

Binge Drinking and Violence Against Dating Partners: The Mediating Effect of Antisocial Traits and Behaviors in a Multinational Perspective

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Research has consistently shown a link between alcohol use and partner violence (PV). Little is known concerning the strength of this association across cultures and genders, and few have assessed possible mediators. This study assesses the link between binge drinking and PV among 7,921 college students in 38 sites around the world, and investigates the mediating role of antisocial traits and behaviors (ASTB). A significant association was found between binge drinking and PV, the strength of which differed by site but not by gender. ASTB fully mediated this association. The mean level of binge drinking at each site did not significantly influence the strength of the association between binge drinking and PV. *Aggr. Behav.* 33:441–457, 2007. © 2007 Wiley-Liss, Inc.

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INTRODUCTION

Population-based surveys in the United States [e.g., Kaufman et al., 1990] and studies of high-risk samples [e.g., Fals-Stewart, 2003] consistently show an association between problem drinking behaviors such as binge drinking and the perpetration of partner violence (PV) among men. However, there are reasons to question if this association holds in all contexts because associations between alcohol use and various psychosocial characteristics and behaviors may vary by culture [e.g., Eisner, 2002]. Furthermore, little research has been conducted on whether this association exists for both genders, even though both men and women have been shown to perpetrate PV [e.g., Archer, 2000]. In addition, little research has been conducted that investigates the important mediating roles that related variables, such as antisocial traits and behaviors (ASTB), may have in this association. Therefore, this study has three aims: (1) to investigate the extent to which the association between problem drinking and PV perpetration exists in 38 sites around the world, (2) to investigate whether gender is an important moderator of this association, and (3) to investigate the possible mediating role of ASTB in this association.

Associations Between Alcohol Use and Partner Violence

The link between problem drinking behaviors and PV has most consistently been shown among high-risk samples in the United States [Wekerle and Wall, 2001]. These samples usually consist of men in treatment for alcoholism or for severe PV perpetration, and it has repeatedly been shown that a high percentage of males who perpetrate severe PV evidence alcohol problems [e.g., Gondolf, 1988; Hamberger and Hastings, 1991; Hotaling and Sugarman, 1986; Saunders, 1992] and a high percentage of male alcoholics also have problems with PV perpetration [e.g., Gondolf and Foster, 1991; Murphy and O'Farrell, 1994; Murphy et al., 2001; Stith et al., 1991]. In addition, when male

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alcoholics remit from using alcohol, their rates of PV perpetration mirror those of population-based samples [O'Farrell et al., 2003]. One particularly informative study of men receiving treatment for PV perpetration and domestically violent men receiving treatment for alcoholism investigated the odds of PV occurring on days when the men had been drinking versus on days when they had not been drinking. For men in the domestic violence program, the odds for the perpetration of any PV was eight times greater on days when they had been drinking, and the odds for severe PV was 11 times greater. For domestically violent men in the alcoholism treatment program, the odds were 11 times greater for the perpetration of both any and severe PV on days when the men had been drinking [Fals-Stewart, 2003].

Community samples of newlywed couples in the United States also show a link between males' problem drinking behavior and PV both cross-sectionally and at least 1-year post-marriage [e.g., Heyman et al., 1995; Leonard and Quigley, 1999; Leonard and Senchak, 1996], and some estimates show that the male is intoxicated in about 40% of male-perpetrated PV incidents [Leonard, 1993]. National population-based studies of married couples consistently show an association between problem drinking behaviors and PV perpetration [e.g., Caetano et al., 2001; Coleman and Straus, 1983; Greenfield, 1998; Kaufman et al., 1990, 1997; O'Leary and Schumacher, 2003; Salari and Baldwin, 2002]. For example, PV perpetration is approximately three times as frequent among male binge drinkers than it is among men who abstain from using alcohol [Kaufman Kantor and Straus, 1990].

The national population-based surveys offer benefits that specific population and clinical samples lack, including the ability to detect whether the link between problem drinking and PV perpetration is unique to just special populations or common to the population as a whole, and whether the link exists for both genders. All of the known national studies show that there is a link between problem drinking and PV perpetration, and those that assess gender differences show that the link exists for both males and females but is consistently stronger for males [e.g., Caetano et al., 2001; Coleman and Straus, 1983; Kaufman Kantor and Asdigian, 1997]. One purpose of this study is to assess whether this stronger association for males exists in a sample of university students from 38 sites around the world.

Although not as well researched, there is evidence that the link between problem drinking and PV may operate in several different cultures and countries

around the world. For example, in Levinson's [1988] study of family violence in 90 small-scale and peasant non-Western societies, in 15% of societies, wife beating (i.e., severe husband-to-wife violence) occurred only when the husband was intoxicated. This link between PV perpetration and alcohol use has also been shown in Sweden [Norstrom, 1993], Finland [Wiseman, 1976], Switzerland [Maffi and Zumbrunn, 2003], India [Ramanathan, 1996], Czechoslovakia [Student and Matova, 1969], Scotland [Dobash et al., 1977-78], New Zealand [Magdol et al., 1997], and the aboriginal communities in New South Wales, Australia [Kamien, 1975].

Not all studies in other countries, however, show significant associations between problem drinking and PV perpetration. For example, in 70% of the societies in Levinson's [1988] study, wife beating occurred usually when the husband was sober. In addition, among men and women presenting at a city marriage clinic in Brisbane, Australia, neither alcohol consumption nor alcoholism was significantly associated with the perpetration of PV for either gender [Halford and Osgarby, 1993], and among British adolescents aged 13 to 19 years, alcohol use was not significantly associated with the use of dating aggression [Hird, 2000]. Furthermore, the bulk of the international studies that show an association between problem drinking and PV perpetration are similar to the high-risk studies in the United States; that is, these studies usually assess the rate of PV perpetration among male alcoholics [e.g., Kamien, 1975; Student and Matova, 1969; Wiseman, 1976] or the rate of alcoholism among men who are referred to either the police or some other agency for problems with PV [e.g., Dobash et al., 1977-78; Maffi and Zumbrunn, 2003]. Therefore, it is unknown whether problem drinking would be associated with the perpetration of PV internationally among samples that are not "high risk".

These cross-cultural associations are important to investigate because even though certain problem behaviors, such as problem drinking, violence, and criminal offending, have been shown to cluster within individuals around the world, international studies have shown that these same problem behaviors are clustered within nations in different ways depending upon the characteristics of each nation [Eisner, 2002]. For example, in nations in which there is great social unrest, high levels of violence but low levels of problem drinking are evident. Conversely, in affluent nations in which lifestyles are leisure-oriented, high levels of problem drinking but low levels of violence are evident. The

exception to this rule is the United States, in which both high levels of violence and problem drinking are evident [Eisner, 2002].

Because the bulk of the research on the association between problem drinking and PV has been conducted within the United States, the associations between these two behaviors could be different in other national contexts. Therefore, another purpose of this study is to investigate whether the link between problem drinking and the perpetration of PV applies to a sample of college students from 38 sites around the world. In addition, we will investigate possible reasons for why these associations may differ across sites, such as social norms concerning drinking behavior in each site. We hypothesized that the more normative binge drinking behavior is at a site, the weaker the associations will be between PV and binge drinking.

Possible Mediating Influence of Antisocial Traits and Behaviors

Although current evidence suggests that the association between problem drinking behaviors and PV is strong, problem drinking is only one of many factors that have been implicated in the perpetration of PV. The association between problem drinking behaviors and PV may vary considerably based upon certain characteristics of the person and the situation in which problem drinking occurs [Fals-Stewart et al., in press]. These potential mediating influences are important to investigate because problem drinking behaviors are associated with both aggressive and *altruistic* behaviors [Steele and Josephs, 1990].

Steele and Josephs [1990], in their theory of Alcohol Myopia, stress situational influences on the effects of alcohol intoxication. They assert that alcohol affects a person's behavior because it disrupts information processing and higher cognitive functioning, resulting in the narrowing of attention to cues that are most salient. Thus, alcohol can increase aggression by reducing one's ability to attend to inhibitory cues and by focusing one's attention on salient, instigating cues. By contrast, it can also increase altruistic behaviors if the salient cues in the situation are ones that elicit helping behavior.

Although Steele and Josephs [1990] stress situational influences in the problem drinking/PV association, they also assert that the cues that elicit certain responses to alcohol intoxication can vary from person to person. Thus, dispositional influences are also important to consider, and those that

may be important as a mediator would be ones that have been shown to be important in the association between problem drinking and PV perpetration. For example, it has been shown that the risk for PV is particularly elevated among men whose problem drinking behavior is accompanied by antisocial personality (ASP) features [Murphy and O'Farrell, 1994]. These results point toward the possible mediating role of ASTB in the association between problem drinking behaviors and the perpetration of PV. Thus, it is possible that the association between problem drinking behaviors and PV acts through one's constellation of ASTB.

Studies on the possible mediating role of ASTB have been conducted mostly on high-risk samples of men in treatment for either alcoholism or PV. For instance, among men in treatment for PV, those with alcohol problems display more ASTB than those without alcohol problems [e.g., Gondolf, 1988; Hamberger and Hastings, 1991; Saunders, 1992]. In addition, male alcoholics who also have problems with PV have a higher prevalence of arrest history than those who do not have problems with PV [Bennett et al., 1994; Gondolf and Foster, 1991; Murphy and O'Farrell, 1994]. Only two studies to our knowledge have specifically addressed the possible mediating role of ASTB. In one [Fals-Stewart et al., in press], the association between drinking and the perpetration of severe PV was stronger among men with ASP disorder (ASPD) than it was among men without ASPD who also drank. In the second, [Murphy et al., 2001], male alcoholics who were also violent toward their partners showed significantly higher levels of ASTB than those who were not partner violent, and after controlling for ASTB, PV was no longer associated with alcohol use, suggesting that alcohol problem severity was largely redundant with ASTB.

Because studies on the mediating role of ASTB have been conducted on high-risk samples, the extent to which ASTB mediates the association between PV and problem drinking behaviors in other populations is unknown. Several studies have been conducted, however, on non-clinical populations that show that perhaps ASTB may be an important mediator in the association between problem drinking and PV. For example, alcohol consumption has been shown to predict the perpetration of PV only among couples who are hostile [e.g., Leonard and Blane, 1992], maritally distressed [e.g., Leonard and Senchak, 1993], and verbally aggressive [e.g., Leonard and Quigley, 1999]. Therefore, the third purpose of this study was to investigate the extent to which the association

between PV perpetration and problem drinking behavior is mediated by ASTB among university students in a multinational context.

Hypotheses and Research Questions

This study had three main goals. We investigated:

- (1) *the association between problem drinking behavior and PV perpetration in a multinational context.* We assessed both binge drinking behaviors and PV perpetration among university students in 38 sites around the world. On the basis of previous research, it was hypothesized that binge drinking would be significantly associated with PV among college students, but this association would not be strong because college students are a low-risk sample. In addition, we hypothesized that the association between binge drinking and PV perpetration would differ across sites because other multi-site studies have shown that problem behaviors cluster differently in different nations [Eisner, 2002]. Finally, we hypothesized that the extent to which binge drinking was normative behavior in each site would determine the strength of the association between binge drinking and PV, in that the association would be weaker in sites where binge drinking was normative behavior.
- (2) *whether the association between binge drinking and PV differs by gender.* On the basis of previous research [e.g., Caetano et al., 2001], we hypothesized that this association would be stronger for males than for females.
- (3) *whether ASTB is a mediator for the association between binge drinking and PV.* On the basis of previous research [e.g., Murphy et al., 2001], we hypothesized that ASTB would mediate the association between binge drinking and PV.

METHODS

Participants

The data for this paper are from the International Dating Violence Study (IDVS). The IDVS is being conducted by members of a consortium of researchers at universities in every region of the world. The questionnaires were usually administered in classes taught by members of the consortium and in other classes for which they could make arrangements. Thus, it is a convenience sample. The results describe what was found for the students in those classes in each country and cannot be taken as

representative of students in general or of the countries in which they are located. A detailed description of the study, including the questionnaires and all other key documents, is available on the study website <http://pubpages.unh.edu/~mas2>, and a report on some of the preliminary results is available [Straus and Members of the International Dating Violence Research Consortium, 2006].

The completed questionnaires were examined for questionable response patterns, such as reporting an injury from dating violence but not reporting an assault as having occurred; or cases with an implausible response, such as attacking a partner with a knife or gun ten or more times in the past year. About 7.5% of the cases were identified as questionable and were removed from the sample. In addition, students who did not complete the measure of dating aggression were eliminated from the analyses. This process resulted in a sample of 7,921 students. Of these, 63.5% reported on a current romantic relationship, whereas 36.5% reported on a relationship that ended at some point within the previous year.

Demographic characteristics of the 7,921 students in each of the 38 university sites are presented in Table I. As shown in the first column, sample sizes ranged from 71 (India, Pune) to 658 (Sweden, Gavle). Because most of the classes in which the questionnaires were administered were in disciplines in which females predominate (i.e., social science classes), the majority of the participants were females (column 2), which was the case for both the total sample (72.3%) and each university site, with the exception of Canada, Quebec 2 (36.0%). The average age of the participants (column 3) for the total sample was 23.28 years, and it ranged from a low mean of 19.38 years at the London, Canada site, to a high mean of 39.17 years at the Swiss, German-speaking site. Finally, the average length of the partner relationship (column 4) was 14.80 months. It ranged from a low of 11.40 months at South Korea, Pusan, to a high of 19.49 months in Sweden, Gavle.

Measures

There is a core questionnaire that each member of the IDVS Research Consortium translated. All consortium members agreed to back-translate to maintain conceptual equivalence [Straus, 1969] across the sites. This core questionnaire consists of demographic items (e.g., gender, age, parents' education and income, length of relationship), the *Revised Conflict Tactics Scales (CTS2)*; Straus et al.

TABLE 1. Sample Demographics

Site	n	% female	Mean age (SD)	Mean length of relationship (SD)	% perpetrated PV in past year	Mean no. of physical assaults in past year (SD)	Mean binge drinking score (SD)	Mean ASTB score (SD)
Overall	7921	72.3	23.28 (6.39)	14.80 (8.74)	25.2	2.79 (10.51)	2.00 (0.84)	1.58 (0.39)
Asia								
China, Hong Kong	154	58.4	23.98 (4.32)	13.54 (7.95)	38.3	5.04 (12.52)	1.52 (0.53)	1.74 (0.34)
India, Pune	71	64.8	22.57 (2.34)	13.63 (8.57)	31.0	5.62 (14.39)	1.60 (0.64)	1.82 (0.48)
Singapore	196	70.4	24.54 (3.43)	17.26 (8.13)	20.4	2.46 (9.25)	1.52 (0.61)	1.57 (0.32)
South Korea, Pusan	185	62.2	24.74 (3.89)	11.40 (8.16)	30.8	6.74 (21.77)	2.12 (0.70)	1.81 (0.33)
Australia/New Zealand								
Australia, Adelaide	221	82.8	23.48 (7.06)	15.66 (8.90)	19.9	1.80 (6.54)	2.15 (0.85)	1.55 (0.38)
New Zealand	122	77.9	21.50 (5.42)	13.15 (8.57)	24.6	3.22 (12.12)	2.46 (0.87)	1.60 (0.38)
Canada								
Canada, Hamilton	231	85.7	21.20 (4.10)	14.95 (8.66)	19.0	1.77 (6.33)	2.10 (0.79)	1.59 (0.36)
Canada, London	106	57.5	19.38 (1.02)	11.58 (8.97)	28.3	4.05 (10.31)	2.72 (0.76)	1.80 (0.44)
Canada, Quebec 1	276	80.1	23.87 (5.25)	17.33 (8.19)	21.0	2.35 (12.28)	1.99 (0.78)	1.47 (0.37)
Canada, Quebec 2	136	36.0	22.33 (2.74)	14.23 (9.04)	17.6	1.07 (4.13)	2.20 (0.76)	1.55 (0.37)
Canada, Toronto	190	68.4	20.28 (3.35)	13.54 (8.73)	25.3	2.57 (7.34)	1.92 (0.78)	1.75 (0.45)
Canada, Winnipeg	130	87.7	22.16 (4.43)	15.16 (8.81)	25.4	2.44 (8.09)	2.09 (0.88)	1.58 (0.36)
Europe								
Belgium, Flemish	416	77.6	20.43 (2.13)	14.63 (8.67)	28.4	2.08 (6.60)	1.85 (0.74)	1.47 (0.36)
England, Leicester	188	86.2	19.74 (2.71)	15.25 (8.46)	40.4	4.01 (15.19)	2.50 (0.77)	1.56 (0.33)
Germany, Freiburg	163	58.9	23.79 (3.44)	13.30 (8.58)	28.8	2.64 (9.11)	1.98 (0.65)	1.63 (0.34)
Lithuania, Vilnius	332	67.8	20.52 (2.57)	13.91 (8.91)	30.1	3.22 (10.22)	2.09 (0.73)	1.72 (0.34)
The Netherlands, Amsterdam	129	76.0	22.70 (7.51)	14.33 (8.55)	29.5	1.81 (5.73)	1.82 (0.76)	1.42 (0.32)
Portugal, Braga	352	68.2	21.74 (3.38)	15.77 (8.57)	16.2	0.98 (4.04)	1.55 (0.65)	1.54 (0.32)
Scotland, Glasgow	208	85.6	21.94 (5.49)	14.47 (8.81)	31.3	4.98 (15.35)	2.54 (0.73)	1.62 (0.40)
Sweden, Gavle	658	76.7	28.64 (7.43)	19.49 (7.25)	16.1	0.80 (4.89)	2.39 (0.89)	1.41 (0.38)
Swiss, French-speaking	193	75.1	31.02 (9.85)	16.61 (8.31)	24.9	2.27 (7.90)	1.91 (0.70)	1.56 (0.36)
Swiss, German-speaking	123	78.0	39.17 (9.47)	15.16 (8.93)	23.6	1.08 (3.29)	1.93 (0.78)	1.44 (0.31)
Latin America								
Brazil, Sao Paulo	234	66.7	21.03 (3.65)	13.38 (9.04)	21.8	2.09 (9.06)	1.63 (0.63)	1.58 (0.35)
Mexico, Northern	192	84.9	20.59 (3.97)	13.23 (8.71)	43.2	7.14 (17.90)	1.62 (0.72)	1.67 (0.43)
Middle East								
Israel, Emek Yezreel	305	82.3	31.20 (8.58)	12.95 (8.75)	18.4	2.33 (8.81)	1.47 (0.60)	1.48 (0.33)
USA								
USA, Indiana	192	74.0	19.92 (3.31)	13.29 (8.77)	28.1	4.48 (12.61)	2.05 (0.85)	1.59 (0.40)
USA, Louisiana	103	70.9	21.47 (4.19)	13.73 (8.44)	42.7	9.62 (23.03)	1.54 (0.63)	1.68 (0.48)
USA, Mississippi	205	90.2	29.01 (8.12)	18.53 (7.81)	32.7	4.01 (21.19)	1.42 (0.60)	1.51 (0.37)
USA, NH Durham 1	333	64.9	19.54 (2.58)	12.21 (8.79)	25.5	2.06 (6.48)	2.41 (0.90)	1.55 (0.38)

TABLE I. Continued

Site	n	% female	Mean age (SD)	Mean length of relationship (SD)	% perpetrated PV in past year	Mean no. of physical assaults in past year (SD)	Mean binge drinking score (SD)	Mean ASTB score (SD)
USA, NH Durham 2	269	77.0	20.80 (3.19)	14.13 (8.56)	24.2	1.68 (6.91)	2.49 (0.84)	1.58 (0.39)
USA, Ohio, Cincinnati	277	52.7	20.48 (2.53)	14.16 (8.66)	20.9	3.31 (11.96)	2.21 (0.88)	1.71 (0.44)
USA, Pennsylvania	205	76.6	20.14 (2.82)	11.63 (8.10)	20.0	1.47 (6.56)	2.40 (0.80)	1.61 (0.42)
USA, TX, Houston	74	52.7	20.04 (1.48)	13.32 (8.69)	14.9	1.97 (9.01)	2.03 (0.80)	1.54 (0.39)
USA, TX, Mexican-American	212	64.2	24.62 (5.69)	16.85 (8.72)	31.6	3.19 (12.49)	1.71 (0.76)	1.60 (0.44)
USA, TX, Non-Mexican-American	201	53.7	24.05 (6.21)	15.49 (8.67)	28.9	3.19 (13.49)	2.03 (0.82)	1.60 (0.40)
USA, TX, Nacogdoches	107	71.0	20.68 (4.44)	12.91 (8.48)	29.9	4.48 (14.06)	2.05 (0.86)	1.67 (0.48)
USA, Utah	156	64.1	21.82 (3.16)	11.94 (8.55)	15.4	1.60 (6.62)	1.30 (0.65)	1.47 (0.35)
USA, Washington, DC	76	86.8	20.57 (2.26)	14.88 (8.31)	40.8	4.17 (8.71)	1.70 (0.74)	1.74 (0.40)

Note: There are two New Hampshire sites because data was collected on each site 4 years apart. There are two Quebec sites because data was collected at two different universities in Quebec. ASTB, antisocial traits and behaviors; PV, partner violence.

[1996]), and the *Personal and Relationships Profile (PRP; Straus et al. [1999])*. In addition, the consortium members added questions to measure variables that were uniquely important for their site or constructs that were needed to test a theory of particular interest. These procedures allowed the benefits of both standardized measures for all the sites and of culturally informed investigations of unique issues at each university. For this study, only the demographic information and questions pertaining to PV, binge drinking, ASTB, and social desirability were used.

Partner violence. Perpetration of PV was measured by the physical assault subscale of the *CTS2*. For each participant, the number of physically assaultive acts perpetrated in the previous year was computed. Participants indicated on a scale from 0 to 6 how many times in the previous year they used the acts listed (0 = 0 times; 1 = 1 time; 2 = 2 times; 3 = 3–5 times; 4 = 6–10 times; 5 = 11–20 times; 6 = more than 20 times). In addition, participants indicated whether they *ever* (not necessarily just in the past year) used any of the tactics listed in their relationships. The scores for the individual items were then added together to form a continuous measure of physical assault.

To establish past-year prevalence rates of assault, participants were coded as 1 (= yes) if they reported using any of the physically assaultive acts listed in the *CTS2* in the previous year and 0 (= no) if they reported using no physically assaultive acts in the previous year. In the hierarchical linear modeling (HLM) analyses, the continuous measure of physical aggression was used. Because this variable represents a count of the number of physically aggressive acts the participants used within the previous year, the models were estimated using a procedure that allows for the dependent variable to be of a Poisson distribution. The Physical Assault subscale of the *CTS2* has been shown to demonstrate good cross-cultural construct validity and reliability, with an overall α of .85. Twenty-seven (71.1%) of the sites in this study have α greater than .80, with seven additional sites having α greater than .70. Four sites (Switzerland, German-speaking; Amsterdam, Netherlands; Lithuania, Vilnius; Canada, Quebec 2) have α lower than .70 [Straus, 2004]. It was necessary to limit the data on violence to violence perpetrated by the respondent because the binge drinking and ASTB measures were available only for the respondent. A limitation is that defensive and offensive striking are counted the same, even though they have different meanings and may differ by gender.

Binge drinking. To obtain a measure of binge drinking, four questions from the Substance Abuse subscale of the *PRP* were used. These questions measure excessive use of alcohol (i.e., “binge drinking”) on a level that is not necessarily proximal to the perpetration of PV: “I sometimes drink enough to feel really high or drunk,” “When I am drinking, I usually have five or more drinks at a time,” “I sometimes drink five or more drinks at a time, but only on weekends,” and “Sometimes I can’t remember what happened the night before because of drinking.” Participants responded to these questions using the following categories: 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree. An average score for their binge drinking behavior was computed by adding the scores for the four items and dividing by the number of items. We chose the term “binge drinking” to represent these items to be consistent with other studies of binge drinking behaviors in college populations. According to the National Institute on Alcohol Abuse and Alcoholism [1995], binge drinking in these studies is defined as drinking five or more drinks at one sitting. The overall internal consistency reliability (i.e., Chronbach’s α) of the current scale was very good ($\alpha = .84$; see Table II), with 27 (71.1%) sites showing reliability coefficients of at least .80. All other sites had reliability coefficients greater than .70, with the exception of Canada, London, and Pune, India, whose reliabilities were .68.

There is preliminary data on the validity of this binge drinking measure. Validity was obtained by comparing our binge drinking measure to the World Health Organization’s (WHO) statistics on adult per capita alcohol consumption for the year 1999, from Eisner’s [2002] composite measure of problem alcohol use among juveniles in 37 nations, and from the US Department of Health and Human Services (DHHS) National Survey on Drug Use and Health (NSDUH) for the year 2002. We first ranked the 19 nations in our study according to their mean binge drinking score and according to the adult per capita alcohol consumption statistic from the WHO. A Spearman’s rank correlation showed that our data were significantly correlated with the WHO data ($r = .50$, $P < .05$). Next we ranked the 12 nations in Eisner’s study that overlapped with our nations on his composite measure of problem alcohol use. A Spearman’s rank correlation showed that our data were significantly correlated with Eisner’s ($r = .56$, $P = .059$).

We also compared our data to that of the DHHS survey data on the rate of binge drinking in each of

the regions of the United States. We used the binge drinking data from the NSDUH (i.e., consuming five or more drinks on the same occasion at least once in the past 30 days) for ages 18–25 years because that data best represented both the measure we used and the age group we assessed. We coded each of our 13 US sites in reference to the region in which they were located. The Spearman’s rank correlation revealed that the mean *PRP* binge drinking score for the 13 universities was significantly correlated with the DHHS’s binge drinking statistics for the region in which the university was located ($r = .81$, $P < .01$).

Antisocial traits and behavior. This scale is intended to measure ASP features derived from the DSM-IV [American Psychiatric Association, 1994], such as irresponsibility, general hostility, impulsivity, and poor social relationships characterized by a lack of closeness, and juvenile and adult property and violent criminal behaviors, such as stealing things and physically attacking a non-family member. The antisocial *trait* items are the nine items in the Antisocial Personality Symptoms subscale of the *PRP* (e.g., “I often lie to get what I want,” “I often do things that are against the law”, “I don’t think about how what I do will affect other people”), and the antisocial *behavior* items are the eight items from the Criminal History subscale of the *PRP* which pertain to the types of crimes they may have committed (i.e., violent and property) and the age at which they committed those crimes (i.e., before or after age 15) (e.g., “Before age 15, I stole money from anyone, including family”, “Since age 15, I have physically attacked someone with the idea of seriously hurting them”). Because the DSM-IV definition of ASPD includes criminal behavior, both before and after age 15 [American Psychiatric Association, 1994], and because previous studies that have assessed ASTB as a mediator have included arrest histories, we combined both subscales and labeled it ASTB. Participants responded by indicating their level of agreement with each item using a four-point scale ranging from 1 (Strongly Disagree) to 4 (Strongly Agree).

The 17 items comprising both subscales were summed and divided by the number of items to obtain a mean ASTB score. The internal consistency reliability (Chronbach’s α) was .84, with 35 (92.1%) of the sites having reliability coefficients of at least .80. The remaining three sites all had reliabilities greater than .75 (see Table II). It is important to note that although the questions were derived from the DSM-IV definition of ASP, this scale was *not* designed as a diagnostic tool. Thus, high scores on

TABLE II. Internal Consistency Reliability and 95% Confidence Intervals for Binge Drinking, Antisocial Traits and Behavior, and Social Desirability Subscales, Overall and by Site

Site	Binge drinking α (95% CI)	ASTB α (95% CI)	Social desirability α (95% CI)
Overall	.84 (.84, .85)	.84 (.83, .84)	.69 (.68, .70)
Asia			
China, Hong Kong	.80 (.74, .84)	.83 (.79, .86)	.62 (.54, .69)
India, Pune	.68 (.58, .76)	.80 (.75, .85)	.59 (.46, .69)
Singapore	.80 (.75, .84)	.80 (.77, .84)	.64 (.57, .70)
South Korea, Pusan	.76 (.71, .80)	.76 (.72, .80)	.61 (.54, .67)
Australia/New Zealand			
Australia	.88 (.85, .90)	.85 (.82, .88)	.70 (.64, .75)
New Zealand	.87 (.83, .90)	.81 (.76, .85)	.66 (.58, .73)
Canada			
Canada, Hamilton	.83 (.79, .86)	.83 (.79, .86)	.70 (.64, .75)
Canada, London	.68 (.59, .76)	.84 (.79, .87)	.63 (.53, .72)
Canada, Quebec 1	.82 (.79, .85)	.81 (.78, .84)	.71 (.66, .75)
Canada, Quebec 2	.79 (.73, .84)	.81 (.76, .85)	.67 (.59, .74)
Canada, Toronto	.84 (.80, .87)	.86 (.83, .88)	.69 (.63, .74)
Canada, Winnipeg	.90 (.87, .92)	.82 (.77, .86)	.76 (.70, .82)
Europe			
Belgium, Flemish	.74 (.70, .78)	.81 (.78, .83)	.66 (.62, .71)
England, Leicester	.80 (.75, .84)	.80 (.76, .84)	.73 (.68, .78)
Germany, Freiburg	.76 (.69, .81)	.81 (.76, .85)	.64 (.55, .71)
Lithuania, Vilnius	.77 (.74, .81)	.80 (.77, .82)	.65 (.60, .70)
The Netherlands, Amsterdam	.80 (.74, .84)	.78 (.73, .83)	.70 (.63, .76)
Portugal, Braga	.82 (.79, .85)	.81 (.78, .83)	.66 (.61, .70)
Scotland, Glasgow	.76 (.70, .80)	.85 (.82, .88)	.72 (.67, .77)
Sweden, Gavle	.84 (.81, .85)	.83 (.81, .85)	.67 (.63, .70)
Swiss, French-speaking	.81 (.77, .85)	.80 (.76, .83)	.71 (.65, .76)
Swiss, German-speaking	.85 (.81, .88)	.78 (.72, .83)	.64 (.55, .72)
Latin America			
Brazil, Sao Paulo	.78 (.74, .81)	.81 (.78, .84)	.72 (.68, .76)
Mexico, Northern	.83 (.79, .86)	.85 (.82, .88)	.65 (.58, .71)
Middle East			
Israel, Emek Yezreel	.76 (.72, .80)	.80 (.77, .83)	.70 (.65, .74)
USA			
USA, Indiana	.86 (.83, .88)	.88 (.85, .90)	.67 (.61, .73)
USA, Louisiana	.80 (.74, .84)	.87 (.84, .90)	.74 (.67, .80)
USA, Mississippi	.75 (.69, .79)	.82 (.78, .85)	.71 (.65, .76)
USA, NH, Durham 1	.88 (.86, .90)	.83 (.81, .86)	.75 (.71, .79)
USA, NH, Durham 2	.84 (.81, .86)	.87 (.84, .89)	.76 (.72, .80)
USA, Ohio	.87 (.85, .89)	.87 (.85, .89)	.73 (.69, .77)
USA, Pennsylvania	.85 (.81, .87)	.87 (.84, .89)	.77 (.72, .81)
USA, TX, Houston	.90 (.87, .93)	.85 (.80, .89)	.73 (.65, .81)
USA, TX, Mexican-American	.86 (.83, .88)	.87 (.84, .89)	.72 (.66, .77)
USA, TX, Non-Mexican	.83 (.79, .86)	.83 (.80, .86)	.69 (.63, .74)
USA, TX, Nacogdoches	.89 (.86, .92)	.89 (.86, .92)	.73 (.65, .79)
USA, Utah	.91 (.89, .93)	.86 (.82, .89)	.75 (.70, .80)
USA, Washington, DC	.83 (.76, .88)	.81 (.74, .86)	.73 (.64, .81)

this subscale cannot necessarily be interpreted as indicative of ASP disorder.

There is also preliminary data on the construct and concurrent validity of this ASTB subscale. Previous

research has shown that males evidence significantly more ASTB than do females [American Psychiatric Association, 1994] and that ASTB are highly correlated with substance abuse [e.g., Regier et al.,

1990]. In this study, the correlation between the ASTB subscale and the substance abuse subscale was .48 ($P < .001$). For every site, the correlation was significant, and correlations ranged from a low of .34 in the Netherlands to a high of .68 in Louisiana, USA. In addition, males scored significantly higher than females on ASTB both in the overall sample (males: $M = 1.79$, $SD = 0.44$; females: $M = 1.51$, $SD = 0.35$; $t = 32.43$, $P < .001$) and at every site, with the exception of the Canada, Quebec 2 site (males: $M = 1.55$, $SD = 0.37$; females: $M = 1.53$, $SD = 0.42$; $t = 0.35$, $P = .73$). With regard to concurrent validity, we compared our data and the composite measure of violent crime developed by Eisner [2002] in his multinational study of problem behaviors. Twelve nations overlapped between our study and his, and we ranked those nations on the average ASTB score in our study and on the standardized score for violent crime they had in Eisner's. A Spearman's rank correlation showed that the two measures were significantly correlated ($r = .63$, $P < .05$). Thus, overall, there is evidence for both reliability and validity of the ASTB for the overall sample and for each site.

Social desirability. We controlled for respondent's tendency to minimize socially undesirable behavior with the social desirability subscale of the *PRP*. This 13-item scale includes behaviors and emotions that are slightly undesirable but true of most people, such as, "I sometimes try to get even rather than forgive and forget." Respondents indicated on a four-point scale (1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree) the extent to which they agreed with each item. The items were then summed and divided by the number of items in the scale to obtain an average social desirability score. In this study, the more items a respondent denied, the less likely a respondent reported PV ($r = -.14$, $P < .001$), binge drinking ($r = -.22$, $P < .001$), and ASTB ($r = -.48$, $P < .001$). The mean social desirability score for the sample was 2.62 ($SD = 0.36$). The overall internal consistency reliability of this scale is .69, and it ranged from a low of .59 in Pune, India to a high of .77 in Pennsylvania, USA (see Table II).

Socioeconomic status. A socioeconomic status (SES) variable was created for each site using three variables: father's education, mother's education, and family income. To create a variable that measured the SES of each student that is relevant to the SES of others at the student's university, the SES variables at each site were transformed into z -scores. The scale thus measures SES as the number of standard deviations each student is above or below the mean at their site.

Analyses

To test our research questions, a series of hierarchical linear models were estimated. HLM is a technique that allows one to simultaneously consider both individual- and group-level influences on a variable of interest without violating assumptions of independence (as would occur in the individual-level analysis using site as an independent variable) or losing valuable variability (as would occur in analyses aggregating scores by sites). For example, students' school performance may not only depend on individual characteristics, but may also be dependent on classroom membership, so that students within classrooms may have similarities in outcome measures. HLM allows one to examine how group influences interact with individual characteristics by running a series of nested linear models that take into account hierarchical structure [Raudenbush and Bryk, 2002].

Using the program HLM, we ran a series of models to investigate our research questions. Because PV, our dependent variable, represents a count variable, all of our analyses were run allowing for a Poisson distribution in our outcome variable. Control variables used in our analyses included gender of the respondent, SES, age, length of relationship (LR), and social desirability response bias (SD) of the respondent. Our first model was a random-coefficient model in which we investigated the influence of binge drinking on the frequency of PV at the individual level of analysis (Level 1) and investigated whether this association differed across sites at the site level of analysis (Level 2). The equation for this model was:

$$\begin{aligned} \text{Level 1: } PV(\gamma_{00}) &= \beta_0 + \beta_1(\text{sex}) + \beta_2(\text{SES}) \\ &+ \beta_3(\text{age}) + \beta_4(\text{RL}) + \beta_5(\text{SD}) \\ &+ \beta_6(\text{Binge Drinking}) \end{aligned}$$

$$\begin{aligned} \text{Level 2: } \beta_0 &= \gamma_{00} + \mu_0 \\ \beta_1 &= \gamma_{10} \\ \beta_2 &= \gamma_{20} \\ \beta_3 &= \gamma_{30} \\ \beta_4 &= \gamma_{40} \\ \beta_5 &= \gamma_{50} \\ \beta_6 &= \gamma_{60} + \mu_6 \end{aligned}$$

Our second model was a slopes-as-outcomes model. Specifically, we added a Level 2 predictor to investigate possible site-level influences on the site differences we observed in the association between

TABLE III. Random-Coefficient Model—Binge Drinking as a Predictor of Partner Violence

Fixed effects	Coefficient	SE	<i>t</i> ratio	Event rate ratio
Overall partner violence, γ_{00}	0.22	.22	1.00	
Gender, γ_{10}	0.29	.12	2.44*	1.34
SES, γ_{20}	-0.09	.05	-1.86	0.91
Age, γ_{30}	-0.05	.01	-4.18**	0.95
Relationship length, γ_{40}	0.04	.01	6.93**	1.04
Social desirability, γ_{50}	-1.53	.12	-12.74**	0.22
Binge drinking, γ_{60}	0.23	.06	3.64**	1.26
Random effects	Variance	<i>df</i>	χ^2	
Site mean, u_{0j}	0.34	37	7353.29**	
Binge drinking–PV slope, u_{6j}	0.12	37	1508.04**	

Note: SES, age, relationship length, and social desirability are group mean centered and constrained to have equal variances across sites. Binge drinking is group mean centered and allowed to vary across sites. Gender: 1 = male, 2 = female. PV = partner violence; SES, socioeconomic status.

* $P < .05$; ** $P < .001$.

binge drinking and PV. Specifically, we investigated whether the mean level of binge drinking at each site (*mean binge drinking*) influenced the association between binge drinking and PV at the individual level. The equation for this model was:

$$\begin{aligned} \text{Level 1: } PV(\gamma_{00}) = & \beta_0 + \beta_1(\text{sex}) + \beta_2(\text{SES}) \\ & + \beta_3(\text{age}) + \beta_4(\text{RL}) + \beta_5(\text{SD}) \\ & + \beta_6(\text{Binge Drinking}) \end{aligned}$$

$$\begin{aligned} \text{Level 2: } \beta_0 = & \gamma_{00} + \mu_0 \\ \beta_1 = & \gamma_{10} \\ \beta_2 = & \gamma_{20} \\ \beta_3 = & \gamma_{30} \\ \beta_4 = & \gamma_{40} \\ \beta_5 = & \gamma_{50} \\ \beta_6 = & \gamma_{60} + \gamma_{61}(\text{Mean Binge Drinking}) + \mu_6 \end{aligned}$$

In our next model, we reverted to the original random-coefficient model, but added an interaction term in Level 1 to investigate whether there was a significant interaction between gender and binge drinking on the frequency of PV and whether this interaction varied across sites. To investigate whether ASTB mediated the influence of binge drinking on PV, we estimated two additional models. In the first, we investigated whether binge drinking predicted ASTB, after controlling for our covariates. In the second, we included the main effects of both binge drinking and ASTB to investigate whether ASTB fully mediated the association between binge drinking and PV [Baron and Kenny, 1986].

RESULTS

Table I also presents descriptive data on the percentage of students at each site and overall who perpetrated assault against their dating partners (column 5), and the mean frequency of assault (column 6), binge drinking (column 7), and ASTB scores (column 8) overall and for each site. As shown, 25.2% of the overall sample reported assaulting their partner at least once, with an average number of 2.79 assaults. The percentage of participants who reported assaulting their partners ranged from 14.9% in Houston, TX, USA, to 43.2% in Northern Mexico, and the mean number of assaults ranged from a low of 0.80 in Gavle, Sweden, to a high of 9.62 in Louisiana, USA. Further information on assault in this sample and gender differences in assault perpetration is reported elsewhere [Straus and Members of the International Dating Violence Research Consortium, 2004]. The mean binge drinking scores ranged from a low of 1.30 in Utah, USA, to a high of 2.72 in London, Canada, with a total mean score of 2.00. Mean scores on the ASTB measure ranged from a low of 1.41 in Gavle, Sweden, to a high of 1.82 at the Pune, India site, with a total mean score of 1.58.

Association Between Binge Drinking and Frequency of PV

Table III presents the results from the random-coefficients model in which we investigated whether binge drinking was associated with PV overall and whether this association varied across sites. The seventh row of the table shows that overall binge drinking was significantly positively associated with PV. Specifically, according to the event rate ratio,

for every point increase on the binge drinking scale, PV increased by 26%. In addition, we controlled for gender, SES, age, relationship length, and social desirability in this model. Consistent with previous research, we found that females perpetrated significantly more PV than males did [e.g., Archer, 2000], that relationship length was significantly positively associated with PV [e.g., Arias et al., 1987], and that age and social desirability were significantly negatively associated with PV [e.g., Sugarman and Hotaling, 1997; Suitor et al., 1990].

The association between binge drinking and PV varied between the sites as evidenced by the significant χ^2 for the binge-drinking PV slope. Figure 1 displays the regression lines for each site, and Table IV presents the slope estimates for each site. As shown, for most sites, the regression lines were either flat or sloped slightly in the positive direction. Some sites, particularly India, Mississippi, and England, had a strong positive association between binge drinking and PV. In contrast, some sites, such as Louisiana, had a strong negative association between binge drinking and PV.

We then investigated possible site-level (i.e., Level 2) predictors for why the association between binge

drinking and PV differed among the sites. Our hypothesis was that any site differences in this association might be because of how normative binge drinking was in that site. That is, if binge drinking is normative behavior, as it is in many colleges in the United States, then the association between binge drinking and PV would be weak. In contrast, in cultures where binge drinking is socially disapproved of, the association would be stronger. Thus, our Level 2 predictor was the mean binge drinking score at each site. As shown in Table V, our hypothesis was not supported: The mean binge drinking score at each site was not a significant predictor of the association between binge drinking and PV. However, the coefficient is in the predicted direction, and it approaches significance.

Gender Differences for the Association Between Binge Drinking and PV

In our next model, we investigated possible gender differences in the binge drinking/PV association. We reverted back to our random-coefficient model and added an interaction term of gender by binge drinking. Table VI displays these results. As shown,

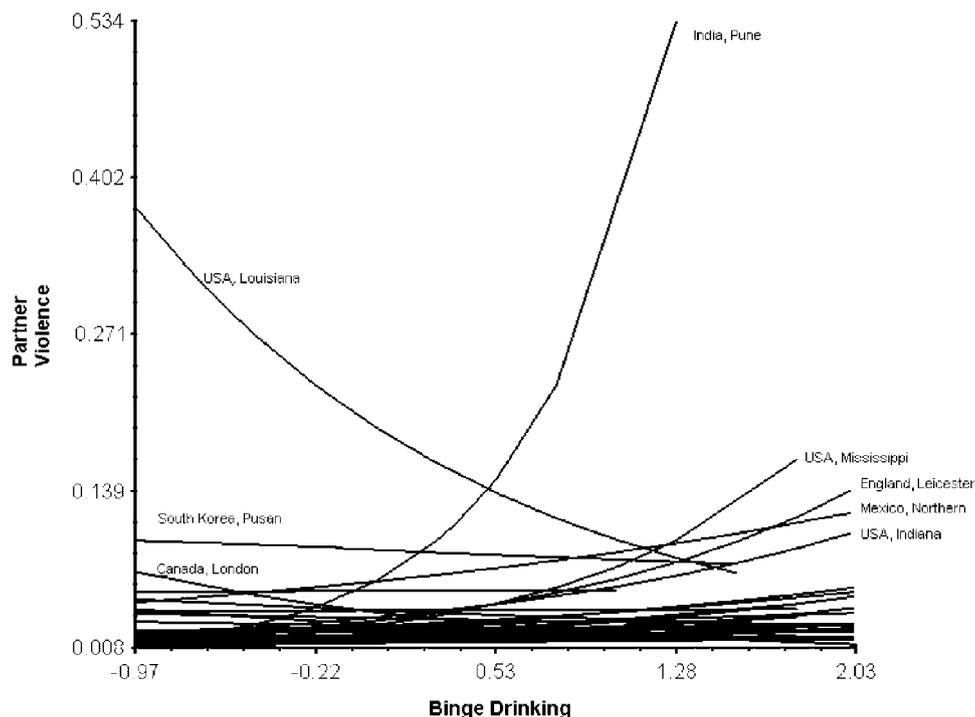


Fig. 1. Regression lines for the association between binge drinking and partner violence at each site. *Note:* Regression lines are labeled only for those sites that stand out. The other sites, which are grouped together at the bottom of the graph, include: Brazil, Singapore, Hong Kong, Australia, New Zealand, Israel; the European sites of the Netherlands, Switzerland (both the German and French speaking sites), Portugal, Belgium, Scotland, Germany, Lithuania, and Sweden; the Canadian sites of Hamilton, Winnipeg, Toronto, and both Quebec sites; and the USA sites of Utah, Ohio, Washington DC, Pennsylvania, all four Texas sites, and both New Hampshire sites.

TABLE IV. Slope Estimates for the Prediction of Partner Violence by Binge Drinking

Site	Slope estimate ^a
India, Pune	0.95
USA, Mississippi	0.89
England, Leicester	0.77
Canada, Winnipeg	0.75
Switzerland, German-speaking	0.63
USA, Utah	0.60
USA, Pennsylvania	0.55
Singapore	0.52
USA, Indiana	0.50
New Zealand	0.50
USA, TX, Houston	0.48
Sweden, Gavle	0.46
Portugal, Braga	0.44
Lithuania, Vilnius	0.37
Mexico, Northern	0.34
Netherlands, Amsterdam	0.34
Israel, Emek Yezreel	0.33
Canada, Quebec 2	0.30
Belgium, Flemish	0.25
Canada, Quebec 1	0.21
USA, Ohio, Cincinnati	0.18
China, Hong Kong	0.14
Germany, Freiberg	0.09
USA, TX, Nacogdoches	0.06
Canada, Toronto	0.05
South Korea, Pusan	0.04
USA, NH, Durham 2	0.02
Switzerland, French-speaking	0.01
USA, NH, Durham 1	-0.03
USA, Louisiana	-0.10
Scotland, Glasgow	-0.16
USA, Washington, DC	-0.17
Australia	-0.19
USA, TX, Mexican-American	-0.21
Canada, Hamilton	-0.23
Brazil, Sao Paulo	-0.30
USA, TX, Non-Mexican-American	-0.40
Canada, London	-0.45

^aEstimates are the empirical Bayes estimates.

Note: Slope estimates are listed from highest to lowest.

the interaction term is not significant, suggesting that there is no moderating influence of gender on this association.

Antisocial Traits and Behavior as a Mediator

Our next hypothesis was that ASTB would mediate the association between binge drinking and PV, in that ASTB would account for any associations between binge drinking and PV. To test this effect, we first transformed our ASTB variable by its function log to correct for positive skewness. Following Baron and Kenny [1986], we estimated three models to investigate the mediating influence of ASTB. Specifically, we investigated (1) whether

our independent variable (binge drinking) was associated with PV, (2) whether our mediator (ASTB) was associated with our independent variable (binge drinking), and (3) whether after including both ASTB and binge drinking in the model, our independent variable (binge drinking) would still be associated with PV. Finally, we computed a Sobel test statistic to test the significance of the mediational model.

Our first model was our original random coefficient model in which we investigated the main effect of binge drinking on PV (see Table III), and as discussed previously, binge drinking was significantly associated with PV. Then we investigated whether binge drinking was associated with ASTB. Table VII displays the results of this model. As shown, after controlling for covariates, binge drinking significantly predicted ASTB. Because binge drinking is associated with both our mediator and our dependent variable, we then proceeded to examine whether ASTB was a significant mediator of the association between binge drinking and PV. To test this, we included both binge drinking and ASTB as main effects in our model with PV as the dependent variable. As shown in Table VIII, binge drinking was no longer associated with PV after accounting for ASTB. The Sobel test statistic for this mediational model was 5.22 and $P < .001$. Thus, ASTB completely mediated the association between binge drinking and PV, and the influence of alcohol on PV would not exist were it not for alcohol's associations with ASTB. Further, for every one point increase on the ASTB scale (four-point scale), the frequency of PV increased almost tenfold (event rate ratio = 9.70).

DISCUSSION

Associations Between Drinking Problems and PV

Previous studies of college students in the United States have shown that if an association exists between alcohol use and PV, the effect is usually small [Wood and Sher, 2002]. In addition, population-based studies [e.g., Caetano et al., 2001; Kaufman Kantor and Asdigian, 1997], studies of community samples [e.g., Heyman et al., 1995; Leonard, 1993], studies using clinical samples [e.g., Fals-Stewart, 2003; O'Farrell et al., 2003], and studies in other cultures [e.g., Levinson, 1988] have shown a significant association between problem drinking behaviors and PV. Similarly, in our study of college students at 38 sites worldwide, we found

TABLE V. Slopes-as-Outcomes Model—Mean Binge Drinking as Level 2 Predictor of the Association Between Binge Drinking and Partner Violence

Fixed effects	Coefficient	SE	<i>t</i> ratio	Event rate ratio
Model for site means				
Intercept, γ_{00}	0.22	.22	1.00	
Gender, γ_{10}	0.29	.12	2.44*	1.34
SES, γ_{20}	-0.09	.05	-1.86	0.91
Age, γ_{30}	-0.05	.01	-4.18**	0.95
Relationship length, γ_{40}	0.04	.01	6.93**	1.04
Social desirability, γ_{50}	-1.53	.12	-12.74**	0.22
Model for binge drinking-partner violence slope				
INTERCEPT, γ_{60}	0.23	.06	3.75**	1.26
MEAN BINGE DRINKING, γ_{61}	-0.31	.16	-1.88	0.73
Random effects				
	Variance	<i>df</i>	χ^2	
Site mean, u_{0j}	0.34	37	7353.36**	
Binge drinking-PV slope, u_{6j}	0.12	36	1328.09**	

Note: SES, age, relationship length, and social desirability are group mean centered and constrained to have equal variances across sites. Binge drinking is group mean centered and allowed to vary across sites. MEAN BINGE DRINKING is the Level 2 predictor for the slope and is grand mean centered. Gender: 1 = male, 2 = female; PV, partner violence; SES, socioeconomic status.
 * $P < .05$; ** $P < .001$.

TABLE VI. Random-Coefficient Model—Gender as a Moderator for the Association Between Binge Drinking and Partner Violence

Fixed effects	Coefficient	SE	<i>t</i> ratio	Event rate ratio
Overall PV, γ_{00}	0.39	.52	0.75	
Gender, γ_{10}	0.17	.30	0.55	1.18
SES, γ_{20}	-0.09	.05	-1.77	0.92
Age, γ_{30}	-0.05	.01	-4.00**	0.95
Relationship length, γ_{40}	0.04	.01	6.91**	1.04
Social desirability, γ_{50}	-1.48	.12	-12.12**	0.23
Binge drinking, γ_{60}	0.08	.22	0.35	1.08
Binge drinking \times gender interaction, γ_{70}	0.06	.13	0.47	1.06
Random effects				
	Variance	<i>df</i>	χ^2	
Site mean, u_{0j}	.35	37	6085.76**	
Binge drinking-PV slope, u_{6j}	.30	37	1297.14**	
Binge drinking \times gender interaction, u_{7j}	.09	37	1329.38**	

Note: SES, age, relationship length, and social desirability are group mean centered and constrained to have equal variances across sites. Binge drinking and binge drinking \times gender interaction are group mean centered and allowed to vary across sites. Gender: 1 = male, 2 = female. PV, partner violence; SES, socioeconomic status.
 * $P < .05$, ** $P < .001$.

that on average, binge drinking was associated with the perpetration of PV, and that for every one point increase in binge drinking behavior on a four-point scale, there was a 26% increase in the number of PV assaults. Thus, overall, our study showed a significant association between the two behaviors, but this association varied greatly across sites.

We found that these differences in association did not seem to be because of how normative binge drinking behavior was at each site. We hypothesized that the association between binge drinking would

be weakest in sites where binge drinking was normative, and strongest where binge drinking was not normative behavior. Because PV is strongly associated with ASTB in this study and others [e.g., Murphy et al., 2001], when binge drinking is considered deviant behavior, it should be more strongly associated with other deviant behaviors, such as ASTB and in turn PV. Although the findings were somewhat consistent with this line of reasoning, in that the association was in the predicted direction and approached significance, they did not

TABLE VII. Random Coefficient Model—Binge Drinking as a Predictor of Antisocial Traits and Behaviors

Fixed effects	Coefficient	SE	<i>t</i> ratio
Overall ASTB, γ_{00}	0.69	.02	
Gender γ_{10}	-0.14	.01	-17.69**
SES, γ_{20}	-0.01	.01	-2.91**
Age, γ_{30}	0.00	.00	0.68
Relationship length, γ_{40}	-0.01	.01	-2.31*
Social desirability, γ_{50}	-0.29	.01	-45.12**
Binge drinking, γ_{60}	0.07	.01	13.35**
Random effects	Variance	<i>df</i>	χ^2
Site mean, u_{0j}	.01	37	1129.24**
Binge drinking-ASTB slope, u_{6j}	.00	37	136.33**

Note: Gender: 1 = male, 2 = female. ASTB, antisocial traits and behaviors; SES, socioeconomic status.
* $P < .05$; ** $P < .001$.

TABLE VIII. Random-Coefficient Model—Antisocial Traits and Behaviors as a Mediator of the Association Between Binge Drinking and Partner Violence

Fixed effects	Coefficient	SE	<i>t</i> ratio	Event rate ratio
Overall partner violence, γ_{00}	-0.46	.21	-2.16*	
Gender, γ_{10}	0.61	.11	5.61**	1.84
SES, γ_{20}	-0.07	.05	-1.46	0.94
Age, γ_{30}	-0.05	.01	-4.41**	0.95
Relationship length, γ_{40}	0.04	.01	7.48**	1.04
Social desirability, γ_{50}	-0.81	.15	-5.43**	0.44
Binge drinking, γ_{60}	0.06	.07	0.88	1.06
ASTB, γ_{70}	2.27	.29	7.79**	9.70
Random effects	Variance	<i>df</i>	χ^2	
Site mean, u_{0j}	0.39	37	7245.88**	
Binge drinking-PV slope, u_{6j}	0.17	37	1482.43**	
ASTB-PV slope, u_{7j}	2.46	37	1651.80**	

Note: SES, age, relationship length, and social desirability are group mean centered and constrained to have equal variances across sites. Binge drinking and ASTB are group mean centered and allowed to vary across sites.
Gender: 1 = male, 2 = female. ASTB, antisocial traits and behaviors; PV, partner violence.
* $P < .05$; ** $P < .001$.

attain significance and should thus be viewed with caution. Thus, the results suggest that future research should further explore the possibility that the acceptability of binge drinking and/or alcohol abuse behaviors at a site might influence the association between binge drinking and PV. Moreover, future research needs to explore further reasons why sites may differ in the association between binge drinking and the use of PV, such as cultural differences in alcohol expectancy effects—that is, the association may be stronger in cultures in

which it is expected that alcohol consumption would lead to aggression.

The association between drinking problems and PV worldwide provides a basis for future research on the link between alcohol use/abuse and PV. Our drinking problems measure was one of binge drinking, and although it was shown to be both a valid and reliable measure, there are several caveats to consider when interpreting these results. First, participants reported whether they drank five or more “drinks” at one time. Although this is a measure of binge drinking, in reality, consuming five or more “units” of alcohol constitutes binge drinking. In some cultures, a “drink” may be larger than a “unit” of alcohol. However, we chose to use the word “drink” because it is much more comprehensible to laypeople than “unit” is. This does not create a problem if they report consuming five or more “drinks” because they would still be consuming five or more “units” of alcohol. We would, however, be missing those participants who drank less than five drinks, but more than five units. This would cause error in our analyses and weaken our results. However, the excellent reliability and validity of our scale indicates that this was probably not a large problem in our analyses.

Second, alcohol use and abuse can be measured in a number of different ways. Other researchers have found that frequency of drunkenness and overall consumption are related to PV [e.g., Caetano et al., 2001; Coleman and Straus, 1983; Kaufman Kantor and Asdigian, 1997], and still others have shown that alcohol use just before a couple conflict is strongly associated with PV [e.g., Fals-Stewart, 2003], especially among college students [e.g., Shook et al., 2000] and regardless of general drinking patterns [e.g., Stets and Henderson, 1991]. Thus, future cross-cultural research on the association between alcohol use/abuse and PV should include measures of drinking at the time of the violent encounter.

Although the association between binge drinking and PV varied across sites, it did not vary by gender. That is, contrary to our expectations and prior research [e.g., Caetano et al., 2001; Coleman and Straus, 1983; Kaufman Kantor and Asdigian, 1997], we found that the association between binge drinking and PV was not significantly different for males and females. This discrepancy between our study and previous studies is possibly because of differences in the measure of alcohol use. We measured binge drinking, whereas studies that have shown that the association between alcohol use and PV is stronger for males measured frequency of drunkenness and

overall alcohol consumption [Caetano et al., 2001; Coleman and Straus, 1983; Kaufman Kantor and Asdigian, 1997]. Future research should further explore these discrepancies to investigate whether certain alcohol use behaviors are more strongly related to PV perpetration for males or females. These discrepancies are important for intervening and preventing PV perpetration for both genders, because they may point toward somewhat differing mechanisms.

Mediating Effect of Antisocial Traits and Behavior

Studies on high-risk samples in the United States have provided preliminary evidence that the association between drinking problems and PV may be mediated by ASTB, such that the association between binge drinking and PV disappears after accounting for ASTB [e.g., Murphy et al., 2001]. In this study, we tested this mediating effect on a much broader scope: among 38 university sites worldwide. Consistent with Murphy et al. [2001], we found that the association between binge drinking and PV was fully mediated by ASTB. In both studies, alcohol use had no effect on PV once the influences of ASTB were accounted for.

The mediating effect of ASTB is an important finding because it could provide further explanation as to why certain biological and situational influences have been shown to account for a link between drinking problems and PV. Future research should explore these links of biological and situational influences on the alcohol abuse–PV association to investigate whether they could be accounted for by ASTB. For example, proponents of the Alcohol Myopia Theory assert that alcohol increases aggression because it reduces one's ability to attend to inhibitory cues to aggression and focuses one's attention on instigating cues [Steele and Josephs, 1990]. In addition, they state that the cues that elicit certain responses to alcohol intoxication can vary from person to person. Perhaps people with high levels of ASTB are more likely to focus their attention on instigators in the first place and would be more likely to respond aggressively to these cues. In addition, alcohol may have an effect on the brains of those with high levels of ASTB that is different than that experienced by those with lower levels of ASTB. For example, a laboratory experiment that showed that the aggression-inducing effects of alcohol operate only on men with clinical levels of ASP, led researchers to speculate that men with ASP may be more susceptible to the disruptions in the

frontal lobe function and the decrease in serotonin levels that occur with alcohol ingestion because they already have pre-existing deficits in those areas of the brain [Moeller et al., 1998].

In addition, several researchers have explored the role that alcohol expectancy effects play in the alcohol abuse–PV association [e.g., Kaufman Kantor and Asdigian, 1997; Williams and Smith, 1994]. These researchers have found that people who believed that alcohol leads to aggression are more likely to perpetrate PV than those who did not have these aggressive alcohol expectancies. Perhaps it is people who are high on ASTB who have these aggressive alcohol expectancies in the first place. Similarly, Learned Behavior Theory could also be explained by the mediating role of ASTB. Proponents of Learned Behavior Theory assert that aggressive behavior under the influence of alcohol is an acquired behavior because people learn that aggression can be enacted while under the influence [Coleman and Straus, 1983]. People with high levels of ASTB may be more likely to learn to behave aggressively while drunk, and they may also be the ones who use drinking as an excuse for their aggressive behaviors.

Although our measure of ASTB was reliable and valid for the sample overall and within each site, future studies should explore this mediating effect of ASTB by using other measures of ASTB. For example, because our measure could not be used to infer a clinical diagnosis of ASP disorder, future studies should explore how clinical manifestations of ASP disorder mediate the association between problem drinking and PV severity. In addition, it would be valuable to investigate whether ASTB mediates the alcohol abuse–PV association when alcohol abuse is measured proximally, rather than distally.

Limitations

This study has some limitations that need to be addressed in future cross-cultural studies on the association between problem drinking and PV and the mediating effect of ASTB. As mentioned previously, other measures should be employed to further validate these results. In addition, multiple informants (e.g., the other member of the couple) should be used, particularly for the measurement of dating violence severity, because a meta-analysis of 43 studies on PV showed that perpetrators of both genders tend to underestimate the extent to which they use violence in their relationships [Archer, 1999].

Although this study does lend further support to the findings from clinical populations of a mediating effect of ASTB on the problem drinking–PV association, the results cannot necessarily be generalized to other populations because this is a sample of college students. Moreover, the colleges sampled do not necessarily represent the cities, countries, or regions, in which they were located. Future cross-cultural research should strive to obtain a more representative sample of people from many more sites and nations of the world.

CONCLUSIONS

This study provides evidence that the associations between binge drinking and PV perpetration occur across many different sites around the world, that this association is similar for males and females, and that the association is mediated by ASTB, such that ASTB fully accounts for the association between binge drinking and PV. Although this study uses only college students, it has the benefit of providing a test of these hypotheses on a cross-cultural level, which few, if any, previous studies have done. In addition, because we used a large sample of both male and female college students, we were able to test for possible gender differences in these associations. Finally, because we used the same measures at each of the 38 sites around the world, we were able to investigate possible site-level influences on differences in the associations and interactions.

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