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Not all drinking events are the same: Exploring 21st birthday and typical alcohol expectancies as a risk factor for high-risk drinking and alcohol problems

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Abstract

Alcohol expectancies are a central construct in understanding college student typical alcohol use. However, to our knowledge, there is no research addressing how alcohol expectancies for specific events (i.e. 21st birthday) are different from expectancies regarding typical drinking. We examine the extent to which 21st birthday alcohol expectancies differ from general alcohol expectancies and how 21st birthday expectancies are associated with actual alcohol use and consequences experienced on 21st birthdays, above and beyond expectancies for typical drinking. Participants were college students (N=585; 54% women) who were turning 21 within a week, and intended to drink 4/5 (female/male) drinks on their birthday. All negative expectancies (impairment, risk and aggression, negative self-perception) and positive expectancies (social, liquid courage, sex) except tension reduction were significantly greater for 21st birthday drinking than for typical drinking. While 21st birthday expectancies were not uniquely related to actual birthday drinking, several positive and negative 21st birthday expectancy subscales were associated with 21st birthday drinking-related consequences, even when controlling for typical drinking expectancies. Expectancy challenge interventions aimed specifically at these subscales may be effective at attenuating alcohol-related consequences that result from 21st birthday drinking.

Keywords

event-specific drinking; 21st birthday; alcohol expectancies; college students

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Contributors

Example: Authors Lee, Lewis, and Larimer designed the study and wrote the protocol and edited the manuscript. Drs. Geisner and Ramirez conducted literature searches and provided summaries of previous research studies, outlined and wrote sections of the introduction and discussion. Dr. Rhew conducted the statistical analysis and wrote the results section. All authors contributed to and have approved the final manuscript.

Conflict of Interest

All authors declare that they have no conflicts of interest.

1 Introduction

College student drinking is a common phenomenon on campuses. Up to 90% of students drink and experience consequences across academic, health, social, and legal domains (Fromme & Quinn, 2012; Hingson & White, 2012; Johnston, O'Malley, Bachman, & Schulenberg, 2013; Schulenberg & Patrick, 2012). Furthermore, college students in the U.S. have been shown to engage in event-specific drinking (e.g. 21st birthday drinking, spring break drinking, etc.) that is different from typical drinking (Brister, Sher, & Fromme; 2011; Lee, Lewis, & Neighbors, 2009; Lefkowitz, Patrick, Morgan, Bezemer, & Vasilenko, 2012; Neighbors et al., 2011; Neighbors, Foster, Fossos & Lewis; 2012a). Thus it is perhaps not surprising that perceptions and cognitions related to drinking during specific events may be different from those for typical or general drinking behavior. For example, drinking norms for 21st birthday have been found to be different than typical drinking norms (e.g., Lewis, Neighbors, Lee, & Oster-Aaland, 2008; Neighbors, Bergstrom, Oster-Aaland, & Lewis, 2006; Patrick, Neighbors, & Lee, 2012). In the past decade, event-specific prevention approaches have begun to target known windows of risk such as 21st birthdays, spring break, etc. (LaBrie, Migliuri, & Cail, 2009; Lewis et al., 2008; Neighbors, Lee, Lewis, Fossos, & Walter, 2009; Neighbors et al. 2012b).

1.1 Alcohol expectancies defined and linked to drinking outcomes

Alcohol expectancies are known to play a role in alcohol consumption and related consequences. Alcohol outcome expectancies may be defined as beliefs regarding the probability of experiencing certain effects as a result of alcohol use. According to social learning theory (Bandura, 1977), alcohol outcome expectancies can be formed from either direct or indirect (observational) experiences with alcohol use; and can reflect both positive (e.g., feeling happy) and negative (e.g., feeling nauseous) alcohol consumption effects (Goldman, Brown, Christiansen & Smith, 1991; Maisto, Carey, & Bradizza, 1999; Oei & Baldwin, 1994). Further, such models predict that stronger expectancies of positive effects should be associated with increased drinking behavior, whereas stronger expectancies of negative effects should be associated with decreased drinking behavior. To date, these models are in part supported by evidence that positive alcohol expectancies are positively associated with both alcohol consumption and related consequences (Fromme & D'Amico, 2000; Ham, Stewart, Norton, & Hope, 2005; Vilenne & Quertemont, 2015; Young, Connor, Ricciardelli, & Saunders, 2006). These findings have led to the development of expectancy challenge interventions (Darkes & Goldman, 1993; 1998), which aim to reduce positive expectancies. Study findings however, are mixed as to whether heavier drinkers expect fewer negative effects or more negative effects relative to lighter drinkers (see Leigh, 1999 for review). While some studies have found that stronger negative expectancies are associated with less alcohol use (Fromme & D'Amico, 2000), others have found that negative expectancies are positively associated with alcohol-related risk behaviors (Des Rosiers, Schwartz, Zamboana, Ham, & Huang, 2013) and alcohol-related problems (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007), or have found no relationship between negative expectancies and alcohol-related outcomes (Neighbors et al., 2007; Young et al., 2006).

Although alcohol expectancies are often measured as a trait construct, there is evidence to show that expectancies vary within-person (Lee, Atkins, Cronce, Walter, & Leigh, 2015; Patrick, Cronce, Fairlie, Atkins, & Lee, 2016) and are sensitive to specific drinking contexts. For example, research has demonstrated that college students had stronger positive alcohol outcome expectancies in a naturalistic bar setting than in a traditional laboratory setting (Wall, McKee, & Hinson, 2000; Wall, Hinson, McKee, & Goldstein, 2001). Additional research has utilized event-level methodologies to demonstrate within-person variation in expectancies across other social (e.g., with a group of friends) and environmental (e.g., at a pub or restaurant) contexts (Monk & Heim, 2014; Wall et al., 2001). Although most research establishing expectancies as key predictors of alcohol consumption and related consequences have examined between-person variation, within-person changes in expectancies may also be important when predicting heavy drinking and its consequences. Further, despite the known increased risks surrounding 21st birthday drinking, no studies have compared alcohol outcome expectancies pertaining to 21st birthday drinking with an individuals' typical drinking expectancies.

1.2 Current Study

Understanding if and how 21st birthday expectancies differ from general drinking expectancies and how they relate to drinking and consequences has the potential to help inform interventions targeting 21st birthday drinking. While expectancy challenges have been incorporated into some event-specific preventions, no study to date has examined how 21st birthday expectancies may differ from typical drinking expectancies and how these event-specific expectancies relate to drinking and related consequences. Examining students' expectancies, comparing them to their actual experiences, and providing information known to challenge these beliefs may help students make decisions to consume less alcohol or drink alcohol in a less risky manner. By identifying specific expectancies related to 21st birthday drinking and related consequences, we may be able to tailor and improve alcohol expectancy interventions by aiming to reduce these specific expectancies. However, if event-specific expectancies do not add predictive power to typical expectancies, assessment batteries could be shortened by eliminating redundant measures, and interventions targeting typical drinking expectancies could be utilized to reduce consumption and harmful consequences related to event-specific drinking. The aims of this study were to 1) examine whether alcohol expectancies for 21st birthdays differ from alcohol expectancies for typical drinking, and 2) to explore whether 21st birthday alcohol expectancies predict 21st birthday drinking and consequences above and beyond typical expectancies. Based on demonstrated differences between 21st birthday and typical drinking norms (Lewis et al., 2008; Neighbors et al., 2006; Patrick et al., 2012), we hypothesized that both positive and negative alcohol expectancies would be greater for 21st birthdays as compared to typical drinking episodes. Consistent with models of social learning theory (Bandura, 1977), we further hypothesized that 21st birthday alcohol expectancies would predict 21st birthday drinking and consequences after controlling for typical expectancies.

2. Method

2.1 Participants and Procedures

Participants for the present study were part of a larger 6-arm randomized controlled trial evaluating event-specific 21st birthday interventions on 21st birthday drinking (see Neighbors et al., 2012 for details). A random sample of 3,043 students turning 21 during the 2008 and 2009 academic years was obtained from the Registrar's office of a large, public, west coast university in the United States of America. Students were emailed an invitation and PIN one month prior to their 21st birthday and completed all assessments on line. Of the students contacted, 1558 (51%) completed screening, of whom 642 (41%) met criteria (i.e. intended to drink 4 [women] or 5 [men] drinks during their 21st birthday celebration) and were invited to the study and 599 (93.3% of those eligible) completed the baseline assessment. The final sample for this analysis included 585 participants with no missing drinking data. Of the final sample, 54.4% were female. The racial composition of the sample was 69.5% White, 15.8% Asian, 2.4% Black, and 12.3% Other; and 5.7% reported being Hispanic ethnicity. The mean number of intended 21st birthday drinks was 10.1 (SD = 5.5; range: 4, 30). Regarding intervention condition, 16.2% were assigned to an attention-only control group, while others were assigned to one of five interventions conditions that included a brief alcohol intervention delivered in-person or via the Internet and either did or did not include a participant's friend. The intervention was delivered immediately (internet delivered) or at any time prior to the student's birthday (in-person). Students were assessed via the Internet again at 1-week post their 21st birthday to obtain their actual drinking and related consequences. The Institutional Review Board approved all procedures. For detail description of the study methodology see Neighbors et al., 2012b.

2.2 Measures

Demographics—Standard demographic questions (gender and age) were asked of all participants at screening. Intervention condition was coded as 0 (control) and 1 (intervention).

21st birthday drinking—The measure of 21st birthday drinking was obtained at the 1-week post birthday assessment and scored as the number of standard drinks participants reported drinking on their 21st birthday.

21st birthday alcohol-related consequences—A subset of ten alcohol-related consequences were taken from the Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut & Sher, 1992) and administered during the 1-week post birthday assessment. The 10 items were selected based on a pilot study and were the items participants most frequently endorsed experiencing over their 21st birthday week (See Appendix 1). Participants reported whether each of these consequences happened because of drinking on the 21st birthday (α=.75). Three of the consequences were assessed for the day after the 21st birthdays (Headache morning after, late for work next day, could not remember night before). Scores reflected the number of consequences experienced with a possible range of 0 to 10.

Alcohol expectancies—The Comprehensive Effects of Alcohol (CEOA; Fromme, Stroot, & Kaplan, 1993) is a 38-item measure of alcohol expectancies administered during the baseline assessment. The CEOA breaks down into 7 subscales. The Positive Subscales included: Social facilitation, Tension reduction, Liquid courage, and Sexual enhancement, while Negative Subscales were: Impairment, Risk/aggression, Negative self-perception. The directions for the 21st birthday asked participants "what you would expect to happen if you were drinking alcohol **while celebrating your 21st birthday**" while the typical directions simply asked "what you would expect to happen if you were drinking alcohol". Item responses range from 0 - disagree, 1 - slightly disagree, 2 - slightly agree, and 3 - agree. The exact items were asked about 21st birthday drinking expectancies and typical drinking expectancies with similar reliabilities for each typical/21st birthday positive scales: α=.85/ α=.82 respectively and typical/21st birthday negative scales: α=.83/α=.83 respectively.

2.3 Data analytic plan

Paired *t*-tests were performed to assess whether each of the alcohol expectancies for 21st birthday drinking were different compared to the corresponding expectancies for typical drinking. Then, for each of the expectancy subscales, we ran a separate regression model to assess whether the 21st birthday alcohol expectancy subscale was associated with actual 21st birthday number of drinks consumed and consequences (YAAPST score) independent of the corresponding typical drinking expectancy subscale (e.g., when examining social expectancies, the 21st birthday and the typical social expectancy variables are included in the same model). Because both the number of drinks consumed and alcohol-related consequences experienced on 21st birthday are non-negative integers that were positively skewed in this sample, we used negative binomial regression (Atkins and Gallop 2007). Coefficients in negative binomial regression are connected to the outcome via a log-link. They are commonly exponentiated (i.e., e^{β}) to yield rate ratios (RRs) that describe the proportional change in the outcome associated with a one-unit increase in the exposure (e.g., expectancies). We included study condition and sex as covariates in the negative binomial models. All statistical analyses were performed using Stata 14.0 (Stata Corporation, College Station, TX).

3. Results

Table 1 shows the mean values for each of the alcohol expectancies subscales for 21st birthday and typical drinking and the *p*-value from the paired *t*-test for their differences. In general, alcohol expectancies for 21st birthday drinking were higher than typical drinking expectancies. Thus, students tended to expect that the effects of alcohol would be enhanced for 21st birthday drinking compared to typical drinking. These differences were statistically significant ($p < .05$) for all expectancies except for tension reduction and sexual enhancement.

We then examined whether 21st birthday alcohol expectancies were associated with the number of drinks consumed on one's 21st birthday as well as alcohol-related consequences independent of their corresponding typical drinking expectancy adjusted for sex and study condition. In this sample, the mean number of drinks consumed was 9.6 (SD = 6.4; range: 0

to 30), which was somewhat lower than the intended number of drinks reported at baseline (mean = 10.1; SD = 5.5), and the mean number of consequences was 2.8 (SD = 2.0; range: 0 to 10). There were no statistically significant associations between any of the 21st birthday expectancy subscales and 21st birthday number of drinks consumed after accounting for the corresponding typical drinking expectancy (Table 2). However, typical social expectancies were significantly associated with drinks consumed. When examining 21st birthday alcohol-related consequences, a different picture emerged (Table 3). For most expectancy subscales, when including both the 21st birthday and its corresponding typical expectancy in the same model, the 21st birthday drinking expectancy was significantly associated with 21st birthday alcohol-related consequences while the association was weaker and nonsignificant for the typical drinking expectancy (Table 3). For example, in the model examining social expectancies a one-unit increase in 21st birthday social expectancies was associated with an 83% increase in the number of alcohol-related consequences on one's 21st birthday (RR = 1.83, $p < .001$) while typical social expectancies showed no significant association. However, typical, but not 21st birthday, drinking expectancy for negative self-perception was significantly associated with 21st birthday drinking. Sensitivity analyses that further adjusted for number of drinks consumed on one's 21st birthday showed that findings were similar and substantive interpretations remained the same.

4. Discussion

In this sample of high-risk college students who were selected for the intentions to consume at least 4 (for women) or 5 (for men) drinks during their 21st birthday, beliefs about the positive and negative effects of alcohol consumption were heightened for one's 21st birthday drinking compared to typical drinking. College students reported that a variety of expected effects would be more enhanced when drinking on their 21st birthday compared to typical drinking. These included both positive and negative expectancies, therefore, students expected most alcohol-related outcomes regardless of valence to be more likely after 21st birthday drinking compared to typical drinking. In the context of social learning theory, stronger positive expectancies are predicted to result in greater drinking but stronger negative expectancies are thought to be protective against drinking. Therefore, if both positive and negative expectancies are enhanced, these expectancies should be at odds with one another and the overall predicted effect on drinking is unclear. Perhaps consistent with this, there was no evidence of 21st birthday expectancies predicting alcohol consumption after controlling for typical expectancies. With regard to typical expectancies, enhanced expectancies of social facilitation were associated with a greater number of drinks consumed, lending some support to a positive relationship between positive expectancies and alcohol consumption.

Highlighting the importance of these 21st birthday-specific vs. typical drinking beliefs, a number of birthday specific expectancies were associated with greater alcohol related consequences on one's 21st birthday above and beyond typical drinking expectancies. In particular, enhanced expectancies of social and sexual facilitation, liquid courage, impairment, and risk/aggression were all positively associated with alcohol-related consequences. This grouping of expectancies once again includes both positive and negative outcomes. The finding that enhanced positive expectancies (social and sexual facilitation,

liquid courage) were positively associated with alcohol-related consequences is consistent with both social learning theory and past research (e.g., Fromme & D'Amico, 2000). However, enhanced negative expectances (impairment, risk/aggression) also were associated with more alcohol-related consequences and is at odds with social learning theory, but consistent with other studies demonstrating positive associations between negative expectancies and alcohol-related problems (Neighbors et al., 2007).

It is important to note that birthday specific expectancies were predictors of 21st birthday negative consequences but not 21st birthday alcohol use. When considering which of the birthday specific expectancies predicted consequences (i.e., social, liquid courage, sexual facilitation, impairment, and risk/aggression) it is noticeable that many of these expectancies are specific to several of the consequences assessed (i.e., Did your drinking get you into sexual situations which you later regretted?, Did you drive a car when you knew you had too much to drink?, Did you become rude, obnoxious, or insulting after drinking?). This may further suggest that expectancies exert most of their influence on the expected behavior itself (i.e., driving while intoxicated), and not on alcohol use. Furthermore, many of the negative consequences assessed could occur at various levels of alcohol use, thus it seems reasonable that birthday specific expectancies related to negative consequences but not alcohol use.

4.1 Clinical implications

21st birthday expectancies may be higher because students plan to drink more. It is possible that controlling for drinking intentions would shed light on this issue. Another reason students may expect different outcomes from 21st birthday drinking are perceptions of the experience as portrayed in media and through social norms. Drinking with more friends, in social settings, and for celebratory reasons may all alter the expectations students have from alcohol (Monk & Heim, 2014; Wall et al., 2000; Wall et al., 2001). However, the physical effects of alcohol remain the same and it may be important to incorporate these event-specific expectancies and compare them to regular alcohol expectancies during education, prevention, or intervention efforts. Although there have been recent efforts to provide 21st birthday-focused, individually-tailored brief interventions, there are mixed findings regarding the effectiveness of these interventions (Neighbors et al., 2012b; Steinka-Fry, Tanner-Smith, & Grant, 2015). The current findings highlight potential alcohol-related outcomes that could be the focus of event-specific expectancy challenge interventions. In particular, expectancies of social facilitation, sexual facilitation, and liquid courage were all enhanced for 21st birthday drinking relative to typical drinking and were associated with more alcohol-related consequences. Expectancy challenges that aim to reduce this cluster of positive expectancies may be effective at attenuating alcohol-related consequences that result from 21st birthday drinking.

4.2 Limitations

This study was collected on one campus, with high-risk students (those intending to consume 4/5 drinks on their birthday), and thus results may not generalize to other campuses, those who are turning 21 and are not in college, or to those with the intention of consuming fewer than 4 and 5 drinks. Furthermore, measures were not counterbalanced in their presentation, thus it is possible that seeing the 21st birthday expectancies first somehow

biased typical drinking expectancies answers. Future studies should collect broader samples (e.g. more schools, no restriction on intentions, etc) and counterbalance the measures to remove bias. Finally, it is possible that the improvement in predictability of drinking consequences for the 21st birthday is not due to the special importance of that day, but rather to the fact that students were being probed about a specific upcoming drinking event (rather than a generic assessment of "typical" drinking). Thus, the results may not really be specific to the 21st birthday, but may actually highlight the importance of assessing expectancies yoked to an identified drinking episode. Future research should address this possibility comparing expectancies for other specific events or using daily diary research methods.

4.3 Future directions

As this was the first study of this kind, replicating these findings would be a critical next step. Future studies need to examine how location of drinking, number of friends, and other potential environmental variables moderate the relationship between 21st birthday expectancies, typical drinking expectancies and drinking. Also, past research has shown that students who are most likely to experience negative consequences are those who drink excessively during 21st birthdays but do not typically do so (Lewis, Lindgren, Fossos, Neighbors, & Oster-Aaland, 2009). Future research may determine if discrepancies in alcohol expectancies between 21st birthday drinking and typical drinking are especially large for typically lighter drinkers, and whether these students may be particularly likely to benefit from expectancy challenge interventions. Finally developing and testing education, prevention, and intervention materials that would incorporate event-specific alcohol expectancies may reduce the increased consequences associated with such drinking.

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Appendix 1: YAAPST ITEMS

Did you drive a car when you knew you had too much to drink?

Did you become rude, obnoxious, or insulting after drinking?

Did you feel very sick to your stomach or throw up after drinking?

Did you have a headache (hangover) the morning after you had been drinking?

Did you participate in drinking contests or drinking games (e.g. 'quarters', chugging contests, 'progressive' parties)?

Did you pass out or faint suddenly?

Did you show up late for work or school because of drinking, a hangover, or an illness caused by drinking?

Did you skip an evening meal because you were drinking?

Did you wake up the morning after a good bit of drinking and find that you could not remember a part of the evening before?

Did your drinking get you into sexual situations which you later regretted?

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Highlights

- Examines differences in expectancies for 21st birthday drinking versus typical drinking
- Examines associations between expectancies, 21st birthday alcohol use and consequences
- 21st BD drinking expectancies significantly greater than expectancies for typical drinking
- 21st BD drinking expectancies associated with 21st BD consequences

Table 1

Mean expectancy scores for 21st birthday and typical drinking at baseline

Expectancy	21st birthday Mean (SD)	Typical Mean (SD)	*p*-value
Positive Subscales:			
Social Facilitation	2.52 (0.38)	2.42 (0.41)	<.001
Tension reduction	1.82 (0.58)	1.81 (0.63)	0.815
Liquid courage	1.78 (0.63)	1.67 (0.62)	<.001
Sexual enhancement	1.50 (0.65)	1.46 (0.69)	0.057
Negative Subscales			
Impairment	1.90 (0.52)	1.71 (0.50)	<.001
Risk and aggression	1.48 (0.64)	1.28 (0.64)	<.001
Negative self-perception	0.72 (0.57)	0.67 (0.57)	0.030

Table 2

Adjusted* rate ratios and 95% confidence intervals for 21st birthday number of drinks consumed according to 21st birthday and typical drinking expectancies.

	21st birthday-specific			Typical		
Expectancy	**RR**	**95% CI**	**p-value**	**RR**	**95% CI**	**p-value**
Social	1.07	.87, 1.32	.542	1.27	1.05, 1.54	.016
Tension reduction	.91	.80, 1.03	.152	1.08	.96, 1.21	.207
Liquid courage	1.13	.99, 1.29	.076	1.01	.88, 1.16	.850
Sexual facilitation	1.10	.94, 1.28	.250	.99	.85, 1.15	.899
Impairment	1.15	.98, 1.36	.096	.95	.80, 1.14	.588
Risk/aggression	1.13	.97, 1.32	.125	1.03	.88, 1.20	.729
Negative self-perception	.93	.81, 1.06	.289	1.04	.91, 1.20	.567

* adjusted for sex and randomized study condition

Table 3

Adjusted* rate ratios and 95% confidence intervals for 21st birthday alcohol consequences according to 21st birthday and typical drinking expectancies.

	21st birthday-specific			Typical		
Expectancy	**RR**	**95% CI**	**p-value**	**RR**	**95% CI**	**p-value**
Social	1.83	1.44, 2.32	<.001	.85	.69, 1.04	.121
Tension reduction	.90	.78, 1.04	.144	.98	.86, 1.12	.805
Liquid courage	1.19	1.03, 1.37	.022	1.08	.93, 1.26	.317
Sexual facilitation	1.37	1.16, 1.62	<.001	.92	.79, 1.08	.318
Impairment	1.33	1.12, 1.59	.002	.93	.69, 1.06	.427
Risk/aggression	1.30	1.10, 1.53	.002	1.06	.90, 1.25	.515
Negative self-perception	.95	.82, 1.10	.496	1.25	1.08, 1.44	.003

*adjusted for sex and randomized study condition