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College Students' Daily-level Reasons for not Drinking

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Abstract

Introduction and Aims—Motivational models of alcohol use posit opposing approach and avoidance motives related to drinking, yet no micro-longitudinal study of college students has examined avoidance motives (i.e., reasons for not drinking [RNDs]). This exploratory study examined daily- and person-level correlates of students' RNDs to identify factors that may inhibit alcohol use.

Design and Methods—College students ($N = 1631$; 54% female) participated in a 30-day daily diary study in which they reported RNDs for non-drinking evenings, as well as daily moods, global drinking motives, and alcohol expectancies.

Results—Daily sadness was positively associated with not drinking due to having nobody with whom to drink, but negatively associated with not drinking due to school work. Daily anxiety was negatively associated with not drinking due to lack of desire and positively associated with not drinking due to habit or having school or job responsibilities. At the person level, multiple RNDs were associated with both coping and conformity motives (but not social or enhancement motives), as well as positive (but not negative) alcohol expectancies.

Discussion and Conclusions—Results demonstrate the complexity of modelling mood-drinking contingencies proposed by motivational theories of alcohol use. Distinct moods may promote or inhibit drinking through various pathways, which could help explain the weak associations between daily mood and drinking level observed in previous studies. Measuring reasons both for and against drinking in micro-longitudinal studies (e.g., daily diaries) is recommended to better understand the processes underlying alcohol use and to inform future prevention efforts.

Keywords

Alcohol use; Daily diary methods; Reasons for not drinking; Daily mood; College students

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Motivational models posit affect regulation as a primary reason for alcohol use (i.e., drinking to enhance positive emotions and to cope with negative emotions [1–4]). To capture the dynamic interplay between mood and motivation theorized to promote drinking, multiple micro-longitudinal studies have measured these variables in close to real-time [5]. These studies, however, have produced inconsistent results regarding mood-drinking contingencies and mood-motivation interactions [6–11]. These equivocal findings may be partly attributable to the exclusive focus on approach motives (i.e., reasons why individuals drink [1, 4]), to the neglect of avoidance motives, or individuals' reasons for not drinking (RNDs). In fact, motivational models propose that competing approach and avoidance motives give rise to alcohol use [3], and ambivalence toward drinking (i.e., conflict between approach and avoidance motives) has been identified as a key component of alcohol craving and addiction [12–13]. The goal of the current micro-longitudinal study was to shed further light on the complexity of affect-regulation theories of alcohol use by examining both daily- and person-level correlates of RNDs among college students, a high-risk drinking population [14–15].

College students cite numerous reasons for limiting their alcohol intake, including interference with academic and professional responsibilities, social norms, and lack of availability [16–18]. Ambivalence or indifference toward alcohol use has also been identified as an influential constraint on drinking [19]. More important, however, are longitudinal findings that stronger endorsement of any RNDs is associated with delayed alcohol initiation, lower levels of alcohol use, and higher rates of abstinence among adolescents and young adults, including college students [16, 20–22]. RNDs have also been shown to be empirically distinct from positive alcohol expectancies, abstinence expectancies, and drinking motives [20, 23]. For example, correlations between RNDs and drinking motives did not exceed .50 in a high school sample, and RNDs negatively predicted drinking outcomes and related problems among these students, independent of motives, positive expectancies, and abstinence expectancies [23].

Although past research indicates a unique role of RNDs in explaining drinking behaviour, these studies have exclusively utilized cross-sectional or longitudinal designs that cannot capture the rapidly unfolding within-person processes that influence RNDs. This is the first study, therefore, to measure and predict RNDs at the daily level. This design is well-suited for examining discrete behaviours such as drinking [24] and allowed us to assess RNDs shortly after each opportunity for evening drinking had passed, as opposed to global scales that measure the general importance of RNDs [16–17, 19]. Moreover, global scales conceptualize RNDs as trait-like constructs that function similarly across time and situation. By instead measuring RNDs for each non-drinking evening, this is the first study to consider RNDs as also having a state component (i.e., within-person variability).

We examined the prevalence of RNDs across the week, as well as their relations with pertinent daily- and person-level correlates derived from motivational models of alcohol use, including daily positive and negative mood, drinking motives, and alcohol expectancies [2–3]. These exploratory analyses, therefore, may provide additional insight into affect-regulation theories of drinking and explain inconsistent findings from prior micro-longitudinal investigations of these processes. Moreover, studying reasons why college students choose not to drink, rather than focusing narrowly on their reasons for drinking,

may help us better understand the contextual factors surrounding alcohol use in this population and highlight mechanisms by which to intervene against problematic drinking.

Method

Participants

As part of a project examining daily experiences and alcohol use, 1818 students were recruited over 9 semesters through the undergraduate psychology participant pool and campus-wide advertising. To be eligible, students had to be at least 18 years old, have consumed alcohol at least twice in the past 30 days, and never undergone treatment for alcohol problems (measured during pre-screening). Five students were omitted due to reports of treatment seeking at baseline, five due to missing baseline data, and 177 due to unacceptable protocol compliance (i.e., fewer than 15 daily reports), leaving a final sample for analysis of 42881 daily surveys (88% compliance) completed by 1631 students (54% female; 80% European American; $M_{age} = 19.2$ years, $SD_{age} = 1.4$). These students, on average, drank on 5.9 days ($SD = 4.4$) and engaged in heavy episodic drinking (i.e., four or more drinks for women and five or more drinks for men [25]) on 3.7 days ($SD = 3.8$) in the 30 days prior to baseline. Students in the final sample engaged in heavy episodic drinking on fewer days than students who were omitted ($M = 4.3$, $SD = 4.0$; $t[1809] = -2.47$, $p = .02$) and were more likely to be women, $\chi^2(1) = 20.22$, $p < .001$.

Daily-level Measures

Each day students were asked how many standard alcoholic drinks they consumed the night before (i.e., after completing yesterday's survey, or after 6:00 PM yesterday). When students reported no alcohol use, they were queried about their *RNDs*. Six items were constructed by the researchers based on previous findings to capture RNDs relevant to college students, including interference with responsibilities ("I had to work at my job" and "I had too much school work to do"), social norms ("I had nobody to drink with") availability ("I couldn't obtain alcohol") and ambivalence toward alcohol ("I had no desire to drink" and "I usually don't drink on this night of the week") [16–19]. Students responded to each statement using a true/false scale, and students could report multiple RNDs or none.

Positive and negative mood were measured by asking students how they felt from the time they awoke that day until taking the daily survey. Using a scale from 1 (*not at all*) to 5 (*extremely*), students rated mood adjectives chosen by the researchers based on the circumplex model of emotion [26] and the Positive and Negative Affect Schedule-Expanded (PANAS-X [27]). *Sadness* was assessed with "sad," "unhappy," and "dejected," $\alpha = .83$; *anxiety* with "anxious" and "nervous," $\alpha = .72$; *anger* with "angry" and "hostile," $\alpha = .76$; and *positive mood* with "happy," "enthusiastic," "content," and "cheerful," $\alpha = .89$ (as calculated across person-days).

Person-level Measures

At baseline, students completed a slightly modified version of the Drinking Motives Questionnaire-Revised [1]. Specifically, two original coping items ("because it helps you when you feel depressed or nervous" and "to feel more self-confident and sure of yourself")

were divided into separate items that each addressed a single reason for drinking. Students responded on a scale from 1 (*almost never / never*) to 5 (*almost always / always*) to seven items for *coping*, $\alpha = .90$, and five items each for *conformity*, $\alpha = .87$, *enhancement*, $\alpha = .90$, and *social* motives, $\alpha = .92$.

Alcohol expectancies were measured with 40 items from the Alcohol Effects Questionnaire [28], using a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). These items were subdivided based on prior research [29–30]: *Positive alcohol expectancies* comprised the global positive, social and physical pleasure, social expressiveness, sexual enhancement, power and aggression, and relaxation and tension reduction subscales (31 items; $\alpha = .95$), and *Negative alcohol expectancies* comprised the cognitive and physical impairment, and careless unconcern subscales (9 items; $\alpha = .87$).

Typical alcohol use comprised retrospective reports of frequency of use, frequency of heavy drinking, and typical drinks per day [15]. Students reported the number of days in the past 30 days in which they consumed any alcohol, and in which they had a heavy drinking episode (i.e., 4+/5+ drinks [25]). To curtail positive skew, reports of 16 or more drinking days were recoded as 16 (2.3% of sample), and reports of 13 or more heavy drinking days as 13 (2.4% of sample). Students also reported the typical number of drinks they consumed for each day of the week in the past 3 months, which were averaged together. These three variables were standardized and combined, $\alpha = .92$.

Procedure

Procedures were approved by the institutional review board at the University of Connecticut. Approximately 1 month into the semester, students provided informed consent and completed an online baseline survey in which they reported, among other measures, gender, age, drinking motives, alcohol expectancies, and typical alcohol use. Students began the daily diary study approximately 2–4 weeks later. Pertinent to the current analyses, this brief survey measured today's mood, last night's alcohol use, and when students did not drink, their RNDs. Each day for 30 days, students accessed the survey via a secure website between 2:30 PM – 7:00 PM. This window approximated the usual time between students' classes and evening activities. If students missed that day's survey, they could contact the researchers to complete it up to 12:00 PM the next day ('late' surveys accounted for approximately 10% of the data). Students were paid and, when applicable, provided with classroom credit for both the baseline and daily diary surveys.

Analysis

To test relations between daily- and person-level factors and RNDs, we used multilevel modelling with HLM 6.08 [31], which accounts for the non-independence of data resulting from the daily (i.e., repeated measures) design. Each RND was examined in a separate model estimated using restricted maximum likelihood and a Bernoulli distribution for dichotomous outcomes. These models used daily moods (measured in the afternoon on day t) to predict RNDs for that evening (measured in the afternoon on day $t+1$). Because RNDs were reported during the subsequent day's diary, outcome measures were lagged to coincide with mood data reported on the previous day. The intercept was treated as random, but all

random slopes were fixed to zero to facilitate model convergence. An intercept-only model was first estimated for each RND, and the intraclass correlation was computed assuming a threshold model for dichotomous outcomes [32], which fixes the residual variances to $\pi^2/3$. Next, we individually tested each person- and daily-level correlate. Effects were trimmed from the final models if they failed to predict any of the RNDs, but due to the exploratory nature of these analyses coupled with the volume of tests performed, we adopted a conservative alpha of .01 to maintain an effect.

Daily-level correlates (i.e., the level 1 model) included negative mood (i.e., anxiety, sadness, and anger), positive mood, and weekend (0 = weeknight; 1 = Friday or Saturday night). Mood was person-mean centred, thus effects reflected deviations from an individual's average mood over the study month [33]. Person-level effects (i.e., the level 2 model) included gender (0 = male, 1 = female), age, drinking motives, alcohol expectancies, and the aggregated means for daily negative and positive moods. Including the aggregated means allowed us to disambiguate the within-person and between-person effects of daily moods on RNDs [34]. All person-level variables except gender were grand-mean centred.

Results

Descriptive Statistics

Table 1 presents means, standard deviations, and correlations among the daily- and person-level predictors. Students reported not drinking on 33996 evenings (79.3% of reported evenings). Not drinking remained consistent through the school week, with 82%–86% of Sunday-Wednesday evenings having no drinking. As expected, rates changed near the weekend, with no drinking reported on approximately half (44%–51%) of Thursday-Saturday evenings. Figure 1 illustrates how often each RND was cited, as a percentage of the number of non-drinking evenings reported for each day of the week. The most common RNDs were having no desire to drink (85.9% of non-drinking evenings), not usually drinking on that night of the week (70.7%), and having too much school work (47.1%). All three RNDs, however, showed a clear weekly pattern in which they were less frequently reported on weekends than weekdays. In contrast, having nobody with whom to drink (21.2%), not being able to obtain alcohol (17.1%), and having to work at a job (10.9%), were less frequently cited but were reported more consistently across the week. Finally, intraclass correlations (see Table 2) showed that 37%–63% of the variance in RNDs was explained at the within-person level.

Reasons for not Drinking

Results from the final models predicting RNDs are presented in Table 2. Daily (and aggregated mean) anger, social and enhancement motives, and negative alcohol expectancies did not show any effects across all models, and thus were trimmed from the final models and are not listed. Given the high correlation between social and enhancement motives, $r = .76$, $p < .001$, we also examined positive reinforcement drinking motives in separate models, but results did not change. Finally, due to the nature of college drinking on Thursday nights, alternative models were tested with Thursdays coded as the weekend. These models did not meaningfully vary and are not presented, but are available upon request.

At the daily level, students were more likely on weekends to report not drinking because they could not obtain alcohol, but less likely to report all other RNDs. On days characterized by elevated sadness, students were more likely to report not drinking due to having nobody with whom to drink and less likely to report not drinking because they had too much school work. On days when anxiety was elevated, students were less likely to report not drinking due to a lack of desire, but more likely to report not drinking because they had to work at a job, had too much school work, or did not usually drink on that evening. Finally, on days characterized by elevated positive mood, individuals were less likely to report too much school work as a reason for not drinking.

Daily mood was also associated with RNDs at the between-person (i.e., aggregate) level. Students who reported higher mean sadness were more likely to report not drinking due to not being able to obtain alcohol, having nobody with whom to drink, or having to work at a job, and less likely to report having too much school work or not usually drinking on that evening. Higher mean anxiety was associated with a higher likelihood of reporting too much school work or not usually drinking on those evenings, but a lower likelihood of reporting a lack of desire. Finally, mean positive mood was positively associated with not usually drinking on those evenings, but negatively related to having no desire to drink and not being able to obtain alcohol.

RNDs were also significantly associated with multiple person-level correlates. Women were more likely than men to report not drinking due to having no desire, having too much school work, or not usually drinking on that night of the week, but less likely to report not drinking due to being unable to obtain alcohol. Additionally, older students were more likely to report not drinking because of having to work at a job, and less likely to report being unable to obtain alcohol, having nobody with whom to drink, or not usually drinking on that night of the week. Students who engaged in more typical alcohol use were less likely to report not drinking because they could not obtain alcohol, had nobody with whom to drink, did not usually drink on those nights, or lacked desire. Finally, among the constructs derived from motivational models of alcohol use [2–3], students who endorsed stronger positive alcohol expectancies were less likely to report not drinking due to having no desire, having to work at a job, or not usually drinking on that night of the week. Also, students with higher coping motives were more likely to report not drinking due to having to work at a job; and students with higher conformity motives were more likely to report not drinking because they had nobody with whom to drink or had too much school work.

Discussion

This is the first study to assess RNDs at the daily level of analysis, close to when the decision not to drink occurred. Results showed that both daily- (e.g., negative and positive moods) and person-level factors (e.g., negative reinforcement drinking motives, positive alcohol expectancies) were associated with college students' RNDs. Given the exploratory nature of the study and large number of variables examined, we focus our discussion on findings relevant to affect-regulation models of alcohol use [2–3]. Specifically, we focus on how these results might explain inconsistent findings regarding negative mood-related drinking from previous micro-longitudinal studies [6–11]: namely the possibility that

negative mood could be related at different times to both increased and decreased levels of proximal drinking through distinct pathways, thereby obscuring evidence in support of affect-regulation models.

We found several instances in which daily negative moods were positively associated with RNDs. For example, on days characterized by elevated sadness, students were more likely to report not drinking because they could not find anybody with whom to drink. This effect might simply reflect increased sadness as a result of the lack of opportunity to engage in social alcohol use, which is a common pattern of drinking among college students [35]. Nevertheless, the presence of elevated sadness on non-drinking days could drown out—from an analytic perspective—patterns relevant to affect-regulation theories (i.e., increases in drinking as a result of increased sadness).

We also found that on days when students experienced elevated anxiety, they were less likely to report not drinking due to having no desire, but more likely to report not drinking due to school, work, or habit. Daily anxiety, therefore, appears related to an increased desire to drink [36], which, in turn, has been associated with actual use [7]. However, elevated anxiety may result in drinking restraint when related to academic or work responsibilities [16, 19]. Consistent with this finding, college students' daily drinking motives have been shown to be influenced by their perceptions of whether their daily responsibilities are complete [37]. Taken together with the findings for daily sadness, these results shed light on the complexity involved in modelling affect-regulation processes postulated to underlie drinking behaviour [2–3]. In other words, attempts to find evidence consistent with these models may fail without considering important daily-level factors (e.g., social companions; ongoing responsibilities) that may moderate, mediate, or confound these relations.

RNDs were also associated with various person-level factors related to motivational models of alcohol use [2–3]. First, aggregate daily moods generally showed a similar pattern of relations with RNDs as did daily moods, which might reflect similar mechanisms to those described for the daily level of analysis. For instance, individuals were more likely not to drink due to having nobody with whom to drink both when they were generally sadder (i.e., the between-person effect) and when feeling sadder than usual (i.e., the within-person effect). Second, stronger endorsement of positive alcohol expectancies was associated with lower likelihood of reporting RNDs related to desire and habit. These findings are not surprising given that these students hold positive associations about the effects of alcohol, thereby implying that they might maintain a relatively strong desire to drink consistently across the week. Finally, higher endorsement of conformity motives were related to a lower likelihood of reporting not drinking due to having nobody with whom to drink, an expected finding given that these students drink explicitly to fit in with others. Given the exploratory nature of the study, however, and some of the unexpected findings (e.g., the positive association between coping motives and not drinking due to having to work at a job), we advise caution in interpreting these results and encourage replication.

Limitations to the current study include the fact that RNDs were not reported until the following day (or, rarely, 2 days later), which may have introduced error into students' responses. Most problematic would be the possibility that students' moods shaped their

RND reports in a *post hoc* fashion. However, next-day reports greatly reduce the recall period compared to previous studies that have generally asked respondents for one-time ratings of the importance of RNDs [16–17, 19]. Moreover, given that one can only query about the lack of a behaviour after the opportunity for that behaviour has passed, asking students about RNDs the next day may be the only practical solution. Furthermore, RNDs collected in this study were narrow in scope. A myriad of RNDs have been identified, including violation of moral code, risks to physical health, cost, and loss of self-control/inhibition; future studies would benefit from using an already validated measure that covers a broader range of RNDs [16–19]. Also, some RNDs measured in this study indicated an avoidance of alcohol (e.g., “I had no desire to drink”), whereas others implied a desire to drink that was impeded by situational constraints (e.g., “I had nobody to drink with”). Future work should attempt to distinguish motives that influence the decision not to drink from those that explain why intended drinking did not occur. Finally, omitted participants were more likely to be male and reported more heavy episodic drinking episodes at baseline compared to those included. Although these effects were small, they could influence the generalizability of our results.

Limitations notwithstanding, these exploratory findings shed light on the complexity of modelling associations among proximal levels of mood states and the decision to engage in alcohol use. Further research is necessary, however, to replicate and expand upon these results concerning within-person variability in RNDs. More broadly, we believe that a greater understanding of how both approach and avoidance motives influence drinking behaviour proximally to those decisions will allow for the development of more effective prevention and intervention efforts.

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References

1. Cooper ML. Motivations for alcohol use among adolescents: development and validation of a four-factor model. *Psychol Assessment*. 1994; 4:117–128.
2. Cooper ML, Frone MR, Russell M, et al. Drinking to regulate positive and negative affect: a motivational model of alcohol use. *J Pers Soc Psychol*. 1995; 69:990–1005. [PubMed: 7473043]
3. Cox WM, Klinger E. A motivational model of alcohol use. *J Abnorm Psychol*. 1988; 97:164–180.
4. Kuntsche E, Knibbe R, Gmel G, et al. Why do young people drink? a review of drinking motives. *Clin Psychol Rev*. 2005; 25:841–861. [PubMed: 16095785]
5. Bolger, N.; Laurenceau, JP. *Intensive longitudinal methods: an introduction to diary and experience sampling research*. New York: Guilford Press; 2013.
6. Armeli S, Conner TS, Cullum J, et al. A longitudinal analysis of drinking motives moderating the negative affect-drinking association among college students. *Psychol Addict Behav*. 2010; 24:38–47. [PubMed: 20307111]
7. Carney MA, Armeli S, Tennen H, et al. Positive and negative daily events, perceived stress, and alcohol use: a diary study. *J Consult Clin Psych*. 2000; 68:788–798.
8. Grant VV, Stewart SH, Mohr CD. Coping-anxiety and coping-depression motives predict different daily mood-drinking relationships. *Psychol Addict Behav*. 2009; 23:226–237. [PubMed: 19586139]

9. Hussong AM, Galloway CA, Feagans LA. Coping motives as a moderator of daily mood-drinking covariation. *J Stud Alcohol*. 2005; 66:344–353. [PubMed: 16047523]
10. O'Hara RE, Armeli S, Tennen H. Drinking to cope motivation and negative mood-drinking contingencies in a daily diary study of college students. *J Stud Alcohol Drugs*. 2014 In press.
11. Park CL, Armeli S, Tennen H. The daily stress and coping process and alcohol use among college students. *J Stud Alcohol*. 2004; 65:126–135. [PubMed: 15000512]
12. Breiner MJ, Stritzke WGK, Lang AR. Approaching avoidance: a step essential to the understanding of craving. *Alcohol Res Health*. 1999; 23:197–206. [PubMed: 10890815]
13. Collins RL, Koutsky JR, Morsheimer ET, et al. Binge drinking among underage college students: a test of a restraint-based conceptualization of risk for alcohol abuse. *Psychol Addict Behav*. 2001; 15:333–340. [PubMed: 11767266]
14. Jackson, KM.; Sher, KJ.; Park, A. Drinking among college students: consumption and consequences. In: Galanter, M., editor. *Recent developments in alcoholism*, vol. 17: alcohol problems in adolescents and young adults. New York: Kluwer Academic/Plenum; 2005. p. 85-117.
15. Wechsler H, Lee JE, Kuo M, et al. Trends in college binge drinking during a period of increased prevention efforts. *J Am Coll Health*. 2002; 50:203–217. [PubMed: 11990979]
16. Epler AJ, Sher KJ, Piasecki TM. Reasons for abstaining or limiting drinking: a developmental perspective. *Psychol Addict Behav*. 2009; 23:428–442. [PubMed: 19769427]
17. Greenfield TK, Guydish J, Temple MT. Reasons students give for limiting drinking: a factor analysis with implications for research and practice. *J Stud Alcohol*. 1989; 50:108–115. [PubMed: 2927125]
18. Johnson TJ, Cohen EA. College students' reasons for not drinking and not playing drinking games. *Subst Use Misuse*. 2004; 39:1137–1160. [PubMed: 15387207]
19. Stritzke WGK, Butt JCM. Motives for not drinking alcohol among Australian adolescents: development and initial validation of a five-factor scale. *Addict Behav*. 2001; 26:633–649. [PubMed: 11676375]
20. Bekman NM, Anderson KG, Trim RS, et al. Thinking and drinking: alcohol-related cognitions across stages of adolescent alcohol involvement. *Psychol Addict Behav*. 2011; 25:415–425. [PubMed: 21534645]
21. Huang J-H, DeJong W, Schneider SK, et al. Endorsed reasons for not drinking alcohol: a comparison of college student drinkers and abstainers. *J Behav Med*. 2011; 34:64–73. [PubMed: 20559703]
22. Maggs JL, Schulenberg J. Reasons to drink and not to drink: alcohol trajectories of drinking through an alcohol misuse prevention program. *Appl Dev Sci*. 1998; 2:48–60.
23. Anderson KG, Grunwald I, Bekman N, et al. To drink or not to drink: motives and expectancies for use and nonuse in adolescence. *Addict Behav*. 2011; 36:972–979. [PubMed: 21665373]
24. Gunthert, KC.; Wenzel, SJ. Daily diary methods. In: Mehl, MS.; Conner, TS., editors. *Handbook of research methods for studying daily life*. New York: Guilford Press; 2012. p. 144-159.
25. National Institute on Alcohol Abuse and Alcoholism. NIAAA Newsletter. Vol. 3. Washington, D.C.: Office of Research Translation and Communication; 2004. NIAAA council approves definition of binge drinking; p. 3
26. Larsen, RJ.; Diener, E. Promises and problems with the circumplex model of emotion. In: Clark, MS., editor. *Emotion: review of personality and social psychology*, vol. 13. Thousand Oaks: Sage Publications; 1992. p. 25-59.
27. Watson D, Clark LA, Tellegen A. Developing and validation of brief measures of positive and negative affect: the PANAS scales. *J Pers Soc Psychol*. 1988; 54:1063–1070. [PubMed: 3397865]
28. Rohsenow, DJ. Alcohol effects questionnaire. In: National Institute on Alcohol Abuse and Alcoholism. , editor. *NIAAA treatment assessment instrument handbook, series 4, assessing alcohol problems: clinicians and researchers*. National Institute on Alcohol Abuse and Alcoholism; 2000.
29. Cooper ML, Russell M, Skinner JB, et al. Stress and alcohol use: moderating effects of gender, coping, and alcohol expectancies. *J Abnorm Psychol*. 1992; 101:139–152. [PubMed: 1537960]

30. George WH, Frone MR, Cooper ML, et al. A revised alcohol expectancy questionnaire: factor structure confirmation and invariance in a general population sample. *J Stud Alcohol*. 1995; 56:177–185. [PubMed: 7760564]
31. Raudenbush, SW.; Bryk, AS.; Cheong, YF., et al. HLM 6: hierarchical linear and nonlinear modeling. Chicago: Scientific Software International; 2004.
32. Snijders, T.; Bosker, R. Multilevel analysis. London: Sage Publications; 1999.
33. Enders CK, Tofighi D. Centering predictor variables in cross-sectional multilevel models: a new look at an old issue. *Psychol Methods*. 2007; 12:121–138. [PubMed: 17563168]
34. Raudenbush, SW.; Bryk, AS. Hierarchical linear models. 2nd. Thousand Oaks: Sage Publications; 2002.
35. Christiansen M, Vik PW, Jarchow A. College student drinking in social contexts versus alone. *Addict Behav*. 2002; 27:393–404. [PubMed: 12118627]
36. Armeli S, Tennen H, Affleck G, et al. Does affect mediate the association between daily events and alcohol use? *J Stud Alcohol*. 2000; 61:862–871. [PubMed: 11188492]
37. Arbeau KJ, Kuiken D, Wild TC. Drinking to enhance and to cope: a daily process study of motive specificity. *Addict Behav*. 2011; 36:1174–1183. [PubMed: 21864984]

Figure 1. Prevalence of students' reasons for not drinking (RNDs). Values indicate the percentage of non-drinking evenings for which each RND was reported for each day of the week.

Table 1
Descriptive Statistics and Correlations among Daily- and Person-level Predictors

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender ^a															
2. Age	19.23	1.41	-.05*												
3. Typical drinking ^b	0.00	0.92	-.19***	.03											
4. Positive expectancies ^c	3.84	1.09	-.04	.04	.43***										
5. Negative expectancies ^c	4.24	1.15	.06*	.03	.19***	.67***									
6. Social motives ^d	3.25	1.09	-.02	-.02	.42***	.61***	.40***								
7. Enhancement motives ^d	2.84	1.10	-.06**	-.05*	.47***	.63***	.41***	.76***							
8. Coping motives ^d	1.81	0.83	.00	-.02	.24***	.54***	.31***	.52***	.52***						
9. Conformity motives ^d	1.66	0.80	-.04	.00	.06*	.30***	.22***	.38***	.28***	.58***					
10. Daily sadness ^d	1.41	0.43	.09***	-.04	.02	.13***	.07**	.08***	.09***	.28***	.21***	.***	.49***	.66***	-.28***
11. Daily anxiety ^d	1.73	0.54	.16***	-.03	-.02	.14***	.12***	.11***	.08***	.24***	.21***	.69***	.39***	.39***	-.11***
12. Daily anger ^d	1.30	0.39	.00	-.05*	.08**	.12***	.03	.08**	.09**	.24***	.18***	.78***	.58***	.58***	-.16***
13. Daily positive mood ^d	2.68	0.65	.12***	-.10***	.02	-.01	.08**	.02	.08**	-.14***	-.06***	-.16***	.02	-.07**	

Note. For daily mood variables, person-level correlations below the diagonal, daily-level correlations above the diagonal.

^a0 = male, 1 = female;

^bStandardized variable;

^c1–7 scale;

^d1–5 scale.

* *p* .05,

** *p* .01,

*** *p* .001.

Table 2

Final Models Predicting College Students' Reasons not to Drink

	No desire to drink			Couldn't obtain alcohol			Nobody to drink with			Had to work at job			Too much school work			Usually don't drink this night of the week		
	B	SE	OR	B	SE	OR	B	SE	OR	B	SE	OR	B	SE	OR	B	SE	OR
Intraclass correlation		.467			.632			.610			.557			.468			.364	
<i>Daily-level correlates</i>																		
Sadness ^a	-.053	.043	0.95	.018	.047	1.02	.090*	.040	1.09	-.016	.049	0.98	-.135***	.034	0.87	.025	.043	1.03
Anxiety ^a	-.182***	.030	0.83	.043	.033	1.04	-.008	.029	0.99	.093**	.034	1.10	.236***	.023	1.27	.068*	.031	1.07
Positive mood ^a	-.059	.033	0.94	-.007	.036	0.99	-.044	.031	0.96	-.067	.038	0.93	-.271***	.025	0.76	-.054	.032	0.95
Weekend ^b	-1.379***	.049	0.25	.300***	.059	1.35	-.372***	.054	0.69	-.160*	.064	0.85	-1.997***	.046	0.14	-4.745***	.063	0.01
<i>Person-level correlates</i>																		
Gender ^c	.312**	.103	1.37	-.371**	.144	0.69	-.201	.132	0.82	.137	.131	1.15	.526***	.102	1.69	.269*	.114	1.31
Age ^d	-.059	.036	0.94	-.411***	.056	0.66	-.109*	.047	0.90	.208***	.043	1.23	.002	.035	1.00	-.273***	.039	0.76
Typical drinking	-.470***	.060	0.62	-.489***	.088	0.61	-.230**	.079	0.79	-.079	.080	0.92	.010	.060	1.01	-.740***	.068	0.48
Positive expectancies ^d	-.168**	.059	0.85	-.084	.080	0.92	.053	.074	1.08	-.271***	.073	0.76	-.081	.057	0.92	-.127*	.064	0.88
Coping motives ^d	-.113	.086	0.89	-.029	.119	0.97	-.077	.110	0.93	.237*	.107	1.27	-.037	.085	0.96	-.047	.095	0.95
Conformity motives ^d	.130	.076	1.14	.203	.105	1.22	.263**	.096	1.30	-.040	.095	0.96	.189*	.075	1.21	.062	.084	1.06
Mean daily sadness ^d	-.251	.161	0.78	.720**	.222	2.05	.874***	.205	2.40	.821***	.200	2.27	-.333*	.162	0.72	-.363*	.182	0.69
Mean daily anxiety ^d	-.280*	.129	0.76	.149	.179	1.16	.135	.165	1.14	.000	.162	1.01	.972***	.128	2.64	.288*	.144	1.33
Mean daily positive mood ^d	-.297***	.081	1.35	-.214*	.112	0.78	-.122	.104	0.88	-.112	.101	0.89	-.024	.079	0.98	.208*	.088	1.23

Note. Unstandardized coefficients.

^aPerson-mean centred;^b0 = weeknight, 1 = weekend;^c0 = male, 1 = female;^dGrand-mean centred.

SE = standard error; OR = odds ratio.

.100^{*} *p* ***
;10^{*} *p* ***
;50^{*} *p* *

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