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Substance Use and Physical Dating Violence:

The Role of Contextual Moderators

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Abstract

Introduction—Theoretic models suggest that associations between substance use and dating violence perpetration may vary in different social contexts, but few studies have examined this proposition. The current study examined whether social control and violence in the neighborhood, peer, and family contexts moderate the associations between substance use (heavy alcohol use, marijuana, and hard drug use) and adolescent physical dating violence perpetration.

Methods—Adolescents in the eighth, ninth, and tenth grades completed questionnaires in 2004 and again four more times until 2007 when they were in the tenth, 11th and 12th grades. Multilevel analysis was used to examine interactions between each substance and measures of neighborhood, peer, and family social control and violence as within-person (time-varying) predictors of physical dating violence perpetration across eighth through 12th grade (N=2,455). Analyses were conducted in 2014.

Results—Physical dating violence perpetration increased at time points when heavy alcohol and hard drug use were elevated; these associations were weaker when neighborhood social control was higher and stronger when family violence was higher. Also, the association between heavy alcohol use and physical dating violence perpetration was weaker when teens had more-prosocial peer networks and stronger when teens' peers reported more physical dating violence.

Conclusions—Linkages between substance use and physical dating violence perpetration depend on substance use type and levels of contextual violence and social control. Prevention

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programs that address substance use–related dating violence should consider the role of social contextual variables that may condition risk by influencing adolescents’ aggression propensity.

Introduction

Physical dating violence perpetration (PDVP), which is the use of physical violence against a dating partner during adolescence, is a prevalent national problem¹ that can result in devastating consequences.² One risk factor that has been consistently linked to adult^{3–13} and adolescent^{14–20} partner violence is substance use. The predominant explanation for this linkage is that psychopharmacologic effects impair cognition and disinhibit aggression.^{10,11} However, many individuals who engage in substance use do so without engaging in partner violence, suggesting other factors may play a role in conditioning their association.^{4,5,10,11} This notion is consistent with numerous theoretic “interaction” models that suggest the effects of substance use on PDVP will vary depending on characteristics of the individual and their social context.^{21–25} Some research with adults supports this proposition^{21,26–33}; however, few studies have examined moderators of the linkage between substance use and adolescent PDVP. A better understanding of the contextual factors that condition associations between substance use and PDVP could inform primary prevention efforts that go beyond focusing exclusively on individual risk factors to changing the social contexts that influence risk for substance-related PDVP. To this end, the current longitudinal study examined whether indicators of violence exposure and social control drawn from family, peer, and neighborhood environments, three critical social contexts that influence adolescent development, moderated associations between substance use (heavy alcohol use [HALC], marijuana use [MAR], and hard drug use [HDRG]) and PDVP across eighth through 12th grade.

Empirical studies with adults suggest that substance use works synergistically with other aggression-provoking factors to predict the use of partner violence.^{21,26–33} These findings are consistent with theoretic models that propose that substance use will more likely lead to partner violence among individuals with greater propensity for aggression.^{21,25} The basic reasoning underlying these models posits that individuals vary in their aggression threshold, which is the point at which the strength of aggressive motivation exceeds the strength of aggressive inhibitions; when the threshold is exceeded, violent behavior results. Substance use intoxication may lower the threshold by impairing cognitive function. Intoxication will thus be more likely to lead to partner violence among individuals with increased aggression propensity because they already have low thresholds, even in the absence of intoxication.^{5,21,25} Conversely, this reasoning suggests that substance use may be less likely to lead to partner violence among individuals with high aggression thresholds (e.g., owing to strong inhibitions against the use of aggression) because intoxication will not lower the threshold enough for violence to occur.

Contextual social control and violence are aspects of adolescents’ social environments that may influence aggression propensity and thus moderate associations between substance use and PDVP. Contexts (i.e., neighborhoods, peer groups, families) that promote social control may increase constraints or inhibitions against aggressive behavior, producing a higher aggression threshold, through social regulation of deviant behavior and by encouraging

conformity to prosocial values and norms, including antiviolenence and social responsibility norms.^{34,35} As such, the effects of substance use on PDVP may be weaker among adolescents nested in social environments with higher levels of social control (e.g., higher levels of parent monitoring) because these controls establish a higher aggression threshold.

Exposure to violence in different contexts may also influence aggression propensity and thus moderate the influence of substance use on PDVP. In particular, elevated levels of contextual violence may increase adolescent propensity for aggression (and thus lower aggression thresholds) by making it more likely that youth access aggressive scripts and schemas as guides for behavior or by increasing negative affect.³⁶⁻⁴⁰ Increased propensity for aggression that results from violence exposure (e.g., family violence exposure) may work synergistically with substance use to increase risk for PDVP.

The Current Study

The current study aims to determine whether and how indicators of contextual social control and violence moderate associations between HALC, MAR, and HDRG and PDVP. The overarching hypotheses are that associations between substance use and PDVP will be weaker when contextual social control is elevated and stronger when contextual violence is elevated. Hypotheses are tested with longitudinal data using an analytic strategy focused on within-person changes in substance use in relation to within-person changes in PDVP; this approach allows for determining if PDVP increases at time points when substance use is elevated, an expectation based on the psychopharmacologic effects model of substance use on PDVP, and whether that effect is moderated by changes in contextual social control or violence.⁴¹ The potential for sex differences in moderated effects is also explored based on work suggesting that associations between substance use and PDVP may differ for boys and girls.¹⁶⁻¹⁸

Few studies have examined contextual moderators of the association between substance use and PDVP. The only study to examine social control as a contextual moderator found that neighborhood collective efficacy, defined as community social cohesion and willingness to intervene for the common good, did not moderate the association between a composite measure of substance use and PDVP assessed 6 years later⁴²; however, that study did not distinguish among specific substances, and focused on the distal effects of early substance use on later PDVP. Previous research using the same data source as the current study found that the association between HALC and PDVP was moderated by family and peer violence, but not neighborhood violence. However, that study did not control for or examine interactions with other substances or examine measures of contextual social control as potential moderators.³⁹ The current study addresses these limitations and builds on this previous work by simultaneously examining interactions between indicators of contextual social control and violence and the unique effects of three substance use behaviors (HALC, MAR, and HDRG) as predictors of PDVP.

Methods

Data were from a multi-wave study of adolescent health.^{43,44} Participants were enrolled in public school systems located in two counties. Four waves of data were collected beginning

when adolescents were in eighth to tenth grades (2003) and continuing until they were in tenth to 12th grade (2005). Six-month time intervals separated the first three waves and a 1-year interval separated the last two waves. Parents could refuse consent for their child's participation by returning a form or via a toll-free telephone number. The University of North Carolina at Chapel Hill Public Health IRB approved study protocols.

Study Sample

Of the 3,343 students eligible for participation at Wave 1 (W1), 2,636 (79%) completed a questionnaire. Analyses excluded respondents who were missing data on race ($n=40$), dating status ($n=67$), or PDVP ($n=74$) across all waves, yielding an analytic sample size of 2,455. Nearly all students contributed at least two waves of data ($n=2,299$, 94%), with 78% participating in three or more waves ($n=1,920$). The analytic sample was 47% black, 48% were male, and 40% reported that the highest education obtained by either parent was high school or less. Table 1 presents W1 sample characteristics and descriptive statistics.

Measures

To assess physical dating violence perpetration, adolescents were asked: *During the past 3 months, how many times did you do each of the following things to someone you were dating or on a date with? Don't count it if you did it in self-defense or play.* Six items listing physically violent behavioral acts were listed (e.g., *hit or slapped them*). Response options ranged from *never* (0) to *ten or more times* (4). Scores were summed to create a composite (Cronbach's $\alpha=0.93$).

All substance use measures used a past 3-month reference period with response options that ranged from *never* (0) to *ten or more times* (3). HALC was measured by averaging four items assessing how many times respondents had: three or four drinks in a row, five or more drinks in a row, gotten drunk from drinking alcohol, or been hung over ($\alpha=0.95$). MAR was assessed by asking respondents how often they had engaged in MAR. HDRG was assessed by asking how often respondents had engaged in *other hard drug use (cocaine, LSD, heroin, ecstasy, or other)*; owing to low prevalence (4% at W1), responses were dichotomized to denote whether the respondent had (1) or had not (0) used hard drugs in the past 3 months.

Family control was measured by averaging three items ($\alpha=0.76$) assessing the respondent's report of parent rule setting and monitoring (e.g., *he/she has rules that I must follow*). Using a directory of enrolled students, adolescents were asked to identify up to five of their closest friends. Peer control was measured via two scales assessing the extent to which the respondents' nominated friends endorsed conventional beliefs (three items; e.g., *it's good to be honest*) and prosocial values (three items; e.g., *it's important to finish high school*); scores were averaged to create a composite measure (standardized $\alpha=0.75$). Neighborhood control was measured by averaging five items ($\alpha=0.80$) assessing respondents' perceptions of neighborhood social cohesion, adult monitoring of youth, and willingness to intervene to prevent deviance.

Family violence was measured by averaging three items ($\alpha=0.87$) from Bloom's family functioning scale (e.g., *family members sometimes hit each other*).⁴⁵ Neighborhood violence

was measured by averaging three items ($\alpha=0.87$) assessing perceptions of violence and safety in their neighborhood (e.g., *people there have violent arguments*). Peer dating violence was measured by summing the number of nominated friends who reported any PDVP.

Statistical Analysis

Data were analyzed in 2014. Data were reorganized by grade (rather than wave) and multilevel analysis (using SAS, version 9.3) was used to examine the within-person (time-varying) effects of substance use, contextual moderators, and their interactions on levels of PDVP (logged) across eighth through 12th grades. The best-fitting unconditional trajectory model of PDVP included both linear (grade) and quadratic (grade²) fixed effects for grade-level, heteroscedastic errors, and a random intercept. Following standard recommendations for examining within-person effects of time-varying covariates, all substance use and contextual moderator variables were person-mean centered.⁴⁶ Models controlled for the linear and quadratic effects of grade, sex, race/ethnicity, parent education, and dating abuse victimization (i.e., experiencing any dating violence in the previous 3 months). Multiple imputation (20 imputations) using SAS PROC MI/MIANALYZE was used to address missing data.⁴⁷

A series of conditional multilevel models were estimated to test hypotheses. First, a baseline model was estimated that included the time-varying (“main”) effects of each substance use type and contextual moderator as well as controls. Next, sets of two- and three-way interactions among HALC, the contextual moderators, and sex were added to the baseline model and the joint significance of the contribution of each set of interactions to the model was evaluated using a multiparameter Wald test, which was set at a Bonferroni-corrected value of 0.002 ($\alpha=0.05/9$ sets of interactions). Individual significant ($p<0.05$) interactions within each set of interactions that contributed significantly to the model were retained. This model reduction procedure was repeated for examining interactions involving MAR and HDRG. Significant individual interactions were probed by producing model-estimated simple slopes denoting the association between the focal substance use variable and PDVP at high (+1 SD above the mean) and low (−1 SD below the mean) levels of the moderator variable.⁴⁸

Results

Table 2 presents results from the reduced models. The final HALC model (Column 1) retained significant interactions with neighborhood control ($p<0.001$), peer control ($p=0.02$), peer dating violence ($p=0.01$), and family violence ($p=0.003$). Simple slopes analyses found that, as expected, neighborhood and peer control buffered the effects of HALC on PDVP (Figure 1, Panels A and C). Increased HALC was not associated with increased PDVP when neighborhood control was high ($p=0.85$), but was associated with PDVP when it was low (coefficient=0.17, $p<0.001$). HALC was positively related to PDVP when peer control was both high and low; however, associations were significantly weaker when peer control was high (coefficient=0.05, $p=0.01$) compared with when it was low (coefficient=0.11, $p<0.001$).

Also as expected, peer dating violence and family violence exacerbated the effects of HALC on PDVP (Figure 1, Panels B and D). Findings replicate those reported previously³⁹ and show that the prior findings are robust to inclusion of controls for other substance use behaviors as well as the contextual social control indicators and their interactions with HALC. Elevated HALC was associated with increased PDVP when peer dating violence was both high and low; however, associations were stronger when peer violence was high (coefficient=0.11, $p<0.001$) compared with low (coefficient=0.05, $p=0.01$). Similarly, associations were stronger when family violence was high (coefficient=0.12, $p<0.001$) compared with low (coefficient=0.05, $p=0.04$).

The reduced model for MAR (Table 2, Column 2) included one significant interaction with neighborhood control ($p<0.001$). As expected, neighborhood control buffered the association between MAR and PDVP (Figure 1, Panel E); elevated MAR was not significantly associated with PDVP when neighborhood control was high ($p=0.12$), but was when it was low (coefficient=0.05, $p<0.001$).

The reduced model for HDRG (Table 2, column 3) included significant two-way interactions with family violence ($p=0.01$) and neighborhood control ($p<0.001$). As expected, family violence exacerbated and neighborhood control buffered the effects of increased HDRG on PDVP. The strength and pattern of these moderating effects was the same for boys and girls (i.e., there was no three-way interaction with sex); however, because there was a significant two-way interaction between HDRG and sex ($p<0.001$), simple slopes were probed separately for boys and for girls (Figure 1, Panels F and G). Among girls, HDRG and PDVP were not associated when neighborhood control was high ($p=0.09$), but they were associated when neighborhood control was low ($p<0.001$); also, the association for girls was significant when family violence was high ($p=0.002$) but not low ($p=0.79$). Among boys, associations between HDRG and PDVP were significantly weaker when neighborhood control was high (coefficient=0.49, $p<0.001$) compared with low (coefficient=0.93, $p<0.001$), and stronger when family violence was high (coefficient=0.83, $p<0.001$) compared with low (coefficient=0.59, $p<0.001$).

Ancillary analyses examined whether findings held when all significant interactions were modeled simultaneously (results not shown). Interactions with HALC and HDRG maintained statistical significance (family violence interactions were marginal); however, the interaction between MAR and neighborhood control became non-significant ($p=0.60$), thus this finding should be viewed with caution.

Discussion

This study extends previous research that has established a linkage between substance use and PDVP by demonstrating that associations depend on characteristics of the social context in which the adolescent is embedded. In particular, associations between specific substances (HALC, MAR, and HDRG) and PDVP were buffered by neighborhood and peer control and exacerbated by family and peer violence, though findings depended on substance use type.

Associations between all three substances and PDVP were weaker when teens reported higher levels of neighborhood control; associations between HALC and PDVP were also buffered by peer control. Social disorganization perspectives suggest that higher levels of neighborhood control may be associated with exposure to positive conflict resolution models, antiviolence norms, and the availability of prosocial supports and helping resources to teens; these effects, in turn, may lower aggression propensity and strengthen aggressive inhibitions, dampening the effect of substance use on PDVP.^{43,49–51} Similarly, teens nested in prosocial peer networks may have lower aggression propensity because they are exposed to positive peer models of conflict resolution and believe that using dating violence could harm their peer relationships; this decreased aggression propensity may weaken the influence of HALC on PDVP. Unexpectedly, family control did not moderate associations between any of the substances and PDVP; it may be that increased parental controls do not strengthen adolescent inhibitions against the use of aggression in romantic relationships.

Associations between HALC and PDVP were stronger for teens reporting elevated levels of family and peer violence; family violence also exacerbated associations between HDRG and PDVP. Elevations in family and peer violence may increase aggression propensity, and thus work synergistically with HALC and HDRG to increase PDVP risk, because adolescents draw on family and peer models as immediate sources of information as to how to act when faced with dating conflict or because violence exposure may contribute to negative affect (e.g., anger).³⁸ Unexpectedly, neighborhood violence did not moderate associations between use of the substances and PDVP; interactions with neighborhood control or with the more-proximal violence exposures may have accounted for the moderating effect of neighborhood violence.

Some findings differed by substance use type. The only interaction found for MAR was with neighborhood social control, which was not robust in ancillary analyses. We view this finding with caution, particularly given the inconsistent results of research examining associations between MAR and adult partner violence.^{10,52–56} It is also notable that peer violence and control only conditioned associations between HALC and PDVP. Perhaps when teens engage in HALC on dates, they are particularly likely to do so in social events where peers are present, enabling them to have a proximal influence on dating conflict.

Together, findings suggest that interventions that increase neighborhood control by fostering interaction among neighbors (e.g., community network–building programs) and establishing informal community social control networks (e.g., via community policing programs) could reduce HALC-, MAR-, and HDRG-related PDVP.⁵⁷ In addition, violence interventions for teens exposed to family violence should address the link between HALC and HDRG and PDVP. Finally, interventions that promote prosocial values and antiviolence norms in peer networks may be particularly effective in reducing alcohol-related PDVP.

Limitations

The following limitations should be considered. The observational design of the study precludes our ability to make any causal inferences with respect to the associations that were detected. Measures were self-reported and thus subject to social desirability and same-source bias; further, measures were composed of relatively few items, potentially limiting

their ability to assess complex multidimensional constructs. In addition, the study examined only three substances and did not examine associations with psychological or sexual violence.

Conclusions

The current study used longitudinal data to examine the dynamic associations between within-individual changes in substance use and PDVP and potential social contextual moderators of these associations. Findings suggest that risk for substance-related adolescent dating violence perpetration may be exacerbated by contextual violence and constrained by contextual social control. Interventions that address substance-related dating violence should consider the role of contextual variables that may condition risk by influencing aggression propensity.

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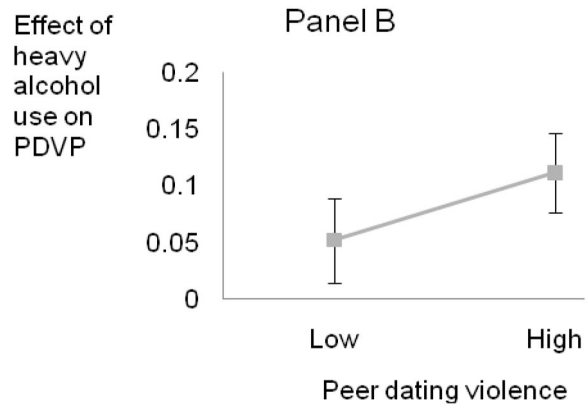
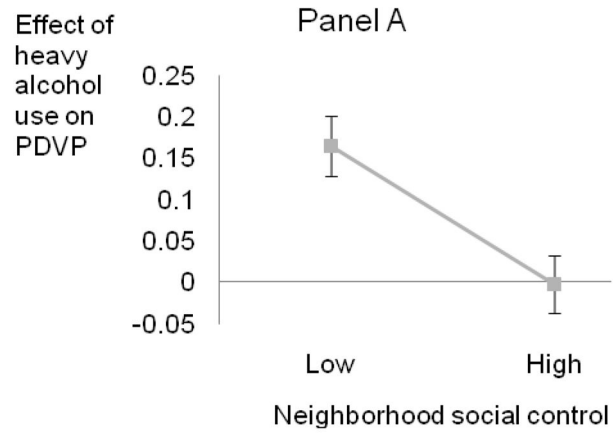
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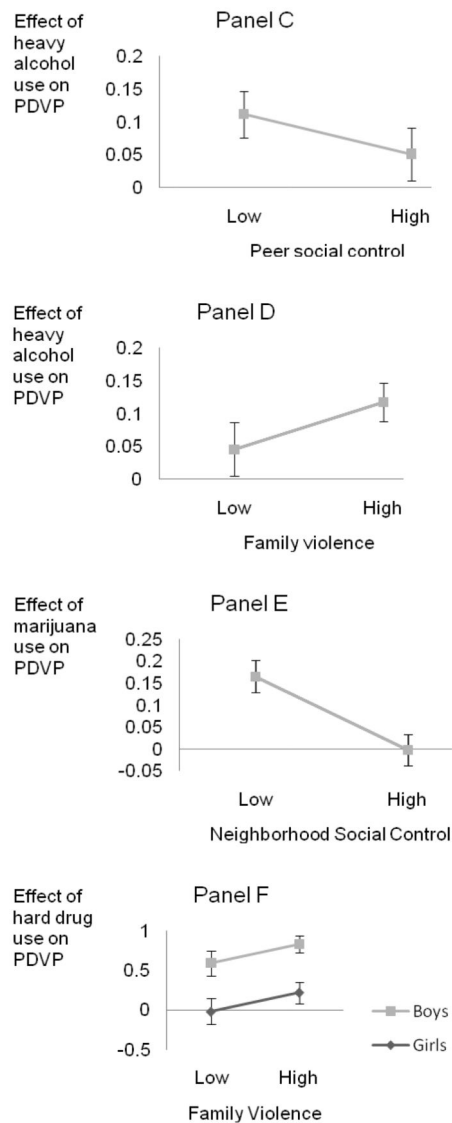


Figure 1. Parameter estimates and 95% CIs for the within-person effects of heavy alcohol (Panels A–D), marijuana (Panel E) and other hard drug use (Panels F–G) on physical dating violence perpetration (PDVP) at low (–1 std below the mean) and high (+1 std above the mean) levels of contextual social control and violence. *Note:* Error bars depict 95% CIs. Effects for hard drug use are depicted separately for boys and girls because there was a significant two-way interaction between hard drug use and sex.

Table 1Participant Characteristics at Wave 1 ($n=2,455$)

	%	M [SD]
Demographic characteristics		
Sex		
Male	48	--
Female	52	--
Race		
White	43	--
Black	47	--
Other race ethnicity	10	--
Parent education		
Less than high school	10	
High school graduate	30	
More than high school	60	
Grade		
8	35	--
9	34	--
10	31	--
Past three month substance use		
Heavy alcohol use	18	0.25 [0.74]
Marijuana use	21	0.50 [1.14]
Hard drug use	4	--
Past three month physical dating violence perpetration	15	0.62 [2.43]
Contextual social control		
Neighborhood control	--	2.70 [1.02]
Peer control	--	2.93 [0.40]
Family control	--	2.11 [0.85]
Contextual violence		
Neighborhood violence	--	1.13 [1.04]
Peer dating violence	--	0.46 [0.66]
Family violence	--	1.14 [1.23]

Note: Means (M) and SD are based on scale scores; percentages (%) for substance use and physical dating violence perpetration denote proportion of sample reporting any past three month involvement in the behavior.

Contextual Moderators of Longitudinal Within-Person Associations Between Substance Use and Physical Dating Violence Perpetration

Table 2

	Heavy alcohol use interactions		Marijuana use interactions		Hard drug use interactions	
	b (se)	p	b (se)	p	b (se)	p
Main Effects						
Heavy alcohol use (HALC)	0.08 (0.01)	<0.001	0.10 (0.01)	<0.001	0.09 (0.01)	<0.001
Marijuana use (MAR)	0.02 (0.01)	0.05	0.02 (0.01)	0.05	0.01 (0.01)	0.11
Hard drug use (HDRG)	0.45 (0.04)	<0.001	0.48 (0.04)	<0.001	0.10 (0.06)	0.13
Neighborhood control	-0.02 (0.01)	0.01	-0.03 (0.01)	0.003	-0.02 (0.01)	0.01
Peer control	-0.01 (0.02)	0.57	-0.02 (0.02)	0.36	-0.01 (0.01)	0.46
Family control	-0.001 (0.01)	0.93	-0.004 (0.01)	0.77	-0.001 (0.01)	0.94
Neighborhood violence	0.01 (0.01)	0.30	0.01 (0.01)	0.32	0.01 (0.01)	0.38
Peer dating violence	0.02 (0.01)	0.14	0.02 (0.01)	0.11	0.02 (0.01)	0.14
Family violence	0.03 (0.01)	<0.001	0.03 (0.01)	<0.001	0.03 (0.01)	<0.001
Heavy alcohol use interactions						
HALC X Neighborhood control	-0.11 (0.02)	<0.001	--	--	--	--
HALC X Peer control	-0.08 (0.03)	0.03	--	--	--	--
HALC X Peer dating violence	0.05 (0.02)	0.01	--	--	--	--
HALC X Family Violence	0.04 (0.01)	0.003	--	--	--	--
Marijuana use interactions						
MAR X Neighborhood SC	--	--	-0.04 (0.01)	<0.001	--	--
Hard drug use interactions						
HDRG X Male	--	--	--	--	0.61 (0.08)	<0.001
HDRG X Neighborhood control	--	--	--	--	-0.29 (0.05)	<0.001
HDRG X Family violence	--	--	--	--	0.12 (0.04)	0.01

Note: Variables were time-varying and person-mean centered. Models controlled for sex, grade, race, parent education, and dating abuse victimization.