODD)[a]	0.42	0.07	6.30	.73
Aggression scale score	8.81	0.98	8.98	.72
Antisocial behaviors	1.00[b]	N.A.	N.A.	.49
Drinking style				
Alcohol as "time out"	0.72	0.06	11.80	.67
Drink to cope motivation	0.86	0.08	11.39	.70
Drinking-induced disinhibitions	1.13	0.10	10.86	.53
Alcohol-related aggression expectancies	2.29	0.15	15.23	.78
AUDIT	1.00[b]	N.A.	N.A.	.69

Notes: ODD = oppositional defiant disorder; N.A. = not applicable; AUDIT = Alcohol Use Disorders Identification Test. [a]Categorical variable; [b]factor loading fixed to 1.00 to identify the model.

more years older and being a witness to interparental partner violence. Participants were assigned a continuous ACE score that reflected the number of different adverse exposures that they had and how many times they had experienced them. In addition, we created a binary variable indicating repeated exposure to physical violence by a parent or guardian. For repeated physical abuse by a parent, a code of 1 indicated parent-to-child physical abuse three or more times during the respondent's lifetime, and a code of 0 indicated zero to two such experiences. Both measures loaded well onto our childhood victimization latent variable (Table 1).

Drinking style. The latent variable drinking style was composed of five alcohol use–related scale scores, including the Alcohol Use Disorders Identification Test (AUDIT; Chung et al., 2002), the Drinking-Induced Disinhibition Scale (Leeman et al., 2007), the Alcohol-Related Aggression Questionnaire (McMurran et al., 2006), the drinking to cope subscale of the Drinking Motives Questionnaire (Cooper, 1994), and using alcohol as a time-out (Field et al., 2004). Each of these scales produced a continuous score that loaded well onto our drinking-style latent variable (Table 1).

Problem behavior. The latent variable propensity for problem behavior was composed of three measures. The first was the Aggression Questionnaire, which assesses physical and verbal aggression, anger, and hostility (Buss and Perry, 1992). We used 18 of the original 29 items, and our reduced version had excellent internal consistency in our sample (α = .87). The second measure was the score on six questions from the antisocial behavior subscale of the Personality Diagnostic Questionnaire–Fourth Edition (PDQ-4; Hyler, 1994), including "Lying comes easily to me and I do it often," and "I don't care if others get hurt as long as I get what I want." The third was a binary variable representing conduct disorder or problems. Respondents were asked, "Has a doctor or health professional ever told you or your parents that you had behavioral or conduct problems . . . conduct disorder or anti-social personality disorder . . . or oppositional defiant disorder?" Any positive responses were coded as 1, whereas negative responses were coded as 0. Each of these three measures loaded well onto our problem behavior latent variable (Table 1).

Procedures

Participants completed the survey while they were waiting to receive patient care in their emergency department room. Most participants completed the survey in 45 minutes. The survey was designed to be easily stopped and restarted so that it would not interfere with medical care flow. Participation was voluntary and anonymous. Participants who were unaccompanied by an adult guardian and younger than age 18 were able to provide their own assent; otherwise, consent was sought from minors' parents/guardians. All parents, friends, intimate partners, and other nonpatient visitors accompanying the participants were required to wait outside the room while the participant completed the survey for privacy purposes. Participants received $20 for completed surveys and $10 for surveys that were less than 80% complete.

Overview of analytic strategy

Structural equation modeling is a multivariate analysis technique that is used to assess diagrammed path relationships between variables, and it typically involves two steps: (a) confirmatory factor analysis, through which directly observed variables are linked to latent variables, and (b) structural modeling, which estimates model parameters for the pathways between latent variables (Kaplan, 2009). For the present analysis, we used Mplus Version 6.0 with maximum likelihood estimation to test the theoretical model (Figure 1) (Muthén and Muthén, 1998–2010). Latent variables were

TABLE 2. Participant characteristics, by gender ($N = 456$)

Variable	Full sample % (n)	Males ($n = 202$) % (n)	Females ($n = 254$) % (n)	Significant difference[b]
Race/ethnicity				
African American/Black	55 (250)	52 (105)	57 (145)	
Latino/Latina	14 (64)	15 (30)	13 (34)	
White	15 (70)	19 (38)	13 (32)	
Multiracial/other	15 (69)	13 (27)	17 (42)	
Nativity				
U.S. born	85 (386)	83 (167)	87 (219)	
Foreign born	15 (68)	17 (34)	13 (34)	
Residential status				$p < .05$
Reside with parents	67 (284)	73 (136)	62 (148)	
Reside without parents	33 (141)	27 (51)	38 (90)	
Parent status				
Subject is a parent	18 (81)	16 (32)	19 (49)	
Subject is not a parent	82 (373)	84 (169)	81 (204)	
Education[a]				
High school graduate or GED	59 (250)	60 (116)	57 (134)	
In high school	27 (115)	27 (51)	27 (64)	
Dropped out of school	15 (62)	13 (25)	16 (37)	
Sexual orientation				$p < .001$
Gay or bisexual	16 (63)	8 (15)	21 (48)	
Heterosexual	84 (339)	92 (163)	79 (176)	
Dating violence				
≥1 acts of perpetration in past year	57 (261)	49 (98)	64 (163)	$p < .01$
≥1 acts of victimization in past year	65 (298)	64 (130)	66 (168)	
≥2 acts of perpetration in past year	45 (205)	34 (68)	54 (137)	$p < .001$
≥2 acts of victimization in past year	56 (257)	53 (108)	59 (149)	
Physical abuse				
Victimization	58 (263)	58 (118)	57 (145)	
Perpetration	46 (212)	35 (71)	56 (141)	$p < .001$
Sexual abuse				
Victimization	13 (60)	13 (26)	13 (34)	
Perpetration	4 (16)	3 (6)	4 (10)	
Psychological abuse				
Victimization	68 (309)	65 (132)	70 (177)	$p < .05$
Perpetration	61 (278)	55 (111)	66 (167)	
Child abuse experience				
Experienced child abuse ≥3 times	32 (148)	34 (87)	30 (61)	
Has been told has conduct problems/disorder or ODD	21 (96)	23 (47)	19 (49)	
	Full sample M (SD)	Males ($n = 202$) M (SD)	Females ($n = 254$) M (SD)	
Age, in years	19.1 (1.7)	19.2 (1.6)	19.0 (1.7)	
Drinking style				
AUDIT score	7.3 (6.6)	7.9 (6.6)	6.8 (6.5)	$p < .05$
Drinking-Induced Disinhibition Scale	25.5 (9.7)	27.0 (9.5)	24.3 (9.6)	$p < .01$
Alcohol aggression expectancies	34.2 (13.3)	34.4 (13.0)	34.0 (13.6)	
Alcohol as time-out	12.9 (4.9)	13.0 (4.7)	12.8 (5.0)	
Drinking to cope	5.5 (5.5)	4.8 (4.9)	6.0 (6.0)	$p < .01$
Childhood victimization				
Adverse Childhood Experiences score	5.2 (5.7)	4.6 (5.7)	5.7 (5.6)	$p < .05$
Propensity for problem behavior				
Aggression scale	49.7 (14.4)	51.0 (13.3)	48.7 (15.1)	
Antisocial behaviors	1.6 (1.6)	1.9 (1.7)	1.4 (1.5)	$p < .001$

Notes: GED = General Educational Development credential; ODD = oppositional defiant disorder; AUDIT = Alcohol Use Disorders Identification Test. [a]Does not sum to 456 because of missing data; [b]chi-square, Fisher's exact, or t test, as appropriate.

created for drinking style, propensity for problem behavior, and childhood victimization. The following structural relationships or pathways were tested: Adolescent DV perpetration and victimization were each regressed on drinking style, problem behavior, and childhood victimization, and problem behavior and drinking style were each regressed on childhood victimization (Figure 1). Correlations were estimated between DV perpetration and victimization, and also between problem behavior and drinking style (Figure 1). A strength of structural equation modeling is that it can

be used to estimate indirect effects (i.e., mediation) using the product of coefficients method (Hayes, 2009).

We examined whether there were differences in participant characteristics by gender using *t* tests for continuous variables and chi-square tests for categorical variables (Table 2). Males and females differed significantly on several variables, including sexual orientation, whether they resided with their parents, whether they had perpetrated DV in the past year, whether they had experienced psychological DV victimization in the past year, and mean scores on the AUDIT, Drinking-Induced Disinhibition scale, drinking to cope subscale, ACE score, and antisocial behavior measure (Table 2). Therefore, we stratified the data by gender and conducted separate analyses for males and females.

Results

Rates of dating violence perpetration and victimization, and other sample descriptors

Approximately 57% of our sample reported perpetrating one or more acts of DV in the prior year ($n = 261$), and 65% reported experiencing DV victimization one or more times in the prior year ($n = 298$) (Table 2). Approximately 81% of those reporting DV victimization also reported perpetration, and 87% of those reporting DV perpetration also reported victimization. The vast majority of DV victims and perpetrators had experienced more than one abusive victimization and perpetration incident in the past year, respectively; 91% of victims had two or more experiences, and 79% of perpetrators had two or more perpetration experiences. Thirty-two percent reported being physically abused by a parent three or more times (Table 2), and 64% met the criteria for problematic alcohol use using the AUDIT cutoff of 4 (Fairlie et al., 2006).

Confirmatory factor analysis (CFA)

A CFA was performed to assess the fit of the factor structure of the latent variables for drinking style, childhood victimization, and propensity for problem behavior. The CFA was first conducted for all participants in the sample and then for male and female participants separately. The overall CFA of the three factors indicated a good fit to the data, $\chi^2(32, N = 456) = 32.11$, $p < .461$, Tucker–Lewis Index (TLI) = 1.000, comparative fit index (CFI) = 1.000, root mean square error of approximation (RMSEA) = .003. To test measurement invariance across gender, a multigroup CFA model allowing male and female research participants' factor loadings and intercepts to be freely estimated showed

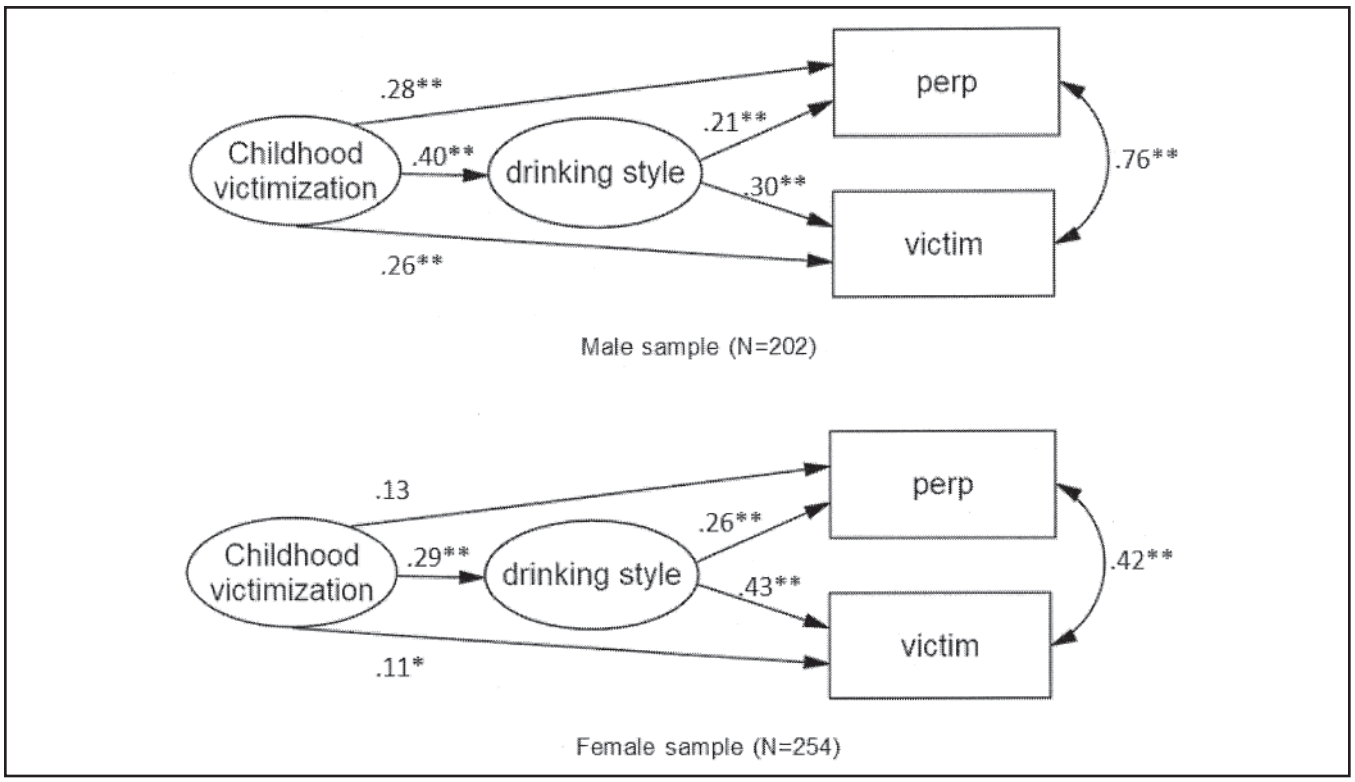

FIGURE 2. Preliminary structural equation model predicting the effect of childhood victimization and drinking style on adolescent dating violence (DV) perpetration and victimization, for males and females. Perp = perpetrator.
*$p < .01$; **$p < .001$.

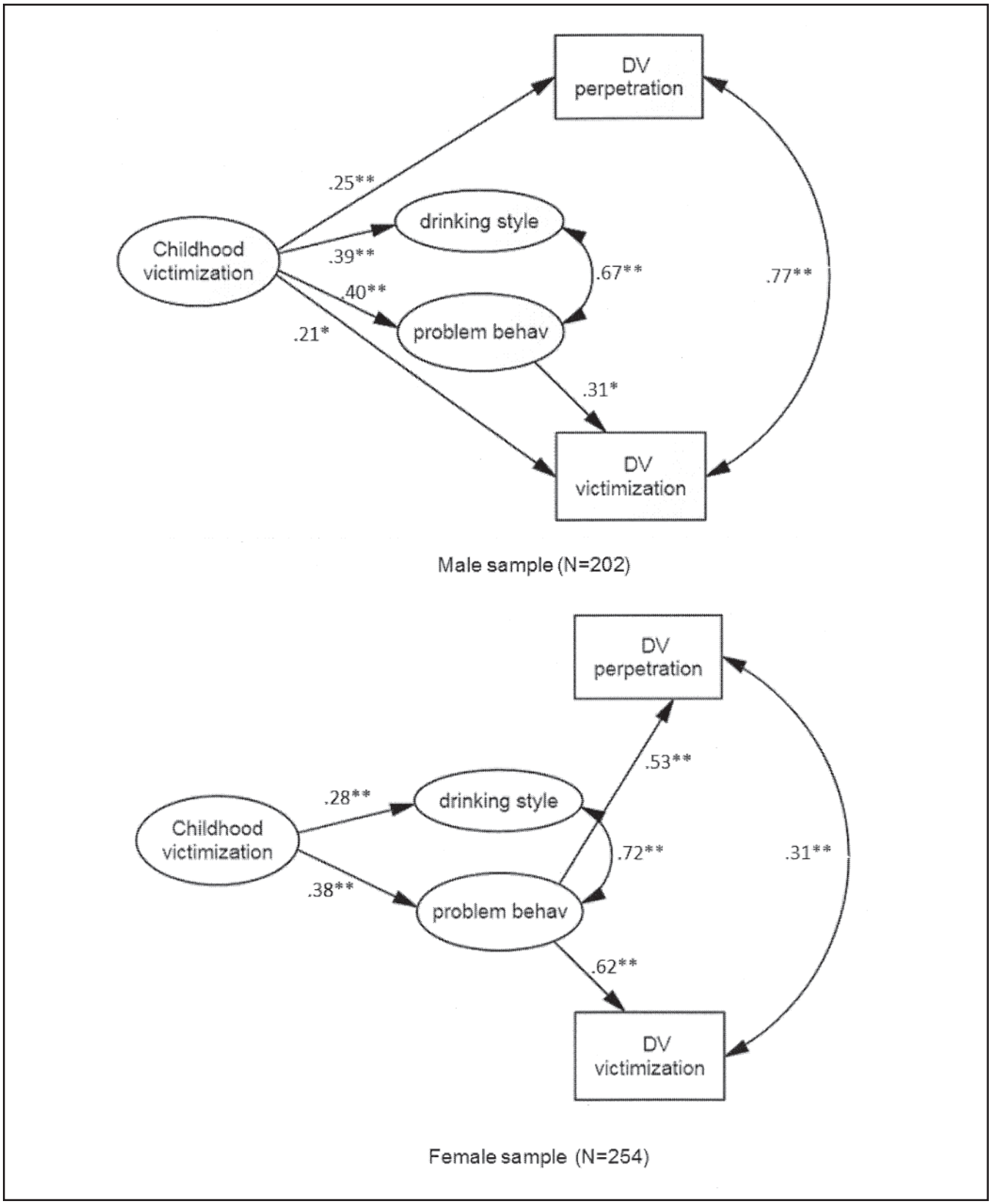

FIGURE 3. Final structural equation model predicting the effect of drinking style on adolescent dating violence (DV) perpetration and victimization, for males and females. Statistically nonsignificant pathways have been removed. Behav = behavior.
*$p < .01$; **$p < .001$.

a reasonably good fit of the data to the predicted factor structure, $\chi^2(64, N = 456) = 60.44$, $p < .603$, TLI = 1.006, CFI = 1.00, RMSEA < .001. When the factor loadings and intercepts for males and females were constrained to be equal (i.e., strong factorial invariance), the constrained model was not significantly different from the freely estimated model as tested by the likelihood ratio test, indicating that the measurement model was invariant across gender, $\chi^2(12, N = 456) = 20.49$ $p < .058$ (Meredith, 1993).

Structural model

First, we examined simple models where adolescent DV perpetration and victimization were regressed on drinking style and childhood victimization for males and for females (Figure 2). These models showed an adequate fit to the data for males, $\chi^2(23, n = 202) = 24.02$, $p = .40$, TLI = .997, CFI = .998, RMSEA = .015, and for females, $\chi^2(23, n = 254) = 29.52$, $p = .16$, TLI = 0.979, CFI = .986, RMSEA = .03. In both the male and female models, DV perpetration and victimization were significantly correlated, and drinking style was significantly related to both DV perpetration and victimization (Figure 2). A test of pathway differences between the male and female models indicated that there was one significant difference by gender, which was the pathway from drinking style to DV victimization (pseudo z score = 2.01, $p < .05$). For males, this simple model accounted for 16% of the variance in DV perpetration and 22% of the variance in DV victimization. For females, the simple model accounted for 10% of the variance in DV perpetration and 23% of the variance in DV victimization.

Next, the fit of the full structural model, which included problem behavior, was tested (Figure 3). First, we confirmed the fit of the structural model in the pooled sample for all participants. Then we conducted a test of the equivalence of the structural paths for males and females. Using information from all participants, the structural model showed an adequate fit to the data, $\chi^2(46, N = 456) = 58.21$, $p = .11$, TLI = .987, CFI = .991, RMSEA = .024. To test for gender differences, a series of multigroup models by gender were conducted. In the first multigroup model, model parameters were freely estimated for males and females. In the second model, the structural paths for males and females were constrained to be equal. A likelihood ratio test indicated that there were significant differences overall between males and females in the structural paths, $\chi^2(10, N = 456) = 19.09$, $p = .04$. For males, the freely estimated model accounted for 17% of the variance in DV perpetration and 26% of the variance in DV victimization. For females, the freely estimated model accounted for 22% of the variance in DV perpetration and 39% of the variance in DV victimization. A test of specific differences in path weights for males and females indicated that three of the paths were statistically significantly different ($p < .05$), and one was marginally different ($p = .057$). These pathways were (a) DV perpetration on problem behavior, where the coefficient was significant for females but not males ($\beta_{male} = .121$ vs. $\beta_{female} = .534$, pseudo $z = -2.81$, $p = .005$), (b) DV victimization on problem behavior, which was significant for both males and females ($\beta_{male} = .314$ vs. $\beta_{female} = .615$, pseudo $z = -2.05$, $p = .041$), (c) DV victimization on childhood victimization, which was significant for males but not for females ($\beta_{male} = .212$ vs. $\beta_{female} = .004$, pseudo $z = 1.91$, $p = .057$), and (d) the correlation of DV victimization with perpetration, which was significant for both males and females but substantially stronger for males ($r_{male} = .768$ vs. $r_{female} = .307$, pseudo $z = 6.46$, $p < .001$).

Finally, given the relatively broad age range of the sample, age was entered into the structural models as a covariate to test how it affected the examined structural patterns. When the full sample was analyzed without regard to gender, and age was regressed on problem behavior, drinking style, DV perpetration, and DV victimization, age was significantly related to DV perpetration ($\beta = -.097$, $p = .017$) and problem behavior ($\beta = -.128$, $p = .031$). All of the structural pathways that had been significant in the model without age remained significant and unchanged, although the magnitude of DV perpetration regressed on problem behavior was attenuated from $\beta = .248$ to .202. When age was entered into separate male and female models, all of the pathways that had been significantly different between gender remained significantly different and the marginal difference between male and female DV victimization on childhood victimization was now significant ($\beta_{male} = .216$ vs. $\beta_{female} = -.005$, pseudo $z = -2.30$, $p = .04$).

Discussion

The present study examined relationships among childhood victimization, propensity for problem behavior, drinking style, as indicated by five interrelated drinking attitudes and behaviors, and DV. The goal of this study was to extend prior research that has detected broad correlations between the amount and frequency of youth alcohol consumption and reports of past-year or past-month DV perpetration by using a more complex latent variable construct to represent interrelated alcohol factors (drinking style) and to assess whether the relationship between drinking style and DV could be attributable to other factors such as propensity for problem behavior or childhood victimization experiences.

In simple models stratified by gender, we observed that past-year DV perpetration and victimization were each associated with a more risky drinking style, characterized by more frequent and heavier alcohol use, expectancies that alcohol increases aggressive behavior, drinking to cope with negative feeling, and beliefs that alcohol is disinhibiting and that being drunk provides a time-out from normal behavioral expectations. All of these factors were highly correlated with

one another and thus usefully represented youths' drinking-related attitudes and behaviors. When propensity for problem behavior was added into the model, the pathways from drinking style to DV perpetration and victimization changed substantially, and the models for male and females became dissimilar. In short, males' DV victimization and perpetration were predicted by childhood victimization, but females' were predicted by problem behavior. These findings are consistent with prior research that has found that early childhood physical abuse or witnessing neighborhood violence are more strongly associated with adolescent males' DV perpetration than females' and that school failure (potentially a proxy for problem behavior) is associated with females' but not males' DV perpetration (Rothman et al., 2010). We speculate that males who are exposed to childhood abuse and other adverse events may be more likely to engage in externalizing behaviors, including violence, in their peer and dating relationships (Dulmus and Hilarski, 2006). Further, it is plausible that females who are similarly exposed are more likely than males to internalize the trauma (Dulmus and Hilarski, 2006), increasing their subsequent risk for mental health problems and DV victimization, which increases the likelihood that they will also use violence in their relationships (Feiring et al., 2009).

The current study examined adolescent drinking style as a potential mediator between childhood victimization and DV. A strength of this study is that we looked at an interrelated set of alcohol-use related factors and not just the frequency or quantity of alcohol consumption as a potential correlate of DV. This is advantageous because, as we saw in our data, adolescents' alcohol-related attitudes and behaviors were correlated and had a cojoint influence. Another strength of this study is that we examined the relationship of adolescents' drinking style to DV both with and without propensity for problem behavior in our model. This permitted us to observe first that drinking style was indeed associated with DV, as we hypothesized that it would be based on prior research. However, we have extended prior findings by demonstrating that the relationship between drinking style and DV may be attributable to a tendency for antisocial or problem behavior in general. Given that the sample was drawn from one setting, we cannot generalize our results to all adolescents or young adults. However, we have generated the following hypotheses based on our findings: (a) Drinking style is a proximal risk marker for DV perpetration in both males and females; (b) the relationship between drinking style and DV perpetration is attributable to a propensity for adolescent problem behavior in general, rather than pharmacological effects of alcohol itself; and (c) the etiology of DV for males and females differs, although the relative importance of drinking style in the etiological chain of events may not vary substantially by gender. Additional research that will advance knowledge on this topic will include daily diary or momentary assessment studies that permit the assessment of potential acute effects of alcohol consumption on DV and longitudinal studies that investigate potential trajectories from early alcohol use to later DV, controlling for other potentially causal factors, or longitudinal studies that assess the quantity and frequency of alcohol use over time (i.e., drinking patterns) and concurrent and subsequent risk for DV.

Limitations

This study was subject to several limitations. First, data were self-reported. DV-related data and alcohol use data may have been underreported for social desirability reasons, or erroneously overreported in some cases, as a result of recall bias. From these data, there is no way to ascertain the true rates of either DV or alcohol use; therefore, it is not possible to speculate whether males or females may have systematically under- or overreported either one. Prior research suggests that among adults, both males and females tend to underreport their own perpetration (Simpson and Christensen, 2005).

Second, our measure of DV asked about any "dating or sexual partner." It is possible that youths' relationships varied in terms of number, length, and seriousness, and, if these factors were also associated with DV and alcohol use, it may have confounded results. Future studies of alcohol and DV should investigate relationship number, length, and seriousness.

Third, we defined DV broadly and on a continuum, including one or more self-reported acts of physical, sexual, or threatened physical abuse in our definition. It is possible that a narrower definition of DV, such as one that includes only severe and recurring forms of abuse, may have resulted in different path coefficients. Our decision to include one or more acts of abuse as part of the DV phenomenon and to include less physically severe acts such as "made me feel afraid" was driven by our interest in capturing as many potentially abusive acts as possible and being able to generalize to a wider assortment of DV perpetrators and is consistent with the definition of dating abuse used by other researchers (i.e., one or more acts of abuse) (Jain et al., 2010; Jouriles et al., 2005; Miller et al., 2010; Raiford et al., 2007).

Fourth, mental health disorder is a likely contributor to at least a proportion of DV perpetration and victimization, and alcohol use may exacerbate some mental health symptomatology (Kushner et al., 2000; Paljärvi et al., 2009; Wang and Patten, 2002). In the present study, the measure of mental health disorder (that is, ever being told that you have a behavior or conduct disorder, oppositional defiant disorder, or antisocial personality disorder) was crude and also self-reported. The use of more reliable, valid assessments of adolescent mental health status would improve the quality of data.

Fifth, this was a cross-sectional study, so the results provide no insight into whether alcohol may have an acute

(i.e., immediate, pharmacological) effect on DV. Daily or momentary studies that assess the temporal order of alcohol consumption and DV events among youth are needed to answer questions about the potential that alcohol may have a direct, pharmacological relationship to partner violence in this population.

Sixth, although we did include a measure of parental alcohol use in our survey—and this variable appeared to be unrelated to DV in this sample—it is possible that more refined measures of family alcohol use would have indicated relationships among family drinking history, childhood adversity, and current problem behaviors.

Finally, one of the components of our problem behavior latent variable was aggression. It is possible that some individuals in our sample were only violent with dating partners but were misclassified as having a tendency to behave in generally violent ways because they reported their partner-violent behavior on the aggression scale. This misclassification would have exaggerated the relationship between problem behavior and DV. Future studies that use the aggression scale and DV scales should consider instructing participants to think of people other than dating partners when completing the aggression scale.

Conclusions

This study of DV perpetration and victimization among an urban, emergency department sample of adolescents found support for the hypothesis that drinking-related attitudes and behaviors were predictive of DV and mediated the relationship between childhood victimization and DV involvement. However, the relationship between drinking style and DV appeared to reflect adolescents' propensity for problem behavior in general, for both males and females.

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References

Amar, A. F., & Gennaro, S. (2005). Dating violence in college women: Associated physical injury, healthcare usage, and mental health symptoms. *Nursing Research, 54,* 235–242.

Banyard, V. L., Cross, C., & Modecki, K. L. (2006). Interpersonal violence in adolescence: Ecological correlates of self-reported perpetration. *Journal of Interpersonal Violence, 21,* 1314–1332.

Brown, A., Cosgrave, E., Killackey, E., Purcell, R., Buckby, J., & Yung, A. R. (2009). The longitudinal association of adolescent dating violence with psychiatric disorders and functioning. *Journal of Interpersonal Violence, 24,* 1964–1979.

Buss, A. H., & Perry, M. (1992). The aggression questionnaire. *Journal of Personality and Social Psychology, 63,* 452–459.

Caetano, R., McGrath, C., Ramisetty-Mikler, S., & Field, C. A. (2005). Drinking, alcohol problems and the five-year recurrence and incidence of male to female and female to male partner violence. *Alcoholism: Clinical & Experimental Research, 29,* 98–106.

Chung, T., Colby, S. M., Barnett, N. P., & Monti, P. M. (2002). Alcohol Use Disorders Identification Test: Factor structure in an adolescent emergency department sample. *Alcoholism: Clinical and Experimental Research, 26,* 223–231.

Cleveland, H. H., Herrera, V. M., & Stuewig, J. (2003). Abusive males and abused females in adolescent relationships: Risk factor similarity and dissimilarity and the role of relationship seriousness. *Journal of Family Violence, 18,* 325–339.

Cogan, R., & Ballinger, B. C., III. (2006). Alcohol problems and the differentiation of partner, stranger, and general violence. *Journal of Interpersonal Violence, 21,* 924–935.

Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment, 6,* 117–128.

Dulmus, C. N., & Hilarski, C. (2006). Significance of gender and age in African American children's response to parental victimization. *Health & Social Work, 31,* 181–188.

DuRant, R., Champion, H., Wolfson, M., Omli, M., McCoy, T., D'Agostino, R. B., Jr., . . . Mitra, A. (2007). Date fighting experiences among college students: Are they associated with other health-risk behaviors? *Journal of American College Health, 55,* 291–296.

Fairlie, A. M., Sindelar, H. A., Eaton, C. A., & Spirito, A. (2006). Utility of the AUDIT for screening adolescents for problematic alcohol use in the emergency department. *International Journal of Adolescent Medicine and Health, 18,* 115–122.

Fals-Stewart, W., Birchler, G. R., & Kelley, M. L. (2003). The timeline followback spousal violence interview to assess physical aggression between intimate partners: Reliability and validity. *Journal of Family Violence, 18,* 131–142.

Fals-Stewart, W., Leonard, K. E., & Birchler, G. R. (2005). The occurrence of male-to-female intimate partner violence on days of men's drinking: The moderating effects of antisocial personality disorder. *Journal of Consulting and Clinical Psychology,* 73, 239–248.

Fang, X. M., & Corso, P. S. (2007). Child maltreatment, youth violence, and intimate partner violence: Developmental relationships. *American Journal of Preventive Medicine, 33,* 281–290.

Fang, X. M., & Corso, P. S. (2008). Gender differences in the connections between violence experienced as a child and perpetration of intimate partner violence in young adulthood. *Journal of Family Violence, 23,* 303–313.

Feiring, C., Simon, V. A., & Cleland, C. M. (2009). Childhood sexual abuse, stigmatization, internalizing symptoms, and the development of sexual difficulties and dating aggression. *Journal of Consulting and Clinical Psychology, 77,* 127–137.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., . . . Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14,* 245–258.

Field, C. A., Caetano, R., & Nelson, S. (2004). Alcohol and violence related cognitive risk factors associated with the perpetration of intimate partner violence. *Journal of Family Violence, 19,* 249–253.

Fletcher, J. (2010). The effects of intimate partner violence on health in young adulthood in the United States. *Social Science & Medicine, 70,* 130–135.

Foo, L., & Margolin, G. (1995). A multivariate investigation of dating aggression. *Journal of Family Violence, 10,* 351–377.

Foshee, V. A., Bauman, K. E., Arriaga, X. B., Helms, R. W., Koch, G. G., & Linder, G. F. (1998). An evaluation of Safe Dates, an adolescent dat-

ing violence prevention program. *American Journal of Public Health, 88,* 45–50.

Foshee, V. A., Bauman, K. E., Linder, F., Rice, J., & Wilcher, R. (2007). Typologies of adolescent dating violence: Identifying typologies of adolescent dating violence perpetration. *Journal of Interpersonal Violence, 22,* 498–519.

Foshee, V. A., Benefield, T., Suchindran, C., Ennett, S. T., Bauman, K. E., Karriker-Jaffe, K. J., . . . Mathias, J. (2009). The development of four types of adolescent dating abuse and selected demographic correlates. *Journal of Research on Adolescence, 19,* 380–400.

Foshee, V. A., Linder, F., MacDougall, J. E., & Bangdiwala, S. (2001). Gender differences in the longitudinal predictors of adolescent dating violence. *Preventive Medicine, 32,* 128–141.

Grant, N. K., & Macdonald, T. K. (2005). Can alcohol lead to inhibition or disinhibition? Applying alcohol myopia to animal experimentation. *Alcohol and Alcoholism, 40,* 373–378.

Gray, H. M., & Foshee, V. (1997). Adolescent dating violence: Differences between one-sided and mutually violent profiles. *Journal of Interpersonal Violence, 12,* 126–141.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76,* 408–420.

Hyler, S. (1994). *Personality Diagnostic Questionnaire-4 (PDQ4).* New York, NY: New York State Psychiatric Institute.

Jain, S., Buka, S. L., Subramanian, S. V., & Molnar, B. E. (2010). Neighborhood predictors of dating violence victimization and perpetration in young adulthood: A multilevel study. *American Journal of Public Health, 100,* 1737–1744.

Jouriles, E. N., McDonald, R., Garrido, E., Rosenfield, D., & Brown, A. S. (2005). Assessing aggression in adolescent romantic relationships: Can we do it better? *Psychological Assessment, 17,* 469–475.

Kaplan, D. (2009). *Structural equation modeling: Foundations and extensions.* Thousand Oaks, CA: Sage.

Kushner, M. G., Abrams, K., & Borchardt, C. (2000). The relationship between anxiety disorders and alcohol use disorders: A review of major perspectives and findings. *Clinical Psychology Review, 20,* 149–171.

Leeman, R. F., Toll, B. A., & Volpicelli, J. R. (2007). The Drinking-Induced Disinhibition Scale (DIDS): A measure of three types of disinhibiting effects. *Addictive Behaviors, 32,* 1200–1219.

Leonard, K. E. (2005). Alcohol and intimate partner violence: When can we say that heavy drinking is a contributing cause of violence? *Addiction, 100,* 422–425.

Lundeberg, K., Stith, S. M., Penn, C. E., & Ward, D. B. (2004). A comparison of nonviolent, psychologically violent, and physically violent male college daters. *Journal of Interpersonal Violence, 19,* 1191–1200.

Luthra, R., & Gidycz, C. A. (2006). Dating violence among college men and women: Evaluation of a theoretical model. *Journal of Interpersonal Violence, 21,* 717–731.

Lysova, A. V., & Hines, D. A. (2008). Binge drinking and violence against intimate partners in Russia. *Aggressive Behavior, 34,* 416–427.

Lyvers, M., & Tobias-Webb, J. (2010). Effects of acute alcohol consumption on executive cognitive functioning in naturalistic settings. *Addictive Behaviors, 35,* 1021–1028.

MacAndrew, C., & Edgerton, R. (1969). *Drunken comportment: A social explanation.* Chicago, IL: Aldine.

McDonell, J., Ott, J., & Mitchell, M. (2010). Predicting dating violence victimization and perpetration among middle and high school students in a rural southern community. *Children and Youth Services Review, 32,* 1458–1463.

McMurran, M., Egan, V., Cusens, B., Van Den Bree, M., Austin, E., & Charlesworth, P. (2006). The alcohol-related aggression questionnaire. *Addiction Research & Theory, 14,* 323–343.

Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika, 58,* 525–543.

Miller, E., Decker, M. R., Raj, A., Reed, E., Marable, D., & Silverman, J. G. (2010). Intimate partner violence and health care-seeking patterns among female users of urban adolescent clinics. *Maternal and Child Health Journal, 14,* 910–917.

Miller, S., Gorman-Smith, D., Sullivan, T., Orpinas, P., & Simon, T. R. (2009). Parent and peer predictors of physical dating violence perpetration in early adolescence: Tests of moderation and gender differences. *Journal of Clinical Child & Adolescent Psychology, 38,* 538–550.

Muñoz-Rivas, M. J., Gámez-Guadix, M., Graña, J. L., & Fernández, L. (2010). Relationship between dating violence and use of alcohol and illegal drugs in Spanish adolescents and young adults. *Adicciones, 22,* 125–133.

Muthén, L., & Muthén, B. (1998–2010). *MPlus Version 6.0.* Los Angeles, CA.

O'Donnell, L., Stueve, A., Myint-U, A., Duran, R., Agronick, G., & Wilson-Simmons, R. (2006). Middle school aggression and subsequent intimate partner physical violence. *Journal of Youth and Adolescence, 35,* 693–703.

O'Keefe, M. (1997). Predictors of dating violence among high school students. *Journal of Interpersonal Violence, 12,* 546–568.

O'Leary, K. D., & Smith Slep, A. M. (2003). A dyadic longitudinal model of adolescent dating aggression. *Journal of Clinical Child & Adolescent Psychology, 32,* 314–327.

Paljärvi, T., Koskenvuo, M., Poikolainen, K., Kauhanen, J., Sillanmäki, L., & Mäkelä, P. (2009). Binge drinking and depressive symptoms: A 5-year population-based cohort study. *Addiction, 104,* 1168–1178.

Raiford, J. L., Wingood, G. M., & Diclemente, R. J. (2007). Prevalence, incidence, and predictors of dating violence: A longitudinal study of African American female adolescents. *Journal of Women's Health, 16,* 822–832.

Rapoza, K. A., & Baker, A. T. (2008). Attachment styles, alcohol, and childhood experiences of abuse: An analysis of physical violence in dating couples. *Violence and Victims, 23,* 52–65.

Riggs, D. S., & O'Leary, K. D. (1996). Aggression between heterosexual dating partners: An examination of a causal model of courtship aggression. *Journal of Interpersonal Violence, 11,* 519–540.

Rivera-Rivera, L., Allen-Leigh, B., Rodríguez-Ortega, G., Chávez-Ayala, R., & Lazcano-Ponce, E. (2007). Prevalence and correlates of adolescent dating violence: Baseline study of a cohort of 7,960 male and female Mexican public school students. *Preventive Medicine, 44,* 477–484.

Rothman, E. F., Johnson, R. M., Azrael, D., Hall, D. M., & Weinberg, J. (2010). Perpetration of physical assault against dating partners, peers, and siblings among a locally representative sample of high school students in Boston, Massachusetts. *Archives of Pediatrics & Adolescent Medicine, 164,* 1118–1124.

Roudsari, B. S., Leahy, M. M., & Walters, S. T. (2009). Correlates of dating violence among male and female heavy-drinking college students. *Journal of Interpersonal Violence, 24,* 1892–1905.

Shin, S. H., Edwards, E., Heeren, T., & Amodeo, M. (2009). Relationship between multiple forms of maltreatment by a parent or guardian and adolescent alcohol use. *American Journal on Addictions, 18,* 226–234.

Shook, N. J., Gerrity, D. A., Jurich, J., & Segrist, A. E. (2000). Courtship violence among college students: A comparison of verbally and physically abusive couples. *Journal of Family Violence, 15,* 1–22.

Shorey, R. C., Cornelius, T. L., & Bell, K. M. (2008). A critical review of theoretical frameworks for dating violence: Comparing the dating and marital fields. *Aggression and Violent Behavior, 13,* 185–194.

Simon, T. R., Miller, S., Gorman-Smith, D., Orpinas, P., & Sullivan, T. (2010). Physical dating violence norms and behavior among sixth-grade students from four U.S. sites. *Journal of Early Adolescence, 30,* 395–409.

Simpson, L. E., & Christensen, A. (2005). Spousal agreement regarding relationship aggression on the Conflict Tactics Scale-2. *Psychological Assessment, 17,* 423–432.

Stappenbeck, C. A., & Fromme, K. (2010). A longitudinal investigation of heavy drinking and physical dating violence in men and women. *Addictive Behaviors, 35,* 479–485.

Stets, J. E., & Henderson, D. A. (1991). Contextual factors surrounding conflict resolution while dating: Results from a national study. *Family Relations, 40,* 29–36.

Stuart, G. L., O'Farrell, T. J., Leonard, K., Moore, T. M., Temple, J. R., Ramsey, S. E., . . . Monti, P. M. (2009). Examining the interface between substance misuse and intimate partner violence. *Substance Abuse: Research and Treatment, 3,* 25–29.

Swahn, M. H., Bossarte, R. M., & Sullivent, E. E., III. (2008). Age of alcohol use initiation, suicidal behavior, and peer and dating violence victimization and perpetration among high-risk, seventh-grade adolescents. *Pediatrics, 121,* 297–305.

Swahn, M. H., & Donovan, J. E. (2005). Predictors of fighting attributed to alcohol use among adolescent drinkers. *Addictive Behaviors, 30,* 1317–1334.

Wang, J. L., & Patten, S. B. (2002). Prospective study of frequent heavy alcohol use and the risk of major depression in the Canadian general population. *Depression and Anxiety, 15,* 42–45.

Whitaker, D. J., Haileyesus, T., Swahn, M., & Saltzman, L. S. (2007). Differences in frequency of violence and reported injury between relationships with reciprocal and nonreciprocal intimate partner violence. *American Journal of Public Health, 97,* 941–947.

Whitaker, D. J., Morrison, S., Lindquist, C., Hawkins, S. R., O'Neil, J. A., Nesius, A. M., Mathew, A., & Reese, L. (2006). A critical review of interventions for the primary prevention of perpetration of partner violence. *Aggression and Violent Behavior, 11,* 151–166.

Wiersma, J. D., Cleveland, H. H., Herrera, V., & Fischer, J. L. (2010). Intimate partner violence in young adult dating, cohabitating, and married drinking partnerships. *Journal of Marriage and Family, 72,* 360–374.

Williams, J. G., & Smith, J. P. (1994). Drinking patterns and dating violence among college students. *Psychology of Addictive Behaviors, 8,* 51–53.