Published in final edited form as:

Addict Behav. 2012 February ; 37(2): 217–220. doi:10.1016/j.addbeh.2011.09.013.

Impulsivity and alcohol consumption in young social drinkers

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Abstract

Impulsivity may have different facets that contribute to drinking patterns in young people. This research examined how aspects of impulse control, especially the ability to inhibit a response, predicted recent alcohol use patterns in young social drinkers. Participants ($N = 109$) between the ages of 18 and 21 performed a cued go/no-go task that required quick responses to go targets and the inhibition of responses to no-go targets. Participants also completed several questionnaires that assessed drinking habits (TLFB) and self-reported impulsivity (BIS-11). Regression analyses revealed that both the impulsivity questionnaire scores and the inhibitory failures observed on the behavioral task predicted various aspects of recent drinking. However, only the inhibitory failures from the behavioral task, and not the impulsivity questionnaire scores, predicted the highest number of drinks consumed on one occasion during the past month. These findings are consistent with the notion that impulsivity may have different components that may be contributing the drinking patterns, and this research suggests that the inability to withhold a response is a strong predictor of the binge use of alcohol.

Keywords

alcohol; binge drinking; impulsivity; behavioral control; reaction time

1. Introduction

Underage and binge drinking are serious public health problems (Marczinski et al., 2009; SAMHSA, 2007). Approximately 500,000 college students are injured and 1,700 die each year from an alcohol-related injury (Hingson et al., 2005). Moreover, alcohol-related brain structural and functional abnormalities have been observed in binge drinking adolescents and college students (Hartley et al., 2004; Medina, 2008). Given that the prefrontal cortex (important for impulse control) continues to mature in the early twenties in humans, this region of the brain may be particularly sensitive to intoxicating doses of alcohol (Chambers et al., 2003). Reports of neuropsychological test performance suggest that binge drinking might impact frontal lobe functioning (Goudriaan et al., 2007; Hartley et al., 2004; Scaife & Duka, 2009; Weissenborn & Duka, 2003).

Impulse control is a predisposing factor that might lead an adolescent to try start drinking earlier and then drink more heavily over time (Fox et al., 2010; Papachristou et al., 2011;

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von Diemen et al., 2008). Given that trait impulsivity contributes to drinking initiation and subsequent alcohol exposure leads to further impaired impulse control, a vicious cycle of even greater impulsivity and drinking over time may develop (de Wit, 2009; Volkow et al., 2003). However, impulsivity may be a multifaceted construct (Evenden, 1999; Meda et al., 2009) and different aspects of impulsivity may contribute to drinking patterns (MacKillop et al., 2007). Recent research has suggested that the different facets of impulsivity may uniquely predict different aspects of alcohol use and alcohol problems (Castellanos-Ryan et al., 2011; Curio & George, 2011). As such, making distinctions among different aspects of impulsivity may increase the utility of clinical assessment for alcohol use problems (Smith et al., 2007). Moreover, since the binge use of alcohol appears most damaging to the developing brain (Crews et al., 2000; Hunt, 1993), it would be important to determine what aspect of impulsivity predicts binge alcohol consumption.

Both questionnaire and behavioral task measures of impulsivity can predict alcohol use (MacKillop et al., 2007; Magid et al., 2007). However, one aspect of impulsivity should theoretically predict the aspect of alcohol use that might be most harmful to the developing brain, the number of drinks on an occasion. The ability to inhibit an action is a facet of impulse control that might prevent alcohol abuse by allowing one to stop the action of drinking, once drinking has been initiated. Thus, failures of inhibition may promote excessive or binge drinking as individuals have an inability to stop the behavior (Jones et al., 2010; Marczinski et al., 2007; Weafer & Fillmore, 2008). One task that was developed to assess this aspect of inhibitory control is the cued go/no-go task, which examines the ability to both execute and suppress (i.e., inhibit) responses to go and stop signals (Miller et al., 1991).

Therefore, the purpose of this study was to determine if measures of impulsivity could be used to predict self-reported drinking habits in college students. We hypothesized that the aspect of impulse control, the ability to inhibit a response, would uniquely predict drinking related to the binge use of alcohol, as measured by the highest number of drinks consumed on one occasion. We also wished to compare task and questionnaire scores using a dichotomized sample of binge versus non-binge drinkers to determine if binge drinkers exhibited poorer impulse control compared to moderate social drinkers.

2. Material and Methods

2.1. Participants

109 young adults (46 men), ages 18–21 years, participated in this study. Participants were recruited from the undergraduate psychology research pool. The mean age (*SD*) for the sample was 19.6 (1.1) and included 92 Caucasian, 12 African American, three Asian, and two other participants. Individuals with self-reported seizures, head injuries, or colorblindness were excluded from the study. All participants provided informed consent and the study was approved by the university's IRB.

2.2. Materials

2.2.1. TimeLine Follow-Back (TLFB)—The TLFB is a self-report measure of participants' alcohol use within the past 30 days. Using a calendar, participants indicate the number of drinks consumed each day over the past month. Measures include: (1) maximum number continuous days of drinking, (2) maximum number continuous days of abstinence, (3) total number of drinking days, (4) total number of drinks consumed, (5) highest number of drinks consumed in 1 day, (6) total number of heavy drinking (5+ drinks) days, and (7) total number of "drunk" days (Sobell & Sobell, 1992).

2.2.2. Personal Drinking Habits Questionnaire (PDHQ)—The PDHQ queries participants' typical drinking experiences. This questionnaire measures the participant's (1) customary number of standard drinks, (2) weekly frequency of drinking, and (3) the hourly duration of the participant's typical drinking occasion (Vogel-Sprott, 1992). Information provided can be used to calculate the customary alcohol dose (i.e., ml abs. alcohol/kg). In addition, estimated peak blood alcohol concentration (BAC) achieved in a typical drinking episode was calculated using the updated Widmark equation (Watson et al., 1981). The peak BAC was used to dichotomize our participants as binge and non-binge drinkers, consistent with the NIAAA definition whereby "binge" is considered a pattern of drinking alcohol that brings BAC to .08 g% or above (NIAAA, 2004). Peak BAC was .08g% or greater for binge drinkers and below .08 g% for non-binge drinkers in this study.

2.2.3. Barratt Impulsiveness Scale (BIS-11)—This 30-item self-report instrument assesses the personality dimension of impulsivity (Patton et al., 1995). Participants rate statements on a 4-point Likert scale ranging from *rarely/never* to *almost always/always*. The higher the summed score, the higher self-reported level of impulsivity (total scores range from 30–120).

2.2.4. Cued Go/No-Go Task—Inhibitory control was measured by the cued go/no-go reaction time task (Marczyński & Fillmore, 2003) operated on a PC by using E-Prime experiment generation software (Schneider et al., 2002). A trial involved the following sequence of events: (1) 800 ms fixation point; (2) 500 ms blank white screen; (3) a cue, displayed for one of five stimulus onset asynchronies, and required no response; (4) a go or no-go target, visible until a response occurred or 1,000 ms elapsed; and (5) 700 ms intertrial interval. The cue (which was a rectangle presented in either a horizontal or vertical orientation) lead participants to anticipate the type of target that might follow, with a horizontal cue signaling a go target 80% of the time and a vertical cue signaling a no-go target 80% of the time. As such, 20% of the time, participants were unprepared for the target that was presented (i.e., horizontal cue followed by no-go target or vertical cue followed by go target). Participants were instructed to press the forward slash (/) key on the keyboard as soon as the rectangle filled with green (go target) and to not respond if the rectangle filled with blue (no-go target). A 500 trial test presented the four possible cue-target combinations and took approximately 25 minutes to complete.

2.3. Procedure

Upon entering the laboratory, participants provided informed consent, were weighed, and completed the questionnaires (BIS-11, TLFB, and PDHQ). Then, participants were asked to complete the cued go/no-go task on a laptop computer. Instructions emphasized that responses should be made as quickly as possible, without compromising accuracy. Upon completion of the study, participants were awarded partial course credit.

2.4. Criterion Measures and Data Analyses

Failures of response inhibition were measured as the proportion of no-go targets in which a participant failed to inhibit a response, calculated separately for each cue condition (valid no-go and invalid go). The measure of interest was the p-inhibition failure score in the go cue (i.e., prepotent) condition, which occurred 20% of the time (Marczyński & Fillmore, 2003), with higher scores indicate poorer inhibitory control. Speed of response execution was measured by the mean reaction time (RT) to go targets and was calculated for each cue condition (valid go and invalid no-go). Factorial ANOVAs were used to examine the effects of gender and binge drinking status for all measures. Multiple regression analyses using a similar set of predictors tested the hypothesis that impulsivity measures from both the cued go/no-go task and the BIS-11 would predict self-reported drinking behaviors from the

TLFB. Gender and history of drinking were included in the model, given that these variables are known to predict drinking among college students (Dawson et al., 2008; Murphy & Garavan, 2011). In addition, the mean RT to go targets was also included in the model to clarify that results were not just due to speed-accuracy trade-offs. Alpha level was set at .05 and SPSS 17.0 was used to conduct analyses.

3. Results

3.1. Demographic characteristics, questionnaire response and behavioral data

Table 1 presents the participants' demographic characteristics, questionnaire responses and behavioral task data for all participants. Twenty-five individuals (20 females) did not report alcohol use in the past 30 days on the TLFB. All variables were submitted to 2(Gender) x 2(Binge Status) factorial ANOVA. Binge drinkers drank more alcohol and with greater frequency, compared to the non-binge drinkers, $ps < .05$ (see Table 1). Regarding the impulsivity measures from the BIS-11 and the cued go/no-go task, there were no main effects or interactions involving binge status for any of the measures, $ps > .05$.

3.2. Regression Analyses

Table 2 reports the results of separate multiple regression analyses conducted to evaluate how the impulsivity measures would predict various aspects of alcohol consumption from the TLFB. For all analyses, predictors included gender, history of drinking from the PDHQ (in months), BIS-11 total score, p-inhibition failures and mean RT. When the criterion variable was the total number of drinks consumed, the regression was significant, $F(5,103) = 10.32$, $p < .001$, with all variables except RT as significant predictors, $ps < .05$. There were significant positive correlations between the total number of drinks consumed and p-inhibition failures, $r(108) = .22$, $p < .05$, and between the total number of drinks consumed and BIS-11 total scores, $r(108) = .22$, $p < .05$. When the criterion variable was the total number of heavy drinking days (5 or more drinks) during the past 30 days, the regression was significant, $F(5,103) = 9.37$, $p < .001$, with all variables except RT as significant predictors, $ps < .05$. There were significant positive correlations between the number of heavy drinking days and p-inhibition failures, $r(108) = .23$, $p < .05$, and between the number of heavy drinking days and BIS-11 total scores, $r(108) = .21$, $p < .05$. When the criterion variable was the total number of drunk days, the regression was significant, $F(5,103) = 9.75$, $p < .001$, with gender and BIS-11 as significant predictors, $ps < .05$. There was a significant positive correlation between the number of drunk days and BIS-11 total scores, $r(108) = .31$, $p < .01$, but only a trend for a correlation between the number of drunk days and p-inhibition failures, $r(108) = .19$, $p = .054$. Finally, when the criterion variable was the highest number of drinks consumed in one day, the regression was significant, $F(5,103) = 7.33$, $p < .001$, with gender, history of drinking, and p-inhibition failures as significant predictors, $ps < .05$. There was a significant positive correlation between the highest number of drinks consumed in one day and p-inhibition failures, $r(108) = .24$, $p < .05$, but no correlation between the highest number of drinks consumed in one day and BIS-11 total scores, $r(108) = .14$, $p > .16$.

4. Discussion

The purpose of this study was to determine if measures of impulsivity could be used to predict self-reported drinking habits in a sample of young college students. Our hypothesis was that failures to inhibit a response, as measured by the cued go/no-go task, would uniquely predict the binge use of alcohol, as measured by the highest number of drinks consumed on one occasion. Our results indicate that impulsivity (as measured by a behavioral task and by a questionnaire) predicted self-reported alcohol consumption patterns

from the past month. Moreover, the inability to inhibit a response (as measured by only the cued go/no-go task and not the BIS-11) predicted the highest number of drinks consumed on one occasion. Thus, our results are consistent with the notion that impulsivity may be multi-faceted (Evenden, 1999; Meda et al., 2009), and that the inability to withhold a response predicts the binge consumption of alcohol. It is notable that the questionnaire measure of impulsivity did not predict this aspect of drinking, since questionnaire measures of impulsivity are often used to identify individuals who are at-risk for alcohol abuse and dependence problems (Charney et al., 2010).

We did not find that our binge and non-binge drinkers were significantly different from one another for the questionnaire and task measures of impulsivity, despite a reasonable sample size. It remains controversial whether binge drinking impairs neurocognitive functioning related to impulse control. While previous work has established that binge drinkers display greater impulsivity on both cognitive tasks and questionnaires (Townshend & Duka, 2005), we did not observe this difference. Perhaps if we had used more extreme drinkers including those clinically diagnosed with an alcohol use disorder, we may have uncovered such a difference. However, it is notable that other studies have also reported no differences in neurocognitive dysfunction when participants were divided based on binge status (Parsons & Nixon, 1998; Rose & Grunsell, 2008).

There are a variety of environmental, social and psychological variables that lead to binge drinking in young people. This research highlights that an aspect of impulsivity, the inability to inhibit responses, may be key in identifying individuals who are most at risk for drinking in an extreme fashion. Identifying those at-risk individuals who have difficulty inhibiting responses could limit future harm associated with alcohol use.

References

- Castellanos-Ryan N, Rubia K, Conrod PJ. Response inhibition and reward response bias mediate the predictive relationships between impulsivity and sensation seeking and common and unique variance in conduct disorder and substance misuse. *Alcoholism: Clinical and Experimental Research*. 2011; 35:140–155.
- Chambers RA, Taylor JR, Potenza MN. Developmental neurocircuitry of motivation in adolescence: a critical period of addiction vulnerability. *American Journal of Psychiatry*. 2003; 160:1041–1052. [PubMed: 12777258]
- Charney DA, Zikos E, Gill KJ. Early recovery from alcohol dependence: factors that promote or impede abstinence. *Journal of Substance Abuse Treatment*. 2010; 38:42–50. [PubMed: 19632079]
- Crews FT, Braun CJ, Hoplight B, Switzer RC III, Knapp DJ. Binge ethanol consumption causes differential brain damage in young adolescent rats compared with adult rats. *Alcoholism: Clinical and Experimental Research*. 2000; 24:1712–1723.
- Curcio AL, George AM. Selected impulsivity facets with alcohol use/problems: the mediating role of drinking motives. *Addictive Behaviors*. 2011; 36:959–964. [PubMed: 21665369]
- Dawson DA, Goldstein RB, Chou SP, Ruan WJ, Grant BF. Age of first drink and the first incidence of adult-onset DSM-IV alcohol use disorders. *Alcoholism: Clinical and Experimental Research*. 2008; 32:2149–2160.
- de Wit H. Impulsivity as a determinant and consequence of drug use: a review of underlying processes. *Addiction Biology*. 2009; 14:22–31. [PubMed: 18855805]
- Evenden JL. Varieties of impulsivity. *Psychopharmacology*. 1999; 16:123–128.
- Fox HC, Bergquist KL, Gu P, Sinha R. Interactive effects of cumulative stress and impulsivity on alcohol consumption. *Alcoholism: Clinical and Experimental Research*. 2010; 34:1376–1385.
- Goudriaan AE, Grekin ER, Sher KJ. Decision making and binge drinking: A longitudinal study. *Alcoholism: Clinical and Experimental Research*. 2007; 31:928–938.
- Hartley DE, Elsabagh S, File SE. Binge drinking and sex: Effects of mood and cognitive function in healthy young volunteers. *Pharmacology, Biochemistry and Behavior*. 2004; 78:611–619.

- Hingson R, Heeren T, Winter M, Wechsler H. Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18–24: Changes from 1998 to 2001. *Annual Review of Public Health*. 2005; 26:259–279.
- Hunt WA. Are binge drinkers more at risk of developing brain damage? *Alcohol*. 1993; 10(6):559–61. [PubMed: 8123218]
- Jones A, Guerrieri R, Fernie G, Cole J, Goudie A, Field M. The effects of priming restrained versus disinhibited behaviour on alcohol-seeking in social drinkers. *Drug and Alcohol Dependence*. 2011; 113:55–61. [PubMed: 20724083]
- MacKillop J, Mattson RE, Anderson MacKillop EJ, Castelda BA, Donovan PJ. Multidimensional assessment of impulsivity in undergraduate hazardous drinkers and controls. *Journal of Studies on Alcohol and Drugs*. 2007; 68:785–788. [PubMed: 17960295]
- Magid V, MacLean MG, Colder CR. Differentiating between sensation seeking and impulsivity through their mediated relations with alcohol use and problems. *Addictive Behaviors*. 2007; 32:2046–2061. [PubMed: 17331658]
- Marczynski CA, Combs SW, Fillmore MT. Increased sensitivity to the disinhibited effects of alcohol in binge drinkers. *Psychology of Addictive Behaviors*. 2007; 21:346–354. [PubMed: 17874885]
- Marczynski, CA.; Grant, EC.; Grant, VJ. Binge drinking in adolescents and college students. Hauppauge, NY: Nova Science; 2009.
- Marczynski CA, Fillmore MT. Pre-response cues reduce the impairing effects of alcohol on the execution and suppression of responses. *Experimental and Clinical Psychopharmacology*. 2003; 11:110–117. [PubMed: 12622349]
- Meda SA, Stevens MC, Potenza MN, Pittman B, Gueorguieva R, Andrews MM, Thomas AD, Muska C, Hylton JL, Pearson GD. Investigating the behavioral and self-report constructs of impulsivity domains using principal component analysis. *Behavioral Pharmacology*. 2009; 20:390–399.
- Medina KL, McQueeney T, Nagel BJ, Hanson KL, Schweinsburg AD, Tapert SF. Prefrontal cortex volumes in adolescents with alcohol use disorders: unique gender effects. *Alcoholism: Clinical and Experimental Research*. 2008; 32:386–394.
- Miller J, Schaffer R, Hackley SA. Effects of preliminary information in a go versus no-go task. *Acta Psychologica*. 1991; 76:241–292. [PubMed: 1927576]
- Murphy P, Garavan H. Cognitive predictors of problem drinking and AUDIT scores among college students. *Drug and Alcohol Dependence*. 2011; 115:94–100. [PubMed: 21145183]
- National Institute on Alcohol Abuse and Alcoholism. NIAAA approves definition of binge drinking. *Newsletter*. 2004 Winter;3:3.
- Papachristou H, Nederkoorn C, Havermans R, van der Horst M, Jansen A. Can't stop the craving: The effect of impulsivity on cue-elicited craving for alcohol in heavy and light social drinkers. *Psychopharmacology*. 2011 in press.
- Parsons OA, Nixon SJ. Cognitive functioning in sober social drinkers: A review of the research since 1986. *Journal of Studies on Alcohol*. 1998; 59
- Patton JH, Stanford MS, Barratt ES. Factor structure of the Barratt Impulsiveness Scale. *Journal of Clinical Psychology*. 1995; 51:768–774. [PubMed: 8778124]
- Rose AK, Grunsell L. The subjective, rather than the disinhibiting, effects of alcohol are related to binge drinking. *Alcoholism: Clinical and Experimental Research*. 2008; 32:1096–1104.
- Scaife JC, Duka T. Behavioural measures of frontal lobe function in a population of young social drinkers with binge drinking pattern. *Pharmacology, Biochemistry and Behavior*. 2009; 93:354–362.
- Schneider, W.; Eschman, A.; Zuccolotto, A. E-prime reference guide. Psychology Software Tools, Inc; 2002.
- Smith GT, Fischer C, Cyders MA, Annus AM, Spillane NS, McCarthy DM. On the validity and utility of discriminating among impulsivity-like traits. *Assessment*. 2007; 14:155–170. [PubMed: 17504888]
- Sobell, L.; Sobell, M. Timeline follow-back: A technique for assessing self-reported alcohol consumption. In: Litten, R.; Allen, J., editors. *Measuring alcohol consumption: Psychosocial and biochemical methods*. Totowa, NJ: Humana Press; 1992. p. 41-72.

- Substance Abuse and Mental Health Services Administration (SAMHSA). Results from the 2006 National Survey on Drug Use and Health: National Findings. Rockville, MD: SAMHSA Office of Applied Statistics; 2007. retrieved October 15, 2008, from <http://www.oas.samhsa.gov>
- Townshend JM, Duka T. Binge drinking, cognitive performance and mood population of young social drinkers. *Alcoholism: Clinical and Experimental Research*. 2005; 29:317–325.
- Vogel-Sprott, M. Alcohol tolerance and social drinking: Learning the consequences. New York: Guilford; 1992.
- Volkow ND, Fowler JS, Wang GJ. The addicted human brain: Insights from imaging studies. *Journal of Clinical Investigation*. 2003; 111:1444–1451. [PubMed: 12750391]
- von Diemen L, Bassani DG, Fuchs SC, Szobot CM, Pechansky F. Impulsivity, age of first alcohol use and substance use disorders among male adolescents: a population based case-control study. *Addiction*. 2008; 103:1198–1205. [PubMed: 18494839]
- Watson PE, Watson ID, Batt RD. Prediction of blood alcohol concentration in human subjects: Updating the Widmark equation. *Journal of Studies on Alcohol*. 1981; 42:547–556. [PubMed: 7289599]
- Weafer J, Fillmore MT. Individual differences in acute alcohol impairment of inhibitory control predict ad libitum alcohol consumption. *Psychopharmacology*. 2008; 201:315–324. [PubMed: 18758758]
- Weissenborn R, Duka T. Acute alcohol effects on cognitive function in social drinkers: Their relationship to drinking habits. *Psychopharmacology*. 2003; 165:306–312. [PubMed: 12439627]

Highlights

- Binge drinking in young people may harm still-developing brain structures, including areas critical for impulse control.
- This research examined the relationship between questionnaire and behavioral task measures of impulsivity and recent alcohol use patterns young social drinkers.
- Results revealed that impulsivity, gender, and history of drinking predicted self-reported alcohol consumption patterns from the previous month.
- Only inhibitory failures from the behavioral task, and not the impulsivity questionnaire scores, predicted the highest number of drinks consumed on one occasion during the past month.
- Impulsivity may have different facets and the inability to withhold a response may be a unique predictor of the binge use of alcohol.

Table 1

Mean demographic, questionnaire and cued go/no-go task measures for male and female binge and non-binge drinkers.

Variable	Binge drinkers (N = 40)				Non-Binge Drinkers (N = 69)				Binge	Gender	Interaction
	Males (N = 20)		Females (N = 20)		Males (N = 26)		Females (N = 43)				
	M	SD	M	SD	M	SD	M	SD			
Age (years)	19.70	1.17	19.30	.92	20.04	1.04	19.35	1.11	NS	.013	NS
Weight (kg)	75.35	13.69	63.61	10.25	79.02	16.48	72.96	17.20	.037	.005	NS
History (months of regular drinking)	43.10	21.56	41.50	14.00	37.12	26.47	36.30	25.98	NS	NS	NS
Customary dose (ml/kg)	1.94	.78	1.78	.71	.93	.70	.88	.52	<.001	NS	NS
Weekly frequency	1.59	.97	.95	.71	1.05	.96	.67	.83	.021	.005	NS
Duration (h)	4.30	2.23	4.15	1.35	3.05	2.45	3.96	2.43	NS	NS	NS
Timeline follow-back (past 30 days)											
Continuous days of drinking	1.75	.85	1.30	.98	2.04	3.53	1.05	1.07	NS	NS	NS
Continuous days of abstinence	8.20	5.75	14.80	8.40	13.54	8.90	19.77	9.53	.004	<.001	NS
Total number of drinking days	6.60	4.12	3.70	2.79	5.35	6.40	2.70	3.04	NS	.002	NS
Total number of drinks	60.25	49.22	23.10	23.66	22.69	30.06	10.70	16.18	<.001	<.001	.035
Highest number of drinks in one day	12.98	8.86	7.70	5.19	5.35	4.83	3.70	4.72	<.001	.004	NS
Heavy drinking (5+) days	5.25	3.68	2.80	2.50	1.58	2.40	.95	1.76	<.001	.003	NS
Drunk days	4.75	4.13	2.20	2.07	1.42	2.04	.79	1.25	<.001	.001	.044
BIS-11 Total Score	56.80	8.62	52.70	6.99	54.77	9.72	52.86	7.99	NS	NS	NS
Cued Go/No-go Task											
p-Inhibition Failures following invalid go cue	.08	.10	.06	.07	.07	.07	.05	.06	NS	NS	NS
p-Inhibition Failures following valid no-go cue	.03	.04	.03	.02	.04	.04	.02	.02	NS	.014	NS
Mean RT (ms) following invalid no-go cue	296.96	21.50	313.96	28.93	306.92	30.30	320.10	51.76	NS	NS	NS
Mean RT (ms) following valid go cue	280.81	23.34	296.96	30.40	293.25	27.64	298.52	22.88	NS	.040	NS

Table 2

Multiple regression analyses conducted to predict the total number of drinks consumed, highest number of drinks consumed, total number of heavy drinking days, and total number of drunk days in the past 30 days from the Timeline Follow-back questionnaire.

Variable	B	SE B	β	t	p
<i>Criterion: Total number of drinks</i>					
Gender	-.19.294	5.772	-.282	-3.343	.001
History (months)	.562	.117	.389	4.819	<.001
BIS total score	.700	.337	.174	2.078	.040
P-inhibition failures	-89.720	37.948	-.196	-2.364	.020
Mean RT	-.005	.073	-.006	-.066	NS
<i>Criterion: Number of heavy drinking days</i>					
Gender	-1.150	.505	-.195	-2.277	.025
History (months)	.051	.010	.413	5.040	<.001
BIS total score	.062	.029	.178	2.092	.039
P-inhibition failures	-8.745	3.321	-.221	-2.633	.010
Mean RT	-.001	.006	-.017	-.194	NS
<i>Criterion: Number of drunk days</i>					
Gender	-1.080	.467	-.197	-2.312	.023
History (months)	.043	.009	.373	1.578	<.001
BIS total score	.092	.027	.285	3.373	.001
P-inhibition failures	-5.804	3.071	-.158	-1.890	.062
Mean RT	-.005	.006	-.077	-.895	NS
<i>Criterion: Highest number of drinks</i>					
Gender	-2.755	1.190	-.206	-2.315	.023
History (months)	.105	.024	.370	4.357	<.001
BIS total score	.081	.069	.103	1.168	NS
P-inhibition failures	-20.253	7.823	-.225	-2.589	.011
Mean RT	-.004	.015	-.025	-.278	NS

Notes. N=109. Total number of drinks, $R^2 = .334$; highest number of drinks, $R^2 = .263$; heavy drinking days, $R^2 = .313$; drunk days, $R^2 = .321$.