Impaired Control and Undergraduate Problem Drinking

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Abstract

Aims—Impaired control, one of the hallmarks of addiction, is also one of the earliest dependence symptoms to develop. Thus impaired control is particularly relevant to undergraduates and other young adults with relatively brief drinking histories. The main goal of this study was to determine whether impaired control predicted heavy episodic drinking and alcohol-related problems cross-sectionally in an undergraduate sample after controlling for gender, family history of alcohol and drug problems and several other established predictor variables from the undergraduate alcohol literature.

Methods—A sample of first-year undergraduates ($N = 312$) completed Part 2 of the Impaired Control Scale (ICS; Heather *et al.*, 1993) and other measures related to alcohol use as part of a larger study on problem drinking in undergraduates.

Results—Scores on Part 2 of the ICS predicted heavy episodic drinking and alcohol-related problems cross-sectionally even after controlling for all other predictor variables. Notably, impaired control was a stronger predictor of alcohol-related problems than overall weekly alcohol consumption. Part 2 of the ICS was found to be a reliable and valid measure for use with undergraduates.

Conclusions—These findings support the notion that impaired control is one of the earliest dependence symptoms to develop. The ICS is an effective tool for identifying young adults at risk for problem drinking.

Keywords

Impaired control; undergraduate drinking; alcohol-related problems; heavy episodic drinking

INTRODUCTION

Impairment of control—defined as "a breakdown of an intention to limit consumption in a particular situation" (Heather *et al.*, 1993, p. 701)—has long been recognized as one of the hallmarks of addiction (Levine, 1978). The centrality of impaired control is reflected in two of the criteria for substance dependence in the fourth edition of the Diagnostic and Statistical Manual (DSM-IV): "The substance is often taken in larger amounts or over a longer period than was intended" and "There is a persistent desire or unsuccessful efforts to cut down or control substance use" (APA, 1994, p. 181). Impaired control is not only an important element of addiction in general, it is of particular relevance to young adults and others with relatively brief drinking histories given its early emergence. Heavy drinking adolescents often report

impaired control, as have adults with problem drinking histories who were asked to recount which of their dependence symptoms developed the earliest (Chick and Duffy, 1979; Langenbucher and Chung, 1995). This is in contrast with DSM-IV dependence criteria like withdrawal and alcohol-induced physical or psychological problems (APA, 1994), which typically require lengthy drinking histories and are rarely reported by adolescents (Martin *et al.*, 1996; Winters *et al.*, 1999).

The high prevalence of reports of impaired control by young adults with relatively brief drinking histories and by those who do not drink excessively has raised concerns about the validity of impaired control as an aspect of addiction (Caetano, 1999; Chung and Martin, 2002; 2005). Caetano analyzed reasons for endorsing impaired control provided by adults in a national survey and found that endorsement of social reasons was very common, while enhancement (i.e., wanting to experience alcohol's positive effects) reasons, coping reasons and drinking in response to stress were also reported. Based on these findings, Caetano expressed a concern that for some respondents, endorsement of impaired control may reflect normative drinking for social or other purposes and not compulsive alcohol use. Given these concerns about validity, it is important to consider impaired control as a predictor of problem drinking above and beyond other contributing factors such as social and coping motives.

While impaired control is at the heart of addiction, DSM-IV dependence criteria like withdrawal and physical or psychological problems are likely consequences of problem drinking rather than core elements of the problem itself. By the time drinkers manifest late developing symptoms, they have likely been excessive drinkers for several years and are severely addicted. Because withdrawal increases vulnerability to relapse (Witkiewicz and Marlatt, 2004), treatment becomes more challenging once patients reach this stage. Despite advances in treatment, 40–60% of patients treated for substance use disorders return to active use within one year (McLellan *et al.*, 2000). By identifying current and future high-risk drinkers, those in need can be treated before they become severely addicted or face serious adverse consequences. A consideration of impaired control may facilitate the early identification of those at high risk.

Heather and colleagues' (1993) Impaired Control Scale (ICS) is a reliable and valid instrument that has been significantly correlated with measures of alcohol-related problems and dependence among drinkers in treatment and has been found to successfully predict treatment outcomes (Heather *et al.*, 1998; Heather and Dawe, 2005). ICS items are measured continuously, based on the assumption that "impaired control is present to a variable degree throughout the population of regular drinkers" (Heather *et al.*, 1998, p. 762). The ICS consists of three parts assessing the frequency of intentions to limit drinking in the past six months (Part 1); the frequency of failures at controlling drinking in the past six months (Part 2) and beliefs regarding ability to control drinking in the future (Part 3).

As an important component of addiction that emerges relatively early, impaired control, may be particularly relevant to undergraduates, many of whom are heavy drinkers, both in the U. S. (Wechsler *et al.*, 2000) and in other countries (e.g., New Zealand; Kypri *et al.*, 2005) Undergraduates in the U. S. have relatively high incidence of dependence and abuse (Knight *et al.*, 2002) despite their brief drinking histories. Nagoshi has found Part 3 of the ICS to be reliable for use with undergraduates (Nagoshi, 1999). With respect to validity in this population, Nagoshi, Patock-Peckham and colleagues have consistently found Part 3 scores to be significantly correlated with both alcohol use and alcohol-related problems (Patock-Peckham *et al.*, 1998; Nagoshi, 1999; Patock-Peckham *et al.*, 2001; Patock-Peckham and Morgan-Lopez, 2006). In these studies, Part 3 scores were found to be predictive of problem drinking in cross-sectional models while controlling for a number of different variables. Nagoshi showed that after controlling for gender, age, impulsivity, venturesomeness,

depression, irrational beliefs, alcohol norms and expectancies and reasons for drinking, Part 3 scores significantly predicted alcohol-related problems but not alcohol consumption. Patock-Peckham and colleagues found that Part 3 score was significantly associated with both alcohol use and related problems in a model above and beyond parental rearing style and self-regulation (2001) and in a separate report, above and beyond parental rearing style and impulsiveness (Patock-Peckham and Morgan-Lopez, 2006).

Part 2 of the ICS was used instead of Part 3 in the present study. Prior research in adult samples has indicated that both Part 2 and 3 are significantly correlated with measures of alcohol dependence (Heather *et al.*, 1993; 1998; Marsh *et al.*, 2002). The use of Part 2, assessing past control behavior, appeared to be more appropriate than the use of Part 3 for the purposes of the present study for two main reasons. One, our goal was to concurrently predict reports of problem drinking in participants' recent past, thus we felt that Part 2, which also assesses reports of past behavior, would be a more valid predictor. A second related reason was that Part 2 more closely resembles the impaired control items that are part of the DSM-IV criteria for dependence, which also relate to participants' reports of their prior behavior. We also believed Part 2 would be more relevant than Part 1 for use with an undergraduate sample given the lack of interest in actively limiting drinking among this population (Dimeff *et al.*, 1999).

We aimed to further establish the validity of impaired control as a predictor of problem drinking among undergraduates. In response to Chung and Martin's (2002, 2005) concerns about the validity of impaired control among young adults and Caetano's (1999) findings suggesting several potential confounding variables for impaired control, social factors (i.e., intensity of best friend's drinking and social motives for drinking), stressful life events, enhancement and coping motives were all included as predictor variables in the present study. Gender, family history and sensation seeking were also included as predictor variables.

It is well established that drinking to cope with negative affect is associated with alcohol-related problems among young adults (Kuntsche et al., 2005) and increased risk of dependence among adults (Carpenter and Hasin, 1999). Stressful events are common sources of negative affect, which may lead to drinking for self-medication purposes (Miranda *et al.*, 2002). It is possible that frequent alcohol consumption for negative reinforcement purposes may eventually lead to an over-reliance upon alcohol and eventually to difficulties in controlling alcohol intake. Accordingly, Nagoshi (1999) reported a significant correlation between a measure of drinking for compulsive/self-medication purposes and weaker perceived control over drinking, as measured by Part 3 of the ICS.

Enhancement motives have been associated with sensation seeking and with difficulties in inhibitory control over behavior (Kuntsche et al., 2006). It is possible that impaired control of alcohol consumption could be an aspect of a general problem with inhibitory control for some young adults. While this possibility has not been well explored in the literature, undergraduates high on impulsiveness have reported weaker perceived control over their drinking as measured by Part 3 of the ICS (Patock-Peckham and Morgan-Lopez, 2006).

Social motives are typically considered to be less problematic than either coping or enhancement motives (Kuntsche et al., 2005). However, significant correlations between a measure of celebratory motives for drinking and weaker beliefs about drinking control measured by Part 3 of the ICS (Nagoshi, 1999) suggest that among undergraduates, social drinking is sometimes associated with difficulties in limiting consumption.

Male gender (Knight *et al.*, 2002) and positive family history of alcoholism (Sher *et al.*, 1991) have both been linked to an increased risk of problem drinking among young adults. Considering its relatively early emergence and central role in addiction, it is likely that impaired control is both more prevalent among young adults in these high-risk groups and especially

problematic for them as well, although prior studies with undergraduates have found no significant gender differences on Part 3 of the ICS (Patock-Peckham *et al.*, 1998; Nagoshi, 1999; Patock-Peckham *et al.*, 2001; Patock-Peckham and Morgan-Lopez, 2006).

In summary, in order to further establish the validity of impaired control and the effectiveness of Part 2 of the ICS as a measure of the construct, several established predictor variables were also examined, a number of which (i.e., family history, sensation seeking, severity of best friend's drinking and enhancement motives) have yet to be included in analyses with impaired control in the prediction of undergraduate problem drinking. The general prediction was that impaired control would be significantly correlated with all of the established predictor variables, yet would still be a significant concurrent predictor of heavy episodic drinking and alcohol-related problems above and beyond these other variables.

METHODS

Participants and Procedures

A battery of pencil-and-paper measures related to alcohol use was administered to a sample of first-year undergraduates at the University of Pennsylvania ($N = 312$) as part of a larger study on problem drinking in undergraduates. Participants were at least 18 years of age and had consumed alcohol at least once since matriculating. Students completed the survey in exchange for partial credit toward the completion of introductory psychology requirements. All participants provided informed consent and the study was approved by the Institutional Review Board for the protection of human subjects at the University of Pennsylvania.

Measures

Part 2 of Heather and colleagues' (1993) *Impaired Control Scale (ICS)* assesses how often participants have engaged in ten behaviors pertaining to control over alcohol consumption in the past six months, including attempts to limit, cut down and stop drinking. The ten items are rated on a 0 (never) to 4 (always) scale and summed for a maximum score of 40 with high scores indicating greater difficulty in controlling alcohol consumption. The authors reported an internal consistency reliability estimate of 0.94 for Part 2.

To assess *family history of alcohol and drug problems*, participants were asked whether any of their relatives ever "had a significant problem with alcohol or drugs, one that either lead to treatment or should have lead to treatment," as in the Addiction Severity Index (McLellan *et al.*, 1992). Reported problems of first-order relatives (i.e., parents and siblings) were allotted two points each, while problems of other relatives were allotted one point each to arrive at a family history score. For the purposes of assessing interactions, a dichotomous version was created. Those reporting an alcohol or drug problem by at least one first-order and at least one second-order relative or by two first-order relatives were classified as family history positive.

Participants were asked to report their typical monthly *frequency* of alcohol use since matriculating, along with their typical *quantity* consumed for four classes of alcohol (i.e., beer, wine, straight hard alcohol and mixed drinks). Quantity estimates were summed and multiplied by the reported weekly frequency (converted from the monthly estimates given) to yield estimates of overall weekly consumption, to which one was added and a log transformation was taken. To arrive at estimates of *heavy episodic drinking*, participants were asked to report how many times per month they consume five drinks at a single sitting (four for females) including all classes of alcohol. These were also converted to weekly estimates.

Alcohol-related problems were assessed using the Rutgers Alcohol Problem Index (RAPI), developed by White and Labouvie (1989). The RAPI is a unidirectional scale comprised of adverse alcohol-related events (e.g., "not able to do your homework or study for a test"). Each

event reported to have occurred at least once during the past three months as a result of alcohol use was scored as a "1" and these were totaled to yield an overall score. To prevent criterion contamination, four items thought to relate to impaired control were removed from the RAPI, leaving 19 items. The authors reported an internal consistency estimate of .92 for the entire scale. Internal consistency for the 19-item version included in the present study was .80.

Magnitude of recent stressful life events was measured using Anderson's (1972) College Schedule of Recent Experience (CSRE), reported in Marx, Garrity and Bowers (1975). This measure was based on Holmes and Rahe's (1967) Social Readjustment Rating Scale. This scale assesses the magnitude of major events occurring in the student's life during the past year (e.g., the end of a close romantic relationship). Participants report the number of times (i.e., 0 through 4 or more) 37 such events have occurred during the past year. Each item has a corresponding, weighted life-change unit, representing the magnitude of the occurrence. These individual event scores are totaled to yield an overall score.

Intensity of best friend's drinking behavior was assessed using the following single item, "Which of the following best describes the drinking habits of your closest friend at Penn?" Participants were given the following five options: "non-drinker," "light/infrequent drinker," "moderate drinker," "heavy social drinker" or "problem drinker,' which were converted to a 1–5 scale of increasing intensity of drinking behavior.

Sensation seeking was assessed using the disinhibition subscale of the Sensation Seeking Scale, Form V (Zuckerman, 1994) (alpha reported as ranging from .74 to .78). Items on this scale present two descriptions and participants were asked to report which pertains most closely to them (e.g., "I like wild, uninhibited parties" or "I prefer quiet parties with good conversation"). Each response indicating sensation seeking tendencies was scored "1" and the sum of these scores was taken.

In Cooper and colleagues' (1992) measure of *drinking motives* (i.e., social, coping and enhancement of positive affect), participants report on a five-point scale the extent to which they drink for each of 15 reasons provided. The authors reported good internal consistency reliability for the three subscales (social: 0.77, enhancement: 0.85, coping: 0.81).

Analyses

Coefficient alpha was used to confirm the internal consistency reliability of Part 2 of the ICS. Correlation coefficients were used to assess relationships among all continuous variables.

The primary method of statistical analysis was hierarchical multiple regression. Two regressions were conducted to predict alcohol-related problems and heavy episodic drinking. Gender and family history were entered at Step 1 of the analysis, followed by overall weekly alcohol consumption at Step 2 (omitted for analyses predicting heavy episodic drinking), the other, established predictor variables (i.e., magnitude of recent stressful life events, intensity of best friend's drinking, sensation seeking and drinking motives) at Step 3 and impaired control score at Step 4. To determine whether impaired control was especially problematic for males and for those with a positive family history of drug or alcohol problems, interaction terms were derived by centering the impaired control score (i.e., the overall mean score was subtracted from each participant's score), then multiplying by "1" for females, "2" for males; "1" for not family history positive, "2" for family history positive. Interaction terms were entered at Step 5.

Due to the use of multiple comparisons, a minimum level of $P < .01$ was adopted for significance testing for all analyses.

RESULTS

Sample characteristics and descriptives

The sample was 59% female and mainly White (76%) with the remainder comprised of East/Southeast Asians (8%), Blacks (5%), Hispanics (4%), South Asians/Indians (1%) and "other" (6%). Descriptives for all continuous variables by gender and for the entire sample are provided in Table 1. Males reported significantly higher overall weekly alcohol consumption, $t(303) = 4.143$, $P < .001$ and more frequent heavy episodic drinking, $t(304) = 4.713$, $P < .001$. Males also reported significantly higher scores on the sensation seeking measure, $t(308) = 4.083$, $P < .001$. There were no significant gender differences in impaired control scores.

Reliability and validity

Internal consistency reliability for Part 2 of the ICS in the present study was .79. Impaired control was significantly and positively correlated with frequency of heavy episodic drinking, alcohol-related problems, overall weekly alcohol consumption and all of the other predictor variables except for sensation seeking (Table 2). Part 2 of the ICS had particularly strong correlations with coping and enhancement motives for drinking and intensity of best friend's drinking.

Regression analyses

The correlation between heavy episodic drinking and alcohol-related problems was found to be highly significant ($r = .50$, $P < .001$), however the R^2 of .25 suggests considerable unshared variance between the two variables. Further, the correlations between impaired control and each of these two variables differed noticeably (Table 2). For these reasons, separate regression analyses predicting heavy episodic drinking and alcohol-related problems were justified.

Neither the family history nor gender interaction terms with impaired control were significant predictors of heavy episodic drinking or alcohol related problems. The interaction terms were eliminated and the regression analyses were conducted again. Results presented in Table 3 and Table 4 are from regression analyses with the interaction terms omitted.

Results from a hierarchical multiple regression analysis predicting heavy episodic drinking are provided in Table 3. Impaired control was a significant predictor of heavy episodic drinking when entered at the final step of the regression with all other established predictor variables already entered into the model. Gender, intensity of best friend's drinking and sensation seeking were all significant predictors as well, both at first entry and in the final model. Enhancement motives was a significant predictor upon entry into the model at Step 3, but was no longer significant after impaired control was added to the model. Only intensity of best friend's drinking was a stronger predictor of heavy episodic drinking than impaired control.

Results from a hierarchical multiple regression analysis predicting alcohol-related problems are provided in Table 4. Impaired control was a significant predictor of alcohol-related problems when entered at the final step of the regression with all other established predictor variables already entered into the model. Family history status, overall weekly alcohol consumption and magnitude of recent stressful life events were all significant predictors as well, both at first entry and in the final model. Impaired control was the strongest predictor of alcohol-related problems in the final model, with a standardized beta even higher than that of overall weekly alcohol consumption.

DISCUSSION

Scores on Part 2 of the ICS (which assesses inability to control drinking in the past) predicted heavy episodic drinking and alcohol-related problems in the present study, even when controlling for several other predictor variables with established links to undergraduate drinking behavior. Notably, impaired control was a stronger predictor of alcohol-related problems than overall weekly alcohol consumption. These findings build on the work of Nagoshi, Patock- Peckham and their colleagues (Patock-Peckham *et al.*, 1998; Nagoshi, 1999; Patock-Peckham *et al.*, 2001; Patock-Peckham and Morgan-Lopez, 2006), who found that scores on Part 3 of the ICS (which assesses beliefs about ability to control alcohol consumption in the future) were significantly correlated with alcohol consumption and alcohol-related problems in undergraduates. The present findings also concur with findings from clinical and non-clinical samples of older adults that have established the validity of the entire ICS (e.g., Heather *et al.*, 1998; Heather and Dawe, 2005).

Part 2 of the ICS was found to be a reliable and valid measure with the present sample of undergraduates. Between the present study and the findings of Nagoshi, Patock-Peckham and their colleagues, the reliability and validity of Parts 2 and 3 of the ICS have now been established for use with undergraduates. The internal consistency reliability of 0.79 for Part 2, while good, was lower than the 0.94 in Heather and colleagues' (1993) original report. The mean age of participants in the Heather study was 35, thus their participants likely had relatively stable drinking patterns established over several years compared to the undergraduates in the present study, who presumably have shorter drinking histories and who likely experienced a change in their drinking behavior after entering college (Baer *et al.*, 1995). Nagoshi (1999) reported similar internal consistency reliability for Part 3 (0.77) with his sample of undergraduates. With respect to validity, the significant findings for Part 2 ICS scores after controlling for the other predictor variables address concerns about the validity of impaired control as an element of problem drinking among young adults (Caetano, 1999; Chung and Martin, 2002; 2005). Specifically, several of the potential confounds identified by Caetano (i.e., peer drinking behavior, social, enhancement and coping motives for drinking and the experience of stressful life events) were included in the present analyses. As predicted, impaired control was significantly correlated with these, as well as the other predictor variables with the exception of sensation seeking. Nevertheless, score on Part 2 of the ICS contributed unique variance in the prediction of problem drinking in the present study.

Impaired control scores did not differ significantly by gender or family history status and neither interaction term was a significant predictor of heavy episodic drinking or alcohol-related problems. While both male gender and a positive family history of alcohol and/or drug problems have been found to predict problem drinking in prior research involving undergraduates (e.g., Sher *et al.*, 1991; Knight *et al.*, 2002; Slutske, 2005; Chalder *et al.*, 2006), in the present sample any risk associated with gender and family history did not relate to impaired control. Future research could address the question of whether these associations change later in life with the possibility of gender or family history status differences having a greater impact on impaired control among adults with longer drinking histories.

This study had a number of limitations, including the high proportion of females in the sample. While the significant correlations between impaired control scores and problem drinking variables speak to the validity of the measure, inclusion of measures of alcohol dependence would have further established the validity of Part 2 of the ICS for use with undergraduate drinkers. Space limitations precluded the inclusion of the entire ICS in the present study. Whenever possible, the entire ICS should be used, in accordance with the recommendations of Heather and colleagues (1993). The correlations reported between Parts 2 and 3 of the ICS (0.48 in Heather *et al.*, 1993 and 0.39 in Heather *et al.*, 1998) suggest the uniqueness of the

two subscales and the possibility that Part 3 can predict additional unique variance in problem drinking above and beyond Part 2. Further, the inclusion of both Parts 2 and 3 allows for use of the improved "substitution method" of scoring developed after initial publication of the scale (see Heather *et al.*, 1998). Use of the substitution method has been found to enhance correlations between Part 2 scores and drinking variables. Thus impaired control may have been an even stronger predictor of problem drinking in the present study if Part 3 had been included.

A number of directions for future research are suggested by the present findings. While the strong findings for Part 2 of the ICS after controlling for the other predictor variables address one concern related to validity, one of the other concerns raised by Chung and Martin (2005), that young adults do not uniformly set the kinds of limits on their drinking that are implied in the impaired control construct, was not addressed. The extent to which young adults set limits on their drinking, the types of limits they set and the ramifications of such limits for problem drinking among this age group are topics deserving of further study. Inclusion of Part 1 of the ICS in future research with young adults would help to address these issues. Assessment of impaired control using the ICS in prospective research throughout the undergraduate years and beyond would provide a better understanding of impaired control's stability as a predictor of high-risk drinking. Inclusion of Part 3 of the ICS may be particularly appropriate for prospective studies where the goal is to predict subsequent problem drinking. Prior work with the measure in older adult samples (Heather *et al.*, 1998; Heather and Dawe, 2005) has established that ICS scores predict treatment outcome. Use of the ICS in treatment research with undergraduates would determine whether the measure has similar predictive validity in this population.

The present findings and other results with the ICS dovetail with prior observations that impairment of control is a hallmark of addiction (Levine, 1978). Specifically, results of the present study, establishing that the ICS predicts problem drinking cross-sectionally in young adults with relatively brief drinking histories, further support the position that impairment of control is one of the earliest stages of addiction (Chick and Duffy, 1979; Langenbucher *et al.*, 1995; Martin *et al.*, 1996; Winters *et al.*, 1999). By the time later stages are reached (e.g., withdrawal and alcohol-induced psychological or physical problems), risk of relapse increases (Witkiewicz and Marlatt, 2004), making treatment more difficult. Identifying those with impaired control early on may facilitate intervention before the later stages of addiction. Thus, impaired control is an important construct both for understanding problem drinking and for identifying those at risk. Findings from the present study, in which impaired control scores predicted problem drinking after controlling for several established predictor variables, speak to the centrality of impaired control in young adult problem drinking. The ICS is a reliable and valid tool for assessing impaired control and to date, has been severely under-utilized in studies of adolescent and young adult drinkers. Given the importance of impaired control and the reliability and validity of the ICS, more researchers working in the areas of adolescent and undergraduate alcohol use should include the ICS in their protocols.

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Table 1

Variable descriptives for entire sample and by gender and family history status

Variable	Male		Female		Entire Sample	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Impaired control	8.99	5.93	9.48	6.12	9.27	6.03
Overall weekly alcohol consumption	16.79[**]	13.57	10.79	11.53	13.24	12.70
Weekly heavy episodic drinking	1.23[**]	0.98	0.75	0.79	0.95	0.90
Alcohol-related problems	5.34	3.38	4.52	3.66	4.88	3.57
Family history of alcohol and drug problems score	1.43	1.92	1.32	1.79	1.36	1.84
Magnitude of recent life events	1019	476	1109	520	1072	502
Intensity of best friend's drinking	3.13	0.79	2.91	0.92	3.00	0.87
Sensation seeking	3.78[**]	1.51	3.05	1.57	3.35	1.58
Social motives for drinking	3.09	0.70	2.99	0.74	3.04	0.72
Coping motives for drinking	2.19	0.94	1.99	0.78	2.07	0.86
Enhancement motives for drinking	3.12	0.98	2.98	1.09	3.04	1.05

[*]
Statistically significant difference at $P \le .01$ level

[**]
Statistically significant difference at $P \le .001$ level

Table 2

Correlation Coefficients between scores on Part 2 of the Impaired Control Scale with problem drinking variables and established predictor variables

Variable	Correlation Coefficient
Heavy episodic drinking	0.384[**]
Alcohol-related problems	0.583[**]
Overall weekly alcohol consumption[1]	0.365[**]
Family history of drug/alcohol problems	0.156[*]
Magnitude of recent stressful life events	0.189[*]
Intensity of best friend's drinking	0.339[**]
Sensation seeking	0.112
Social motives for drinking	0.245[**]
Coping motives for drinking	0.366[**]
Enhancement motives for drinking	0.378[**]

[*]$P \leq .01$

[**]$P \leq .001$

[1]One was added to raw totals and a log transformation was taken

Table 3

Summary of hierarchical multiple regression predicting heavy episodic drinking

Variable	First Entry Into Model			Final Model		
	B	SE B	β	B	SE B	β
Step one ($R^2 = .061$ **)						
Family history	0.019	0.027	0.039 **	0.000	0.022	0.000
Gender (1 = female, 2 = male)	0.436	0.101	0.243 **	0.284	0.085	0.159 **
Step two ($\Delta R^2 = .311$ **)						
Magnitude of recent stressful life events	0.000	0.000	0.009 **	0.000	0.000	−0.022
Intensity of best friend's drinking	0.343	0.052	0.338 **	0.287	0.052	0.283 **
Sensation seeking	0.113	0.029	0.202 **	0.116	0.028	0.207 **
Social motives for drinking	0.009	0.067	0.007	0.008	0.065	0.007
Coping motives for drinking	0.025	0.060	0.024 *	−0.023	0.059	−0.023
Enhancement motives for drinking	0.168	0.054	0.199 *	0.130	0.053	0.155
Step three ($\Delta R^2 = .037$ **)						
Impaired control		n/a		0.033	0.008	0.227 **

*
$P \leq .01$

**
$P \leq .001$

Table 4

Summary of hierarchical multiple regression predicting alcohol-related problems

Variable	First Entry Into Model			Final Model		
	B	SE B	β	B	SE B	β
Step one (R^2 = .057**)						
Family history	0.401	0.109	0.209**	0.212	0.080	0.110*
Gender (1 = female, 2 = male)	0.774	0.413	0.106	0.433	0.311	0.059
Step two (ΔR^2 = .258**)						
Overall weekly alcohol consumption[1]	4.593	0.436	0.523**	2.565	0.507	0.292**
Step three (ΔR^2 = .141**)						
Magnitude of recent stressful life events	0.002	0.000	0.240**	0.001	0.000	0.194**
Intensity of best friend's drinking	0.518	0.222	0.124	0.246	0.208	0.059
Sensation seeking	−0.179	0.115	−0.079	−0.115	0.106	−0.051
Social motives for drinking	0.417	0.258	0.084	0.473	0.238	0.096
Coping motives for drinking	0.450	0.227	0.108	0.163	0.213	0.039
Enhancement motives for drinking	0.460	0.207	0.135	0.270	0.193	0.079
Step four (ΔR^2 = .083**)						
Impaired control	n/a			0.203	0.028	0.345**

*
P < .01

**
P < .001

[1]
One was added to raw totals and a log transformation was taken