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Relationship Violence Victimization and Binge Drinking Trajectories Among Nationally Representative Sample of Adolescents

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Abstract

The present study evaluated the impact of relationship violence (RV) victimization on the longitudinal trajectory of binge drinking (BD) among 3,614 US adolescents (51.2% male) who participated in an initial telephone interview regarding physical and sexual RV victimization and binge drinking. Two follow-up phone interviews were completed over approximately three years. Multilevel modeling revealed small, but significant, increases in BD over time; older adolescents and those who had ever experienced RV victimization were more likely to report BD at Wave 1 compared to younger adolescents and non-victims. Although new RV victimization reported during the study predicted an increase in the likelihood of BD at that occasion, those who had ever experienced RV victimization were less likely to report BD over time compared to non-victims. Contrary to expectations, no sex differences emerged. Findings indicate that BD may precede RV. Interventions to reduce alcohol-related RV may be especially useful in this population.

Keywords

adolescence; longitudinal; relationship violence; binge drinking

Relationship violence (RV), defined here as physical or sexual assault that occurs within the context of dating or other peer relationships, is associated with significant societal costs and heightened risk for acute and long-term psychosocial difficulties. RV constitutes a substantial problem among adolescents, with 35% of adolescents reporting verbal or physical RV victimization in national samples (Haynie et al., 2013). Importantly, exposure to RV has been linked to a range of detrimental outcomes including long-term mental health problems, increased drug and alcohol use, educational difficulties, depression, suicidal thoughts, and risk for sexual or physical revictimization (e.g., Banyard & Cross, 2008; Exner-Cortens, Eckenrode, Bunge, & Rothman, 2017; Exner-Cortens, Eckenrode, &

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Rothman, 2013; Temple & Freeman, 2011; Wolitzky-Taylor et al., 2008). Although numerous cross-sectional investigations have documented correlates of RV among adolescents, fewer longitudinal studies have examined correlates of RV change over time. Alcohol use, particularly binge drinking (BD), has emerged as a particularly concerning correlate of RV victimization (e.g., Yan, Howard, Beck, Shattuck, & Hallmark-Kerr, 2010). Approximately 18% of adolescents involved in an abusive relationship reported drinking alcohol at least six days per week (Swahn, Bossarte, & Sullivent, 2008). Researchers have postulated a bidirectional relationship, in that alcohol use may both contribute to risk for interpersonal victimization and also serve as a coping mechanism for negative affect resulting from victimization (e.g., Testa, Livingston, & Hoffman, 2007).

Alcohol use may be a critical pathway to RV victimization, particularly among girls (Maas, Fleming, Herrenkohl, & Catalano, 2010). Adolescents who begin drinking at a younger age are at increased risk for RV (van Ouytsel, Ponnet, & Walrave, 2017), possibly because engagement in risky behaviors like BD may increase vulnerability to victimization due to exposure to potentially delinquent peers and dangerous situations (Begle et al., 2011; Rothman et al., 2011). Additionally, daily diary studies suggest increased risk for RV perpetration and victimization on heavy drinking days (Rothman et al., 2012). However, alcohol use also has been suggested as a means of coping with or “self-medicating” distress emanating from an abusive experience (Miranda, Meyerson, Long, Marx, & Simpson, 2002). At least one study found that girls who experienced physical or psychological RV as teens were significantly more likely to report BD when assessed five years later than those who did not report BD; this same pattern was not evident with boys (Exner-Cortens et al., 2013). In that study, RV did not include sexual victimization and it was assessed five years before various negative outcomes, including BD. Although these data suggest there may be a long-term impact of physical and psychological RV on BD use among girls, they tell us little about reciprocal relationships between BD and a broader measure of RV. Additional research is needed to gain a better understanding of the associations between BD and RV to develop more effective prevention and risk reduction programs.

Independent of victimization experiences, BD tends to increase over the course of adolescence, peaking in early adulthood (Chen & Jacobson, 2012). Past research has revealed mixed findings for gender differences in the relations between RV and BD, with some studies suggesting that girls are more likely to engage in relationship disputes after consuming alcohol (Wells, Speechley, Koval, & Graham, 2007) and subsequently experience RV victimization (Marquart, Nannini, Edwards, Stanley, & Wayman, 2007). Additionally, RV victimization is prospectively associated with more frequent binge drinking among adolescent girls but not boys (Exner-Cortens, 2013). However, other studies suggest equally problematic associations between RV and BD for both sexes (Rothman et al., 2012; Yan et al., 2010). Thus, greater clarification of age and sex effects on RV and BD is warranted.

The Present Study

The purpose of this study was to examine how RV impacts the longitudinal course of BD among adolescents. Using data from a three-wave longitudinal study, the first goal was to explore the trajectory of BD among adolescents, ages 12 to 17, over this three year time

period. The second goal was to explore the time-invariant and time-varying role that RV victimization plays in BD. Hypotheses were that:

1. BD would increase over the course of the study with older adolescents and boys reporting more frequent binge drinking at the initial interview (Wave 1).
2. Adolescents who reported ever experiencing RV victimization would report more binge drinking at the initial interview and over the course of the study.
3. At each occasion when a new instance of RV victimization was reported, it was expected that binge drinking also would increase significantly at that occasion.

Method

Participants

The National Survey of Adolescents-Replication (NSA-R) is a longitudinal, nationally representative study of adolescents aged 12–17¹ years ($N=3,614$ at wave 1) designed to assess the prevalence, risk factors, and mental health outcomes of exposure to potentially traumatic events. The NSA-R sample consists of a national household probability sample and an oversample of urban-dwelling youth. To correct for oversampling, data were weighted to bring the sample in line with the adolescent U.S. population based on 2005 Census data. Mean age at Wave 1 was 14.60 ($SD = 1.71$). Regarding racial/ethnic makeup, 69% were Caucasian, 13% were African-American, 10% were Hispanic, 3% were Native American, and 3% were Asian/Pacific Islander. At Wave 2, 49.7% of the sample was male, mean age was 15.9 ($SD = 2.03$), and 70.8% of the sample was Caucasian, 13.5% African American, 10.6% Hispanic, 2.6% Native American, and 2.6% Asian/Pacific Islander. At Wave 3, 50.5% of the sample was male, mean age was 17.3 ($SD = 2.6$), and 74.1% of the sample was Caucasian, 11.9% African American, 9.1% Hispanic, 2.5% Native American, and 2.4% Asian/Pacific Islander. For more detailed descriptions of sampling and methodological procedures, refer to McCauley et al. (2010) or Wolitzky-Taylor et al. (2008).

Measures

Information regarding demographic characteristics, RV and BD were embedded in a larger structured telephone survey about traumatic life events and mental health symptoms. To increase accuracy of responses, behaviorally specific terminology was used to collect information, and introductory statements oriented adolescents to the questions (Kilpatrick, Saunders, and Smith, 2003).

Relationship violence victimization—RV victimization was assessed using behaviorally specific, dichotomous questions regarding sexual and physical assault by a dating partner, boyfriend, or girlfriend. For sexual assault, four screening questions assessed: (a) forced anal, vaginal, and/or oral sex (e.g., Participants responded affirmatively to both “Has a man or boy ever put his private sexual part inside your private sexual part, your rear end, or your mouth when you didn't want him to?” and “Did the person(s) who did this to you use physical force, threaten to hurt you, or threaten to hurt someone else if you did not

¹Ten participants were outside of this age range (6 were 11 years old; 4 were 18 years old)

do what they wanted?”); (b) forced digital penetration and/or foreign object penetration; (c) forced touching of genitalia at least once in the youth’s lifetime, and/or (d) any of the aforementioned events when the adolescent was voluntarily or involuntarily incapacitated by drugs and/or alcohol. For physical assault, five screening questions assessed: (a) being attacked or threatened with a gun, knife, or other weapon (e.g., “Has anyone—including family members, dating partners, or friends—ever attacked you with a gun, knife or some other weapon, regardless of when it happened or whether you ever reported it to the police?”) (b) being attacked without a weapon but worrying about being killed or seriously injured (c) being attacked and injured with a stick, club, or bottle and/or (d) being attacked and injured by fists. At baseline, participants who responded affirmatively to any of the nine screening questions above and noted that the perpetrator was a dating partner, boyfriend, or girlfriend were coded as having experienced lifetime RV. At each subsequent assessment, participants were asked the same screening questions but since the last interview; those who responded affirmatively were coded as having experienced RV since the previous assessment. Dichotomous responses at each wave were used to create the time-varying RV variable, and participants who reported RV at any wave were considered lifetime victims.

Binge Drinking (BD)—Consistent with standards developed by the National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2004), BD was defined as a dichotomous variable reflecting the presence of one or more days when the participant reported consuming five or more drinks on a single occasion in the previous twelve months or one or more days when the participant reported drinking to intoxication in the previous twelve months.

Procedure

Data collection procedures were approved by the Institutional Review Board and were similar to those used in the original 1995 NSA (Kilpatrick et al., 2000). Participants were selected using a multi-stage, regionally stratified, random-digit dial procedure. Structured telephone interviews took an average of 43 minutes and were administered in English by trained interviewers employed by abtShulman, Ronca, and Bucuvalas, Inc., (abtSRBI), an experienced survey research firm. A computer-assisted telephone interview system prompted interviewers with each question consecutively on a computer screen, and supervisors conducted random checks of data entry accuracy and interviewers’ adherence to assessment procedures. Parental consent and adolescent assent were obtained prior to the interview. Although parents provided demographic information, the majority of the interview was conducted with the adolescent. All data for the present study were collected from adolescents. Wave 1 data were collected in 2005, Wave 2 between 2006 and 2008, and Wave 3 between 2007 and 2009. The mean number of months between Wave 1 and Wave 2 was 15.29 ($SD = 4.58$), and mean number of months between Waves 2 and 3 was 14.44 ($SD = 2.67$).

Attrition

A total of 6,694 households were contacted during initial recruitment, in which parents completed a brief structured interview and were asked to identify at least one eligible adolescent. Of these, 1,268 (18.9%) parents refused adolescent participation; 188 (2.8%) adolescents refused to be interviewed following parental consent; 119 (1.8%) adolescent

interviews were initiated but not completed; and 1,505 (22.5%) identified eligible adolescents were unreachable or not available for interview. Thus, 3,614 adolescents (54%) completed interviews at Wave 1, including 2,459 in the national cross-section and 1,155 urban-dwelling adolescents. Of the 3,614 adolescents measured at Wave 1, 2,549 (70.5%) completed Wave 2, and 1,684 (46.6%) completed Wave 3. Those who completed Wave 1 only did not differ significantly from those who completed Wave 2 or Wave 3 on age ($p > .05$), gender ($p > .60$), lifetime RV at Wave 1 ($p > .07$) or BD at Wave 1 ($p > .10$).

Analytic Approach

Multilevel models (MLM) provide a means of distinguishing between-person and within-person effects of longitudinal predictors while accommodating dependency in the residuals arising from longitudinal measurements via flexible variance structures (e.g., random effects). MLM also allow for modeling of individual differences in times between measurement occasions. The present study employed MLM via Mplus version 6.0 (Muthen & Muthen, 2008) to test the random linear effects model. BD was treated as a categorical outcome. On Level 1, the within-person effect of time and the time-varying effect of RV were modeled as predictors of past-year BD. On level 2, the between person effect of lifetime RV was modeled while controlling for mean age at Wave 1. Missing data were handled using maximum likelihood estimation with robust standard errors (MLR), which permits analysis of data missing at random (MAR). MLR uses all available data to test various combinations of population parameter estimates until it identifies those that yield the best fit to the data as indicated by the highest log-likelihood value (Graham, Olchowski, & Gilreath, 2007). This approach, referred to as full information maximum likelihood, is asymptotically equivalent to multiple imputation (Graham et al., 2007). Because the study variables of interest (i.e., RV and BD) were not associated with likelihood of dropout, data were modeled under MAR assumptions.

Results

Descriptive Statistics

Frequencies, means, and standard deviations for study variables are presented in Table 1. Further, although time was modeled on Level 1, age centered at Wave 1 also was modeled to account for potential age-related differences in BD initially and over time.

Multilevel Modeling

The intraclass correlation for BD in an empty model was .56, which suggests that slightly more than half of the variance in BD over time can be accounted for by between-person factors. There was significant residual variance in BD, suggesting that there is individual variability in BD at each occasion above and beyond that accounted for by the model (see Table 2).

Intercept and Slope of BD—At Wave 1, the likelihood of engaging in BD for 14.6 year-old adolescents after controlling for sex and RV victimization was not significantly different than 0. However, the significant positive fixed effect of slope is consistent with the hypothesis that BD would increase over the course of the study, and suggests that, on

average, 14.6 year-old adolescent girls without RV victimization had a .2 greater log-likelihood of reporting BD for each year that they participated in the study. , the non-significant main effect of sex on intercept and slope suggests that there were no gender differences in initial BD or in the rate of increase over time.

Time-Invariant Effect of RV Victimization—The fixed time-invariant effect of lifetime RV on the intercept was significant, suggesting that those who ever experienced RV had a .41 greater log-likelihood of reporting BD at intercept when compared to those who never experienced RV. Lifetime RV victimization also predicted the slope of BD over time, but, contrary to hypotheses, RV victims evidenced a steeper decline in binge drinking over the course of the study when compared to non-victims. There were significant random effects of intercept and slope after controlling for age centered at Wave 1, sex, and RV victimization, which suggests that there is significant variability in binge drinking among this sample of adolescents above that which is explained by age, sex, and RV victimization

Time-Invariant Effect of Age—Consistent with the hypothesis that older adolescents would be more likely to report BD at baseline, age significantly predicted the fixed intercept of BD such that, at Wave 1, older adolescents had a .12 greater log-likelihood of reporting BD. Age did not predict the fixed slope for BD, suggesting that age is not related to changes in BD over time, on average, after controlling for the effects of RV victimization and sex.

Time-Invariant Effect of Sex—Contrary to the hypothesis that boys would be more likely to report more BD at intercept and over time, sex did not significantly predict the fixed intercept or slope of BD suggesting that boys and girls do not differ significantly in their initial reports of BD or in the rate of change over time.

Time-Varying Effect of RV Victimization on BD—The significant time-varying fixed effect of RV suggests that the log-likelihood of engaging in BD was .16 higher on average at occasions when participants reported a new instance of RV.

Discussion

The purpose of the current investigation was to examine longitudinal associations between RV victimization and binge drinking (BD) among adolescent boys and girls. Hypotheses were partially supported in that BD increased at a slow steady rate over the course of the study, and participants reporting lifetime RV victimization endorsed greater BD at the start of the study. However, contrary to expectations, RV victimization was actually associated with a significantly faster decline in BD over the course of the study, suggesting that RV victims are not necessarily developing a pattern of engaging in more frequent BD over time to cope with the experience of RV victimization. At each occasion when a new RV incident was reported, however, the likelihood of engaging in BD was also heightened. Yet unknown is whether this increased BD preceded or resulted from the RV experience. These findings suggest that BD may precede RV, as BD decreases over time, but is heightened at occasions when RV is reported. Adolescents may engage in BD to ameliorate anxiety or reduce inhibitions in social situations (Gilles et al., 2006) but experiencing RV victimization while engaging in BD may serve as a catalyst to identify BD as a substantial and problematic

contributor to subsequent RV and other negative events. As a consequence, these adolescents may engage in BD less frequently over time compared to non-victims as a way to reduce their risk of subsequent RV and other adverse experiences. It also is possible that RV victims may engage in BD proximal to the time of the RV perhaps as a means of coping with acute distress, which could support the self-medicating hypothesis (Miranda et al., 2002). Although BD may provide short-term relief from the distress of experiencing RV, victims may find that it does not ameliorate distress over the long-term and thus engage in BD less frequently over time. Although the directionality of these relationships cannot be determined with certainty from these data, the linkages between time-varying RV and BD at each assessment point highlight the strong relation between these constructs and suggest a need to focus on risk reduction among adolescents.

Age and sex differences

BD findings emerged when controlling for the effects of age and suggested that older adolescents are more likely to report increased BD at the start of the study. These age-related associations buttress literature documenting increases in adolescent drinking over time (Chen & Jacobson, 2012) and suggest that older adolescents may have had greater opportunity for exposure to potentially traumatic events or social pressures to drink. However, they also highlight a potential need to tailor RV reduction and BD interventions differently for older and younger adolescents (e.g., risk reduction with older adolescents and primary prevention for younger adolescents). Interestingly, few sex differences emerged in the present study, which contrasts with studies finding associations between RV and BD for girls only (Exner et al., 2013) but fits with literature suggesting that the sex differences previously observed in externalizing and risk behaviors may be converging (Begle et al., 2011).

Limitations and Future Directions

Study findings should be considered in the context of limitations. Although the 54% initial response rate is consistent with response rates observed in recent national epidemiologic surveys (Baruch & Holtom, 2008), the study was advertised to parents and adolescents as a study of “dangerous things that happen in their school, neighborhood, and family” so it is possible that some parents or adolescents declined initial participation due to the nature of the questions. Furthermore, although neither RV victimization nor BD at Wave 1 were associated with study dropout at Waves 2 and 3, attrition in the present study was significant and highlights a need for future studies to focus on better retention of participants to confirm these conclusions. Further, RV and BD were assessed via self-report; thus, responses may have been biased by inaccurate recall or underreporting. Albeit challenging in a phone survey, future studies should corroborate findings with official victimization reports or biological indicators of intoxication (e.g., breathalyzer). The assessment of BD and RV in the present study did not permit the examination of acute temporal sequencing of events (e.g., whether BD immediately preceded or resulted from RV victimization); future studies using daily diary methods or more frequent assessments of BD and RV may shed better light on the temporal sequencing of these events. The current study only examined any exposure to RV, without considering the impact of different types of RV (physical or sexual) or the frequency or severity of RV. The present study also did not query about RV perpetration,

which limits our understanding of the immediate precursors to and processes involved in RV victimization, including the potential role of bidirectional violence. Finally, although random digit dialing facilitates collection of nationally representative data, participants without landlines may have been excluded here. This concern is lessened by U.S. Census Bureau reports that 91% of families with parents in the age range of interest had landlines in 2005. Future efforts should attempt to contact potential participants without phones or with cellular phones.

These limitations notwithstanding, results provide strong support for the link between RV and BD among adolescents age 12 to 17, and highlight important avenues for future research. Collecting additional waves of data would enable modeling of non-linear relationships between RV and BD over time, and more frequent assessments of RV and BD would facilitate a more detailed analysis of the temporal sequencing of variables. Further, to more comprehensively understand the role of BD in RV over time, future work should follow adolescents into adulthood to examine how pre-adult RV victimization experiences predict coping behaviors and subsequent RV in adulthood. The present findings also highlight the utility of querying about immediate precursors to RV (e.g., alcohol use at the time of the violence, etc). Additionally, studying these relationships in clinical populations with more severe BD may reveal more problematic trajectories of functioning.

Implications for future research, policy, and practice

Findings from the present study have implications for the treatment of RV and BD among adolescents, especially given the results of heightened BD around incidences of RV. This provides support for programs designed to reduce RV and BD, with recent recommendations highlighting adolescence as a critical period for intervention (Foshee & Reyes, 2009). Results from this study confirm previous findings that RV and BD are similarly problematic for boys and girls (e.g., Rothman et al., 2012; Yan et al., 2010) and highlight the importance of incorporating prevention and/or treatment of BD, and perhaps other high risk behaviors, into programs focused on RV among adolescents. Specifically, development and evaluation of programs that simultaneously target RV and BD may reduce risk for both experiences as well as later revictimization and long-term problematic drinking behavior. This is an extremely important target given the increased risk for BD as adolescents become older, and research indicating that adolescents with a history of RV have an increased likelihood of experiencing a more severe incident of RV in the future (Exner-Cortens et al., 2017).

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Table 1

Descriptive Statistics for Time-Varying Relationship Victimization, Lifetime Relationship Victimization, and Binge Drinking

Variable	Wave 1 (N = 3614)	Wave 2 (N = 2511)	Wave 3 (N = 1653)
Age	$M = 14.6$ (1.7)	--	--
Relationship Victimization	$n = 409$ (11.3%)	$n = 91$ (2.5%)	$n = 48$ (1.3%)
Binge Drinking	$n = 553$ (15.3%)	$n = 584$ (23.4%)	$n = 517$ (31.3%)
Lifetime Relationship Victimization	$n = 493$ (13.6%)	--	--

Note: Wave 1 relationship victimization refers to lifetime reports of sexual or physical assault by a peer or dating partner, whereas Wave 2 and 3 relationship victimization refers to sexual or physical assault by a peer or dating partner in the past year.

Table 2

Parameter Estimates for Random Linear Effects Model

Parameter	<i>Estimate</i>	<i>S.E.</i>	<i>p-value</i>
Binge Drinking Residual Variance	.05	.02	<.05
Fixed			
Binge Drinking Intercept	-.22	.17	.20
Binge Drinking Slope	.02	.01	<.01
Time-varying Relationship Victimization on BD	.16	.06	<.01
Binge Drinking Intercept on Relationship Victimization (Ever)	.41	.14	<.01
Binge Drinking Slope on Relationship Victimization	-.01	.004	<.05
Binge Drinking Intercept on Age	.12	.03	<.001
Binge Drinking Slope on Age	-.001	.001	.37
Binge Drinking Intercept on Sex (1 = male; 0 = female)	.18	.10	.07
Binge Drinking Slope on Sex (1 = male; 0 = female)	-.01	.003	.06
Random			
Binge Drinking Intercept	.16	.07	<.05
Binge Drinking Slope	.001	.001	.12
Time-varying RV victimization	.08	.06	.19