

Anticipated Versus Actual Alcohol Consumption During 21st Birthday Celebrations*

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ABSTRACT. Objective: The 21st birthday celebration is often associated with excessive alcohol consumption. The current study examined whether individuals consume more alcohol than anticipated during their celebration and whether situational factors contribute to prediction errors. **Method:** College students ($N = 150$; 50% female) who planned to drink during their 21st birthday celebration were contacted by telephone 1 week before their celebrations and asked about their birthday plans, including anticipated alcohol consumption. The week after the celebration, in-person semi-structured interviews and self-report measures were administered to obtain information about the 21st birthday celebration, including type and amount of alcohol consumed, pace of

drinking, influential peer involvement, and engagement in 21st birthday traditions. **Results:** The majority of 21st birthday celebrants consumed more alcohol than they anticipated, with men showing greater prediction error than women. Situational factors were positively associated with the discrepancy between anticipated and actual alcohol consumption. **Conclusions:** Drinking shots, drinking at a fast pace, celebrating with influential peers, and engaging in 21st birthday traditions were associated with drinking more alcohol than anticipated during 21st birthday celebrations. Findings suggest future interventions that target situational factors could reduce excessive 21st birthday drinking. (*J. Stud. Alcohol Drugs*, 71, 180-183, 2010)

THE 21ST BIRTHDAY CELEBRATION has received significant media attention as a result of alcohol-related deaths that have occurred while celebrating the transition to legal drinking age. Although available studies have focused primarily on programs to prevent heavy drinking (Hembroff et al., 2007; Neighbors et al., 2005, 2006; Smith et al., 2006), they provide consistent descriptions of excessive alcohol consumption during 21st birthday celebrations. Approximately 85% of celebrants consume alcohol and drink to dangerous levels, with average blood alcohol concentrations of 0.17% (Neighbors et al., 2005). Although some evidence suggests that celebrants anticipate drinking excessively during their 21st birthday celebrations (Hembroff et al., 2007), research on behavioral forecasting (Diekmann et al., 2003; Epley et al., 2000) suggests that they may be inaccurate in predicting their drinking behavior.

One explanation for poor behavioral prediction posits that people predict they will behave in a way that is perceived to be socially desirable (Diekmann, 2008). Accordingly, individuals may anticipate that their alcohol consumption on their 21st birthday will be within socially desirable amounts. Another explanation for behavioral prediction errors relates to the failure to consider influential situational factors

(Vallone et al., 1990). For example, on their 21st birthday, individuals may drink more or fewer drinks than they anticipated based on who is with them, where they are, and what opportunities arise throughout the celebration. During 21st birthday celebrations, peers may encourage the celebrant to drink excessively as turning 21 has become popularized as a “rite of passage” with certain social expectations.

Given the potential dangers and paucity of research, we sought to more thoroughly evaluate 21st birthday drinking by examining (a) anticipated and actual alcohol consumption for the celebration, (b) whether individuals made forecasting/prediction errors regarding 21st birthday drinking, and (c) the influence of situational factors on potential prediction errors. We hypothesized that individuals would inaccurately predict their birthday drinking. Specifically, we expected that most celebrants would consume more alcohol than they anticipated and that situational factors would be associated with the discrepancy between anticipated and actual drinking. Although many situational factors influence alcohol consumption, we predicted that peer encouragement of heavy drinking, engagement in 21st birthday traditions, drinking quickly, and drinking distilled spirits (e.g., shots or mixed drinks) would be associated with underprediction errors.

Method

Participants

Participants were selected from a longitudinal study ($N = 2,245$) of first-time college students attending a large public

Received: February 18, 2009. Revision: July 18, 2009.

*This research was supported by National Institute on Alcohol Abuse and Alcoholism grants RO1-AA013967 and T32-AA-07471 and the Waggoner Center for Alcohol and Addiction Research.

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Southwestern university (for additional details see Corbin et al., 2008). For the current study, participants reaching the legal United States drinking age of 21 during the 2007 spring semester ($n = 575$) were identified, and participants who had completed the previous 5 waves of the longitudinal study ($n = 409$) were targeted for the current study. Of these 409 participants, 212 were initially contacted by email and were prescreened by telephone approximately 7 days before their 21st birthday. Volunteers who planned to drink alcohol as part of their celebration and were able to come to the laboratory for an in-person assessment within 7 days after their 21st birthday celebration were invited to participate. Twenty (9%) individuals refused participation, 40 (19%) were ineligible (e.g., did not plan to drink), and 6 (3%) dropped out of the study (i.e., agreed to participate but did not complete the in-person interview). From the 212 individuals who completed the prescreening assessment, 152 (72%) completed the in-person assessment, and two individuals reported no alcohol consumption during their celebration and were dropped from analyses. All 152 participants who were prescreened completed the in-person, postbirthday assessment. Proportionally, there were significantly more women in the identified (70%) and targeted (77%) samples relative to the final sample (both $ps < .001$). There were, however, no differences in ethnicity or typical drinking frequency or quantity among those identified as turning 21 ($n = 575$), targeted for this study ($n = 409$), or who completed both pre- and postbirthday assessments ($n = 152$; all $ps > .05$). The final sample ($N = 150$) was 50% female. Its racial/ethnic composition was 38% White, 15% Asian, 12% Hispanic/Latino(a), and 3% Black/African American; 32% reported mixed or other ethnicity.

Measures

Anticipated alcohol use. During the brief telephone prescreen (i.e., 2-5 minutes), volunteers were asked about their celebration plans including questions about their anticipated alcohol use: "How many standard drinks do you think you will have [during your 21st birthday celebration]?" A standard drink was defined as 12 oz. of beer, 5 oz. wine, or 1.5 oz. of distilled spirits either straight (e.g., as a shot) or in a mixed drink.

Actual alcohol use. Alcohol consumed during the 21st birthday celebration was assessed during the in-person assessment using a modified Timeline Followback procedure (Sobell and Sobell, 1992). To facilitate recall, interviewers presented a 24-hour timeline divided into 15-minute increments. Participants reported the number of standard drinks consumed, type of drink, name of shots and mixed drinks, and time of first and last drink during the birthday celebration.

Situational factors. Details of the birthday celebration were assessed using the Birthday Celebration Structured

Interview-21 (for details see Wetherill and Fromme, 2009). For the current study, participants were asked about the presence and number of their "friends that try to influence the celebratory atmosphere and encourage drinking and other behaviors" and about any drinking traditions (e.g., drinking 21 shots, drinking at midnight) in which they engaged during their celebration.

Procedures

Volunteers were contacted by telephone approximately 1 week before their 21st birthday to determine study eligibility. During the telephone screen, participants indicated celebration plans, including their anticipated celebration date, intent to consume alcohol, and anticipated number of drinks they would consume. The majority of participants (94%) completed the in-person assessment approximately 4 ($SD = 2$) days after celebrating their 21st birthday. On arrival at the laboratory, participants provided informed consent, completed written questionnaires, and then completed the 21st birthday Timeline Followback and the Birthday Celebration Structured Interview-21. Participants were paid \$40.

Results

Discrepancy scores were calculated by subtracting anticipated from actual number of drinks consumed. Because of the concentration and likelihood of greater intoxication for distilled spirits, two variables were created based on the number of shots and number of mixed drinks reported. The total number of shots or mixed drinks was divided by the total number of drinks to provide scores for the proportion of shots and mixed drinks consumed. Numbers of 21st birthday-specific traditions and influential peers present during the celebration were summed. Pace was computed by dividing the total number of standard drinks by total time spent drinking (i.e., time between first and last drink). The lower the pace value, the faster the rate of consumption.

Descriptive data

Table 1 provides descriptive data for alcohol consumption, influential peers, and 21st birthday traditions. Overall, participants consumed an average of 10.70 ($SD = 6.35$) drinks. Paired samples t tests revealed significant differences between anticipated and actual drinking on the 21st birthday, $t(149) = 6.76, p < .001$, with men showing greater prediction error than women. Specifically, men consumed 4.0 drinks more than anticipated, whereas women consumed 1.87 drinks more than anticipated.

Of the 150 participants, 68% ($n = 102$) consumed more drinks than anticipated, 11% ($n = 16$) consumed as anticipated, and 21% ($n = 31$) consumed fewer drinks than anticipated. Consistent with study hypotheses and given the large

TABLE 1. Descriptive data

Variable	Males (<i>n</i> = 75)	Females (<i>n</i> = 75)	Total (<i>n</i> = 150)
Anticipated no. of drinks, <i>M</i> (<i>SD</i>)	8.47 (5.16)	7.07 (4.36)	7.76 (4.80)
Actual no. of drinks consumed, <i>M</i> (<i>SD</i>)	12.47 (6.72)	8.94 (5.47)	10.70 (6.35)
Type of alcohol, %			
Beer	29.49	7.83	18.66
Wine	3.53	10.11	6.82
Shots	32.54	32.73	32.63
Mixed drinks	34.46	48.10	41.27
No. of influential peers, %			
0	36.84	40.79	38.82
1	28.95	25.00	26.97
≥2	34.21	34.21	34.21
No. of 21st birthday traditions, %			
0	39.47	40.79	40.13
1	31.58	38.16	34.87
≥2	28.95	21.05	25.00
Pace, <i>M</i> (<i>SD</i>) ^a	3.53 (2.63)	2.83 (3.00)	3.18 (2.84)

^aPace was computed by dividing number of self-reported drinks by total time spent drinking during celebration.

number of participants who consumed more drinks than anticipated, the remainder of the analyses focuses on the situational factors that could lead an individual to consume more alcohol than anticipated.

Situational factors related to discrepancy between anticipated and actual drinking

Individuals who underestimated their drinking anticipated consuming 7.19 (*SD* = 3.78) drinks but consumed 12.37 (*SD* = 6.16). An analysis of variance indicated that overall differences in prediction error were considerably larger for men than for women, $F(1, 101) = 5.52, p < .02$. Two linear regression analyses assessed factors associated with underprediction error. In each model, the discrepancy variable was entered as the dependent variable, and the hypothesized influencing factors and their interactions were entered as dependent variables, controlling for gender. The first model tested alcohol-specific variables and included the type of drinks (i.e., shots and mixed drinks) consumed, drinking pace, and their interactions. Analyses revealed main effects for proportion of shots ($\beta = .24, p < .01$) and drinking pace ($\beta = .26, p < .01$). Proportion of mixed drinks consumed and the interactions were not significant. Individuals who celebrated their 21st birthday by consuming shots and those who drank at a faster pace consumed more drinks than anticipated.

The second regression analysis focused on situational factors and included 21st birthday traditions, number of in-

fluential peers, and their interaction. Main effects were found for number of 21st birthday traditions endorsed ($\beta = .34, p < .01$) and number of influential peers ($\beta = .47, p < .001$) as well as their interaction ($\beta = .46, p < .02$). Thus, individuals who engaged in more 21st birthday drinking traditions, had more influential peers present, and engaged in traditions with peers present showed greater prediction error and consumed more drinks than anticipated.

Discussion

Among 150 people who celebrated their 21st birthday by drinking alcohol, approximately 87% were inaccurate when forecasting their level of consumption, with 68% drinking more than anticipated. Men showed greater prediction error than women, and approximately 30% of individuals consumed five or more drinks than they anticipated. Situational factors contributed to participants' forecasting errors, in that those who drank more than anticipated generally drank faster, consumed more shots, engaged in more 21st birthday drinking traditions, and had more influential friends present relative to individuals who were generally accurate or drank less than anticipated. Additionally, 55% of celebrants reported drinking free shots in bars, which is more than double the proportion reported by Hembroff and colleagues (2007). Peer influence was also associated with drinking more than anticipated, especially among celebrants who also engaged in drinking traditions, suggesting that peers may influence excessive birthday drinking by encouraging participation in drinking traditions.

With an average of 10.7 drinks, rates of 21st birthday drinking in the current study were greater than those reported in most studies, 7.42 (*SD* = 6.62) drinks (Neighbors et al., 2006), 8.73 (*SD* = 6.41) drinks (Neighbors et al., 2005), approximately 9.35 (*SD* = 7.53) drinks (Hembroff et al., 2007), and 6.16 (*SD* = 7.2) drinks (Smith et al., 2006), but were lower than those reported by Rutledge and colleagues (2008; *M* = 12.87, *SD* = 8.37). Differences may relate to recruitment strategies, response rates, goals of the study, or regional variability in birthday practices.

The current study benefited from a higher response rate from individuals who were invited to participate (72%) relative to most other 21st birthday studies (39% and 61% for Smith et al., 2006; 11%, Neighbors et al., 2006; 68%, Rutledge et al., 2008). Furthermore, celebration drinking was assessed within 4 days (on average) of the birthday celebration compared with highly retrospective data of previous studies (e.g., *M* = 164 days, *SD* = 104; Rutledge et al., 2008). Finally, the current study was the first to assess birthday celebration plans before the celebration and not within an intervention study explicitly designed to reduce birthday drinking. Individuals in the current study were informed that the primary aim was to better understand 21st birthday experiences; therefore, there may have been less influence

on planned or actual celebration drinking relative to that on individuals in an intervention study.

It is important to note that all of the current data were based on self-report. Although accuracy of self-report measures has been questioned, evidence suggests that college student self-report is both reliable and valid (Babor et al., 2000; Miller et al., 2002). It is also possible that assessing drinking plans before the celebration influenced behaviors during the celebration. Even so, the higher number of drinks consumed in this study relative to most other studies of 21st birthdays suggests that precelebration assessment of drinking does not serve a preventative function. Last, data were collected from a single geographic location, and there may be regional differences in prevalence of birthday drinking and celebration traditions. Future multisite studies would provide valuable insight into similarities and differences of 21st birthday drinking among college students.

The current study represents the most thorough assessment of 21st birthday alcohol consumption celebrations to date. The amount and style of drinking observed during 21st birthday celebrations are excessive and should be viewed as a serious public health threat. Previous unsuccessful attempts to reduce heavy 21st birthday drinking have primarily focused on correcting misperceptions of typical 21st birthday drinking norms (Neighbors et al., 2005, 2006; Smith et al., 2006), suggesting the need for more empirically based interventions. By examining situational factors that potentially led to excessive alcohol consumption during the 21st birthday, we are able to provide insight into future interventions that may reduce 21st birthday heavy drinking and consequences. First, findings support the use of community-based interventions to stop or reduce the amount of free shots given to young adults by drinking establishments (e.g., Toomey et al., 2007). Second, because friends may encourage excessive drinking through participation in 21st birthday drinking traditions, interventions might encourage responsible peer behavior and teach celebrants skills to stay within their anticipated drinking limits. More important, in an effort to keep students safe during their celebration, there needs to be a shift in the culture about turning 21—from an excuse for excess to one of rectitude and reason.

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