The Roles of Risk Perception and Borderline and Antisocial Personality Characteristics in College Alcohol Use and Abuse[1]

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This study examined the relationships among risk perceptions, alcohol use and abuse, and borderline and antisocial personality characteristics in college students. College students who perceived themselves less able to avoid negative consequences reported drinking more and having more substance abuse symptoms than those who perceived themselves as more able to avoid negative consequences. College students who scored higher on borderline or antisocial personality tended to rate personal avoidability of negative consequences lower than those who scored lower on these personality characteristics. A multiple regression model accounted for 50% of the variance in self-reported substance abuse symptoms. Low perceived personal avoidability of negative drinking consequences and high borderline or antisocial personality characteristics are risk factors for substance abuse problems.

As substance abuse continues to be a significant health problem, the need for innovative approaches for prevention as well as treatment continues. In addition to many adverse consequences to individual health, substance abuse has been connected with social problems, such as violent crime, motor vehicle accidents, and birth defects (Straussner, 1993). The serious consequences of substance abuse are of increasing concern, given the prevalence of college binge drinking. At the University of Wisconsin–Madison in 1989, McDonald, Fleming, and Barry (1991) found that 29% of 989 undergraduate participants met DSM-III (Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition, American Psychiatric Association, 1981) criteria for alcohol abuse. Numbers of undergraduate binge drinkers across the nation increased over the 1980s and into the 1990s (Bennett et al., 1992). Late adolescence is a time when substance abuse problems often make their first appearance. Preventing recreational substance use from progressing to substance abuse disorders is an important public health issue.

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Late adolescence is also a time when most severe mental illnesses begin to become problematic (Alliance for the Mentally Ill, 1999). Depression in adolescents is related to a variety of unhealthy behaviors, including substance abuse (Kelder et al., 2001). Psychiatric patients diagnosed with a personality disorder are more likely to report an earlier onset age of substance-use disorders than those patients not diagnosed with a personality disorder (Skodol, Oldham, & Gallaher, 1999). It has been found that college students diagnosed with a personality disorder are more than twice as likely as those without a personality disorder to be heavy users of alcohol (Johnson, Bornstein, & Sherman, 1995). Borderline personality disorder is of particular interest when studying this age group because of its high rates of comorbidity with depression, suicide, and substance-use disorders (Becker, Grilo, Edell, & McGlashan, 2000; Moskovitz, 1996; Skodol et al., 1999). Conversely, patients with a substance-use disorder are more likely than other psychiatric patients to be diagnosed with a personality disorder (Nace, 1989). Borderline and antisocial personality disorders are the most common personality disorders found in substance-abusing samples (Rounsaville et al., 1998; Skinstad & Swain, 2001; Skodol et al., 1999).

There have been several explanations offered for the comorbidity between personality disorders and substance abuse. For example, it has been suggested that the overlap is merely a tautological association, since one aspect of the criteria for a borderline personality diagnosis can include substance abuse as an indicator of impulsivity. However, a strong relationship between substance abuse disorder and borderline personality is found even when substance abuse is removed from the borderline personality disorder criteria (Skodol et al., 1999). It has also been suggested that long-term substance abuse can sometimes lead to a so-called generic personality disorder because of the harmful effects of the drugs (Rounsaville et al., 1998). Researchers commonly find strong overlap among all personality disorders, especially within adolescent populations. This has led some researchers to suggest that dimensional approaches to classification and assessment of symptoms may be more useful than the current categorical system to understanding mental illness among adolescents (Becker et al., 2000).

The present study investigates the role of risk perceptions in alcohol abuse in college students, and the possible mediating role of risk perceptions in the relationship between alcohol abuse and borderline and antisocial personality characteristics. One piece of evidence that suggests that risk perceptions may differ for those with borderline personality disorder comes from the finding that substance abusers with borderline personality disorder (BPD) tend to use escape–avoidance coping mechanisms more often and problem-solving less often than other substance abusers (Kruedelbach, McCormick, Schulz, & Grueneich, 1993). Escape–avoidance coping implies a refusal or inability to think about the potential harm that substance use may pose to oneself. Thus, it is quite possible that college students high in borderline personality characteristics may be

susceptible to substance abuse partly because they do not perceive a high risk from using substances. It is possible that while college students high in borderline personality characteristics may recognize substance use as risky behavior when others engage in it, they may avoid calculating the personal risk of using substances, and as a result may not actively seek ways to refrain from using or to protect themselves from potentially negative consequences while under the influence.

A second piece of evidence that suggests that risk perceptions may differ in those high in borderline personality characteristics is the comorbidity of BPD and childhood trauma. Out of 5 people diagnosed with BPD, 4 have experienced childhood trauma (Moskowitz, 1996), and patients with sexual abuse histories are more likely than those without such histories to be diagnosed with BPD (Zlotnick, Mattia, & Zimmerman, 2001). There are two main reasons why distorted risk perception might result from childhood trauma. First, trauma survivors may have learned that personal risks are unavoidable. For example, for victims of child abuse, the decision to leave home and thus avoid continued abuse is a luxury not afforded to them. Thus, what seems to others to be an avoidable event (and therefore less risky) may not necessarily be perceived by a trauma survivor as less risky than a truly unavoidable event. Second, trauma survivors may not clearly differentiate among the severities of potentially negative events. After everything a trauma survivor has been through, perhaps not many situations will appear comparable in terms of severity. Thus, those who have experienced childhood trauma may perceive future events as less severe than most other people. Although many variables influence perceived risk (Slovic, 1987), perceived likelihood, severity, and avoidability of an event are very important influences (Peterson & Beach, 1967; Rippetoe & Rogers, 1987). Anything that lowers one's sense of controllability or raises perception of severity should theoretically also raise perceived risk.

There is also reason to believe that antisocial personality characteristics would be related to risk perceptions of substance use. To the extent that antisocial personality involves sensation seeking, the potential effects of heavy substance use might not be viewed as being very hazardous. Some evidence suggests that antisocial personality shares variance with sensation seeking, especially in youth (Finn, Mazas, Justus, & Steinmetz, 2002). In addition, one proposed typology of alcoholism categorizes Type I alcoholics as those who use alcohol because of its anti-anxiety effects, whereas Type II alcoholism is theoretically linked to antisocial personality characteristics, low harm avoidance, and high sensation seeking, although evidence for this typology is mixed (Gilligan, Reich, & Cloninger, 1988; Sannibale & Hall, 1998). Based on this typology, it is reasonable to speculate that risk perceptions and antisocial personality characteristics might both contribute to predicting alcohol abuse symptoms in a college population.

Several studies have indicated a negative relationship between risk perception of specific health effects and a variety of health-related behaviors, such as smoking (Weinberger, Greene, Mamlin, & Jerin, 1981) and other substance abuse (Hittner, 1997). Several studies have suggested a positive relationship between risk perception and active problem-solving coping mechanisms that may prevent these potentially harmful health behaviors (Gonzalez & Haney, 1990; for a summary, see Gardner & Stern, 1996). Hence, risk perception is potentially of great importance where issues of health, especially substance abuse, are concerned.

In studies of health, risk perception is often measured either as perceived probability (e.g., the likelihood that one will get cancer or heart disease from smoking) or overall risk or threat to people, oneself, or one's health (Cavalini, Loeter-Kemmerling, & Pulles, 1991; Rippetoe & Rogers, 1987). In the health belief model, perceived vulnerability to a disease and perceived severity of the illness are proposed to be important factors influencing health-related behaviors (Prohaska, Leventhal, Leventhal, & Keller, 1983). In many studies, only a global judgment of the hazard is made and sometimes only one question is used (McBride, Weatherby, Inciardi, & Gillespie, 1999). For example, using the health belief model, Weinberger et al. (1981) asked people to name potential ill health effects of smoking on their own health, reasons people should quit smoking, and the likelihood of experiencing health problems from smoking. Only the first two variables were significant in discriminating smokers from nonsmokers. Notice that the first two variables differ in whether they are personally focused versus focused on people in general, and it was not clear whether the likelihood question was personally or generally focused.

Gonzalez and Haney (1990) assessed perceived risk of alcohol in college students by asking "how much they think people risk harming themselves" by *trying one or two drinks*, *taking one or two drinks nearly every day*, *taking three to five drinks nearly every day*, *having five or more drinks once or twice each weekend*, and *getting drunk*. The risk question was focused on people in general, and no specific hazards of drinking were mentioned. An analogous question was found to be a relatively strong predictor of a decrease in drug use in a series of studies of high school marijuana and cocaine use (Bachman, Johnston, & O'Malley, 1990; Bachman, Johnston, O'Malley, & Humphrey, 1988).

In contrast to the health literature, a common method used in environmental risk perception research has been to ask participants to make quantitative judgments concerning the overall riskiness of a list of diverse potential hazards (e.g., radiation, hunting, smoking, food additives; Flynn, Slovic, & Mertz, 1994; Slovic, 1987). We adapted this method to study the role of risk perception in alcohol use in college students by asking participants to rate the riskiness of specific possible consequences of alcohol use (e.g., vomiting, losing valuables, losing a friend). The list of consequences fell into four categories: (a) serious and

life-threatening consequences (e.g., getting in a car accident, flunking out of school), (b) sexual consequences (e.g., having unprotected sex, having sex that is regretted later), (c) social embarrassment (e.g., crying in public, earning a poor reputation), and (d) routine consequences (e.g., a hangover). The items are listed in the Appendix. This assessment provides a more comprehensive assessment of risk perception than a single or very few items.

Our study also differs from past research on health risks in two other ways. Participants rated not only global riskiness, but also made separate ratings of perceived severity and avoidability of each separate potential consequence. Severity and avoidability are also concepts that have been used in other health research, including the health belief model. However, we also examine perceived severity and avoidability for the list of 25 consequences. Understanding which specific aspects of risk perception may be altered in those with alcohol abuse symptoms or those who use alcohol heavily has important implications for both prevention and treatment of substance abuse. For example, if a substance abuser views most negative consequences of alcohol use as unavoidable, a focus on self-efficacy and coping strategies may be more helpful than alcohol education about the nature of the risks. Individuals like this may comprise a subgroup of substance abusers who may understand, but have been unaffected by the increasing efforts to educate young adults about the potential health consequences of substance abuse (Gibbons & Gerrard, 1995).

Finally, following Sjoberg (2000), in the present study we solicited separate measures of risk, avoidability, and severity for one's personal well-being as well as for college students in general. A distinction between personal and general risk has potential to distinguish between those individuals who do not have a clear understanding of the potentially negative consequences of alcohol (which would be indicated by low ratings of both personal and general risk) from those individuals who perceive themselves to be less at risk for the potentially negative consequences of alcohol than college students in general. We chose this method because it has been found that people estimate risks to themselves differently from risks to people in general. In addition, it has been found that those who perceive a potential hazard as controllable tend to rate it as less likely to affect their personal lives (Sjoberg, 2000).

In summary, the present study examines the relationships among the aspects of risk perception, substance abuse, alcohol consumption, and borderline and antisocial personality characteristics in college students. It is hypothesized that higher rates of substance abuse will occur in college students who score higher in either borderline or antisocial personality characteristics compared to those individuals scoring lower. In addition, it is expected that higher rates of substance abuse will occur among those who do not perceive themselves personally to be at high risk for the potentially negative consequences of using alcohol. Finally, based on the literature reviewed, we hypothesize that distorted risk perception

may be a mediating factor between either antisocial or borderline personality characteristics and substance abuse.

Method

Participants and Sampling Plan

All participants were students enrolled in introductory psychology at the University of Wisconsin–Madison. Each semester, the Department of Psychology administers a survey (the "mass survey") to all introductory psychology classes that is composed of questionnaires submitted by department researchers. The data reported here were from participants recruited based on their responses to the mass survey in Fall 1999 and Spring 2000. For our project, the department mass survey included a measure of substance abuse in college students (Rutgers Collegiate Substance Abuse Screening Test, RCSAST; Bennett et al., 1992) and items that assess aspects of borderline, antisocial, and narcissistic personality disorder (from the Wisconsin Personality Inventory [WISPI]; Klein, Benjamin, Rosenfeld, & Treece, 1993).

Students were contacted by telephone and were invited to participate in the present study based on their scores on the two questionnaires. We sampled the ends of the distributions to increase statistical power (Myers, 1972). Students in each of the following categories were contacted: the highest WISPI BPD scorers (score of 36 or higher), the lowest WISPI scorers (score of 11 or lower), the highest RCSAST scorers (score of 6 or higher), and the lowest RCSAST scorers (score of 0). A total of 2,877 students were screened across two semesters. Of the 600 students contacted, 239 initially declined to participate (200 of 400 contacted during the fall semester, and 39 of 200 contacted during the spring semester). Most of those who declined had already committed themselves to another research project to earn their extra-credit points. In some semesters there is heavy competition among department researchers for students to participate in research. This occurred in the fall semester of our project.

Of the 361 scheduled participants, 285 participated (142 male, 143 female), 75 failed to keep or cancelled their appointments, and 1 did not finish the session, yielding a 79.0% participation rate; 17 participants were eliminated from the data analysis because one or more items were left blank. In the sample of 268 participants on which the data analyses were based, there were 133 females and 135 males. Of the 17 with missing responses, 7 participants omitted items from the substance abuse questionnaire, and the 10 other participants omitted items from other sections. For each variable, we tested for differences between the 268 participants with complete data and those with missing values on any other variable. None of the differences approached significance ($p > .10$) Therefore, we did a listwise deletion of the 17 cases, as recommended by Allison (2002). The average age of participants was 19 years.

Materials and Procedure

Each participant received a packet of questionnaires containing the measures of risk perception, personality characteristics, and substance use and abuse questionnaires, in addition to the Rosenberg (1979) Self-Esteem scale, and two measures of interpersonal attachment. The self-esteem and attachment measures will not be discussed further in this paper. Participants worked at their own pace and received extra-credit points for their introductory psychology class after completing the study.

Risk Perception

The measure of risk perception in this study consists of six pages designed to assess perceived personal risk, severity, and avoidability; and perceived risk, severity, and avoidability for college students in general. Each page contains a list of the same 25 events that could occur as a result of alcohol or other drug use. The items used in the present study range from "getting a hangover" to "dying." The items were generated by college students in our laboratory group (who are qualified as cultural informants), piloted in a separate study, and trimmed to the final set of 25.

Six types of ratings were made for the 25 events. The first page asked participants to rate the overall riskiness of the 25 events as a result of alcohol or other drug use. Participants were asked to rate the riskiness of each item as a hazard to the well-being of college students in general on a 19-point rating scale ranging from 1 (*least risk*) to 10 (*moderate risk*) to 19 (*highest risk*). The second page asked participants to rate the degree of negative impact that each of the 25 events would have on the well-being of college students in general, assuming that each event did occur as a result of alcohol or other drug use. Again, participants were asked to rate the events on a 19-point rating scale ranging from 1 (*least severe impact*) to 10 (*moderately severe impact*) to 19 (*most severe impact*). The third page asked participants to rate how capable college students are of avoiding each of the 25 events when drinking or using other drugs on a 19-point rating scale ranging from 1 (*least avoidable*) to 10 (*moderately avoidable*) to 19 (*most avoidable*). The fourth page was the same as the first page, except that participants were asked to rate the overall riskiness of the 25 events as a hazard to their own personal well-being. The fifth page was the same as the second page, except that participants were asked to rate the degree of negative impact of the 25 events on their own personal well-being. The sixth page was the same as the third page, except that participants were asked to rate how capable they personally are of avoiding each of the 25 events.

Six total scores were made by averaging the ratings from each page. These scores are referred to in the results as perceived general risk (GR), perceived

general severity (GS), perceived general avoidability (GA), perceived personal risk (PR), perceived personal severity (PS), and perceived personal avoidability (PA).

Principal components factor analyses were performed on the ratings of the list of potentially negative consequences of alcohol use. Four subscales appeared consistent across the six different types of ratings. We formed subscale scores covering four categories of consequences: (a) serious and life-threatening events, but not including sexual consequences; (b) sexual consequences; (c) social embarrassment; and (d) routine consequences/hangover. Items included in each subscale score are listed in the Appendix. The ratings were averaged to form each subscale score.

Alpha coefficients for each total risk perception score and their corresponding subscale scores are presented in Table 1. The intercorrelations of the total risk perception measures are also shown in Table 1. General risk and personal risk showed the highest correlation. The correlation matrices for each subscale were similar to the matrix for total scores in Table 1 in that the highest correlation was between general and personal risk, and the matching dimensions (e.g., personal severity and general severity) usually were also significantly but less strongly associated. Correlation matrices between the subscales were also calculated. Subscales 1 and 2 were relatively strongly related within each of the six risk dimensions (*Mdn r* = .70), followed by Subscales 3 and 4 (*Mdn r* = .57), Subscales 2 and 3 (*Mdn r* = .44), Subscales 1 and 3 (*Mdn r* = .42), Subscales 2 and 4 (*Mdn r* = .16), and Subscales 1 and 4 (*Mdn r* = .10).

Borderline and Antisocial Personality Characteristics

The WISPI (Klein et al., 1993) was used to assess disordered personality characteristics: 34 items were used to form the subscale for characteristics of borderline personality disorder (BPD), the subscale for characteristics of antisocial personality disorder (APD), and the subscale for characteristics of narcissistic personality disorder (NPD). In addition, items from the Personality Diagnostic Questionnaire (PDQ-4; Hyler, Skodol, Kellman, Oldham, & Resnick, 1990) were used.

Alpha coefficients for BPD WISPI, APD WISPI, and NPD WISPI were .90, .73, and .78, respectively. Alpha coefficients for BPD PDQ, APD PDQ, and NPD PDQ were .40, .63, and .60, respectively. Because the internal reliability of PDQ scales was not as good as the WISPI, we used the WISPI in all analyses reported in the following sections. The results were very similar when the PDQ scales were used.

The three personality characteristics were significantly correlated: .560, .512, and .616 for WISPI BPD–APD, BPD–NPD, and APD–NPD, respectively, all *p*s < .001. This is expected for these Axis II characteristics.

Table 1

Reliabilities and Correlations of the Risk Perception Measures

	GR	GS	GA	PR	PS	PA
Alpha coefficients of risk perception measures						
Subscale 1	.936	.926	.872	.968	.836	.894
Subscale 2	.833	.843	.825	.931	.862	.833
Subscale 3	.759	.830	.754	.802	.791	.836
Subscale 4	.621	.754	.492	.648	.746	.630
Total	.909	.931	.903	.950	.886	.924
Correlations of risk perception measures						
GS	.321**	—				
GA	-.142	.087	—			
PR	.459**	.148	.047	—		
PS	.392**	.240**	-.007	.267**	—	
PA	.140	-.058	.348**	-.051	.231**	—

Note. $N = 268$. GR = risk to college students in general; GS = severity of outcome for college students in general; GA = perceived general avoidability; PR = perceived personal risk; PS = perceived personal severity; PA = perceived personal avoidability.
** $p < .001$.

Substance Use/Abuse

The RCSAST (Bennett et al., 1992) was used as a measure of problem substance use. This questionnaire consists of 25 True/False items designed for college students. Sample items include using substances alone, having financial troubles as a result of substance use, using substances in the morning, having previously received treatment for substance abuse, and so forth. The sum of the "Yes" responses was added to make the substance abuse (RCSAST) score. Alpha reliability coefficient was .88.

The Alcohol Consumption Questionnaire was designed for this study, was piloted in a separate study, and was used to measure the frequency of drinking and type of alcohol consumed. The first question is a Yes/No question asking whether or not the participant has drunk alcoholic drinks at all in the last 3 months. If the answer to the first question is "Yes," the participant is instructed to answer eight more questions. Two scores were derived from this questionnaire. The first score, Total Alcohol, is a measure of how much alcohol participants report typically consuming on a day of drinking. This score is derived by

averaging the responses to the two questions: "On a day when you have had beer or wine coolers to drink, how many glasses, bottles, or cans have you been drinking?" and "On a day when you have had hard liquor to drink, how many single shots have you been drinking?" For both of these questions, participants had the option of selecting *1*, *2*, *3*, *4*, *5*, *6*, *7-9*, *10-12*, or *more than 12*. The second score, Alcohol Days, is a measure of the average number of days per week that participants report consuming alcohol. This score is derived by averaging the responses to the following two questions: "On average in the last 3 months, how many days per week have you been drinking beer or wine coolers?" and "On average, how many days per week have you been drinking hard liquor (rum, tequila, wap,[3] vodka, etc.)?" For both of these questions, participants had the option of selecting *none*, *1*, *2*, *3*, *4*, *5*, *6*, or *every day*. Alpha reliability coefficients for Total Alcohol and Alcohol Days were .63 and .54, respectively.

Results

Gender Differences

We tested for gender differences in the risk perception, alcohol, and personality variables. There were significant ($p < .01$) gender differences in perceived general risk ($M_F = 12.7$, $M_M = 11.34$), $t(266) = 4.14$; perceived personal severity ($M_F = 13.74$, $M_M = 12.61$), $t(266) = 4.81$; total alcohol ($M_F = 6.63$, $M_M = 8.77$), $t(266) = 4.10$; and antisocial personality characteristics ($M_F = 15.33$, $M_M = 20.13$), $t(266) = 4.58$. Other variables for which gender differences approached significance ($p < .05$) were age ($M_F = 18.75$, $M_M = 19.30$), RCSAST ($M_F = 4.30$, $M_M = 5.78$), alcohol days ($M_F = 2.52$, $M_M = 2.99$), and narcissistic personality ($M_F = 26.55$, $M_M = 29.46$).

Alcohol Use

The mean number of reported drinks consumed on a typical day of drinking was in the 7-to-9-drink category ($M = 7.63$). The median number of drinks was in the 10-to-12-drink category, and the mode was 0. The maximum reported number of drinks consumed was *more than 12*. On average, males reported drinking between 10 and 12 drinks on a typical drinking occasion, while females reported drinking 6.6 drinks.

The mean number of reported days of drinking alcohol was 2.76 days per week. The median days per week was 3, with a mode of 2. The maximum reported drinking days per week was 7, and the minimum was 0. There were 5

[3]"Wap" is a slang term for a strong hard liquor punch made with vodka, another liquor such as rum, fruit juice, and fruit.

Table 2

Substance Use/Abuse and Disordered Personality Characteristics

	Total alcohol	Alcohol days	RCSAST
BPD WISPI	.146	.184*	.467**
APD WISPI	.395**	.420**	.541**
NPD WISPI	.154*	.149	.181*

Note. $N = 268$. Total alcohol = average consumption of alcohol per week; Alcohol days = average number of days per week on which alcohol was consumed; RCSAST = Rutgers Collegiate Substance Abuse Screening Test; BPD WISPI, APD WISPI, and NPD WISPI = averages of the Wisconsin Personality Inventory questions designed to measure borderline, antisocial, and narcissistic personality characteristics, respectively. *$p < .01$. **$p < .001$.

people (1.8%) in our sample who reported drinking every day, and 8.4% who reported drinking 6 days a week.

Participants positively endorsed a mean of 5.16 questions on the RCSAST, the measure of substance abuse problems. The median score on the RCSAST was 3, with a mode of 0. The maximum score in our sample was 12 (higher scores indicate more substance abuse problems). The three alcohol scales were significantly correlated with each other (rs = .651, .493, and .541 for total alcohol–alcohol days, total alcohol–RCSAST, and alcohol days–RCSAST, respectively, ps < .001).

Substance Use, Substance Abuse, and Personality Characteristics

The first hypothesis was that individuals with higher borderline or antisocial personality characteristics would show higher reported rates of both alcohol use and substance abuse symptoms than individuals lower in these personality characteristics. The correlations are presented in Table 2.[4] Total Alcohol, Alcohol Days, and RCSAST were all positively correlated with borderline, antisocial, and narcissistic personality characteristics. APD scores were related to both alcohol consumption and substance abuse symptoms, with these variables sharing between 16% and 29% of their variance. In contrast, BPD scores shared 22% variance with substance abuse symptoms, but only 2% to 3% variance with alcohol use. Although NPD scores were also significantly associated with two of the three measures of alcohol use and abuse, narcissism shared only 2% to 3% of

[4]The Spearman rank-order correlations were also very similar to the Pearson correlations shown in the tables.

Table 3

Correlations of Substance Use/Abuse and Risk Perception

	PR	PS	PA	GR	GS	GA
Total alcohol	-.018	-.252**	-.322**	-.250**	.085	.063
Alcohol days	-.018	-.268**	-.327**	-.234**	.023	.105
RCSAST	.044	-.184*	-.498**	-.140	.031	-.042

Note. PR = perceived personal risk; PS = perceived personal severity; PA = perceived personal avoidability; GR = perceived general risk; GS = perceived general severity; GA = perceived general avoidability.
*$p < .01$. **$p < .001$.

variance with these variables. For each of the three personality disorder variables, the differences among the correlations were tested with the method of Meng, Rosenthal, and Rubin (1992) for dependent correlations. The correlations of borderline characteristics with the three alcohol variables differed significantly, $\chi^2(2) = 13.34$, $p < .005$. The correlations of antisocial and narcissistic personality with the alcohol variables did not differ significantly among themselves, $\chi^2(2) = 3.76$, and 0.34, ps $> .10$, respectively. Thus, while antisocial personality characteristics showed a similarly strong relation to all three alcohol variables, borderline personality characteristics were significantly more strongly related to substance abuse symptoms than to alcohol use per se.

Substance Use/Abuse and Risk Perception

The second hypothesis was that higher rates of substance use and abuse would occur among those who perceive themselves to be at lower risk for the negative effects of substance use. The relevant correlations are presented in Table 3. The results show significant negative correlations between the three alcohol variables and perceived personal severity, perceived personal avoidability, and perceived general risk that accounted for 2% to 25% of the variance. The relationship between perceived personal avoidability and RCSAST was relatively strong, accounting for 25% of the variance such that lower perceived personal avoidability was predictive of higher report of substance abuse symptoms. It is notable that only perceived personal avoidability and personal severity showed significant correlations with alcohol abuse symptoms, whereas general perceptions of avoidability and severity did not. This indicates that participants who drink heavily or who abuse alcohol perceive the potential consequences to themselves as less severe and also as less avoidable than those who use less alcohol or who do not abuse alcohol.

Table 4

Correlations Between Substance Use/Abuse and Risk Perception Subscale Scores

	PR	PS	PA	GR	GS	GA
Subscale 1: Serious events						
RCSAST	*ns*	*ns*	-.380**	*ns*	*ns*	*ns*
Alcohol days	*ns*	-.184*	*ns*	-.170*	*ns*	.215**
Total alcohol	*ns*	-.184*	*ns*	-.161*	*ns*	.170*
Subscale 2: Sexual consequences						
RCSAST	*ns*	-.199*	-.335**	*ns*	*ns*	*ns*
Alcohol days	*ns*	-.233**	-.251**	-.165*	*ns*	*ns*
Total alcohol	*ns*	-.259**	-.214**	-.229**	*ns*	*ns*
Subscale 3: Social embarrassment						
RCSAST	*ns*	*ns*	-.447**	*ns*	*ns*	*ns*
Alcohol days	*ns*	-.173*	-.259**	*ns*	*ns*	*ns*
Total alcohol	*ns*	*ns*	-.295**	*ns*	*ns*	*ns*
Subscale 4: Routine consequences						
RCSAST	*ns*	*ns*	-.334**	*ns*	*ns*	*ns*
Alcohol days	*ns*	-.289**	-.261**	-.192*	*ns*	*ns*
Total alcohol	*ns*	-.256**	-.314**	-.223**	*ns*	*ns*

Note. PR = perceived personal risk; PS = perceived personal severity; PA = perceived personal avoidability; GR = perceived general risk; GS = perceived general severity; GA = perceived general avoidability; RCSAST = Rutgers Collegiate Substance Abuse Screening Test; alcohol days = average number of days per week drinking; total alcohol = average number of drinks on a typical drinking day.
ns: $p > .01$. *$p < .01$. **$p < .001$.

Risk Perception Subscale Scores

The correlations between each risk subscale score and alcohol use and abuse are presented in Table 4. The general pattern of relationships shown in Table 3 between alcohol use and abuse and perceived personal avoidability and severity holds in Table 4 as well. However, both alcohol days and total alcohol correlated positively with perceived general avoidability of the serious and life-threatening consequences of alcohol use (e.g., dying, suffering permanent brain damage, flunking out of school). Thus, participants who consume more alcohol perceive college students in general to be more capable of avoiding the serious consequences of alcohol use.

Table 5

Correlations Between Risk Perception and Disordered Personality Characteristics

	PR	PS	PA	GR	GS	GA
BPD WISPI	.044	-.018	-.287**	.053	.064	-.068
APD WISPI	.065	-.283**	-.278**	-.111	-.040	.016
NPD WISPI	.062	-.100	-.109	.051	.017	-.072

Note. PR = perceived personal risk; PS = perceived personal severity; PA = perceived personal avoidability; GR = perceived general risk; GS = perceived general severity; GA = perceived general avoidability; BPD WISPI, APD WISPI, and NPD WISPI = averages of the Wisconsin Personality Inventory questions designed to measure borderline, antisocial, and narcissistic personality characteristics, respectively.
**$p < .001$.

Risk Perception, Borderline, and Antisocial Personality Characteristics

The third hypothesis was that individuals with higher antisocial or borderline personality characteristics would rate risk lower than those scoring lower on those personality scales. The relevant correlations are presented in Table 5. Borderline and antisocial personality characteristics correlated negatively with perceived personal avoidability. Antisocial personality characteristics also correlated negatively with perceived personal severity, as would be expected because antisocial personality characteristics overlap with sensation seeking (Epstein, Ginsburg, Hesselbrock, & Schwarz, 1994).

Using the same risk subscale scores as in Table 4, the results (Table 6), with a few exceptions, show the same pattern as Table 5. Borderline and antisocial personality scales correlated negatively with perceived personal avoidability for serious and sexual consequences. Interestingly, for the social embarrassment subscale (e.g., crying in public, loss of coordination), borderline and narcissistic personality characteristics correlated positively with perceived general and personal risk.

Risk Perception as a Mediator of the Personality–Substance Abuse Relationship

The fourth research hypothesis was that risk perception variables would mediate the relationship between borderline and antisocial personality characteristics and substance abuse. We tested the potential mediating role of the risk

Table 6

Correlations Between Risk Perception Subscale Scores and Disordered Personality Characteristics

	PR	PS	PA	GR	GS	GA
Subscale 1: Serious events						
BPD WISPI	*ns*	*ns*	-.223**	*ns*	*ns*	*ns*
APD WISPI	*ns*	-.306**	-.237**	*ns*	*ns*	*ns*
NPD WISPI	*ns*	-.170*	*ns*	*ns*	*ns*	*ns*
Subscale 2: Sexual consequences						
BPD WISPI	*ns*	*ns*	-.238**	*ns*	*ns*	*ns*
APD WISPI	*ns*	-.368**	-.229**	-.176*	*ns*	*ns*
NPD WISPI	*ns*	-.171*	*ns*	*ns*	*ns*	*ns*
Subscale 3: Social embarrassment						
BPD WISPI	.228**	*ns*	-.234**	.217**	*ns*	*ns*
APD WISPI	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
NPD WISPI	.197*	*ns*	*ns*	.218**	.169*	*ns*
Subscale 4: Routine consequences						
BPD WISPI	.162*	*ns*	*ns*	.178*	*ns*	*ns*
APD WISPI	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*
NPD WISPI	*ns*	*ns*	*ns*	*ns*	*ns*	*ns*

Note. PR = perceived personal risk; PS = perceived personal severity; PA = perceived personal avoidability; GR = perceived general risk; GS = perceived general severity; GA = perceived general avoidability; BPD WISPI, APD WISPI, and NPD WISPI = averages of the Wisconsin Personality Inventory questions designed to measure borderline, antisocial, and narcissistic personality characteristics, respectively.
ns: $p > .01$. *$p < .01$. **$p < .001$.

variables in a series of hierarchical multiple regression analyses for all three personality variables (Baron & Kenny, 1986). In order to test whether a risk perception variable is a mediator, the first requirement is that the personality variable have a significant relationship with both substance abuse and the risk perception variable. Given this, then the risk perception variable would be a mediator if the effect of the personality characteristic on substance abuse were reduced markedly when the risk perception variable is included in the regression model. We used RCSAST (substance abuse) as the dependent variable, and WISPI BPD, APD, NPD, and perceived personal avoidability as predictor variables. Personal

avoidability was used in these analyses because it showed the most consistent relationship with the substance use variables. In each analysis, age and gender were entered first. Either personal avoidability or the relevant personality variable was entered second, followed by the other variable.

The results are shown in Table 7. Surprisingly, personal avoidability was not a mediator of the relationship between substance abuse and borderline, antisocial, or narcissistic personality characteristics, but was an independent predictor of substance abuse. Also, none of the three personality variables was a mediator of the effect of personal avoidability on substance abuse. All three personality variables contributed significantly to predicting RCSAST scores, over and above personal avoidability, and were entered in the final regression model shown in Table 7. However, NPD was a suppressor[5] of APD and, to a lesser extent, BPD (Cohen & Cohen, 1975). Because the RCSAST scores are censored at zero, we also conducted all the same analyses using Tobit regression (Breen, 1996). The Tobit regression results were highly similar to the least-squares regression, with personal avoidability and the personality variables all contributing significantly to prediction of substance abuse symptoms. NPD also functioned as a suppressor variable in the Tobit regression. The Tobit results for the final model with the three personality variables and personal avoidability are presented in Table 7 for comparison. The final least-squares regression model accounted for approximately 50% of the variance in self-reported substance abuse measured by the RCSAST.

Discussion

Our assessment of multiple aspects of risk perception of alcohol use shows that different variables have different relationships to alcohol use and abuse in college students. The results of this study indicate that those who perceived themselves to be less capable of avoiding the potentially negative consequences of alcohol tended to report drinking more and having more substance abuse problems than those who perceived themselves to have more control over avoiding those consequences. Perceived personal avoidability of negative consequences was the single strongest predictor of substance abuse symptoms. This finding in itself is a bit surprising because lower perceived avoidability of negative events would normally be expected to cause people to resist becoming involved in the situation in which those negative events may occur. This has been shown to be an important process, inducing some people to avoid academic challenges (Dweck, Chiu, & Hong, 1995). Perhaps the hedonic attraction of alcohol outweighs the perceived unavoidable negative consequences of alcohol overindulgence (Lowenstein, 1996).

[5]A suppressor variable usually has a regression coefficient that is opposite in sign from its zero-order relationship to the dependent variable, and causes some of the other coefficients to increase when it is entered in the regression. This is true of NPD in the present study.

Table 7

Tests of Possible Mediating Role of Personal Avoidability in Substance Abuse

		b	*SE*	Total R^2	ΔR^2	ΔF	*p*
Least squares regression							
Step 1	Gender	1.086	0.587				
	Age	0.304	0.142	.034			
Step 2	Gender	1.045	0.512				
	Age	0.163	0.125				
	PA	-0.916	0.100	.266	.233	83.81	.001
Step 3a	Gender	1.194	0.470				
	Age	0.164	0.115				
	PA	-0.723	0.096				
	BPD	0.080	0.011	.386	.119	51.02	.001
Step 3b	Gender	-0.099	0.469				
	Age	0.199	0.110				
	PA	-0.028	0.004				
	APD	0.240	0.027	.426	.168	78.24	.001
Step 3c	Gender	0.903	0.513				
	Age	0.168	0.124				
	PA	-0.696	0.092				
	NPD	0.049	0.023	.279	.013	4.68	.05
Final model	Gender	0.256	0.455				
	Age	0.191	0.104				
	BPD	0.055	0.013				
	APD	0.257	0.034				
	NPD	-0.116	0.024				
	PA	-0.604	0.088	.499	.090	46.92	.001

		b	*SE*	Type III χ^2	*p*
Tobit regression final model					
	Gender	0.526	0.541	0.94	.33
	Age	0.168	0.121	1.92	.17

(*table continues*)

Table 7 (Continued)

	b	*SE*	Type III χ^2	*p*
BPD	0.063	0.015	18.11	.001
APD	0.278	0.040	47.91	.001
NPD	-0.123	0.029	18.26	.001
PA	-0.753	0.106	50.34	.001

Note. $N = 268$. Dependent variable is Rutgers Collegiate Substance Abuse Screening Test (RCSAST) score. PA = perceived personal avoidability; BPD, APD, and NPD = borderline, antisocial, and narcissistic personality disorders, respectively.

Our results also show that those who perceived the potentially negative consequences of their own alcohol use as less severe were more likely to drink heavily, to report more substance abuse symptoms, and to score high in antisocial personality characteristics. Underestimating the severity of consequences may allow heavy drinkers to concentrate on the hedonic qualities of alcohol. Thus, two key risk perception variables, personal avoidability and personal severity of consequences, could be pulling in opposite directions.

Another interpretation of the negative relationship between perceived personal avoidability of negative consequences and substance use and abuse problems can be based on Bandura's (1990, 1999) social cognitive theory. In this approach, one's past performance influences one's present perception of self-efficacy, which in turn influences future performance. According to this theory, perceived self-efficacy to exercise control over potentially threatening events plays a central role in anxiety arousal (Bandura, 1990). Thus, those who believe that they cannot manage potential threats tend to experience high levels of anxiety. The results of the present study can be interpreted as consistent with this theory in that substance abusers who have previously experienced negative consequences of alcohol use may have a lowered sense of self-efficacy to control such consequences in their future. This would be expected to raise anxiety about social situations involving alcohol. Ironically, this raised anxiety may place people at higher risk of repeating those negative consequences by self-medicating the anxiety with alcohol. According to this interpretation, the negative relationship between perceived personal avoidability and alcohol use and abuse may be simply a reflection of reality for these individuals.

A third interpretation of the relationship between perceived avoidability and substance abuse symptoms might be based on attributional style (Gotlib & Abramson, 1999). For example, someone with a depressive attributional style who has unsafe sex while intoxicated would tend to attribute the event to stable

internal factors (one's own character, as opposed to attributing the negative consequence to poor judgment while under the influence). According to hopelessness theory, such a cognition lowers self-esteem. If negative events (and specifically one's perceived lack of control over these negative events) repeatedly follow alcohol use—and are repeatedly attributed to a stable, internal factor—a learned hopeless cognition may be perpetuated with respect to avoiding either those negative consequences of alcohol use or limiting one's alcohol use. This explanation may apply to those high in borderline characteristics, because BPD is also comorbid with depression.

Borderline and antisocial personality characteristics were both significant predictors of substance abuse symptoms, but showed different relationships to alcohol use per se. These results suggest that these two personality characteristics may be different paths to substance abuse, in a way that is consistent with Cloninger's typology of alcoholism, as outlined in the introduction (Gilligan et al., 1988).

We hypothesized that the comorbidity of BPD with the experience of child abuse would be consistent with lower perceived severity and avoidability of negative events. Higher borderline personality characteristics were related to lower perceived avoidability of the negative consequences of alcohol use, but not perceived severity. However, those higher in borderline personality characteristics tended to perceive social embarrassment as a result of alcohol use as more risky, both to themselves and to college students in general. This was also true for narcissistic personality characteristics. The weak positive relation between risk of social embarrassment and these personality characteristics is consistent with either high social anxiety or a personality that derives a sense of self-worth from external sources. Both of these interpretations are consistent with characteristics of either borderline or narcissistic personality.

It was surprising that perceived avoidability of negative events did not function as a mediator of the relationship between either borderline or antisocial characteristics and substance abuse. Instead, perceived avoidability was a separate contributor from both borderline and antisocial personality characteristics in predicting substance abuse symptoms. This suggests that borderline personality and antisocial characteristics impact substance abuse in ways other than through perceived avoidability.

The finding that perceived personal avoidability of negative consequences is an independent contributor to predicting substance abuse symptoms has important implications for prevention of college substance abuse and tragic campus incidents that result from alcohol intoxication. Although college binge drinking is regarded as a nationwide problem, only a minority of college drinkers start bar fights, are taken to detox facilities or develop substance abuse problems that affect other aspects of their lives. Our results point in two directions for prevention: a focus on who is most likely to develop substance abuse problems, and a

focus on how those individuals perceive the risks of alcohol use. What is new in our results is the insight into college alcohol abuse problems that the data on the risk perception variables provide.

Our study shows that global questions about the riskiness of drinking are unlikely to reveal important differences among college students. First, risk perception measures should distinguish not just avoidability and severity, but also should ask about personal avoidability and severity, rather than asking just about people in general or in a social category such as college students. These distinctions also might be applied in studies of smoking and other health-related behaviors. Second, it may be useful to teach college students about the distinctions among personal and general perceived avoidability and severity. Those who drink more heavily and more frequently perceive drinking hazards as less personally avoidable. For those higher in antisocial characteristics, the consequences are perceived to be less severe. Thus, education about the dangers of alcohol would not be expected to be an effective prevention or treatment strategy unless the severity of the dangers is highly personalized, and strategies for personally avoiding those hazards are included.

Advertising campaigns in college newspapers tout drinking responsibly, but are not explicit about what responsible drinking is, except for having a nondrinking driver. Our data show that perceived personal avoidability of negative consequences is as strongly related to substance abuse symptoms as is heavy drinking per se. Based on our results, we believe that college alcohol education programs could usefully focus on which students are most vulnerable to alcohol abuse, rather than just on heavy drinking. Such programs, often conducted as part of freshman orientation, could include a brief discussion of the relationship of substance abuse to personality characteristics, as well as to the perceived personal avoidability and perceived severity of negative consequences. Students could be informed that perceiving the negative consequences of drinking as personally unavoidable or not severe should be considered "red flags" for substance abuse, especially if such perceptions occur in the presence of antisocial or borderline personality characteristics. Strategies for avoiding negative consequences of alcohol could also be included.

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Appendix

Items From Risk Perception Subscale Scores

Subscale 1: Serious and Life-Threatening Events

Making friends or family suffer
Suffering permanent damage to health or organs (e.g., liver)
Taking other drugs that wouldn't be taken in circumstances when not under the influence
Getting HIV (AIDS)
Being on academic probation because of poor grades
Suffering permanent brain damage
Becoming homeless because of an alcohol or drug habit
Developing an addiction to alcohol or other drugs
Getting in a car accident
Dying
Flunking out of school
Losing a friendship
Getting in a fight

Subscale 2: Sexual Consequences

Having unprotected sex
Having sex that is regretted later
Having unwanted sex
Being forced or forcing someone to have sex

Subscale 3: Social Embarrassment

Losing valuables
Spending more money than would have been spent normally
Having a negative emotional experience
Suffering from an injury because of loss of coordination (e.g., accidents as a result of falling)
Suffering from social embarrassment that otherwise would not have occurred (e.g., crying in public, hurting someone's feelings, earning a poor reputation)

Subscale 4: Routine Consequences/Hangover

Vomiting
Coming down with a cold or flu
Being hung over