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Recommended Citation

LaBrie, J. W., Kenney, S. R., Napper, L. E., & Miller, K. (2014). Impulsivity and Alcohol-Related Risk among College Students: Examining Urgency, Sensation Seeking and the Moderating Influence of Beliefs about Alcohol's Role in the College Experience. *Addictive Behaviors*, 39(1), 10.1016/j.addbeh.2013.09.018.

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Published in final edited form as:

Addict Behav. 2014 January ; 39(1): . doi:10.1016/j.addbeh.2013.09.018.

Impulsivity and Alcohol-Related Risk among College Students: Examining Urgency, Sensation Seeking and the Moderating Influence of Beliefs about Alcohol's Role in the College Experience

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Abstract

The personality trait of impulsivity is predictive of heavy drinking and consequences among college students. The current study examined how impulsivity—measured via positive urgency, negative urgency, and sensation seeking—and a person's beliefs about the role alcohol plays in the college experience relate to drinking and consequences in a sample of 470 college students (mean age = 19 years, 61.3% female, 59.8% white). In support of hypotheses, sensation seeking independently predicted greater drinking, and both positive and negative urgency predicted greater experience of alcohol-related negative consequences after controlling for consumption level. Moreover, alcohol beliefs moderated the relationship between impulsivity types and alcohol outcomes. Among students high (versus low) in sensation seeking, strong beliefs about alcohol's role in college life were related to significantly greater drinking, and among students high (versus low) in negative urgency, endorsing strong beliefs about alcohol's role in college life were related to greater levels of alcohol-related negative consequences. Overall, findings inform college prevention efforts by highlighting the need to distinguish unique facets of impulsivity and examine how they intersect with students' beliefs about alcohol in college.

Keywords

Sensation seeking; Urgency; Impulsivity; College drinking; Alcohol beliefs

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Contributors

Joseph LaBrie, Shannon Kenney, Lucy Napper, and Kevin Miller have each contributed significantly to the preparation of the manuscript. Specifically, Dr. LaBrie oversaw the production of the manuscript, drafted the conclusions, and along with all authors, contributed to editing the manuscript in its entirety. Dr. Kenney assisted with the data analysis, and drafted the Results and Discussion. Dr. Napper drafted the Introduction and portions of the Method. Kevin Miller assisted with the literature review and drafted portions of the Introduction and Method.

Conflict of Interest

All authors declare that they have no conflicts of interest.

1. Introduction

Alcohol misuse among American college students is an ongoing public health problem. Not only is frequent and excessive drinking associated with increased risk for injury, academic problems, unsafe sex, and violence for student drinkers, but these adverse consequences may extend to non-drinking peers and the surrounding community (Hingson, Heeren, Winter, & Wechsler, 2005; Presley & Pimentel, 2006). Identifying specific risk factors for alcohol use and consequences is an essential component of developing effective college prevention programs.

Personality traits, such as neuroticism and extraversion, have been identified as predictors of greater risky behaviors, including heavy drinking and consequences (Cooper, Agocha, & Sheldon, 2000; Martsh & Miller, 1997; Read & O'Connor, 2006). The trait of impulsivity appears to be particularly important for understanding college students' alcohol use, with higher levels of impulsivity consistently related to greater alcohol use and risk (Magid, MacLean, & Colder, 2007; Shin, Hong, & Jeon, 2012). Although impulsivity has been conceptualized in a variety of ways, it generally refers to a tendency to act without thinking, take risks in the pursuit of excitement or new experiences, and an inability to control behaviors and emotions (Whiteside & Lynam, 2001). Impulsivity may best be understood as a multidimensional construct (Cyders & Smith, 2007; Smith et al., 2007; Whiteside & Lynam, 2001), and previous research has noted the need to consider different facets of impulsivity when exploring risk factors for alcohol problems (Curcio & George, 2011; Gonzalez, Reynolds, & Skewes, 2011; Magid et al., 2007; Shin et al., 2012). For instance, impulsivity dimensions of positive urgency (i.e., "the tendency to act rashly or maladaptively in response to positive mood states"; Cyders et al., 2007 p.107), negative urgency (i.e., "tendency to commit rash or regrettable actions as a result of intense negative affect"; Whiteside et al. 2001, p. 677), and sensation seeking (i.e., "tendency to seek excitement and adventure"; Whiteside et al. 2001, p. 677) have divergent relationships with both alcohol use and consequences (Curcio & George, 2011; Cyders, Flory, Rainer, & Smith, 2009; Cyders & Smith, 2008).

Positive and negative urgency have been identified as significant predictors of problematic drinking (Cyders et al., 2007; Fischer, Smith, Annus, & Hendricks, 2007; Settles et al., 2012; Shin et al., 2012). Individuals who report engaging in regrettable actions when in very positive or negative moods are more likely to report negative consequences from drinking. While there is evidence to suggest that urgency is related to drinking (Cyders et al., 2009; Shin et al., 2012), this trait appears to be more closely associated with drinking problems (Curcio & George, 2011). This may reflect that those high in urgency focus on improving immediate mood, rather than the potential negative longer-term consequences of their actions (Cyders et al., 2009). Furthermore, extreme emotions may reduce cognitive resources and lead to poorer decision making (Dick et al., 2010). In the case of negative urgency, although rash actions may be used to avoid negative emotions, these actions can lead to problems, further distress, and more rash actions (Smith et al., 2007). Amongst impulsivity dimensions, negative urgency appears to be among the strongest predictors of the severity of alcohol problems (Adams, Kaiser, Lynam, Charnigo, & Milich, 2012; Curcio & George, 2011; Verdejo-García, Bechara, Recknor, & Pérez-García, 2007).

There is substantial literature documenting the positive relationship between sensation seeking and problematic alcohol use (Adams et al., 2012; Carlson, Johnson, & Jacobs, 2010; Glazer, Smith, Atkin, & Hamel, 2010; Shin et al., 2012; Zuckerman, 1994). Unlike urgency, sensation seeking appears to be more closely associated with frequency of drinking than problem drinking (Curcio & George, 2011; Cyders et al., 2009; Dick et al., 2010; Smith et al., 2007). High levels of alcohol use may reflect sensation seekers' willingness to

experiment with alcohol, motivation to increase arousal, or tendency to seek out social contexts where heavy alcohol use occurs (Carlson et al., 2010; Magid et al., 2007). Unlike those with high urgency, individuals high in sensation seeking may be able to avoid some of the negative consequences of drinking by planning ahead and stopping drinking once they have achieved an optimal level of stimulation (Curcio & George, 2011). Given these findings, when considering the link between impulsivity and alcohol use it is important to consider the role of different facets of impulsivity.

Research has identified several possible moderators of the relationship between impulsivity and alcohol use. For example, Carlson and colleagues (2012) demonstrated that impulsivity was more positively related to the frequency and quantity of alcohol use for those who reported greater positive expectancies. In addition, Cyder and colleagues (2007) found that positive urgency was associated with alcohol problems only for individuals who reported higher levels of enhancement motives or positive alcohol expectancies, but not for those low in these constructs. Similarly, negative urgency was only related to alcohol problems for those high, but not low, on positive expectancies. These findings suggest that student's beliefs about how alcohol affects their emotions and behaviors can influence the impact of impulsivity on alcohol-related behaviors. The current study sought to extend past research by examining whether students' beliefs about the salience of alcohol use in college moderate the relationship between the different facets of impulsivity and drinking outcomes simultaneously.

Students who believe that drinking is an essential part of college tend to drink at higher rates than peers for whom alcohol is not viewed as salient to college life (Crawford & Novak, 2010). Furthermore, students who perceive drinking to be an integral aspect of college also report using fewer protective behavioral strategies for limiting or pacing drinking, and more alcohol-related consequences (Osberg et al., 2010). Osberg and colleagues conceptualize saliency beliefs as a "set of expectancies focused on alcohol's role within the college experience" (p 2). Although Osberg and colleagues found that saliency beliefs were positively correlated with extroversion and negatively correlated with neuroticism, they did not assess whether saliency beliefs moderated the impact of personality traits on drinking, nor did they specifically examine the trait of impulsivity. Gaining a better understanding of how saliency beliefs and impulsivity relate to alcohol consumption and consequences could help better inform alcohol prevention efforts.

The current study examines how impulsivity (positive urgency, negative urgency, and sensation seeking) and a person's beliefs about the role of alcohol in college relate to drinking and consequences. In line with previous research (Curcio & George, 2011; Cyders et al., 2009; Cyders et al., 2007; Smith et al., 2007), we predicted that sensation seeking would predict drinking quantity, negative and positive urgency would predict drinking consequences, and saliency beliefs would predict both drinking quantity and consequences. In addition, we hypothesized that saliency beliefs would moderate the relationship between each impulsivity dimension and drinking and consequences, such that impulsivity would be more strongly associated with alcohol use and harm for participants who viewed alcohol use to be a central component of college life.

2. Method

2.1 Participants

Over two sequential semesters (fall and spring), 470 students from a private, mid-size, university on the west coast (students received class credit in the psychology subject pool) completed online assessments. Students reported a mean age of 19.07 years ($SD = 1.42$) and the sample was 61.3% female. Additionally, 54.7% were freshmen, 27.7% sophomores,

8.6% juniors, and 6.9% seniors. The ethnic composition was varied: 59.8% white, 40.2% non-white (10.5% Asian, 10.3 Hispanic/Latino, 4% African American/Black, .8% Hawaiian/Pacific Islander, .4% Native American/Alaska Native, 14.1% who reported Other/Multiracial backgrounds).

2.2 Procedure

All measures, forms, and procedures were approved by the university's Institutional Review Board. If the student signed up for the current study, research staff sent an email to the student with a study description and a link to an informed consent form. Upon submitting their consent, students were taken to the 30 minute online survey.

2.3 Measures

2.3.1 Alcohol consumption—The Daily Drinking Questionnaire (DDQ, Collins, Parks, & Marlatt, 1985; Dimeff, Baer, Kivlahan, & Marlatt, 1999) was used to measure the number of drinks consumed during a typical week. Participants reported on the typical number of drinks they consumed on each day of the week. Typical weekly drinking was calculated by summing participants' responses to the seven items of daily alcohol use.

2.3.2 Alcohol-related consequences—The Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) was used to assess the number and frequency of occurrences of 23 negative consequences resulting from one's drinking over the past month (e.g., "Went to work or school drunk," "Felt that you needed more alcohol than you used to use in order to get the same effect"). Each item is rated on a 5-point Likert scale with 0 indicating "never" and 4 indicating "more than 10 times" for each item ($\alpha = .90$).

2.3.3 College alcohol beliefs—The College Life Alcohol Salience Scale (CLASS; Osberg et al., 2010) includes 15 items that assess the extent a person believes alcohol is a fundamental part of the college experience (e.g., "To become drunk is a college rite of passage," "A college party is not a true college party without alcohol"). For each item they were asked to respond on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." In Osberg's development and validation of the measure, the alpha was estimated between .90 and .94 in their two samples. In the current study, CLASS had good reliability ($\alpha = .91$).

2.3.4 Impulsivity—The Urgency Premeditation Planning Sensation Seeking Impulsive Behavior Scale – Revised (UPPS-R; Whiteside & Lynam, 2001) is a 45-item measure that assesses negative urgency (12 items), sensation seeking (12 items), (lack of) Premeditation (11 items), and (lack of) Perseverance (10 items). The subscales relevant to the current study were negative urgency (e.g., "I have trouble controlling my impulses," "When I am upset I often act without thinking") and sensation seeking (e.g., "I generally seek new and exciting experiences and sensations," "I quite enjoy taking risks"). Positive urgency (e.g., "I tend to lose control when I am in a great mood," "When I am in a great mood, I tend to get into situations that could cause me problems") was assessed using the 14-item Positive Urgency Measure (PUM; Cyders et al., 2007). Both impulsivity measures use 4-point Likert scales ranging from "agree strongly" to "disagree strongly". Each impulsivity dimension had good internal consistency (negative urgency $\alpha = .88$; sensation seeking $\alpha = .86$; positive urgency $\alpha = .94$).

2.4 Analytic Plan

Prior to analyses, we explored the distributional properties of all variables. Alcohol-related negative consequences was positively skewed and thus was capped at three standard

deviations above the mean (Tabachnick & Fidell, 2013). Bivariate correlations among study variables were examined first. Next, we implemented two hierarchical regression models with drinks per week and alcohol-related negative consequences as the outcome variables. All predictors were standardized prior to computation of interaction terms to avoid statistical artifacts associated with multicollinearity, and no issues with tolerance were encountered (VIFs < 2.35). At step 1, gender (coded as female = 0, male = 1), age, race (coded non-white = 0, white = 1), and Greek status (coded non-Greek = 0, Greek = 1) were entered as independent variables. In the model predicting alcohol-related consequences, typical drinks per week was entered as a control at Step 2. In both models, negative urgency, positive urgency, sensation seeking and college alcohol beliefs (CLASS) were entered next. At the final step, the interactions between the three impulsivity subscales and saliency beliefs were entered into the models. Significant interactions were interpreted and graphed.

3. Results

As shown in Table 1, all study measures were positively intercorrelated at $p < .001$, except for the negative urgency-sensation seeking correlation ($p < .01$). Hierarchical regression models were examined at the final step. In the model predicting drinks per week [$F(11,458) = 18.70, p < .001$], race ($p = .009$), Greek status ($p = .005$), sensation seeking ($p < .001$), college alcohol beliefs ($p < .001$), and Sensation Seeking \times Beliefs ($p = .022$) emerged as significant predictors (Table 2). In the model predicting alcohol-related negative consequences [$F(12,457) = 26.10, p < .001$], Greek status ($p = .017$), weekly drinks ($p < .001$), negative urgency ($p = .002$), positive urgency ($p = .021$), and Negative Urgency \times Beliefs ($p = .015$) predicted alcohol-related consequences (Table 3). The significant interaction effects between sensation seeking and alcohol beliefs, and negative urgency and alcohol beliefs were graphed (Figures 1 and 2) according to established procedures by which variables were plotted at high (one standard above the mean) and low (one standard deviation below the mean) values (Aiken & West, 1991). Interpretation of the graph in Figure 1 indicates that among those participants high in alcohol salience beliefs, higher (as opposed to lower) levels of sensation seeking were associated with significantly greater levels of weekly drinking. While both slopes were significantly greater than zero, those students with higher levels of sensation seeking had significantly steeper increases in drinking as their salience beliefs increased than those low in sensation seeking. In Figure 2, among those high in alcohol salience beliefs, higher (as opposed to lower) levels of negative urgency were associated with substantially more alcohol-related consequences. While simple slopes analysis revealed that both slopes in Figure 2 differed significantly from zero, those students with higher levels of negative urgency had steeper increases in alcohol consequences as their salience beliefs increased.

4. Discussion

In the current study, we explored the relationship between three established dimensions of impulsivity (sensation seeking, negative urgency, positive urgency) and college students' beliefs about the role of alcohol in college on alcohol consumption and consequences. Findings supported hypotheses that sensation seeking would predict drinking and both positive and negative urgency would predict greater experience of alcohol-related negative consequences, even after controlling for drinking. With respect to saliency beliefs, beliefs that alcohol plays a strong role in the college environment were uniquely related to drinking but not to consequences in the two models. Further, we found that alcohol saliency beliefs moderated the relationship between impulsivity and alcohol outcomes. Strong alcohol beliefs, particularly when they co-occurred with high sensation seeking, were associated with greater alcohol consumption. Although alcohol saliency beliefs were not independently predictive of alcohol-related consequences, holding high beliefs and high negative urgency

appears to predispose students to heightened alcohol-related risk. Overall, findings inform college prevention efforts by highlighting the need to distinguish unique facets of impulsivity and examine how they intersect with students' beliefs about alcohol in college.

As noted, students' beliefs that alcohol is central to college life while uniquely predicting their level of consumption, may not predispose them to increased drinking-related risk in and of itself. Rather, these beliefs coupled with high negative urgency appear to substantially increase alcohol-related risk, over and above drinking. Targeted interventions that screen for personality dimensions of negative urgency should not only aim to change predispositions toward rash behaviors, but may benefit from changing students' beliefs about alcohol in college. Given that these students may overestimate the importance of alcohol among peers, social norms-based interventions that communicate college students' actual attitudes toward the role of alcohol in college may help to correct misperceptions. Interactive group interventions that provide students with immediate in-group normative feedback have demonstrated efficacy in correcting students' drinking-related misperceptions (LaBrie, Hummer, Grant, & Lac, 2010; LaBrie, Hummer, Huchting, & Neighbors, 2009; LaBrie, Hummer, Neighbors, & Pedersen, 2008). Potential reductions in alcohol salience, coupled with information highlighting other important aspects of college and alternative social activities on campus, may be valuable.

It is not surprising that students who tend to act impulsively as a result of intense negative affect (i.e., negative urgency) are susceptible to alcohol-related consequences. Overall, students who are motivated to drink in order to cope with negative mood states face heightened risk for alcohol use and problems (Grant, Stewart, & Mohr, 2009). Especially among those students for whom alcohol is highly salient, cognitive-behavioral therapy interventions may help them develop adaptive emotional and behavioral decision-making skills to use while drinking. For example, teaching protective behavioral strategies—finding alternatives to drinking to cope with distress, arranging transportation prior to drinking in order to avoid drinking and driving, trying not to “keep up” with others—may minimize harmful behaviors associated with negative urgency predispositions.

In the current findings, sensation seeking was related to higher levels of drinking, but not alcohol problems. Students high in sensation seeking may thus benefit from campus-based activities that provide needed stimulation for these students. For example, clubs or programs that enable students to engage in a variety of novel and exciting activities (e.g., rock climbing, paintball, kayaking) may provide opportunities to fulfill students' needs that do not involve alcohol (D'Silva, Harrington, Palmgreen, Donohew, & Lorch, 2001).

This study is limited in several ways. First, we relied on students' self-reports and although we assured students of anonymity and enabled them to complete web-based surveys outside of a lab, response bias was possible. Another limitation is that the present findings are based on cross-sectional data and therefore no causal relationship can be determined. Future research would benefit by observing how beliefs change over time, throughout the academic school year for instance. Particularly with respect to harm reduction interventions, establishing the causal relationship between these study variables would be valuable. Finally, the generalizability of these results may be limited by the sample's characteristics (60% White, 63% female, 54% freshmen, West Coast of the United States). Future studies should incorporate large, racially and ethnically diverse samples. Nonetheless this current study affirms that, among college students, different facets of impulsivity are related to drinking and the experiencing of negative consequences as the result of drinking differently. Further, it highlights that in the college environment where many students have beliefs about the central role of alcohol in the overall college experience, sensation seeking and negative

urgency interact with these beliefs about alcohol's saliency to increase both drinking and harms associated with drinking.

Acknowledgments

Role of Funding Sources

This research was funded by Grant R21AA020104-02 from the National Institute on Alcohol Abuse and Alcoholism (NIAAA). The NIAAA had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication. Support for Dr.'s Kenney and Napper was provided by ABMRF/The Foundation for Alcohol Research.

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Highlights

Impulsivity and Alcohol-Related Risk among College Students: Examining Urgency, Sensation Seeking and the Moderating Influence of Beliefs about Alcohol

1. Examines impulsivity and beliefs about the role of alcohol in college.
2. Sensation seeking predicted greater drinking.
3. Positive and negative urgency predicted greater negative consequences.
4. Beliefs about alcohol use in college moderate the effects of impulsivity.

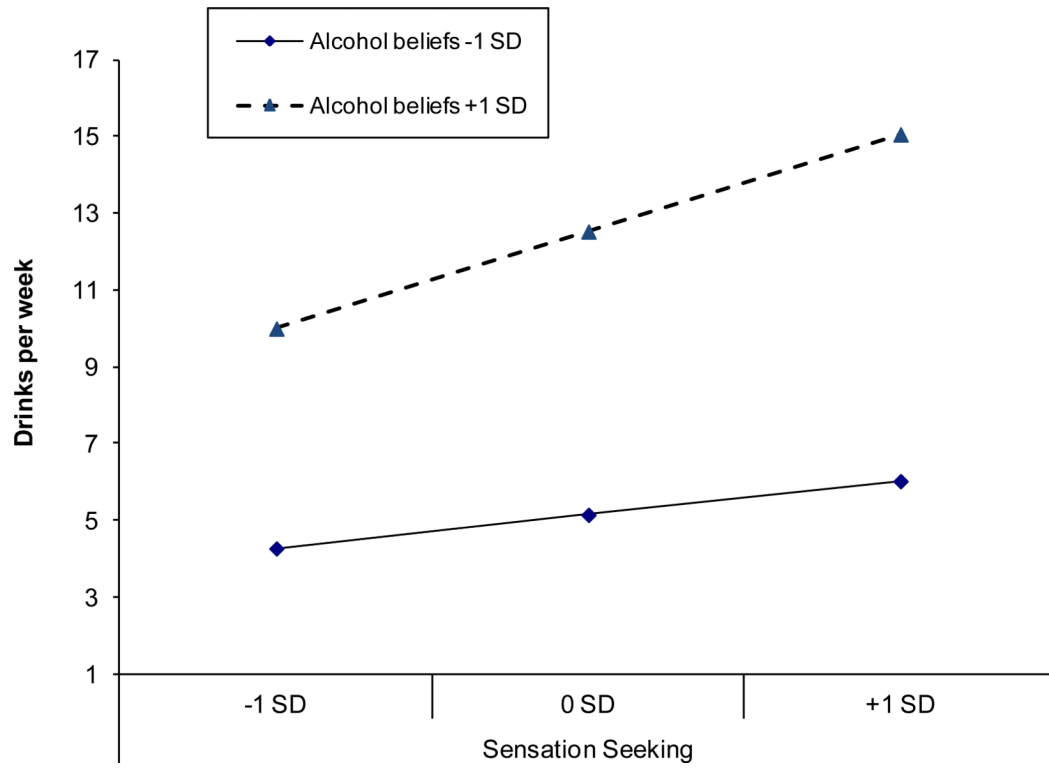


Figure 1. Effect of sensation seeking on drinks per week moderated by alcohol beliefs.

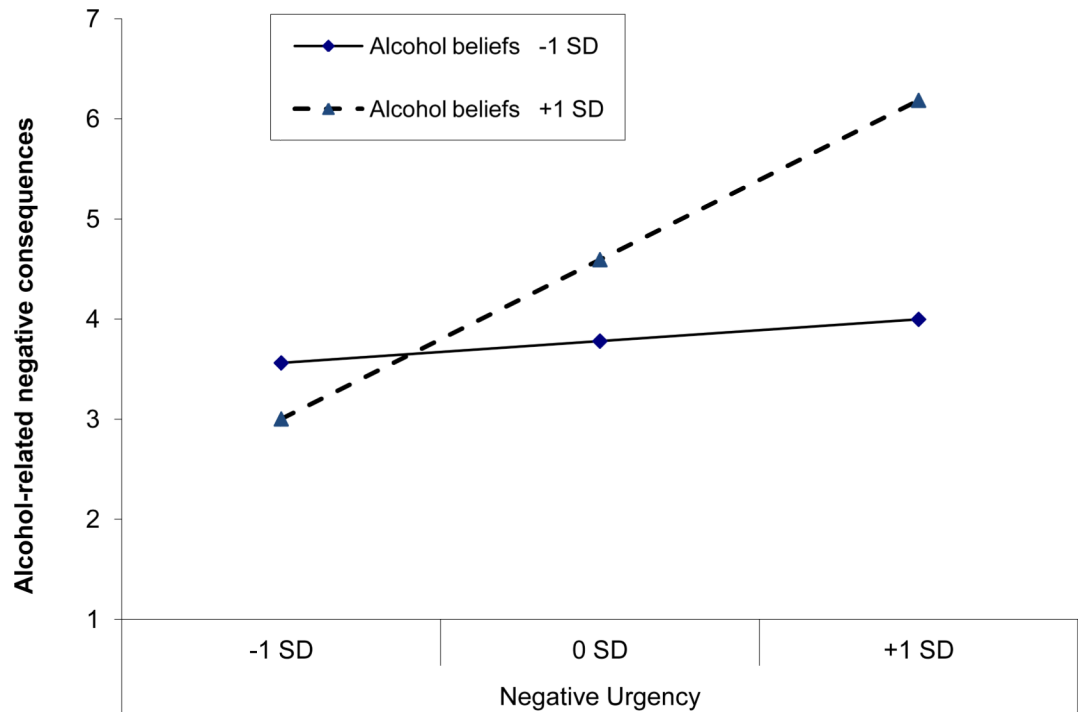


Figure 2. Effect of negative urgency on alcohol-related negative consequences moderated by alcohol beliefs.

Table 1

Correlation Matrix of Variables

Variable	1	2	3	4	5	6
1 Negative urgency	--					
2 Positive urgency	.70 ^{***}	--				
3 Sensation seeking	.13 ^{**}	.24 ^{***}	--			
4 Alcohol beliefs	.31 ^{***}	.32 ^{***}	.30 ^{***}	--		
5 Weekly drinks	.17 ^{***}	.18 ^{***}	.31 ^{***}	.49 ^{***}	--	
6 Negative alcohol-related consequences	.30 ^{***}	.31 ^{***}	.18 ^{***}	.35 ^{***}	.54 ^{***}	--

**
 $p < .01$.

 $p < .001$

Table 2
Hierarchical Multiple Regression Analyses Predicting Drinking From Negative Urgency, Positive Urgency, Sensation Seeking and College Alcohol Beliefs

Step	Variable entered	Step 1 β	Step 2 β	Step 3 β	SE	R ²	Model F	ΔF
1	Gender ^a	.19***	.08*	.07	.41			
	Age	.03	.01	.01	.38			
	Race ^b	.15***	.10**	.11**	.39			
	Greek status ^c	.19***	.11*	.11**	.40	.10	12.32***	
3	Negative urgency		.05	.05	.55			
	Positive urgency		-.01	-.00	.56			
	Sensation seeking		.17***	.18***	.42			
	College alcohol beliefs		.38***	.38***	.44	.30	24.68***	33.59***
4	Negative Urgency \times Beliefs			.04	.54			
	Positive Urgency \times Beliefs			-.10	.54			
	Sensation Seeking \times Beliefs			.10*	.36	.31	18.70***	2.23 [†]

Note. Standard errors are reported for the final step of the regression.

^aFor Gender, female = 0 and male = 1.

^bFor Race, non-white = 0 and white = 1.

^cFor Greek status, non-Greek = 0 and Greek = 1.

[†] $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Hierarchical Multiple Regression Analyses Predicting Alcohol-Related Negative Consequences From Negative Urgency, Positive Urgency, Sensation Seeking and College Alcohol Beliefs.

Table 3

Step	Variable entered	Step 1 β	Step 2 β	Step 3 β	Step 4 β	SE	R ²	Model F	ΔF
1	Gender ^a	0.06	-0.05	-0.04	-0.04	0.21			
	Age	0.00	-0.01	-0.02	-0.01	0.20			
	Race ^b	0.13**	0.05	0.06	0.06	0.21			
	Greek status ^c	0.17***	0.06*	0.08*	0.09*	0.21	0.05	6.27***	
2	Drinks per week		0.54**	0.46***	0.46***	0.24	0.32	43.43***	182.29***
3	Negative urgency			0.15**	0.17**	0.29			
	Positive urgency			0.13*	0.12*	0.29			
	Sensation seeking			-0.01	0.00	0.22			
	College alcohol beliefs			0.07	0.07	0.25	0.40	33.44***	14.59***
4	Negative Urgency \times Beliefs				0.13*	0.28			
	Positive Urgency \times Beliefs				-0.03	0.28			
	Sensation Seeking \times Beliefs				-0.02	0.19	0.41	26.10***	2.86*

Note. Standard errors are reported for the final step of the regression.

^aFor Gender, female = 0 and male = 1.

^bFor Race, non-white = 0 and white = 1.

^cFor Greek status, non-Greek = 0 and Greek = 1.

* $p < .05$.

** $p < .01$.

*** $p < .001$.