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Does Alcohol Use Predict Violent Behaviors? The Relationship Between Alcohol Use and Violence in a Nationally Representative Longitudinal Sample

Mildred M. Maldonado-Molina[1], **Jennifer M. Reingle**[1], and **Wesley G. Jennings**[2]

[1]University of Florida, Gainesville, FL, USA

[2]University of South Florida, Tampa, FL, USA

Abstract

The current study examined the relationship between alcohol and violence using a longitudinal survey of adolescents ages 11–26. Data were derived from 10,828 adolescents in the National Longitudinal Study of Adolescent Health (Add Health) Waves I-III. Survey logistic regression was used to examine the relationship between alcohol use and violence. Even after adjustment for baseline, consistent alcohol use predicted violence in young adulthood (OR =1.41; 95% CI [1.03, 1.91]); however, violence was not predictive of problematic alcohol use. Overall, consistent alcohol use appears to be a predictor of serious physical violence, whereas physical violence does not predict problematic alcohol use.

Keywords

alcohol; violence; youth; adolescents

Introduction

Violence and alcohol consumption among adolescents is an important public health problem. Violence and physical aggression are linked to unintentional injuries and homicide, two of the leading causes of death among young people (Center for Disease Control and Prevention, 2009). Alcohol use is often described as the drug of choice among adolescents (Johnston, O'Malley, Bachman, & Schulenberg, 2009). Furthermore, alcohol is a key contributor to the leading causes of death among those 10 to 24 years old—motor-vehicle mortality, suicide, and other unintentional injuries (Centers for Disease Control and Prevention, 2007).

Corresponding Author: Mildred M. Maldonado-Molina, 1329 SW 16th St, Gainesville, FL 32610, USA, maldonado@ichp.ufl.edu.

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[1]The prevalence of each item in the "problematic alcohol use" scale are as follows: (1) "You had problems at school or work" (*n* = 644; 5.96%); (2) "You had problems with your friends" (*n* = 869; 8.05%); (3) "You had problems with someone you were dating" (*n* = 1,080; 10.01%); (4) "You were hungover" (*n* =4,482; 41.62%); (5) "You were sick to your stomach or threw up after drinking" (*n* = 3,823; 41.62%); (6) "Did you get into a sexual situation you later regretted" (*n* = 1,554; 14.41%); (7) "Did you get into a physical fight" (*n* = 813; 7.53%); and (8) "Were you drunk at school or work?" (*n* = 558; 5.16%). Overall, 5,300 (49.4%) young adults reported one or more of these items.

The association between violence and alcohol consumption has been well studied in the criminological and public health literature. At least four explanations have been proposed to explain the relationship between alcohol and violence: (a) psychopharmacological, meaning that the intoxicating effects of alcohol cause people to be violent to gain resources to support their drug/ alcohol use (Goldstein, 1985); (b) the relationship is causal, in that alcohol use causes violence, because aggressive people self-select into situations that encourage alcohol consumption (Johnston, O'Malley, & Eveland, 1978); (c) the relationship is reciprocal, and the arrow between alcohol use and violence may point in either or both directions (White, Loeber, Stouthamer-Loeber,&Farrington, 1999); or (d) the relationship is spurious, as problem behaviors cluster as part of a more general problem behavior syndrome (Jessor, Donovan, & Costa, 1991).

Few longitudinal studies have attempted to address the directionality of the alcohol–violence relationship, and the findings have been mixed. Dembo and colleagues (1991) conducted a cohort study of detained juvenile delinquents and found that alcohol use predicted violent behavior, and violence was a significant predictor of drug use (e.g., cocaine, marijuana) at the 10- to 15-month follow-up. Similarly, Ellickson, Tucker, and Klein (2003) followed a cohort of seventh graders in California and Oregon through age 23 to evaluate the effects of early alcohol use. They found that early alcohol users were more likely to be delinquent and use other drugs in middle and high school compared to nondrinkers in seventh grade. At age 23, early alcohol users were at an increased risk for substance misuse, violence, and criminality (Ellickson, Tucker, & Klein, 2003). Another longitudinal study conducted using the first two follow-up surveys of the National Longitudinal Study of Adolescent Health (Add Health) found that alcohol use was a significant predictor of physical violence 2 years later (Resnick, Ireland, & Borowsky, 2004).

Despite the well-documented relationship between alcohol consumption as a predictor of violent behavior, another body of literature suggests that the violence predicts alcohol use. For example, Windle (1990) used National Longitudinal Youth Survey data to assess the impact of various antisocial behaviors at ages 14–15 on other delinquent behaviors 4 years later. The results suggested that general delinquency (a function of the frequency of nonsubstance-related delinquent behavior) was a significant predictor of alcohol consumption. Similarly, a study of adolescents ages 12–18 evaluated the effects of early alcohol use among a sample of 218 males and 213 females (White, Brick, & Hansell, 1993). White, Brick, and Hansell (1993) found that early aggression in males predicted alcohol consumption and alcohol-related aggressive behavior; however, more specific levels of alcohol use were not significantly associated with later aggression. In support of these findings, data from the same study were reanalyzed to evaluate the complex relationships between alcohol use, aggression, and alcohol-related aggression over time using structural equation models (White & Hansell, 1996). They found that early initiation of alcohol use predicted physically aggressive behavior.

Several studies provide support for a third theoretical explanation for the association between violence and alcohol use, that a bidirectional relationship exists. First, D'Amico, Edelen, Miles, and Morral (2008) conducted a study of high-risk juveniles in the Los Angeles juvenile probation system between the ages of 13 and 17. They found that

substance use predicted delinquency (a scale of drug-related crime, property crime, and interpersonal violent crime) and delinquency predicted substance use. This study was not specific to alcohol use, and adolescents were only followed for a period of 1 year. In an 8-year study of high school aged African Americans in Michigan, Xue, Zimmerman, and Cunningham (2009) tested the bidirectionality of alcohol use and violent behavior. Their results indicated that early violence (e.g., group fighting, hitting a teacher or supervisor, using a knife or gun to get something from a person, etc.) significantly predicted later alcohol use, and early alcohol use predicted future violent behavior. Among 15- to 19-year-old urban Mexican Americans and European Americans selected from a large health maintenance organization, Brady, Tschann, Pasch, Flores, and Ozer (2008) noted reciprocal relationships between alcohol use and violence when adolescents were older. For example, perpetration of violence at age 18 significantly predicted alcohol use at age 19; however, violence at 15 did not predict alcohol use at age 19. Similarly, alcohol use at age 15 did not predict violent behavior at age 19, whereas alcohol use at age 18 significantly predicted perpetration of violence. Although these studies have consistent findings within ethnic groups, the limited external validity must be considered when applying findings to these groups at the population level.

In light of the findings from longitudinal studies that have tested the relationship between alcohol and violence, most studies drew samples from juvenile justice systems or schools, which may present a selection bias or limited external validity. Considering the breadth of research conducted on this topic, nationally representative studies of youth must be conducted to inform national prevention interventions that may reduce the risk of violence or alcohol use at the population level. Additionally, many studies have tested the relationship between alcohol and general delinquency, rather than serious physical violence. Acknowledging these issues, in this particular study, we utilized the Add Health to test the relationship between alcohol use and violence in a nationally representative sample of youth ages 11 to 26. The benefit of using this data set is that at age 11, many adolescents have not yet begun using alcohol or participating in violence. Many of the recent literature discussed above have used samples of older adolescents, which may be problematic due to previous concurrent use of alcohol and participation in violent behavior. If these behaviors are already intertwined, it may be difficult to tease out the independent effect of each behavior. Therefore, the current study is an important contribution to the literature because of the large, geographically diverse and nationally representative sample, the young age at which youth were recruited to participate in the survey, and the longitudinal design, which allows for an evaluation of changes in behaviors over time.

The purpose of this study is to evaluate the relationship between serious violence and problematic alcohol use. Specifically, we tested the effects of consistently high use of alcohol, initiation or desistance from alcohol use, or no use of alcohol during adolescence on violent behaviors during young adulthood. In addition, we evaluated the effects of consistently high violence, initiation or desistance from violence, or no violence in adolescence on problematic alcohol use in young adulthood. Specifically, we hypothesize that (a) alcohol use is a stronger predictor of violent behavior rather than vice versa, and (b) consistently high users of alcohol will be more likely to engage in violent behavior when compared to other groups (e.g., initiators, desistors, and nonusers).

Method

Research Design

Data were derived from waves I (1994–1995), II (1995–1996), and III (2001–2002) of the restricted-use sample of the Add Health. The Add Health data comprised a nationally representative sample of 80 high schools and 52 middle schools in the United States, with participants selected using a two-stage cluster sampling design. The individual participants were selected from rosters provided by selected schools. Data were collected from an in-home face-to-face interview with the adolescents and adults, ages 11 (Wave I) through 26 (Wave III). Details of data collection and survey procedures are described elsewhere (Harris et al., 2003). After excluding cases with missing weights at Wave III (Chantala & Tabor, 1999), 10,828 participants remained in the data set.

Participants

Table 1 reports demographic and relevant descriptive characteristics of the sample. Briefly, the sample was 47.1% male, with a mean age of 15.28 at Wave I. Whites comprises 63.6% of the sample, 21.7% were African American, and 16.1% self-identified as Hispanic. Approximately half of the participants reported using alcohol prior to the baseline interview, and nearly 20% reported serious violence in the past year (Table 1).

Measures

All covariates were measured at Wave I. Dependent variables (violent behavior and problematic alcohol use) were collected at Wave III.

Dependent Variables

Violent behavior—This dependent variable was created using three items measuring whether three violent behaviors have occurred in the prior 12 months at Wave III (young adults). These items included (a) “You pulled a knife or gun on someone”; (b) “You shot or stabbed someone”; and (c) “How often did you hurt someone badly enough to need bandages or care from a doctor or nurse?” If the respondent reported an event in one or more of these three categories in the past year, they were categorized as violent.

Problematic alcohol use—In accordance with prior research (Marmorstein, 2009), an 8-item scale was created to evaluate problematic alcohol use at Wave III. Each participant who reported drinking was asked the number of times each of the following has occurred due to alcohol consumption: (1) “You had problems at school or work”; (2) “You had problems with your friends”; (3) “You had problems with someone you were dating”; (4) “You were hungover”; (5) “You were sick to your stomach or threw up after drinking”; (6) “Did you get into a sexual situation you later regretted”; (7) “Did you get into a physical fight”; and (8) “Were you drunk at school or work?” Persons who responded affirmatively to more than one of these were categorized as “problematic drinkers.”[1]

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Predictors

Four independent variables were calculated using the lifetime alcohol use variable at Wave I and the following alcohol use variable measured at Wave II: “Since [last interview], have you had beer, wine or liquor—not just a sip or taste of someone else’s drink—more than 2 or 3 times?” Respondents who reported no consumption at either wave were classified as “non-users,” respondents who reported consumption at Wave I but no consumption at Wave II were labeled “desistors,” those who used alcohol at Wave II but not Wave I were considered “initiators,” and those who reported alcohol use at both waves were labeled as “consistent high” users.

Similarly, four categories of violence were created to describe violent behavior between Waves I and II. These independent variables were calculated using the past year violence using the previously described “violent behavior” variable at Wave I and the identically worded violent behavior variable measured at Wave II. Respondents who reported none of the three violent behaviors at either Wave were classified as “nonusers,” respondents who reported one or more violent acts at Wave I but no violence at Wave II were labeled “desistors,” those who reported one or more violent acts at Wave II but not Wave I were considered “initiators,” and those who reported violence at both waves were described as “consistent high” violent individuals.

Covariates

Depression—This mental health status variable was measured with one item, “How often in the past week have you felt depressed?” Values for this variable were dichotomized so that 1 =*One or more times* and 0 =*0 instances of depression in the past week*.

Academic achievement—Academic performance was measured using the variable, “On a scale of 1 to 5, where 1 is *low* and 5 is *high*, how likely is it that you will go to college?”

Parental involvement—Parental influence and involvement was measured using a scale of 20 items (10 for maternal involvement and 10 measuring paternal involvement; Prado et al., 2009). Each individual item was dichotomized, and the scale is the sum of all 20 items (range: 0–20). The 10 items which comprised the scale included whether the respondent reported participating in the following activities with their mother and/or father in the past 4 weeks: (1) going shopping; (2) playing a sport; (3) attending a religious or church-related event; (4) talking about someone they are dating or a party they attended; (5) attending a movie, play, concert, or sporting event; (6) talked about a personal problem they were having; (7) had a serious argument about their behavior; (8) talked about work or grades; (9) worked on a project for school; and (10) talked about other things they are doing in school. Cronbach’s coefficient α for this scale was .74.

Safe neighborhood—Neighborhood safety was measured using one item, “Do you usually feel safe in your neighborhood?”. Responses were dichotomized so that values of 1 indicate *neighborhood safety* and 0 indicates that *the respondent does not usually feel safe in their neighborhood*.

Marijuana and other drug use—Marijuana use was measured using the item, "During your life, how many times have you used marijuana?" Responses were categorized into "users" and "nonusers." Other drug use was created using the self-reported number of times the respondent used cocaine, inhalants, or other drugs in their lifetime. If any of these drugs were used, respondents were categorized as "users."

Desire to leave home—This variable was measured using the following item: "How much do you feel that you want to leave home?" Respondents who reported "very much" or "quite a bit" were categorized as "1" and others were categorized as "0."

Peer marijuana and alcohol use—Peer alcohol use was measured using one item: "Of your three best friends, how many drink alcohol at least once a month?" Respondents who reported having one or more friends who use alcohol monthly were coded as "1." Similarly, respondents were asked, "Of your three best friends, how many use marijuana at least once a month?" Respondents who reported having one or more friends who use marijuana monthly were coded as "1."

Demographic—Respondents were asked to self-report their race as "White," "Black or African American," "American Indian or Native American," "Asian or Pacific Islander," and/or "Other." For this analysis, respondents were grouped as "White," "Black," or "Other" for sample size purposes. Persons who reported multiple races were coded as "other." Ethnicity was recorded using the item, "Are you of Hispanic or Latino background?" Those who responded "yes" to this ethnicity item were coded as Hispanic = 1; non-Hispanics were coded as 0. Age was recorded using the month and date of birth (calculated from the middle of the month for anonymity purposes). Gender was classified as self-reported "male" or "female."

Analytical Methods

Analyses were conducted considering the clustered dual-stage sampling design, and observations were weighted due to the unequal probability of selection of each primary sampling unit (Chantala & Tabor, 1999). The survey logistic regression procedure was used to provide weighted effect estimates and confidence intervals, with calculated robust standard errors (to account for the clustering of individuals within schools). All analyses were conducted using STATA version 11 data analysis software (StataCorp, 2009).

Three models were created to test the effects of alcohol consumption on serious violence and serious violence on problematic alcohol use. The first model tested the bivariate relationships between demographics and other risk and protective factors, which have previously been associated with problematic alcohol use or violence. Only covariates (excluding demographics) that met the inclusion criteria ($p < .10$) were included in the multivariate models. The second model was adjusted for covariates, and the third model was fully adjusted for covariates and baseline violence or alcohol use.

Results

Alcohol as a Predictor of Serious Violence

As displayed in Table 2, unadjusted models (Model A) demonstrate that males (OR =5.86; 95% CI [4.52, 7.60]), African Americans (OR =2.05; 95% CI [1.61, 2.63]), marijuana users (OR =2.09; 95% CI [1.68, 2.60]), other drug users (OR =1.39; 95% CI [1.04, 1.87]), adolescents whose peers use alcohol (OR =1.16; 95% CI [1.05, 1.28]) or marijuana (OR =1.30; 95% CI [1.19, 1.42]), and those who were violent during adolescence (OR =3.62; 95% CI [2.82, 4.65]) were significantly more likely to be violent as young adults. Older adolescents (OR =0.92; 95% CI [0.87, 0.99]), Whites (OR=0.58; 95%CI [0.47, 0.72]) and those who reported increased expectation of college attendance (OR=0.83; 95%CI [0.76, 0.90])were at a significantly reduced risk of violence. Figure 1 depicts the proportion of adolescents who reported violent behavior by whether alcohol was used at baseline.

In Model B (adjusted for covariates other than baseline behavior), predictors of violence remained relatively stable. After adjustment, males (OR =6.13; 95% CI [4.66, 8.09]), African Americans (OR =2.21; 95% CI [1.62, 3.02]), adolescents with high parental involvement (OR =1.04; 95% CI [1.00, 1.07]), and those who have used marijuana (OR =1.61; 95% CI [1.21, 2.14]) had increased risk of serious violence. Older adolescents (OR =0.82; 95% CI [0.75, 0.89]) and those with high expectations of college attendance (OR =0.91; 95% CI [0.83, 0.99]) showed reduced risk of serious violence. The predictors of serious violence were stable from the partially adjusted to fully adjusted model; and as expected, baseline violence was a significant predictor of serious violence (OR =1.77; 95% CI [1.33, 2.34]).

Violence as a Predictor of Problematic Alcohol Use

As displayed in Table 3, bivariate relationships (Model A) linking problematic alcohol use and violent behavior were significant for adolescents who reported consistently high violent behavior (OR=1.31; 95%CI [1.04, 1.63]). The relationship between problematic alcohol use and demographics and covariates were present.Males (OR=1.42; 95%CI [1.27, 1.58]),Whites (OR=2.13; 95%CI [1.81, 2.50]), those with increased expectations of college attendance (OR=1.17; 95%CI [1.10, 1.25]), more parental involvement (OR =1.05; 95% CI [1.03, 1.07]), increased neighborhood safety (OR =1.68; 95% CI [1.38, 2.04]), marijuana users (OR =1.69; 95% CI [1.39, 1.84]), other drug users (OR =1.50; 95% CI [1.20, 1.87]), peer alcohol use (OR =1.23; 95% CI [1.16, 1.30]), peer marijuana use (OR =1.20; 95% CI [1.12, 1.27]), and those who used alcohol at baseline (OR =2.07; 95% CI [1.84, 2.33]) were at an increased risk of problematic alcohol use. In contrast, African Americans (OR =0.39; 95% CI [0.32, 0.48]), Hispanics (OR =0.79; 95% CI [0.66, 0.95]), and “other” racial/ ethnic groups (OR=0.79; 95%CI [0.70, 0.93])were at reduced risk of problematic alcohol use. Figure 2 visually depicts the lack of relationship between violent behavior at baseline and problematic alcohol use, as violence was relatively stable across adolescents who are and are not problematic alcohol users.

After adjustment for covariates other than baseline behavior (Model B), findings were similar to the bivariate models. The relationship between consistently high-violence and

problematic alcohol use was attenuated with covariate adjustment (OR =1.06; 95% CI [0.83, 1.04]). Males (OR =1.55; 95% CI [1.37, 1.73]), Whites (OR =1.38; 95% CI [1.13, 1.67]), those with high expectations of college attendance (OR =1.22; 95% CI [1.14, 1.30]), high parental involvement (OR =1.03; 95% CI [1.01, 1.05]), those who reside in a "safe" neighborhood (OR =1.34; 95% CI [1.12, 1.61]), marijuana users (OR =1.51; 95% CI [1.29, 1.76]), and adolescents whose peers use alcohol (OR =1.17; 95% CI [1.10, 1.25]) were significantly more likely to be problematic alcohol users. In contrast, African Americans (OR =0.54; 95% CI [0.42, 0.69]) and older adolescents (OR =0.96; 95% CI [0.91, 0.99]) were at a reduced risk of problematic alcohol use. Predictors of problematic alcohol use in the fully adjusted model also remained relatively stable; however, it is notable that the effect of peer alcohol use was substantially diminished after accounting for baseline alcohol use in Model C (OR =1.06; 95% CI [0.99, 1.13]). As expected, alcohol use at baseline strongly predicted later alcohol use (OR =1.90; 95% CI [1.67, 2.16]).

Discussion

Although the literature on the relationship between alcohol and violence is extensive, few longitudinal studies have tested the relationship using samples from early adolescence into young adulthood. The current study also used nationally representative data, whereas most of the extant literature was conducted with geographically specific or less diverse populations. This strengthens the external validity of the findings.

Furthermore, this study examined the relationship between alcohol consumption and serious violence. Specifically, we found that consistent alcohol use significantly predicted serious violence compared to nonusers, and nonuse of alcohol was a protective factor for violent behavior before covariate adjustment. After adjusting for several risk and protective factors, consistent alcohol use remained a significant predictor of serious violence and desistance from violence was a protective factor for problematic alcohol use. In the fully adjusted model (also adjusting for baseline violence behaviors), alcohol use was not a significant predictor of serious violence (although the trend of increased risk within this group was sustained).

This study examined the relationship between alcohol use and violent behavior and found that the relationship is complex, and the temporal sequence is dependent on the interrelationship of variables other than alcohol consumption and violent behavior. The relationship between violence and alcohol differs by racial group and behavioral risk factors (such as marijuana use and parental involvement). High levels of alcohol use predicted violence most strongly for Whites, marijuana users, and those with high parental involvement. Violence was not a significant risk factor for problematic alcohol use, regardless of race, ethnicity, or baseline use.

Findings indicate that to some extent, consistently high alcohol use is a significant predictor of later violent behavior. This is consistent with much of the extant literature (Dembo et al., 1991; Ellickson et al., 2003; Resnick et al., 2004). However, there is a body of literature that suggests that the arrow in relationship between alcohol and violence points in the other direction (White et al., 1993; White & Hansell, 1996; Windle, 1990), or is bidirectional in

nature (Brady, Tschann, Pasch, Flores, & Ozer, 2008; D'Amico, Edelen, Miles, & Morral, 2008; Xue, Zimmerman, & Cunningham, 2009). These studies generally included a sample of older adolescents who may have already been participating in violent behavior and/or alcohol use, making the directionality and prediction of each behavior difficult to evaluate. In addition, many are not representative of the general population of youth in the United States.

In this study, predictors of both alcohol use and serious violence were consistent with the previous literature. For example, males, Blacks, and marijuana users were more likely to be violent, and violence decreased with age. Unexpectedly, adolescents who reported higher parental involvement were more likely to be violent than adolescents with low involvement. An alternative explanation is youth were showing problem behaviors early and parents were providing increased involvement and monitoring as a reaction to early alcohol use or violent behaviors. Future studies should examine the role of parental monitoring during childhood and how parental involvement changes over time as youth develop into adolescence.

In addition, our findings were consistent with the extant literature on risk and protective factors associated with problematic alcohol use (Cardenal & Adell, 2000; Stenbacka, 2003). Males, Whites, and marijuana users had an increased risk of problematic alcohol use, whereas Blacks and younger adolescents were at a reduced risk. Interestingly, adolescents who expected to attend college and those who reported residence in a safe neighborhood were at risk of problematic alcohol use. These variables appear to be proxies for socioeconomic status and social capital, in that adolescents who live in safer neighborhoods and reasonably expect to attend college have greater economic resources than those who do not. One might hypothesize that this can translate into greater access to and opportunities to engage in alcohol use.

Overall, findings from the current study have important implications for alcohol prevention at young ages. Many adolescents initiate alcohol use before age 11, and prevention interventions within the schools need to begin earlier to reduce alcohol initiation rates. Many prevention activities are implemented after adolescents have initiated alcohol use and have already engaged in violent behavior. This makes alcohol prevention and/or cessation interventions far more difficult to conduct, as adolescents and their peers are engaged in the behavior. Therefore, support from school and the community are essential in the design and implementation of effective alcohol and violence prevention interventions.

Strengths and Limitations

This study has a number of limitations. First, this survey was conducted using self-reported violent behavior and alcohol use, which is relatively sensitive and may be underreported. To maximize validity in the survey design, sensitive questions (e.g., drug use, violence, illegal behaviors) were recorded by the participant (rather than the interviewer). Even if these behaviors were underreported, increased validity in reporting would only strengthen the effects found in this study. Second, our set of covariates was not exhaustive and it is possible that some excluded predictors could explain a portion of the association between alcohol and violence (e.g., parental alcohol and/or drug use, parental violence). To address

this, we included a number of other variables that may measure the same concept (such as parental involvement, safe neighborhood, and participants' desire to leave home). Despite these weaknesses, this study has a number of strengths. The sample is nationally representative of adolescents ages 11 to 26. Additionally, adolescents were followed longitudinally, allowing this study to evaluate intraparticipant change over time. Longitudinal, nationally representative study designs are rare in the literature evaluating the relationship between alcohol use and violence (Murdoch & Roos, 1990; Young, Sweeting, & West, 2008).

Conclusions

Our findings indicate that consistently high alcohol use during adolescence is a predictor of serious violence among young adults; however, violence during adolescence did not predict problematic alcohol use in young adulthood. These findings indicate that prevention interventions need to begin during late childhood and early adolescence. Both alcohol use and violence should be targeted in elementary school and/or through community interventions to prevent at-risk children from consuming alcohol prior to adolescence. The results of this study suggest that alcohol prevention efforts may efficiently reduce subsequent levels of violent behavior among participants, as violent behavior is not the only predictor of subsequent violence. Interventions designed specifically to target violent behavior may incorporate both alcohol and violence prevention components to maximally reduce violent behavior. These alcohol and violence prevention activities may substantially reduce the risk of alcohol and violence among adolescents and young adults.

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Biographies

Mildred M. Maldonado-Molina is an Assistant Professor in the Department of Health Outcomes and Policy and the Institute for Child Health Policy at the University of Florida. She received her doctorate in Human Development and Family Studies from The Pennsylvania State University. Her research interests include examining health disparities in alcohol and drug use among adolescents, alcohol policy research, and longitudinal methods.

Jennifer M. Reingle is a PhD candidate in Epidemiology, research assistant in the Department of Health Outcomes and Policy, and Fellow of the Institute for Child Health Policy at the University of Florida. She received bachelor's degrees in criminal justice and sociology from the University of North Carolina Wilmington in 2005, and a master's degree in criminal justice from the University of Cincinnati in 2007. Reingle is interested in meta-analysis, the link between alcohol and violence, and gender differences in criminal behaviors among young adults.

Wesley G. Jennings is an Assistant Professor in the Department of Criminology at the University of South Florida. He received his doctorate degree in Criminology from the University of Florida in 2007. His major research interests include longitudinal data analysis, semi-parametric group-based modeling, sex offending, gender, and race/ethnicity. In addition, he is currently a Co-Investigator on a National Institute of Justice funded project examining sex offender recidivism and collateral consequences.

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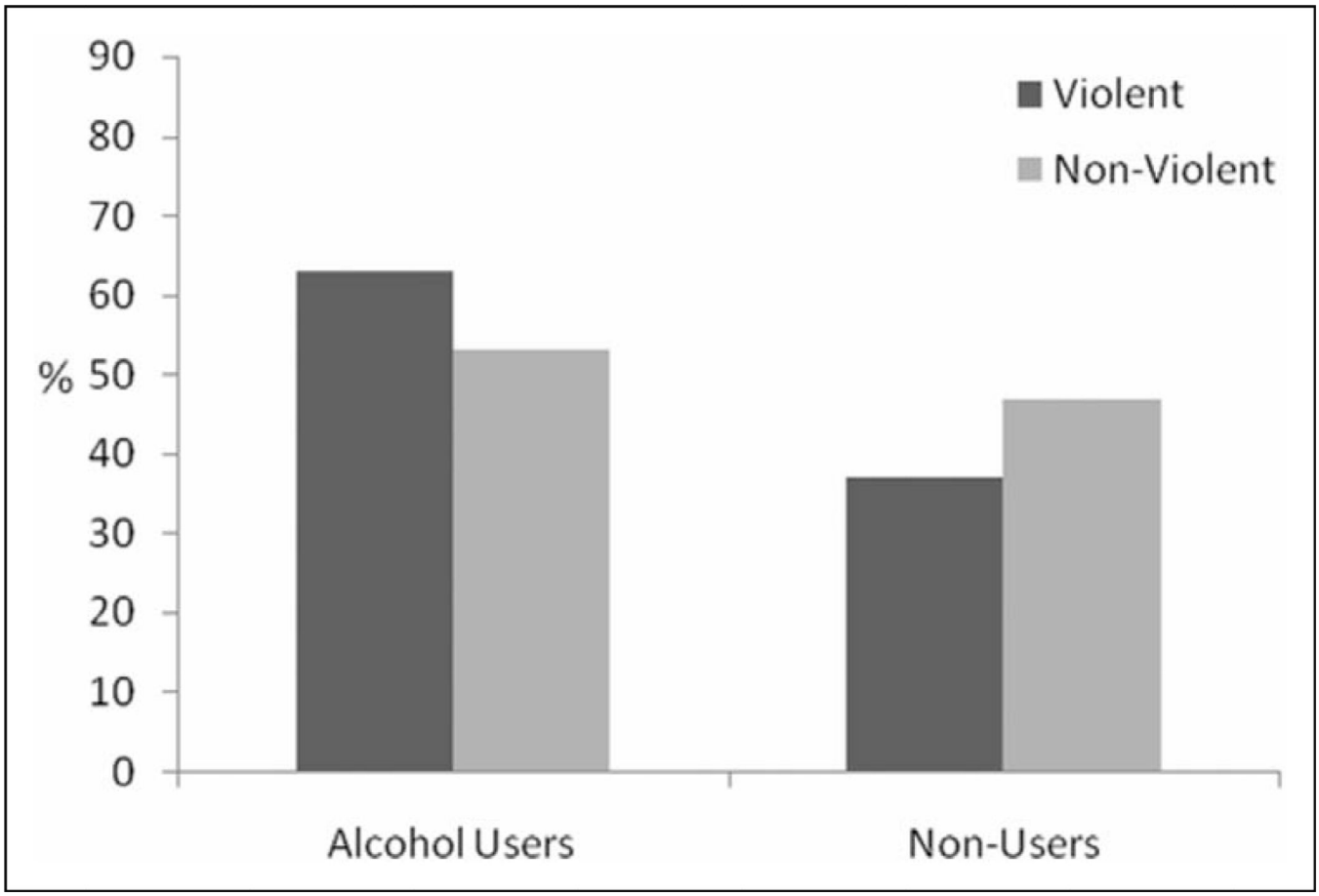

Figure 1.
Proportion of adolescents who reported serious physical violence by alcohol use status at baseline.

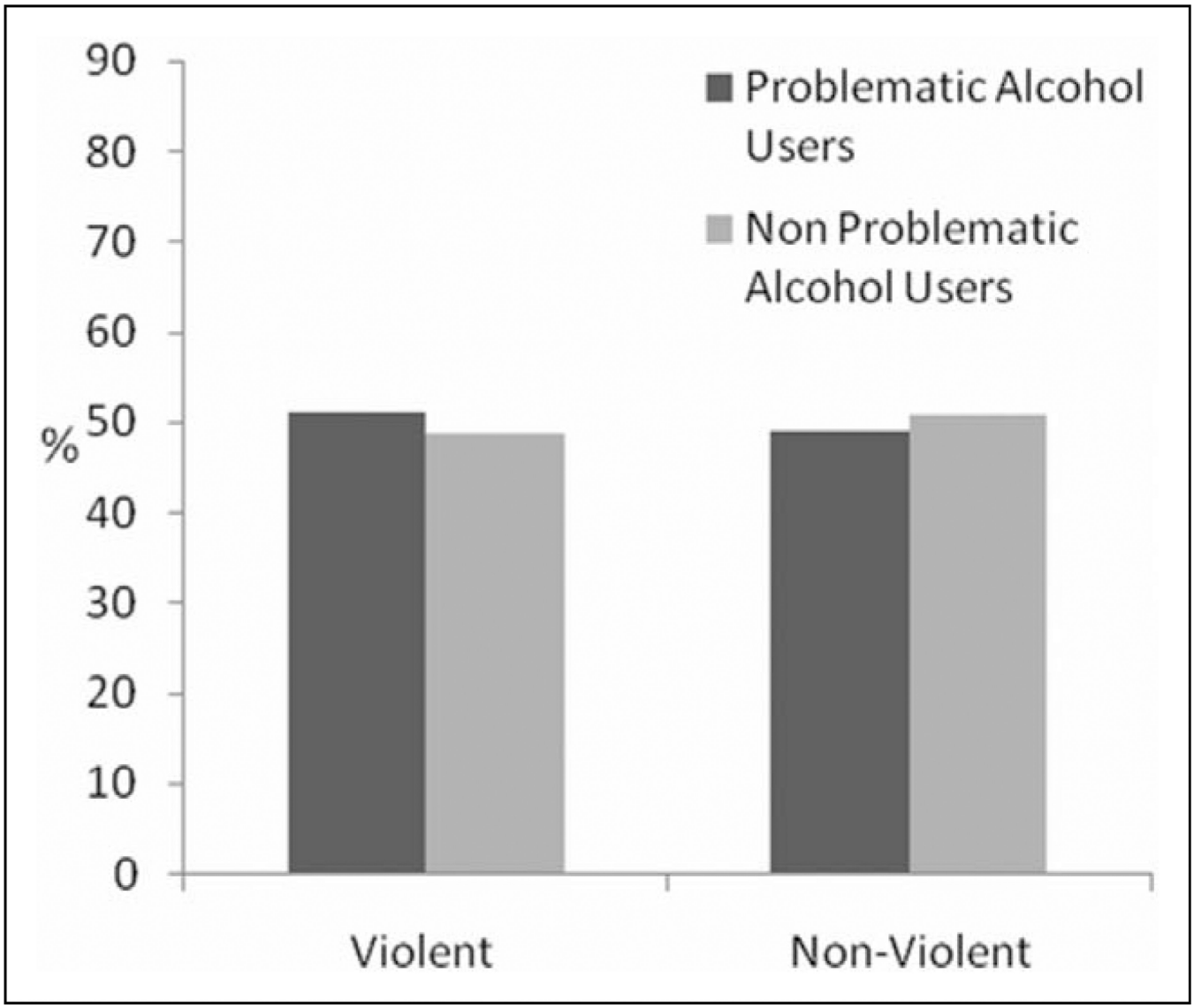

Figure 2.
Proportion of adolescents who reported problematic alcohol use by violent behavior status at baseline.

Table 1

Description of Sample Adolescents, Wave I (n = 10,828)

	n	%	Mean	*SD*	Min	Max
Demographics						
Male	10,828	47.10			0	1
Age	10,821		15.28	1.61	11	21
White	10,811	63.65			0	1
African American	10,811	21.68			0	1
Hispanic	10,796	16.06			0	1
Other	10,811	19.73			0	1
Covariates						
Expect to attend college[a]	10,766		4.15	1.14	1	5
Depressed	10,809	39.42			0	1
Parental involvement	10,810		5.96	3.42	0	20
Desire to leave home	10,711	33.63			0	1
Safe neighborhood	10,768	88.93			0	1
Marijuana use	10,720	25.90			0	1
Other drug use	10,768	6.85			0	1
Peer alcohol use	10,616	53.08			0	1
Peer marijuana use	10,633	32.31			0	1
Alcohol use						
Alcohol users (ever)—Wave I	10,778	53.74			0	1
Alcohol users (since W1)—Wave II	10,767	47.57			0	1
Alcohol users (since W2)—Wave III	10,722	76.67			0	1
Problematic alcohol use—Wave III	10,721	49.44			0	1
Alcohol nonusers	10,749	35.65				
Alcohol initiators	10,780	10.39				
Alcohol desistors	10,741	16.42				
Consistently high alcohol users	10,722	37.16				
Violence (past year)						
Violent activity—Wave I	10,722	19.55			0	1

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	n	%	Mean	*SD*	Min	Max
Violent activity—Wave II	10,828	9.89			0	1
Violent activity—Wave III	10,786	6.66			0	1
Nonviolent	10,777	76.63				
Violence initiators	10,823	3.76				
Violence desistors	10,777	13.46				
Consistently high violent	10,823	6.05				

[a]Higher values indicate increased intention to attend college.

Table 2

Alcohol Usage as a Predictor of Serious Violence[a] at Wave III

	Model A (Bivariate)		Model B		Model C	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Alcohol use status						
No use (reference)	0.66**	[0.53, 0.84]	–	–	–	–
Desistor	1.06	[0.83, 1.36]	1.24	[0.88, 1.75]	1.19	[0.85, 1.67]
Initiator	0.87	[0.61, 1.25]	1.33	[0.88, 2.01]	1.26	[0.83, 1.91]
Consistent user	1.44***	[1.18, 1.75]	1.56**	[1.14, 2.15]	1.41*	[1.03, 1.91]
Covariates						
Male	5.86***	[4.52, 7.60]	6.35***	[4.82, 8.37]	5.61***	[4.25, 7.41]
Age	0.92*	[0.87, 0.99]	0.80***	[0.74, 0.87]	0.81***	[0.74, 0.88]
White	0.58***	[0.47, 0.72]	0.94	[0.72, 1.81]	0.9	[0.70, 1.17]
African American	2.05***	[1.61, 2.63]	2.27***	[1.67, 3.09]	2.01***	[1.46, 2.77]
Hispanic	1.21	[0.92, 1.61]	1.32	[0.95, 1.85]	1.3	[0.93, 1.82]
Other	1.1	[0.82, 1.47]	–		–	
Intention to go to college	0.83***	[0.76, 0.90]	0.89*	[0.81, 0.98]	0.91	[0.83, 1.00]
Parental involvement	0.99	[0.96, 1.02]	1.04*	[1.00, 1.07]	1.03*	[1.00, 1.07]
Neighborhood safety	0.81	[0.59, 1.12]	0.89	[0.63, 1.65]	0.95	[0.66, 1.36]
Marijuana use	2.09***	[1.68, 2.60]	1.71***	[1.29, 2.27]	1.63**	[1.22, 2.18]
Other drug use	1.39*	[1.04, 1.87]	0.98	[0.69, 1.40]	0.92	[0.64, 1.32]
Peer alcohol use	1.16**	[1.06, 1.28]	1.05	[0.92, 1.20]	1.03	[0.90, 1.18]
Peer marijuana use	1.30***	[1.19, 1.42]	1.05	[0.95, 1.17]	1.03	[0.92, 1.16]
Violence at baseline	3.62***	[2.82, 4.65]			2.05***	[1.56, 2.71]

[a] Shot or stabbed someone, got into a serious physical fight, or hurt someone badly enough to need care from a doctor or nurse.

* $p < .05$.

** $p < .01$.

*** p < .001.

Table 3

Violent Behavior as a Predictor of Problematic Alcohol Use at Wave III

	Model A		Model B		Model C	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Violent behavior (Time 1–Time 2)						
No violence (reference)	0.95	[0.84, 1.07]	–	–	–	–
Desistor	0.96	[0.84, 1.11]	0.90	[0.75, 1.07]	0.86	[0.72, 1.02]
Initiator	0.93	[0.70, 1.24]	0.95	[0.69, 1.33]	0.89	[0.64, 1.22]
Consistent violence	1.31*	[1.04, 1.63]	1.06	[0.83, 1.34]	0.96	[0.76, 1.22]
Covariates						
Male	1.42***	[1.27, 1.58]	1.55***	[1.39, 1.73]	1.59***	[1.42, 1.77]
Age	0.99	[0.93, 1.04]	0.96*	[0.91, 0.99]	0.94**	[0.90, 0.98]
White	2.13***	[1.81, 2.50]	1.38**	[1.13, 1.67]	1.37**	[1.13, 1.66]
African American	0.39***	[0.32, 0.48]	0.54***	[0.42, 0.69]	0.55***	[0.44, 0.70]
Hispanic	0.79*	[0.66, 0.95]	0.86	[0.73, 1.02]	0.86	[0.72, 1.02]
Other	0.79**	[0.70, 0.93]	–		–	
Expect to attend college	1.17***	[1.10, 1.25]	1.22***	[1.14, 1.30]	1.22***	[1.15, 1.30]
Parental involvement	1.05***	[1.03, 1.07]	1.03**	[1.01, 1.05]	1.03**	[1.01, 1.05]
Desire to leave home	1.07	[0.99, 1.15]	1.00	[0.98, 1.04]	1.00	[0.98, 1.03]
Safe neighborhood	1.68***	[1.38, 2.04]	1.34**	[1.12, 1.61]	1.31*	[1.10, 1.57]
Marijuana use	1.6***	[1.39, 1.84]	1.51***	[1.29, 1.76]	1.27**	[1.08, 1.50]
Other drug use	1.5***	[1.20, 1.87]	0.86	[0.68, 1.09]	0.86	[0.68, 1.10]
Peer alcohol use	1.23***	[1.16, 1.30]	1.17***	[1.10, 1.25]	1.06	[0.99, 1.13]
Peer marijuana use	1.20***	[1.12, 1.27]	1.08	[0.98, 1.17]	1.08	[1.00, 1.18]
Alcohol use at baseline	2.07***	[1.84, 2.33]			1.90***	[1.67, 2.16]

* $p < .05$.

** $p < .01$.

*** $p < .001$.