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Self-fulfilling prophecies: Documentation of real-world daily alcohol expectancy effects on the experience of specific positive and negative alcohol-related consequences

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Abstract

Alcohol expectancies are consistently associated with alcohol use in cross-sectional and longitudinal studies. However, little research has examined whether alcohol expectancies on specific drinking occasions are associated with reported consequences on those days, particularly when controlling for amount of alcohol consumed, thus, differentiating the extent to which reported consequences may have resulted from alcohol or an "expectancy effect." This study examines consequence-specific daily expectancy effects. College students (N=342; mean age 19.7 [SD=1.25], 52.9% female) participated in a longitudinal measurement burst study. During four 2-week intervals, participants used mobile phones to respond to three surveys per day via automated telephone interviews. Results showed that on days when college students had higher than average expectancies for specific subjective positive consequences (e.g., feeling more relaxed, being in a better mood), they were more likely to report experiencing those same consequences as a result of their alcohol use that day, even after controlling for how much they actually drank on that day. The same held true for subjective interpersonal negative consequences (e.g., becoming aggressive, rude or obnoxious, and embarrassing oneself), but not for less subjective physical/cognitive negative

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consequences (e.g., having a hangover, vomiting, getting hurt/injured, forgetting). Results suggest that one's expectations about the particular effects of alcohol tend to be self-fulfilling for subjective effects of alcohol even when they are not directly tied to the physiological effects of alcohol. Findings underscore the important role of alcohol expectancies, particularly the expectation of subjective positive social and tension reduction/relaxation effects, in understanding problematic alcohol use.

Keywords

expectancy; positive consequences; negative consequences; alcohol; college students

Despite substantial prevention efforts, heavy drinking among college students, and more broadly young adults, remains a significant public health concern (Blanco et al., 2008; Grant et al., 2017; Schulenberg et al., 2017). Alcohol-related consequences include physical and sexual assault, unprotected sex, alcohol-impaired driving and accidents, and overdose hospitalization (Hingson, Zha, & Smyth, 2017; O'Brien et al., 2006; White & Hingson, 2013). Despite the potential for serious and life-altering negative alcohol-related consequences, many young adults continue to engage in high-risk alcohol use and often report experiencing more positive consequences from drinking (e.g., feeling relaxed, becoming more social) than negative consequences, including less serious but more common negative consequences (e.g., hangover, becoming aggressive) (Park, 2004). Individuals also differ from each other with respect to the consequences they experience (between-person variability), and individuals may experience different consequences on different occasions (within-person variability) (Lee et al., 2017; Patrick, Cronce, Fairlie, Atkins, & Lee, 2016). Generally, "alcohol-related" consequences are positively associated with alcohol use. However, there is question as to what extent alcohol-related effects, particularly the less physiological and more subjective effects, are influenced by drinking cognitions (e.g., what one expects to experience from drinking alcohol) after accounting for alcohol use itself. That is, to what extent are alcohol-related consequences a result of alcohol use or a self-fulfilling prophecy due to one's beliefs?

Building on well-established learning principles, alcohol expectancy theory posits that drinking behaviors are driven by an individual's expectations about the social, physical, and behavioral effects or outcomes of drinking, and the individual may be motivated to drink to obtain the desired alcohol effects or, alternatively, motivated to refrain from drinking due to the expected undesirable effects (e.g., Jones, Corbin, & Fromme, 2001; Lee, Greely, & Oei, 1999; Leigh & Stacy, 2004; Stacy, Widaman, & Marlatt, 1990). Common positive alcohol outcome expectancies include tension reduction, heightened sociability, increased courage, and enhanced sexual experiences, whereas common negative alcohol outcome expectancies include cognitive and behavioral impairment, risk and aggression, as well as worsened self-perception (Fromme, Stroot, & Kaplan, 1993). Research has documented the associations between alcohol expectancies and alcohol use and negative consequences, with recent studies showing daily variability in general measures of alcohol expectancies (i.e., positive and negative expectancies rather than expectancies for specific effects) and that this variability is associated with alcohol use and consequences (Patrick et al., 2016). Further,

days with more positive and negative consequences have been associated with next-day changes in expectancies (Lee et al., 2018). As implied by expectancy theory, it would be predicted that expectancies about specific effects (e.g., becoming aggressive) would also have an "expectancy effect" in predicting the occurrence of specific consequences, above and beyond the amount of alcohol consumed that day.

Power of Cognitions: Alcohol Effects as Self-fulfilling Prophecies?

In the alcohol field, alcohol expectancies have primarily been viewed from a motivational framework, such that one's expectations of alcohol's effects either motivate the individual toward or away from drinking (e.g., Jones, Corbin, & Fromme, 2001). Our own research (Patrick, Cronce, Fairlie, Atkins & Lee, 2016) has supported the motivational aspect of alcohol expectancies showing that at the occasion-level alcohol expectancies are associated with later day alcohol use. Specifically, days with greater positive and negative alcohol expectancies were associated with more alcohol use and days with greater alcohol use was associated with greater reports of total number of consequences reported compared to days with average or typical level of expectancies and drinking, respectively. However, research in multiple fields has shown the additional influence of cognitions on later outcomes or attributions of outcomes in academics (e.g., Friedman & Mandel, 2009) and medicine (e.g., Kaptchuk & Miller, 2015). Currently, less is known about a complimentary cognitive model of alcohol expectancies and consequences, that is whether there may be a placebo or expectancy effect on alcohol-related consequences. In other words, it is unknown to what extent alcohol expectancies may cognitively prime the drinkers towards "experiencing" consequences (particularly more subjective ones) above and beyond what may be attributed to alcohol consumption.

Further, most alcohol research has not examined the influence of specific alcohol expectancies on corresponding specific effects at the event of the drinking occasion, that is, the degree to which specific alcohol expectancy effects exist with expectancies exhibiting strong associations with reports of experiencing alcohol's effects. One notable study examined the congruence of alcohol expectancies measured using the Comprehensive Effects of Alcohol (CEOA, Fromme et al., 1993) prior to ad lib drinking in a naturalistic bar setting with the reporting of the same subjective outcomes after the drinking episode among 50 individuals (Wall, Thrussell, & Lalonde, 2003). Wall et al. (2003) found that the subjective affective, behavioral, and cognitive outcomes reported after drinking largely mirrored the prior expectancies; however, individuals, on average, reported feeling less risky and aggressive post-drinking compared to pre-drinking. It should be noted that Wall and colleagues did not control for how much alcohol was consumed in the lab session, thus the extent to which the associations may be partially accounted for by amount consumed cannot be determined.

The extent to which self-fulfilling prophecies occur may depend on the specific type of alcohol consequence expected. The expectations for positive effects (e.g., having fun) and certain negative effects (e.g., being rude) tend to be more subjective in nature and rely more heavily on interpretations and attributions made by an individual. Other negative effects that are linked to the physiological effects of alcohol (e.g., having a hangover, becoming

nauseous or vomiting) tend to have measureable effects that are less subjective. It may be that consequences that are more open to subjective interpretation (regardless if referring to positive or negative alcohol-related effects) would be more prone to a self-fulfilling prophecy from one's belief about what effects the person expects as a result of alcohol use.

The Current Study

This research extends the literature by testing alcohol expectancy effects at the daily level for specific self-reported positive and negative consequences in a sample of young adult college drinkers. Findings can inform alcohol expectancy theory by identifying whether particular item-level alcohol-related consequences may be especially prone to expectancy effects, that is whether self-reported subjective effects (e.g., being embarrassed) may be more prone to expectancy effects than other less subjective effects from alcohol (e.g., hangover). We tested whether alcohol expectancies reported in the afternoon were associated with experiencing that same effect later that day, above and beyond the amount of alcohol consumed. First, we hypothesized a daily expectancy effect on the experience of individual subjective positive consequences (i.e., relaxation, social enhancement, better mood, energetic, expressing feelings), even after controlling for alcohol use. For example, on days individuals expect greater relaxation from alcohol, they will be more likely to report having that experience. Second, we hypothesized a daily expectancy effect on the experience of subjective interpersonal negative consequences (i.e., rude, embarrass, aggressive), controlling for alcohol use. For example, on days individuals expect to be more aggressive as a result of their drinking, they will be more likely to report having been aggressive. Third, we did not hypothesize an expectancy effect on the experience of less subjective negative physical consequences (i.e., hangover, hurt/injured, vomit, forget), after controlling for alcohol use, because these consequences are more directly attributable to alcohol's physiological effects.

Method

Participants and Procedures

In the analytic sample, participants were 342 young adult college students participating in a longitudinal measurement burst study examining daily alcohol use, alcohol expectancies, and consequences for four 2-week intervals across one academic year (mean age 19.7 [SD=1.25], 52.9% female) and who reported having at least one alcohol-related consequence during the daily reporting period (for information about study procedures see Lee et al., 2018). Participation was restricted to students of freshman (17.0%), sophomore (36.5%), and junior standing (46.5%), with 55.0% of the sample indicating being a member of a fraternity or sorority. Most participants (73.4%) were White, with the remainder Asian American (8.8%), multiracial (11.4%), other (5.0%), or unknown (1.5%). All procedures were approved by the university IRB, and a federal Certificate of Confidentiality was obtained; there were no adverse events reported.

Across five academic quarters, randomly selected undergraduate students (18–24, N = 8,923) from the university registrar's list were invited to participate in a brief online eligibility survey (N = 3,210 students, compensated $10). Eligibility criteria included

owning a mobile phone with a service contract and text messaging, being 18–24 years old, and drinking at least twice a week over the past month (N=539 meeting criteria). Eligible students were invited to complete an online 30–45-minute baseline survey (compensation $30) and come to study offices for a training session. A total of 516 students completed the baseline survey and scheduled to come to study offices, with 352 completing training and enrolling in the longitudinal daily study, and 342 reporting data (e.g., alcohol-related consequences) necessary for the current analyses. No significant differences were found between those enrolled in the longitudinal daily study (n = 352) versus those who only completed baseline (n = 164) based on age, $t(364.42) = -1.48$, $p = .14$, gender, χ^2 (1, $N = 516) = 1.19$, $p = .28$, total drinks per week, $t(489) = -0.66$, $p = .51$, AUDIT sum scores, $t(500) = 0.47$, $p = .64$, and negative consequences, $t(260.65) = -0.33$, $p = .74$, at baseline.

Students completed automated telephone interviews (less than 10 minutes in length) three times a day (9am-noon; 3–6pm; 9pm-12am) for four 2-week intervals across one year, including summer. The first quarter of daily reporting began the day after the training session, with subsequent quarters randomly assigning a 2-week period. Participants received text message reminders to do each interview. Participants were paid $2 for each interview, plus a $16 “bonus” if completed at least 36 of 42 interviews each quarter. The study had high retention; the mean number of complete or partial interviews across 56 days was 141 out of 168 possible interviews (84%). Data for current analyses come from the morning interview assessing yesterday’s alcohol use and consequences and from the afternoon interview assessing alcohol expectancies. Analytic models included only data from drinking days ranging from 4129 to 4136 days of data across 342 people.

Measures

Demographics.—Covariates were age at baseline, birth sex (coded as 0 = male and 1 = female), and fraternity and sorority status at baseline (coded as 0 = no membership and 1 = membership) given the relatively high proportion of fraternity/sorority members.

Morning interview measures.—*Alcohol use*. Participants reported on their alcohol use the previous day, including number of standard drinks consumed yesterday (from the time they woke up to the time they went to bed). *Alcohol-related consequences.* Participants who reported drinking the previous day were presented 13 alcohol-related consequences [6 positive (i.e., relaxed, more social, better mood, buzzed, energetic, express feelings more easily) and 7 negative (i.e., hangover, nausea/vomited, hurt/injured, forget, aggressive, rude, embarrassed)] and indicated whether “any of the following things happened to you as a result of your drinking yesterday” (yes/no) (see Tables 1 and 2; Lee et al., 2017 for descriptive and psychometric information).

Afternoon interview measure.—*Alcohol expectancies*. Participants rated the likelihood that they would experience 13 effects from alcohol (6 positive, 7 negative) if they were to drink tonight, from 1 = very unlikely to 9 = very likely. The same 13 items that were asked for consequences were rephrased in terms of alcohol expectancies (see Lee, Atkins, Cronce, Walter, & Leigh, 2015 for details of scale development and psychometric information). *Drinking intentions*. Participants were asked “Are you planning to drink tonight?,” and those

who indicated “yes” were asked “How many drinks do you think you will drink tonight?” The number of drinks students planned to drink was included as a covariate.

Data Analysis Plan

All models addressing the primary hypotheses included only drinking days in the analytic sample given that the outcome was whether or not an alcohol-related consequence was reported as a result of drinking. To test the primary hypotheses, we fit a series of multilevel models (MLMs) with a binary outcome using a logit link function in SAS version 9.4, thus accounting for the clustering of drinking days nested within participants (Raudenbush & Bryk, 2002). Given the large number of statistical tests, an adjusted critical alpha of $p < .01$ was applied to all analyses.

Separate MLMs were run to test for a daily expectancy effect with each alcohol-related consequence (e.g., daily expectancy of a hangover predicting whether hangover subsequently occurred). The dependent variable for each model was whether or not participants reported experiencing the consequence specified in the model. All models included identical covariates: sex, age, Greek status (i.e., fraternity/sorority membership), study period (coded 0 to 3), weekend status (0 = Sun-Wed, 1 = Thurs-Sat), as well as both drinking intentions and alcohol use at the person level (i.e., average alcohol consumption per drinking episode across monitoring period) and the daily level (i.e., daily deviation from individual’s average alcohol consumption per drinking episode). Drinking intentions were included as a covariate due to analyses showing that days with a higher intended number of drinks were associated with a greater likelihood of missing the next-day drink report (overall 10.3% of the morning reports of alcohol use were missing data). Alcohol use behavior was included as a covariate to test for the daily expectancy effect predicting consequences after controlling for amount of alcohol consumed. To disentangle the between- and within-person effects of consequence-specific expectancies (Palta, 2003), we included each participant’s mean consequence-specific expectancy across the monitoring period at the person level, and we included each daily consequence-specific expectancy as a deviation from each individual’s mean across the monitoring period (i.e., the relative strength of an expectancy on a given day) at the daily level. Exploratory analyses tested sex as a moderator of the consequence-specific expectancy effect at Level 1. All Sex by Level 1 consequence-specific expectancy interactions were not significant (p’s > .01). As such, only main effects are presented.

Results

Descriptive Analyses

Descriptive information on expectancies, experienced consequences, and covariates is shown in Table 1. Generally, students reported higher expectancies for positive effects compared to negative effects and also more days on which the positive consequences occurred compared to negative consequences. Correlations among positive and negative expectancies are shown in Table 2 with the highest correlations between being embarrassed and rude ($r = .55$) and also between being social and energetic ($r = .54$). Across drinking days, students reported at least one positive consequence on 87.53% of days. Students reported at least one negative

consequence on 32.00% of days. Exactly one negative consequence was reported on 18.93% of drinking days followed by two negative consequences on 7.59% of drinking days, three negative consequences on 3.26% of drinking days, and four or more negative consequences on 2.22% of drinking days.

Daily Expectancies Predicting Specific Consequences

Numerous consequence-specific expectancies were associated with experiencing the related consequences after controlling for covariates, including number of drinks (Table 3). Supporting the first hypothesis, positive expectancies of feeling relaxed, being more social, being in a better mood, getting buzzed, feeling more energetic, and expressing feelings more easily were all associated with greater likelihoods of experiencing those specific positive consequences as reported the following day. Supporting the second hypothesis, greater daily expectancies of becoming aggressive, acting rude, and doing something embarrassing were associated with greater likelihoods of experiencing those specific negative consequences (Table 4). Supporting the third hypothesis, daily expectancies regarding negative physical and cognitive consequences (i.e., hangover, nausea/vomit, hurt/injury, forget) were not associated with experiencing those specific consequences.

A number of covariates were associated with experiencing specific consequences. At the person-level, greater mean alcohol use per drinking episode across the monitoring period was associated with greater odds of reporting forgetting what happened. Participants who reported greater average consequence-specific expectancies were more likely to report each related consequence (all positive and negative) across the monitoring period. Women in the sample had greater odds than men of reporting vomiting, getting hurt/injured, forgetting what happened, doing something embarrassing, and getting buzzed. Age and fraternity/sorority status were not significantly associated with any consequences. At the daily-level, greater alcohol consumption, relative to an individual's mean alcohol use, was associated with greater odds of reporting all the alcohol-related consequences. There was a negative time trend such that study period was associated with lower odds of reporting all the positive consequences as well as having a hangover and forgetting what happened. Weekend days were associated with greater odds of reporting feeling more energetic.

Because some of the outcome variables showed sex differences (Tables 3 and 4) and due to potential sex differences in alcohol-related expectancy effects and sensitivity to placebo effects, we examined whether the Level 1 associations were moderated by sex. We ran additional MLMs with sex as a moderator of Level 1 consequence-specific expectancy items, and no significant interactions were observed.

Discussion

Using daily-level data, this study found evidence supporting a cognitive account of how alcohol expectancies are associated with alcohol-related consequences, over-and-above the effects of alcohol use (i.e., an expectancy effect where young adults were more likely to report experiencing various effects from alcohol that they had thought were more likely to happen earlier in the day). This perspective is different from, but complementary to, what we know from traditional motivational perspective of alcohol expectancies – that alcohol

expectancies influence drinking behaviors, which in turn may lead to alcohol-consequences (i.e., young adults may drink in part to achieve certain desirable effects). It may be the case that both processes are operating to produce one's behavior and that together these processes influence drinking and the maintenance of high-risk drinking.

Specifically, we found that college students' expectations about alcohol's effects on a given day have direct associations with their reports of the subjective social and behavioral effects that they experienced as a result of their alcohol use that day. That is, even after controlling for how much alcohol students drank, on afternoons students reported expecting more subjective positive alcohol-related effects to occur, they were more likely to report experiencing those same effects later in the day as a result of drinking (as reported the next morning). The findings underscore the important role of alcohol expectancies in the potential maintenance of alcohol use, particularly with the self-fulfilling expectation of positive social and tension reduction/relaxation effects.

Although, theoretically, negative expectancies should be associated with less alcohol use and thus fewer consequences, daily-level research has found that occasions with greater negative expectancies are associated with increased drinking and risk for negative consequences, possibly in anticipation of heavier drinking on that occasion (Patrick et al., 2016). As we hypothesized, we found expectancy effects for the more subjective behavioral consequences (becoming aggressive, acting rude, and doing something embarrassing), but not for acute physical consequences (having a hangover, vomiting, and getting hurt/injured) or cognitive effects (forgetting). The lack of effects for the link between physical expectancies and physical consequences supports the notion that expectancy effects are evident for more subjective state feelings, perceptions and social behaviors, but not less subjective consequences that are dependent on physiological responses to the amount of alcohol consumed.

For the more subjective positive effects of alcohol use measured in this study, future research could explore the influence of affect in the drinking occasion and the role this may have on reinforcing pre-drinking expectancies. For example, using ecological momentary assessment (EMA), recent work exploring pre-drinking affect with post-drinking affect showed a positive shift in affect prior to the first drink and in the early stages of a drinking episode; this association was stronger for drinkers with stronger sociability expectancies (Treloar, Piasecki, McCarthy, Sher & Health, 2015). Future work with EMA designs could examine the degree that drinking outcomes match relatively subjective expectancies, and whether there is a corresponding shift in positive affect early in the drinking experience that is reinforcing or aligning the expectancy to outcome. For example, in the present study, a shift in affect in line with expectancies could be the mechanism by which this alignment occurs with subjectively positive outcomes (e.g., being more social, being in a better mood, feeling energetic, feeling more relaxed).

The current findings offer clinical insight into why young adults who experience negative alcohol-related consequences may view them as no more likely to occur in the future and also may view them as potentially less negative (e.g., Logan, Henry, Vaughn, Luk, & King, 2012; Merrill, Rosen, Boyle & Carey, 2018). Analyses on specific alcohol expectancies

revealed that while a variety of young adults' positive expectancies are likely to be consistently reinforced, only a subset of negative expectancies corresponded to what reportedly happened on drinking occasions. Young adults who expected to experience unpleasant physiological effects of alcohol may be pleasantly surprised when they do not experience these negative consequences, and they may interpret the drinking event as better than expected. The belief that one could get away with negative consequences of drinking may encourage young adults to continue drinking.

Future research could explore additional positive expectancies, as well as perhaps ones less subjective in nature, to see whether there are expectancies that do not accurately predict drinking outcomes. Identification of these expectancies may be a potential area for intervention targets. For example, emerging literature shows that young adults endorsing sexual enhancement alcohol expectancies drink more before sex but report less positive sexual experiences when drinking versus when sober, with the exception of arousal (Cooper, O'Hara & Martins, 2016). Taken together, this suggests, on the one hand, that positive expectancies can persist even when they are not borne out by experience, but also provides another possible inroad into challenging at least some positive expectancies and including discussions on how expectancies are developed and reinforced (e.g., media), particularly if not matched with corresponding effects on drinking events (Cooper et al., 2016).

Brief interventions (Reid & Carey, 2015) often incorporate psychoeducation information about social expectancies being attributable to an expectancy effect. However, it may be beneficial to encourage students to think ahead about what they expect to happen during each drinking occasion and to perhaps dispel potential myths about positive effects from alcohol coming from the drinking but more having to do with the context and people we are around. Clinicians could also strategically highlight the impact of negative consequences in the young adult's lives, including how they may disregard the negative consequence more easily than positive consequences.

Results should be viewed in light of certain limitations including potential lack of generalizability to young adults who are not students in 4-year universities or to lighter drinkers. Second, the study measures relied on retrospective and self-report measures and social desirability in responding may be a factor; however the associations between alcohol use and consequences are in the directions hypothesized, that is that days with more alcohol use is associated with greater likelihood of reporting a given alcohol-related consequence; whereas the potential worry about social desirability would be that students would be to report less consequences, particularly the negative consequences. Additionally, the next-day recall in this study may be a proxy for subjective experience with drinking; it is possible that these next-morning reports may reflect a blend of recalled experience while drinking and recalled self-reported expectancies from the previous day. Finally, while we control for alcohol use on the day the associated consequences were referring to, we do not control for or account for prior-day drinking or prior-day consequences. Prior drinking and/or consequences may have carry-over influences on next-day cognitions and future drinking.

There are several avenues future research could expand on the findings here. First, it would be interesting to examine subjective evaluations of expected alcohol effects, or valence of

expected effects, to see how consistent expected evaluations are with actual reported effects. Second, drinking motives are important proximal predictors of young adult alcohol use and are theoretically related to alcohol expectancies. While alcohol expectancies are needed in order to have a drinking motive, individuals can have alcohol expectancies without having a drinking motive. Future research could examine daily variability in expectancies, drinking motives and how motives may influence the experience of positive and negative consequences. Finally, future research could explore developmental changes in alcohol expectancies and whether the association between expectancies and consequences changes in longitudinal studies that cover a longer development time frame, particularly as young adults undergo major developmental transitions (e.g., leaving college, starting full time work).

In sum, findings from the present analyses support the possibility of a cognitive model of alcohol expectancies, where many of alcohol's subjective effects may be resulting from one's alcohol expectancies and not drinking itself (despite being attributed to drinking by the individual).

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References

Blanco C, Okuda M, Wright C, Hasin DS, Grant BF, Liu SM, Olfson M (2008). Mental health of college students and their non-college-attending peers: Results from the National Epidemiologic Study on Alcohol and Related Conditions. Archives of General Psychiatry, 65(12), 1429–1437. [PubMed: 19047530]

Cooper ML, O'Hara RE, & Martins J (2016). Does drinking improve the quality of sexual experience?: Sex-specific alcohol expectancies and subjective experience on drinking versus sober sexual occasions. AIDS and Behavior, 20(1), 40–51.

Dimeff LA, Baer JS, Kivlahan DR, & Marlatt GA (1999). Brief Alcohol Screening and Intervention for College Students. New York: Guilford Press.

Friedman BA, & Mandel RG (2009). The prediction of college student academic performance and retention: Application of expectancy and goal setting theories. Journal of College Student Retention: Research, Theory & Practice, 11(2), 227–246.

Fromme K, Stroot EA, & Kaplan D (1993). Comprehensive effects of alcohol: Development and psychometric assessment of a new expectancy questionnaire. Psychological Assessment, 5(1), 19–26.

Grant BF, Chou SP, Saha TD, Pickering RP, Kerridge BT, Ruan WJ, … & Hasin DS (2017). Prevalence of 12-month alcohol use, high-risk drinking, and DSM-IV alcohol use disorder in the United States, 2001–2002 to 2012–2013: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. JAMA Psychiatry, 74(9), 911–923. [PubMed: 28793133]

Hingson R, Zha W, & Smyth D (2017). Magnitude and trends in heavy episodic drinking, alcohol-impaired driving, and alcohol-related mortality and overdose hospitalizations among emerging adults of college ages 18–24 in the United States, 1998–2014. Journal of Studies on Alcohol and Drugs, 78(4), 540–548. [PubMed: 28728636]

Jones BT, Corbin W, & Fromme K (2001). A review of expectancy theory and alcohol consumption. Addiction, 96(1), 57–72. [PubMed: 11177520]

Kaptchuk TJ, & Miller FG (2015). Placebo effects in medicine. New England Journal of Medicine, 373(1), 8–9. [PubMed: 26132938]

Lee CM, Atkins DC, Cronce JM, Walter T, & Leigh BC (2015). A daily measure of positive and negative alcohol expectancies and evaluations: Documenting a two-factor structure and within-and between-person variability. Journal of Studies on Alcohol and Drugs, 76(2), 326–335. PMCID: PMC5374483 [PubMed: 25785808]

Lee CM, Cronce J, Baldwin S, Fairlie A, Atkins DC, Patrick ME, …Leigh BC (2017). Psychometric analysis and validity of the daily alcohol-related consequences and evaluations measure for young adults. Psychological Assessment, 29(3), 253–263. PMCID: PMC5116284 [PubMed: 27196690]

Lee CM, Rhew IC, Patrick ME, Fairlie AM, Cronce JM, Larimer ME, …Leigh BC (2018). Learning from experience? The influence of positive and negative alcoholrelated consequences on next-day alcohol expectancies and use among college drinkers. Journal of Studies on Alcohol and Drugs, 79(3), 465–473. [PubMed: 29885155]

Lee NK, Greely J, & Oei TP (1999). The relationship of positive and negative alcohol expectancies to patterns of consumption of alcohol in social drinkers. Addictive Behaviors, 24(3), 359–369. [PubMed: 10400275]

Leeman RF, DeMartini KS, Gueorguieva R, Nogueira C, Corbin WR, Neighbors C, & O'Malley SS (2016). Randomized controlled trial of a very brief, multicomponent web-based alcohol intervention for undergraduates with a focus on protective behavioral strategies. Journal of Consulting and Clinical Psychology, 84(11), 1008–1015. [PubMed: 27599223]

Leigh BC, & Stacy AW (2004). Alcohol expectancies and drinking in different age groups. Addiction, 99(2), 215–227. [PubMed: 14756714]

Logan DE, Henry T, Vaughn M, Luk JW, & King KM (2012). Rose-colored beer goggles: The relation between experiencing alcohol consequences and perceived likelihood and valence. Psychology of Addictive Behaviors, 26(2), 311–317. [PubMed: 21639598]

Merrill JE, Rosen RK, Boyle HK, & Carey KB (2018). The influence of context in the subjective evaluation of "negative" alcohol-related consequences. Psychology of Addictive Behaviors, 32(3), 350. [PubMed: 29658727]

O'Brien MC, McCoy TP, Champion H, Mitra A, Robbins A, Teuschlser H, … DuRant RH (2006). Single question about drunkenness to detect college students at risk for injury. Academic Emergency Medicine, 13(6), 629–636. [PubMed: 16614453]

Palta M (2003). Quantitative methods in population health: Extensions of ordinary regression. Hoboken, NJ: John Wiley & Sons, Inc.

Park CL (2004). Positive and negative consequences of alcohol consumption in college students. Addictive Behaviors, 29, 311–321. 10.1016/j.addbeh.2003.08.006 [PubMed: 14732419]

Patrick ME, Cronce JM, Fairlie AM, Atkins DC, & Lee CM (2016). Day-to-day variations in high-intensity drinking, expectancies, and positive and negative alcohol-related consequences. Addictive Behaviors, 58, 110–116. [PubMed: 26922158]

Raudenbush SW, & Bryk AS (2002). Hierarchical linear models: Applications and data analysis methods (2nd ed.). Thousand Oaks, CA: Sage Publications, Inc.

Reid AE, & Carey KB (2015). Interventions to reduce college student drinking: State of the evidence for mechanisms of behavior change. Clinical Psychology Review, 40, 213–224. [PubMed: 26164065]

Schulenberg JE, Johnston LD, O'Malley PM, Bachman JG, Miech RA, & Patrick ME (2017). Monitoring the future national survey results on drug use, 1975–2016: Volume II, college students and adults ages 19–55. Ann Arbor: Institute for Social Research, The University of Michigan.

Stacy AW, Widaman KF, & Marlatt GA (1990). Expectancy models of alcohol use. Journal of Personality and Social Psychology, 58(5), 918–928. [PubMed: 2348377]

Treloar H, Piasecki TM, McCarthy DM, Sher KJ, & Heath AC (2015). Ecological evidence that affect and perceptions of drink effects depend on alcohol expectancies. Addiction, 110(9), 1432–1442. [PubMed: 25959045]

Wall AM, Thrussell C, & Lalonde RN (2003). Do alcohol expectancies become intoxicated outcomes? A test of social-learning theory in a naturalistic bar setting. Addictive Behaviors, 28(7), 1271–1283. [PubMed: 12915168]

White A, & Hingson R (2013). The burden of alcohol use: excessive alcohol consumption and related consequences among college students. Alcohol Research: Current Reviews, 35(2), 201–218. [PubMed: 24881329]

Zeger SL, Liang KY, & Albert PS (1988). Models for longitudinal data: A generalized estimating equation approach. Biometrics, 44(4), 1049–1060. doi: 10.2307/25317 [PubMed: 3233245]

Table 1.

Descriptive statistics for expectancies, consequences and covariates based on drinking days analyzed in multilevel models.

Construct	*M* (*SD*) or Proportion	Median	Range
Covariates			
Sex	0.52	1	0–1
Age	19.92 (1.36)	20	18–24
Fraternity/sorority member	0.54	1	0–1
Study period	1.36 (1.12)	1	0–3
Weekend	0.59	1	0–1
# drinks intend	3.61 (3.55)	3	0–21
# drinks consumed	5.49 (3.48)	5	1–26
Positive Expectancy/Consequence			
Expectancy: Relax	6.24 (1.84)	6	1–9
Expectancy: Social	6.30 (1.91)	7	1–9
Expectancy: Better mood	5.95 (1.87)	6	1–9
Expectancy: Buzz	6.05 (2.31)	6	1–9
Expectancy: Energetic	5.40 (2.00)	6	1–9
Expectancy: Express feelings	5.20 (2.00)	5	1–9
Consequence: Relax	0.67	1	0–1
Consequence: Social	0.57	1	0–1
Consequence: Better mood	0.52	1	0–1
Consequence: Buzz	0.66	1	0–1
Consequence: Energetic	0.34	0	0–1
Consequence: Express feelings	0.26	0	0–1
Negative Expectancy/Consequence			
Expectancy: Hangover	3.26 (2.04)	3	1–9
Expectancy: Nausea/Vomit	2.44 (1.55)	2	1–9
Expectancy: Hurt/injury	2.43 (1.53)	2	1–9
Expectancy: Forget	2.75 (1.82)	2	1–9
Expectancy: Aggressive	2.31 (1.54)	2	1–9
Expectancy: Rude	2.85 (1.71)	2	1–9
Expectancy: Embarrassed	3.19 (1.82)	3	1–9
Consequence: Hangover	0.22	0	0–1
Consequence: Nausea/Vomit	0.07	0	0–1
Consequence: Hurt/injury	0.02	0	0–1
Consequence: Forget	0.07	0	0–1
Consequence: Aggressive	0.04	0	0–1
Consequence: Rude	0.05	0	0–1
Consequence: Embarrassed	0.06	0	0–1

Note. *N* ranges from 4132 to 4159 days/observations.

Table 2.

Correlations among positive and negative expectancies.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Relax												
2. Social	.40											
3. Better mood	.48	.53										
4. Buzz	.30	.50	.43									
5. Energetic	.30	.54	.48	.45								
6. Express feelings	.32	.50	.44	.42	.48							
7. Hangover	.08	.29	.19	.35	.30	.24						
8. Aggressive	.00 [a]	.09	.04	.12	.12	.10	.32					
9. Nausea/Vomit	−.02 [a]	.13	.07	.20	.17	.15	.50	.39				
10. Hurt/injury	.03 [a]	.14	.13	.19	.22	.20	.37	.37	.44			
11. Forget	.05	.24	.14	.30	.27	.20	.51	.33	.45	.44		
12. Rude	.05	.16	.12	.22	.21	.20	.37	.53	.41	.46	.43	
13. Embarrassed	.08	.24	.18	.29	.29	.28	.42	.40	.43	.48	.45	.55

Note. $N = 4132$ days

[a] p-value is not significant at $p < .01$. For all other correlations, p-value < .01.

Table 3.

Multilevel models examining associations between daily consequence-specific expectancies and experienced positive consequences: Odds ratios [95% Confidence Intervals] for experiencing each consequence.

	Positive Consequences					
Predictor	**Relax**	**Social**	**Better Mood**	**Buzz**	**Energetic**	**Express Feelings**
Person level						
Sex	1.02 [0.74, 1.41]	1.35 [1.00, 1.83]	1.20 [0.89, 1.63]	1.65** [1.19, 2.28]	1.34 [0.99, 1.81]	1.35 [0.95, 1.93]
Age	0.98 [0.86, 1.11]	0.97 [0.86, 1.09]	0.94 [0.84, 1.06]	0.96 [0.84, 1.09]	0.95 [0.84, 1.07]	0.98 [0.85, 1.13]
Greek Status	0.67 [0.48, 0.93]	0.95 [0.70, 1.29]	0.69 [0.51, 0.95]	0.69 [0.50, 0.97]	1.06 [0.79, 1.43]	0.85 [0.59, 1.22]
Person-mean drinking intentions	1.03 [0.86, 1.24]	1.13 [0.95, 1.34]	1.02 [0.86, 1.21]	1.07 [0.89, 1.29]	1.15 [0.97, 1.35]	1.06 [0.87, 1.29]
Person-mean drinks per drinking day	1.01 [0.92, 1.11]	1.11 [1.01, 1.22]	1.12 [1.02, 1.23]	1.12 [1.01, 1.24]	1.05 [0.96, 1.15]	1.12 [1.00, 1.25]
Consequence-specific expectancy (person-mean)	2.00*** [1.77, 2.27]	2.36*** [2.07, 2.69]	2.59*** [2.27, 2.96]	1.89*** [1.69, 2.12]	2.41*** [2.13, 2.74]	2.57*** [2.23, 2.96]
Daily level						
Study Period	0.74*** [0.69, 0.80]	0.79*** [0.74, 0.85]	0.72*** [0.67, 0.77]	0.81*** [0.75, 0.88]	0.78*** [0.72, 0.84]	0.78*** [0.72, 0.85]
Weekend	0.97 [0.83, 1.14]	1.24 [1.05, 1.47]	1.09 [0.93, 1.28]	0.99 [0.83, 1.18]	1.28** [1.07, 1.52]	1.14 [0.95, 1.38]
Drinking intentions (person-centered)	1.01 [0.98, 1.04]	1.03 [1.00, 1.07]	1.02 [0.99, 1.05]	1.01 [0.98, 1.04]	1.01 [0.98, 1.04]	1.00 [0.97, 1.04]
Alcohol use (person-centered)	1.07*** [1.03, 1.10]	1.38*** [1.33, 1.44]	1.15*** [1.11, 1.19]	1.43*** [1.37, 1.49]	1.26*** [1.22, 1.30]	1.20*** [1.15, 1.24]
Consequence-specific expectancy (person-centered)	1.18*** [1.12, 1.24]	1.18*** [1.12, 1.25]	1.12*** [1.07, 1.18]	1.16*** [1.11, 1.22]	1.19*** [1.13, 1.26]	1.21*** [1.14, 1.29]

Note. Separate models were run for each consequence (i.e., each column indicates a unique model). Odds ratios reflect the odds of experiencing a consequence given a one-unit change in the predictor. These units vary between predictors. Sex was dummy-coded (0 = men, 1 = women); Greek Status was dummy-coded (0 = no Greek affiliation, 1 = member of Greek organization); Study Period was coded 0 to 3; Weekend was dummy-coded (0 = Sun-Wed, 1 = Thurs-Sat); Drinking intentions at the daily level represent the number of standard drinks an individual intended to drink on a given day as a deviation from that individual's average on drinking days; Alcohol use at the daily level represents standard drinks consumed on a given day as a deviation from an individual's average alcohol consumption on drinking days. Across models, number of days analyzed ranged from 4133 to 4136 across 342 participants.

** $p<.01$

*** $p<.001$

Table 4.

Multilevel models examining associations between daily consequence-specific expectancies and experienced negative consequences: Odds ratios [95% Confidence Intervals] for experiencing each consequence.

	Negative Consequences						
Predictor	**Hangover**	**Nausea/Vomit**	**Hurt/Injury**	**Forget**	**Aggressive**	**Rude**	**Embarrassed**
Person level							
Sex	1.29 [0.98, 1.71]	2.13*** [1.42, 3.21]	2.09** [1.22, 3.59]	1.93** [1.26, 2.96]	1.18 [0.78, 1.80]	1.58 [0.95, 2.64]	2.20*** [1.44, 3.37]
Age	0.89 [0.80, 0.99]	0.94 [0.81, 1.10]	1.00 [0.82, 1.23]	0.86 [0.73, 1.02]	1.00 [0.85, 1.17]	1.03 [0.85, 1.25]	0.88 [0.74, 1.04]
Greek Status	1.04 [0.79, 1.38]	0.79 [0.54, 1.17]	1.08 [0.66, 1.76]	0.92 [0.61, 1.39]	0.82 [0.54, 1.23]	0.73 [0.44, 1.21]	0.84 [0.57, 1.24]
Person-mean drinking intentions	1.01 [0.86, 1.17]	0.83 [0.67, 1.04]	0.95 [0.73, 1.23]	1.01 [0.82, 1.24]	0.93 [0.75, 1.15]	0.97 [0.75, 1.26]	0.89 [0.71, 1.11]
Person-mean drinks per drinking day	1.08 [0.99, 1.18]	1.05 [0.92, 1.19]	1.15 [0.99, 1.34]	1.21** [1.07, 1.38]	1.14 [1.01, 1.28]	1.12 [0.97, 1.30]	1.13 [1.00, 1.28]
Consequence-specific expectancy (person-mean)	1.49*** [1.34, 1.66]	1.59*** [1.32, 1.91]	1.49*** [1.20, 1.85]	1.55*** [1.31, 1.84]	1.59*** [1.34, 1.89]	1.83*** [1.52, 2.21]	1.34*** [1.15, 1.56]
Daily level							
Study Period	0.88** [0.82, 0.96]	0.87 [0.77, 0.98]	0.86 [0.70, 1.04]	0.83** [0.73, 0.95]	0.85 [0.74, 0.99]	0.88 [0.76, 1.02]	0.93 [0.82, 1.05]
Weekend	1.02 [0.85, 1.24]	1.06 [0.80, 1.41]	1.21 [0.76, 1.90]	0.86 [0.64, 1.15]	0.85 [0.61, 1.18]	0.83 [0.59, 1.16]	0.89 [0.66, 1.20]
Drinking intentions (person-centered)	1.01 [0.97, 1.04]	1.02 [0.97, 1.07]	0.98 [0.92, 1.04]	0.97 [0.93, 1.01]	1.02 [0.97, 1.07]	1.02 [0.97. 1.08]	0.99 [0.94, 1.03]
Alcohol use (person-centered)	1.49*** [1.43, 1.55]	1.37*** [1.29, 1.44]	1.26*** [1.17, 1.36]	1.48*** [1.40, 1.57]	1.17*** [1.11, 1.24]	1.23*** [1.16, 1.31]	1.28*** [1.21, 1.35]
Consequence-specific expectancy (person-centered)	1.00 [0.95, 1.06]	0.99 [0.90, 1.09]	1.05 [0.90, 1.23]	1.05 [0.96, 1.15]	1.17** [1.05, 1.30]	1.16** [1.04, 1.29]	1.13** [1.03, 1.24]

Note. Separate models were run for each consequence (i.e., each column indicates a unique model). Odds ratios reflect the odds of experiencing a consequence given a one-unit change in the predictor. These units vary between predictors. Sex was dummy-coded (0 = men, 1 = women); Greek Status was dummy-coded (0 = no Greek affiliation, 1 = member of Greek organization); Study Period was coded 0 to 3; Weekend was dummy-coded (0 = Sun-Wed, 1 = Thurs-Sat); Drinking intentions at the daily level represent the number of standard drinks an individual intended to drink on a given day as a deviation from that individual's average on drinking days; Alcohol use at the daily level represents standard drinks consumed on a given day as a deviation from an individual's average alcohol consumption on drinking days. Across models, number of days analyzed ranged from 4129 to 4135 across 342 participants.

** $p<.01$

*** $p<.001$