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Do Drinking Motives Distinguish Extreme Drinking College Students From Their Peers?

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Abstract

Objective—The literature highlights the need to move beyond the traditional heavy episodic (“binge”) drinking criteria when trying to identify at-risk college drinkers. Thus, recent attention has focused on more extreme levels of drinking. This study examines whether drinking motives can distinguish college student extreme drinkers from lighter drinkers.

Method—We used data from 3,518 college student current drinkers (63.4% women) who participated in eight different studies at five different college campuses across the United States; a subsample of these students was followed up at 6 months post baseline. At baseline and follow-up, drinkers were divided into three groups: nonbinge drinkers (less than 4 drinks for women and 5 for

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Contributors

Eun-Young Mun and Helene R. White designed the overall study, Project INTEGRATE. Anne E. Ray, Eun-Young Mun, Helene R. White, and other research members of the Project INTEGRATE harmonized the measures across studies. Helene R. White conducted the analyses. Helene R. White and Kristen Anderson wrote the first draft of the paper in consultation with Eun-Young Mun and Anne E. Ray. All authors have contributed to and have approved the final manuscript.

Conflict of Interest

Helene R. White is a member of the Board of the ABRMF/the Foundation for Alcohol Research, which is a nonprofit foundation that sponsors alcohol research. All other authors declare that they have no conflicts of interest.

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men on their maximum drinking occasion), binge drinkers (4–7 drinks for women; 5–9 for men), and extreme drinkers (8+ for women and 10+ for men).

Results—At baseline, extreme drinkers, compared to nonbinge and binge drinkers, reported greater social, enhancement, and coping motives, as well as greater quantity and frequency of drinking per week and more alcohol-related problems. Those who were not extreme drinkers at baseline and later became extreme drinkers at follow-up reported significantly greater increases in social and enhancement motives, compared to those who remained nonextreme drinkers. Those who were extreme drinkers at baseline and reduced their drinking 6 months later, compared to those who remained extreme drinkers, reported greater reductions in enhancement and coping motives.

Conclusions—Focusing on drinking motives might be an efficacious target for preventive intervention programs to reduce extreme drinking among college students.

Keywords

Alcohol use; college students; drinking motives; binge drinking

1. Introduction

Heavy episodic drinking (HED), commonly referred to as “binge drinking,” garnishes a lot of attention on college campuses. Binge drinking increases risk for numerous problems, including academic failure, accidents, risky sexual behavior, and violence (Weschler, Dowdall, Davenport, & Castillo, 1994; White & Rabiner, 2012) and can have long-term negative effects on cognitive functioning and health (Arria et al., 2013; Lisdahl, & Tapert, 2012). Whereas definitions of binge drinking have varied greatly across studies in terms of amounts consumed (for reviews see Courtney & Polich, 2009; Oei & Morawska, 2004), the most common definition is either 5+ drinks in a row for both men and women (Johnston, O’Malley, Bachman, Schulenberg, & Miech, 2014) or 5+ drinks for men and 4+ for women in a row (Wechsler et al., 2002). Using the former definition, it has been estimated that 35% of U.S. college students (43% of men and 30% of women) meet the criteria for binge drinking over a 2-week period (Johnston et al., 2014), which is somewhat lower than what had been reported from a national survey of college students using the latter gender-specific definition (44% total; 49% of men and 41% of women; Wechsler et al., 2002).

Several researchers have proposed that the traditional 5+/4+ binge drinking criteria are too low to identify student problem drinkers (Beirness, Foss, & Vogel-Sprott, 2004; Fillmore & Jude, 2011; Mundt, Zakletskaia, & Fleming, 2009; Read, Beattie, Chamberlain, & Merrill, 2008; White, Kraus, & Swartzwelder, 2006). Patrick et al. (2013) suggest that reliance on traditional binge drinking criteria obscures meaningful variation in how much youth drink and may miss important distinctions between levels of drinking and consequences experienced (see also Turner, Bauerle, & Shu, 2004). In fact, several studies have shown that youth drink much more beyond the traditional binge drinking threshold (Patrick et al., 2013; Read et al., 2008; White et al., 2006), which highlights the need to move beyond traditional binge drinking criteria to identify at-risk drinkers. Thus, attention has recently moved to

more extreme levels of drinking (e.g., double the traditional criteria for binge drinking; Patrick et al., 2013).

To date, there is a lack of information about what motivates extreme drinking. Drinking motives, that is, reasons individuals endorse for drinking alcohol, are considered proximal predictors of alcohol consumption (Cox & Klinger, 1988) and are robustly associated with alcohol-related decision making from adolescence through emerging adulthood (Cooper et al., 2015; Kuntsche, Knibbe, Gmel, & Engels, 2005). Cooper's (1994) framework of drinking motives has been the most frequently studied. In this framework, social motives involve reasons to drink associated with social facilitation; enhancement motives capture reasons associated with fun and pleasure; coping motives indicate drinking to reduce negative affect; and conformity motives relate to drinking to fit-in with peers.

Overall, most individuals endorse social and enhancement motives with fewer indicating coping and conformity motives (Cooper et al., 2015; Crutzen, Kuntsche, & Schelleman-Offermans, 2013; Kuntsche et al., 2005). In general, endorsing greater social motives relates to increasing levels of alcohol consumption, and in some investigations, greater alcohol-related problems (e.g., Van Damme et al., 2013); higher enhancement motives predict risky drinking and related problems, while higher coping motives predict later alcohol-related problems (Cooper et al., 2015; Kuntsche et al., 2005; Schelleman-Offermans, Kuntsche, & Knibbe, 2011). Findings for conformity motives are mixed; some studies suggest increased conformity leads to greater drinking and problems (e.g., Merrill & Read, 2010), while others suggest an opposite relationship or no relation at all (Crutzen et al., 2013; Kuntsche & Cooper, 2010; Kuntsche et al., 2005).

When considering binge drinking, specifically, research indicates that enhancement and social reasons have the strongest positive associations (Cooper et al., 2015). For example, Patrick and Schulenberg (2011) found above average increases in binge drinking were associated most strongly with above average increases in drinking "to get high" or "because of boredom" across early emerging adulthood (ages 18–22). Further, maintenance of binge drinking from mid-emerging adulthood to young adulthood (ages 22–30), when it normally decreases, was associated most strongly with persistence of drinking to manage problems. To our knowledge, no studies have examined whether extreme binge drinkers are differentially motivated than those who binge drink less intensely.

Using a large sample of college students from several U.S. campuses, we examine whether drinking motives differentiate extreme drinkers from their peers who do not engage in extreme drinking. We define extreme drinking as double the usual binge drinking amount: drinking 8+ drinks for women and 10+ for men on a single occasion (Fairlie, Maggs, & Lanza, 2015; Patrick et al., 2015). We compare extreme drinkers to nonbinge drinkers (< 4 drinks for women and < 5 drinks for men per drinking occasion) and binge drinkers (4–7 drinks for women and 5–9 drinks for men) in terms of motives and examine whether changes in drinking motives are related to changes in extreme drinking over time. Based on past research, we hypothesize that, compared to nonbinge and binge drinkers, extreme drinkers will report higher social and enhancement motives for drinking but not necessarily higher coping or conformity motives. We expect that changes in social and enhancement

motives will be positively related to changes in extreme drinking. By pooling participant-level data from several studies conducted on different college campuses, we increase generalizability, compared to single-campus studies of extreme drinking (e.g., Fillmore & Jude, 2011; Read et al., 2008). A focus on motives for extreme drinking may help identify students at high-risk for drinking problems and inform preventive efforts that focus on correcting drinking expectancies.

2. Materials and Methods

2.1. Participants

Data come from Project INTEGRATE (see Mun et al., 2015), an integrative data analysis (IDA; Curran & Hussong, 2009) study evaluating the efficacy of brief motivational interventions for reducing college student heavy drinking and related problems. IDA studies pool raw participant-level data from multiple studies and analyze them as a single data set, and can provide many of the same benefits of multi-site trials at a fraction of the cost if study-level heterogeneity can be properly accounted (see Hussong, Curran, & Bauer, 2013; Mun et al., 2015; Mun, Jiao, & Xie, 2016 for detailed discussions). Project INTEGRATE includes data from 24 independent trials at U.S. colleges. For these analyses, we limited the sample to students who were current drinkers at baseline (i.e., drank in the last 30 days; $N = 3518$) from eight studies (Studies 2, 4, 6, 9, 15, 16, 18, and 19) that collected data on drinking motives; see Mun et al. (2015) for descriptions of the schools and student populations and Ray et al. (2014) for details on the interventions. The sample was 63.4% women; 70.3% were white, 10.5% Hispanic, 9.7% Asian; 7.4% other or mixed, and 2.1% black. Most students were first-year students (57.4%), 20.3% second, 13.2% third, and 9.0% fourth; and 36.6% were associated with a fraternity or sorority.

Follow-up assessments were conducted at various time points from 1 to 12 months post-baseline due to differences in study designs (see Mun et al., 2015 for details). Five studies (Studies 2, 4, 9, 16, and 18, at five different universities) included 6-month follow-up data ($N = 1373$) and were included in the longitudinal analyses of the current study.

Project INTEGRATE used de-identified existing data and was exempt from review by the Institutional Review Board for the Protection of Human Subjects (IRB). All studies included in Project INTEGRATE received IRB approval by their respective universities.

2.2. Measures

2.2.1. Alcohol use and problems—Students reported the *maximum number of drinks* they had on a single drinking occasion or day in the past month, a continuous variable in all studies. We also used measures of the number of drinking days per typical week (frequency) and the total number drinks per typical week (quantity) in the analysis. For four studies, these two measures were obtained from the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985), which assessed the number of drinks consumed each day during a typical week in the past month and has been shown to be reliable (Miller et al., 2002). From the DDQ, we summed the total number of days drinking and the total number of drinks during the week. For the other four studies, participants responded to single items assessing

the number of drinking days in the past week (or month divided by 4), which was used to create the frequency variable. They also completed an item about *the number of drinks* during a typical drinking occasion in the past week or month, which was multiplied by the frequency variable to create the *total number of drinks per week*. Therefore, in all studies, alcohol frequency and quantity were measured using *the number of drinking days* and *the number of drinks*, respectively, per week. The quantity variable was log transformed to reduce skew. Seven of the eight studies included in this analysis used the Rutgers Alcohol Problems Index (RAPI; White & Labouvie, 1989) to measure *alcohol-related problems*. For these analyses, we counted the number of problems (i.e., binary items) from the 18-item RAPI (White & Labouvie, 2000). The RAPI has established reliability and validity (Miller et al., 2002; White, Labouvie, & Papadaratsakis, 2005). When analyses were repeated with the 18-item RAPI frequency response measure, results were identical to those reported below.

2.2.2. Drinking motives—Reasons for drinking were from the Drinking Motivations Questionnaire-Revised (DMQ-R; Cooper, 1994), which has been well validated for college student populations (e.g., Simons, Correia, & Carey, 2000). For the DMQ-R, respondents were asked how often they drank for each of 20 reasons using a 5-point scale (almost never/never, some of the time, half of the time, most of the time, almost always/always). We computed four subscale scores: social (e.g., “to be sociable,” $\alpha = .89$ at baseline; $.89$ at 6-month follow-up in the current study), enhancement (e.g., “because you like the feeling,” $\alpha s = .88$ and $.88$, respectively), coping (e.g., “because it helps you when you feel depressed or nervous,” $\alpha s = .80$ and $.82$, respectively), and conformity (e.g., “because your friends pressure you to drink,” $\alpha s = .81$ and $.86$, respectively).

2.2.3. Demographic variables—Demographic variables included sex (1 = men; 0 = women), race/ethnicity (1 = white; 0 = other), year in school (1 = first-year students; 0 = all others), and Greek membership (1 = fraternity or sorority members or pledges; 0 = nonmembers). Due to between-study differences in the assessment of demographic variables, race/ethnicity and year in school were dichotomized for analysis. Study was included as a categorical control variable.

2.3. Analytic Plan

Drinkers were divided into three mutually exclusive groups: nonbinge drinkers (men who drank < 5 drinks and women who drank < 4) on their maximum drinking occasion/day; binge drinkers (men who drank 5–9 drinks and women who drank 4–7 drinks on their maximum drinking occasion/day); and extreme drinkers (men who drank 10+ drinks and women who drank 8+ drinks on their maximum drinking occasion/day).

We conducted two sets of analyses. The first characterized baseline drinking groups in terms of demographics (chi-square analyses), as well as their drinking, alcohol-related problems, and drinking motives (analysis of covariance). Study membership was a covariate in all analyses of covariance but not demographics because they were confounded (e.g., one study included exclusively women and two studies included first-year students only). We decided to include study membership as a covariate because it broadly covers between-study

differences, including demographic differences. Tukey post hoc comparisons were performed for significant omnibus effects. As participants in these studies were randomly assigned to an intervention or control group at baseline, their group membership was not expected to influence the associations examined in the first set of analyses.

In the longitudinal analyses, we examined whether changes in extreme drinking status from baseline to 6-month follow-up were associated with changes in motives for drinking for a subset of studies with 6-month follow-up data. Changes in extreme drinking group membership were defined by cross-tabulating categorical data over time. Changes in motives from baseline to follow-up were computed as the follow-up score minus the baseline score. Positive change scores indicate increased drinking motives, whereas negative change scores indicate reduced motives. Intervention and control groups were combined for these analyses, and we deemed this would not be a problem for several reasons. First, the intervention and control groups did not differ in prevalence of extreme drinking or drinking motive scores at 6-month follow-up (available from the first author upon request). Second, these groups, both within and across studies, were largely similar in the way they reduced their drinking over time (Huh et al., 2015). Third, the unit of analysis was within-person change over a 6-month period using the same measurement scales over time and across studies (i.e., the maximum number of drinks and the DMQ-R). Finally, study membership was included as a covariate in the longitudinal analyses. Taken together, we reasoned that differences between intervention and control students that might systematically affect within-person changes would be limited and that drawing inferences from the pooled longitudinal analyses of participants was valid. We used SAS 9.3 (SAS Institute, 2002–2010) for all analyses.

3. Results

3.1. Demographic characteristics among the drinking groups

Table 1 shows the percentages for demographics variables across the drinking groups. A large minority of the total sample were extreme drinkers (43.1%), with higher rates of extreme drinking among men than women, even though the drinking group definitions took into account sex differences in drinking. Similarly, white students were more likely to be extreme drinkers than nonwhite students; the latter were more likely to be nonbinge drinkers. First-year, compared to later-year, students were more likely to be nonbinge drinkers and less likely to be extreme drinkers. Greek membership was strongly related to binge drinking group membership, with a much greater percentage of members than nonmembers being in the extreme drinking group.

3.2. Alcohol use and drinking motives differences across groups

ANCOVA results followed by Tukey post hoc tests indicated that as drinking group increased so did quantity, frequency, and drinking problems, with each group reporting significantly higher levels than the previous group (Table 2). In addition, three of the four drinking motives (conformity being the exception) differed across the three groups. Post hoc tests revealed that each drinking group differed from one another in social, enhancement, and coping motives. All three motives were continually higher from nonbinge, to binge, and to extreme drinkers.

3.3. Changes in motives and drinking groups from baseline to follow-up

Table 3 shows continuity and discontinuity in drinking group membership status from baseline to follow-up for those who remained drinkers at follow-up. (Note that 143 of the baseline drinkers were nondrinkers at follow-up and did not complete the DMQ-R at that time; thus, they were excluded from this analysis. The excluded group included: 29.8% nonbinge drinkers, 12.0% binge drinkers, and 3.8% extreme drinkers at baseline.) Among those who remained drinkers at follow-up, there was relative continuity in group membership, with one-half or more of the members of each group remaining in the same group at follow-up. Just over a tenth of the nonbingers became extreme drinkers and half as many extreme drinkers moved to the nonbinge group.

Finally, we examined changes in extreme drinking relative to changes in motives (Table 4). First, we examined whether baseline nonbinge and binge drinkers who became extreme drinkers at the 6-month follow-up, compared to those who remained non-extreme drinkers from baseline to follow-up, changed their motives over time, controlling for study. At follow-up, mean increases in social and enhancement motives were significantly higher among students who became extreme drinkers, compared to those who remained non-extreme drinkers: 0.91 vs. -0.05 and 1.62 vs. 0.28, respectively. There were no significant differences between groups for coping or conformity motives.

We also examined changes in motives for baseline extreme drinkers who reduced their maximum level of drinking, compared to those who did not. At follow-up, mean decreases in enhancement and coping motives were significantly greater among the extreme drinking reducers, compared to the stable extreme drinkers: -0.93 vs. 0.24 and -0.90 vs. 0.31, respectively. The overall models for social and conformity motives were not significant.

4. Discussion

We found strong associations between motives for drinking and extreme drinking. Extreme drinkers, compared to nonbinge and binge drinkers, were more likely to drink for social, enhancement, and coping motives. Greater endorsement of each of these motives increased linearly across the three groups suggesting that drinking motives and maximum drinking quantities moved in tandem. Furthermore, increases in social and enhancement motives over 6 months were associated with becoming an extreme drinker, and reductions in enhancement and coping motives were associated with cessation of extreme drinking 6 months later.

Consistent with previous studies (e.g., Cooper et al., 2015), social and enhancement motives were strongly related to extreme drinking. Also, increases in both types of motives were associated with becoming an extreme drinker over time. Patrick and Schulenberg (2011) also found that enhancement motives (i.e., “to get high”) were related to binge drinking during emerging adulthood. While social and enhancement motives are often considered more “benign” than conformity and coping motives in terms of problematic use (Cooper et al., 2015, p. 28), our findings suggest that they are important correlates of extreme drinking and should not be underestimated as risk factors (see Van Damme et al., 2013). As comprehensive models for how social motives operate have not been articulated (Cooper et al., 2015), further exploration of these motives in relation to excessive drinking is needed.

We had not hypothesized that coping motives would be related to extreme drinking due to general support in the literature for an association between coping motives and alcohol-related problems, which is not necessarily tied to quantity consumed. Nevertheless, we found that extreme drinkers reported higher coping motives than lighter drinkers and reductions in coping motives were related to cessation of extreme drinking over a 6-month period. Patrick and Schulenberg (2011) also found that coping reasons (i.e., “get away from my problems”) was related to greater binge drinking during the transition from emerging to young adulthood; that is, youths who continued to drink to escape from their problems were more likely to continue their binge drinking. Conformity motives were not related to extreme drinking. Our findings regarding conformity motives are consistent with some other studies (e.g., Crutzen et al., 2013; Kuntsche & Cooper, 2010; Kuntsche et al., 2005).

4.1. Limitations

This is the first study to examine the association between extreme drinking and drinking motives; however, we note a few limitations. Although data were from several different colleges, given the nature of a study that utilized existing data, the sample may be best considered as a convenience sample of college students who drink. That is, we could not define in advance which studies or universities would be eligible, calculate their selection probabilities, or determine sampling weights for better population representation. Nevertheless, the sample is suitable for examining within-individual associations among drinking motives and extreme drinking. In addition, some of the studies targeted high-risk or mandated students. Thus, we may have over-estimated the amount of extreme drinking. We also relied on self-reports, although self-reports of drinking patterns (Carey, Carey, Maisto, & Henson, 2006) and motives (Cooper et al., 2015) have been shown to be reliable and valid. Finally, our longitudinal analyses were limited to two-wave data due to the limited number of follow-up assessments in the original studies. Thus, we were able to show only the concurrent association between changes in motives and changes in extreme drinking. Nevertheless, the literature suggests that conceptually and empirically motives influence drinking (Cooper et al., 2015).

4.2. Conclusion

Our results suggest that the traditional binge drinking measure may not be a sufficiently sensitive screening tool for students most at risk for experiencing alcohol problems. Although we did not look at specific alcohol problems (see Neal & Fromme, 2007; Read et al., 2008), Jackson (2008) found that the most serious outcomes were best predicted by a higher threshold than were the less serious outcomes. Thus, it is critical that we target students most at risk, not only to reduce harms associated with drinking during the college years but also to prevent the development of alcohol use disorders later on. We found that alcohol-related problems increased significantly from nonbinge to binge to extreme drinking. Therefore, we need to make efforts to identify extreme drinkers and target them for interventions. Students who engage in extreme drinking may benefit from different interventions than lighter-drinking students (Neal & Fromme, 2007).

Previous studies of binge drinking and extreme drinking have focused on demographic or personality predictors, which are difficult to change. In contrast, motivations may be a more

malleable target for interventions (Ian, Oei, & Morawska, 2004). Based on our results, it appears that prevention programs should focus on enhancement and social motives (Crutzen et al., 2013), in addition to coping motives, as they all differentiate extreme drinkers from nonbinge and nonextreme binge drinkers and relate to increases and decreases in extreme drinking over time.

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Highlights

- College students who report extreme drinking (10+ drinks for men and 8+ for women on a maximum drinking occasion) report higher social, enhancement, and coping motives than their drinking peers without extreme drinking.
- College students who become extreme drinkers over a 6-month period, compared to their peers who do not, report increases in social and enhancement motives.
- Over a 6-month period, extreme-drinking college students who reduce their drinking, compared to their peers who remain extreme drinkers, report decreases in enhancement and coping motives.

Table 1

Baseline demographic differences among drinking groups (in percents).

Variable	Non-binge drinkers (N = 638; 18.1%)	Binge drinkers (N = 1365; 38.8%)	Extreme drinkers (N = 1515; 43.1%)	χ^2 (df)
Sex:				$\chi^2 = 119.04$ (2) ***
Men	16.1	29.1	54.8 [#]	
Women	19.3	44.4	36.3	
Race/Ethnicity:				$\chi^2 = 81.28$ (2) ***
White	14.5	38.7	46.8	
Nonwhite	26.4	39.0	34.6	
Year:				$\chi^2 = 42.20$ (2) ***
First-year	21.1	39.8	39.1	
Non-first-year	14.0	37.5	48.5	
Greek:				$\chi^2 = 88.82$ (2) ***
Member	11.0	37.7	51.4	
Nonmember	22.5	39.1	38.4	

Notes:

[#] Rows sum to 100%, although some may not sum exactly to 100% due to rounding.***
 $p < .001$.

Table 2

Baseline differences in alcohol use, alcohol problems, and drinking motives among drinking groups.

Variable	Non-binge drinkers Mean (SD) (N = 638; 18.1%)	Binge drinkers Mean (SD) (N = 1365; 38.8%)	Extreme drinkers Mean (SD) (N = 1515; 43.1%)	Overall F (df) [#]	Unique Effect of Group F (df) [#]
<u>Alcohol Use and Problems</u>					
Quantity ^{##}	1.94 (2.55) ^{a###}	6.43 (4.94) ^b	17.03 (12.99) ^c	381.29 (9,3505) ***	1206.16 (2,3505) ***
Frequency	0.90 (0.94) ^a	1.71 (1.08) ^b	2.58 (1.33) ^c	157.39 (9,3507) ***	455.83 (2,3507) ***
Alcohol problems	0.85 (1.92) ^a	2.59 (2.82) ^b	4.92 (3.87) ^c	97.84 (8,2996) ***	215.86 (2,2996) ***
<u>Drinking Motives</u>					
Social	10.93 (4.75) ^a	14.41 (4.98) ^b	16.44 (4.86) ^c	99.64 (9,3508) ***	272.07 (2,3508) ***
Enhancement	9.01 (4.38) ^a	12.89 (4.91) ^b	15.20 (5.06) ^c	113.34 (9,3508) ***	353.10 (2,3508) ***
Coping	6.70 (2.73) ^a	7.92 (3.32) ^b	8.87(3.59) ^c	34.69 (9,3508) ***	81.32 (2,3508) ***
Conformity	6.40 (2.58)	6.48 (2.47)	6.69 (2.58)	9.08 (9,3508) ***	2.60 (2,3508)

Notes:

[#] All ANCOVAs controlled for study membership.

^{##} The mean number of drinks is shown; the number of drinks was log-transformed in the analysis to reduce skewness.

^{###} Means followed by different letters differ significantly ($p < .05$) from each other.

 $p < .001$.

Table 3

Continuity and discontinuity in drinking group membership status from baseline to 6-month follow-up ($N=1278$).

Baseline Group	6 Month Follow-up Group		
	Nonbinge	Binge	Extreme
Nonbinge	51.9%	35.1%	13.0%
Binge	19.1%	53.9%	27.0%
Extreme	6.5%	27.0%	66.4%

Note. Diagonal cells indicate those who remained in the same drinking groups over time, whereas off diagonal cells indicate those whose drinking group status changed. Of those who changed, lower triangle cells indicate those who reduced binge drinking and upper triangle cells indicate those whose binge drinking increased. Percentage numbers sum up to 100% within rows, although may not exactly sum to 100% due to rounding.

Table 4

Mean changes in drinking motives in relation to movement into (top block of rows) and out of (bottom block of rows) extreme drinking.

Variable	Non-extreme drinkers who became extreme drinkers Mean (<i>SD</i>) (<i>n</i> = 165)	Non-extreme drinkers who remained non-extreme drinkers Mean (<i>SD</i>) (<i>n</i> = 512)	Overall <i>F</i> (<i>df</i>)	Unique Effect of Group <i>F</i> (<i>df</i>)
Change Social	0.91 (4.88)	−0.05 (4.60)	4.69 (5,671) ***	4.69 (1,671) *
Change Enhancement	1.62 (4.72)	0.28 (4.51)	4.08 (5,671) **	8.06 (1,671) **
Change Coping	0.62 (3.22)	0.25 (3.35)	2.76 (5,671) *	0.54 (1,671)
Change Conformity	0.47 (2.95)	0.13 (2.82)	1.37 (5,671)	1.20 (1,671)
Variable	Extreme drinkers who reduced their drinking Mean (<i>SD</i>) (<i>n</i> = 196)	Extreme drinkers who remained extreme drinkers Mean (<i>SD</i>) (<i>n</i> = 392)	Overall <i>F</i> (<i>df</i>)	Unique Effect of Group <i>F</i> (<i>df</i>)
Change Social	−1.08 (4.89)	−0.20 (4.28)	1.39 (5,582)	5.78 (1,582) *
Change Enhancement	−0.93 (4.89)	0.24 (4.28)	2.75 (5,582) *	9.66 (1,582) **
Change Coping	−0.90 (3.56)	0.31 (3.45)	3.43 (5,582) **	14.57 (1,582) ***
Change Conformity	0.16 (2.95)	0.53 (3.02)	1.32 (5,582)	3.29 (1,582)

Notes: All ANCOVAs controlled for study membership.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.