Changes in Alcohol Consumption Among College Students Due to COVID-19: Effects of Campus Closure and Residential Change

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ABSTRACT. Objective: It is well established that college students increase their drinking when they leave home. This study examined changes in drinking as a result of campus closure due to coronavirus disease 2019 (COVID-19), focusing on the influence of living situation. **Method:** A sample of 312 college students (mean age = 21.2 years; 62% female; 67% White) responded to an online survey regarding their drinking behavior before and after university closures because of COVID-19. Those participants who lived with peers pre-closure and moved home to live with parents post-closure were compared with those who remained living with peers or remained living with parents in terms of changes in frequency and quantity of drinking. **Results:** A comparison of pre- to post-closure drinking indicated significant decreases in the typical number of drinks per week (from 11.5 to 9.9) and maximum drinks per day (from 4.9 to 3.3) and a slight increase in typical drinking days per week (from 3 to 3.2). Patterns of change significantly varied across groups. Those who moved from peers to parents showed significantly greater reductions in drinking days (from 3.1 to 2.7), number of drinks per week (from 13.9 to 8.5), and maximum drinks in one day (from 5.4 to 2.9) than those who remained living with peers or with parents. In contrast, the latter two groups significantly increased their frequency (from 3.0 to 3.7 days and 2.0 to 3.3 days, respectively). **Conclusions:** Participants reduced their quantity of drinking during the COVID-19 pandemic. Returning to live with parents during emerging adulthood may be protective for heavy drinking. (*J. Stud. Alcohol Drugs, 81,* 725–730, 2020)

INCREASES IN SUBSTANCE USE are common during the transition out of high school (Arnett, 2005; Bachman et al., 1997; White et al., 2006). Arnett (2005) has argued that these increases occur because this stage of the life cycle, which he has termed "emerging adulthood," provides more freedom and less social control than during the high school years (see also Schwartz, 2016). Several researchers have attributed these increases, especially in heavy drinking, specifically to the college experience (e.g., Barry & Nelson, 2005; Carter et al., 2010; Dowdall & Wechsler, 2002). However, White et al. (2005) found that increases in alcohol intoxication and alcohol problems occurred as individuals left high school regardless of whether they attended college. Subsequently, White et al. (2006) found that both moving away from home and going to college were significantly related to increases in heavy episodic drinking and alcohol frequency during the period immediately after high school. Nonetheless, they found that leaving home was a stronger predictor of increases in drinking behavior than was going to college and that those youths who left home increased their drinking more than those who stayed home, regardless of college attendance. Dawson et al. (2004) also found larger differences in the rate of heavy drinking for living situation versus college attendance.

Recent work has shown that living with one's parents during college is protective against alcohol consumption and subsequent problems (Cooke et al., 2017). Likewise, Evans-Polce and colleagues (2017) showed that students living with parents were less likely to engage in high-risk drinking, whereas high-risk drinking was exacerbated when living away from parents. Similar to White et al. (2006), Bachman and colleagues (1997) suggested that it was living situation (with friends and roommates vs. with parents or spouses) that accounted for the increased substance use after high school rather than the college experience. Thus, it may not be the college experience per se that contributes to high rates of heavy drinking noted among college students, but rather the move away from home that often coincides with this transition. This notion was recently supported with evidence from a nationally representative sample indicating that the effect of college status on alcohol-related negative consequences was reduced when accounting for living situation (i.e., living with parents vs. not; Patrick et al., 2020).

This research raises an important question about what happens to college students' drinking patterns when they return home to live with their parents. The coronavirus disease 2019 (COVID-19) pandemic offers a natural experi-

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ment to address this question because, as universities shut down quickly, many college students returned home to live with their families whereas others remained with peers. The current study takes advantage of this natural experiment to examine changes in drinking behaviors for those college students who lived with peers before campus closing and returned home to parents compared with those who remained with peers and those who remained at home.

These changes in drinking patterns need to be considered, however, within the context of the potential influence of the COVID-19 pandemic on changes in drinking behavior regardless of living situation. Drinking is a social activity, with college drinking most frequently occurring in a social context (Baer, 2002; Beck et al., 2008, 2013), and social motives are the most often cited reason for student drinking (Cooper et al., 2016). The COVID-19 outbreak imposed drastic changes to social context with campus closings. It changed the way college students socialized through imposed and voluntary social isolation, limiting the number of people one could be around at any given time, and restricting access to public gathering places and on-premise drinking, all of which could lead to a decrease in drinking (see Rehm et al., 2020, for a review of possible implications of COVID-19 on drinking). On the other hand, crises, such as COVID-19, could increase stress and negative affect, which could result in increased drinking (Dumas et al., 2020; Lechner et al., 2020; Rehm et al., 2020; Rodriguez et al., 2020). Thus, a secondary goal of this study was to examine changes in drinking behavior regardless of living situation. We hypothesized that college students would decrease their frequency and quantity of drinking as a result of COVID-19 and that the greatest decreases in drinking frequency, and especially quantity, would occur for those who were living with peers and returned to living in their parents' home.

Method

Design and sample

This sample was derived from a larger study of simultaneous alcohol and cannabis use among college students, the 3-Campus Alcohol and Marijuana Study, conducted during the 2017–2018 academic year and consisting of two waves of online surveys (see White et al., 2019, for details). The larger study recruited full-time undergraduate students from three state universities who were 18–24 years old and had used alcohol and cannabis in the past year. In the spring of 2020, participants who indicated at the end of their Wave 2 survey that they would like to be contacted for future studies were sent email and text invitations to participate in a supplemental survey about the impact of COVID-19, which they had 2 weeks to complete. The sample was restricted to Wave 1 first-year students and sophomores, assuming that if they matriculated as expected, they would still be in college (as juniors and seniors) in the spring of 2020 when universities in the United States closed because of COVID-19; 473 of 634 (75%) students who agreed to be re-contacted were invited to participate in this COVID study. A total of 312 individuals (66.0% of those invited and 71% of the 439 with valid email addresses) responded. Analyses comparing these 312 to the 161 who were invited but did not respond indicated that there were no significant differences in terms of demographic characteristics (i.e., sex, age, year in school, race, ethnicity, school attended, and free lunch while growing up) or past-3-month alcohol or cannabis use frequency collected at Wave 1. The COVID study was approved by the Brown University Institutional Review Board. Participants received a $25 gift card for their participation.

The current sample consisted of 312 participants (37.6% male). The mean age was 21.3 years (*SD* = 0.82). At the time of the survey, the majority were still at the same school as during Wave 1 (80.1%) and were either seniors (50.2%) or juniors (38.3%), although 9.6% were no longer in school.[1] The majority were White (67.2%), 12.8% were Asian, 3.9% were Black, 7.3% were another race, and 8.8% were a mixed race; 13.1% were Hispanic/Latinx.

Measures

Living situation. Participants were asked where they lived before campus closing. Response options were as follows: dormitory/residence hall (*n* = 34), fraternity/sorority house (*n* = 14), apartment/house with parent(s) (*n* = 44), apartment/house with friend(s)/roommate(s)/partner (*n* = 204), apartment/house where I live alone (*n* = 15), and other (*n* = 1). Participants were also asked where they currently live (since leaving campus while still taking classes). Response options were as follows: campus housing (*n* = 13), apartment/house with parent(s) (*n* = 164), apartment/house with friend's family (*n* = 6), apartment/house with friend(s)/roommate(s)/partner (*n* = 119), apartment/house alone (*n* = 9), and other (*n* = 6). For the purposes of this article, we combined all campus housing with apartment/house with friend(s)/roommate(s)/partner to indicate living with peers, maintained the category "living with parents," and excluded participants who reported living alone, living with a friend's family, and other because the numbers were too small. We then combined the living situations at both time points to reflect living in a residence with peers pre- and post-closing of campus (*n* = 125), living in a residence with parents pre- and post-closing (*n* = 39), and moving from a peer residence to a parental residence (*n* = 120).[2] Four students who moved

[1]Although 9.6% of the participants were no longer in college, we treated the sample as a college sample given that they all had been enrolled full time at the time of the parent study.

[2]For the purposes of this study, we defined before and during

from living with parents to living with peers were eliminated because of the small size of this group.

Alcohol use. Participants completed the Daily Drinking Questionnaire (Collins et al., 1985) with reference to a typical week before their campus closed and a typical week since their campus closed. From this we created three summary measures of pre- and post-closure drinking: typical week total number of days drinking, total number of drinks, and maximum number of drinks in any one day.

Covariates. We controlled for birth sex (*male* = 1; *female* = 2) and legal drinking age at of the time of survey completion. Results were unchanged with an alternative indicator of legal drinking age (age 21 by April 1, 2020).

Analyses

For the purposes of this analysis, we limited the sample to only those who reported drinking at pre- and/or post-closure (N = 297). The residential change analysis was limited to 272 participants because of some living situations being excluded (see Measures section): 119 (43.7%) remained living with peers, 35 (12.9%) remained living with parents, and 118 (43.4%) moved from peers to parents.

Paired samples *t* tests were conducted to examine whether there were significant changes in drinking patterns from pre- to post-closure. Analyses of variance (ANOVAs) were conducted to compare the three residential change groups on pre- and post-closure drinking patterns. We used negative binomial regression to examine whether residential change was related to a change in the three dependent drinking variables. In each model, those who remained with peers and those who remained with parents were compared with those who moved from peers to parents (reference group), and we controlled for the pre-closure measure of the same outcome as well as sex and age 21. To further understand associations between residential change and drinking behavior, we conducted follow-up paired *t* tests to examine changes from pre- to post-closure within each group.

Results

Overall change from pre-closure to post-closure

All three drinking measures changed significantly from pre- to post-closure. Drinking frequency slightly increased from an average of 3.0 days to 3.2 days per week, $t(296) = -2.11$, $p < .05$ (Cohen's $d = 0.12$), whereas weekly quantity decreased from 11.5 to 9.9 drinks per week, $t(296) = 2.65$, $p < .01$ ($d = 0.15$). The maximum number of drinks in one day decreased significantly from 4.9 to 3.3 drinks, $t(296) = 8.05$, $p < .001$ ($d = 0.47$).

The influence of living situation and residential change

Supplemental Table 1 shows the means for the drinking measures pre- and post-closure separately for the three residential change groups. (Supplemental material appears as an online-only addendum to this article on the journal's website.) Results from ANOVAs indicate that those who moved from peers to parents, compared with those who remained with parents, reported significantly higher levels of all three drinking measures pre-closure. The former group also reported significantly more drinks per week and maximum drinks per day than those who remained with peers. Those who remained with parents, compared with those who remained with peers, were drinking significantly less frequently and fewer drinks per week pre-closure. Post-closure, the only significant difference among the groups was that those who moved from peers to parents drank significantly less frequently than those who remained with peers.

The results of the negative binomial regression analyses examining the associations between residential change status and change in drinking patterns are shown in Table 1. Those who moved from peers to parents had significantly fewer days drinking, drinks per week, and maximum drinks in one day in a typical week post-closure than those who remained with their peers or with parents with controls for pre-closure drinking, sex, and age 21. Sex and age 21 were not significantly associated with a change in drinking behavior.[3]

Supplemental Table 1 provides results from paired *t* tests examining changes pre- to post-closure for each group. Results indicate that those who moved from peers to parents reported significant decreases in frequency ($d = 0.21$), drinks per week ($d = 0.49$), and maximum quantity ($d = 0.81$). In contrast, those who remained with peers ($d = 0.32$) and with parents ($d = 0.72$) reported significant increases in frequency. Weekly quantity did not change significantly for those who remained with peers or parents, but maximum quantity de-

COVID-19 based on campus closure. Those participants who did not experience campus closure were told to define it using their own subjective experience of when their life was disrupted by COVID-19.

[3]Sensitivity analyses were conducted to determine if being a college student made a difference. We added being in school versus not to the negative binomial regression analyses as another control variable and the results remained virtually identical, and being in school was not a significant predictor. We also tested whether adding a proxy measure of socioeconomic status (SES; highest level of parental education reported at baseline) would affect the results given that it might be related to residential status. When SES was added as a covariate to the negative binomial regressions, the results did not change, and SES was not a significant predictor. Further, we tested the models without any covariates, and the results remained the same. Last, given that being age 21 could potentially affect parental permissiveness of drinking and be related to reductions in on-premise drinking, we tested age 21 as a moderator of residential change. The interaction terms were not significant in any of the models.

TABLE 1. Results from negative binomial regression models of residential change predicting drinking behavior change (n = 266)

Parameter	*df*	Estimate	*SE*	IRR	[Wald 95% confidence limits]	Wald χ^2
Model A. Number of days drinking in a typical week post-closure						
Intercept	1	0.306	0.115	1.358	[1.085, 1.699]	7.12**
Male	1	0.012	0.042	1.012	[0.932, 1.100]	0.09
Under 21	1	0.061	0.058	1.063	[0.949, 1.191]	1.11
Stay with peers	1	0.380	0.088	1.462	[1.229, 1.738]	18.49***
Stay with parents	1	0.512	0.136	1.669	[1.279, 2.177]	14.24***
Pre-close days[a]	1	0.207	0.026	1.230	[1.170, 1.294]	65.57***
Dispersion	1	0.109	0.043	1.115	[1.052, 1.267]	
Model B. Total number of drinks in a typical week post-closure						
Intercept	1	1.228	0.151	3.416	[2.541, 4.592]	66.24***
Male	1	0.059	0.064	1.061	[0.936, 1.202]	0.86
Under 21	1	0.077	0.088	1.080	[0.910, 1.282]	0.77
Stay with peers	1	0.531	0.135	1.700	[1.305, 2.216]	15.42***
Stay with parents	1	0.617	0.206	1.854	[1.238, 2.777]	8.97**
Pre-close drinks[b]	1	0.057	0.007	1.058	[1.043, 1.074]	59.96***
Dispersion	1	0.881	0.093	2.414	[2.049, 2.953]	
Model C. Maximum number of drinks in a typical week post-closure						
Intercept	1	0.312	0.121	1.366	[1.078, 1.730]	6.68**
Male	1	0.063	0.046	1.065	[0.974, 1.165]	1.90
Under 21	1	0.007	0.064	1.007	[0.889, 1.141]	0.01
Stay with peers	1	0.399	0.097	1.490	[1.231, 1.804]	16.79***
Stay with parents	1	0.385	0.150	1.469	[1.095, 1.972]	6.58*
Pre-close max[c]	1	0.126	0.014	1.134	[1.103, 1.167]	77.56***
Dispersion	1	0.201	0.049	1.222	[1.132, 1.382]	

Notes: [a]Pre-close days = number of days drinking in a typical week pre-closure; [b]pre-close drinks = total number of drinks in a typical week pre-closure; [c]pre-close max = maximum number of drinks per day in typical week pre-closure; IRR = incidence rate ratio.
*p < .05; **p < .01; ***p < .001.

creased significantly for those who remained with peers (d = 0.29).

Discussion

This study examined changes in drinking behavior for college students during the COVID-19 pandemic, with a particular focus on the influence of living situation. In the full sample, measures of pre-closure and post-closure drinking indicated significant decreases in amount consumed, especially in heavy drinking. In contrast, there was a slight increase in frequency of drinking. Nonetheless, these changes, except for maximum quantity, were modest. A study of emerging adults in the United Kingdom (Niedzwiedz et al., 2020) and a study of adolescents in Canada (Dumas et al., 2020) both support declines in heaviness of use but increases in frequency of use. In contrast, a study of U.S. college students found increases in both quantity and frequency (Lechner et al., 2020).

As hypothesized, a change from living with peers to parents was associated with significantly greater decreases in both quantity and frequency of drinking, relative to remaining with peers or parents. In fact, there was a significant increase in frequency for these latter two groups, especially those who remained with parents. These findings are consistent with other studies showing that relative to other living arrangements, living with parents is protective against heavy drinking (Cooke et al., 2017; Evans-Polce et al., 2017; White et al., 2006). Although the earlier research showed that remaining with parents when starting college is protective, our findings suggest that moving back with parents may also be protective. The normative decline in parental monitoring observed in emerging adulthood may reverse when the child returns to the family home, and increased social control and restricted freedom may account for drinking reductions (Arnett, 2005). Moving from living with peers to living with parents also may have limited access to alcohol. That those who moved from peers to parents reduced their drinking more than those who remained with parents probably reflects the fact that the latter group was drinking less pre-closure (Supplemental Table 1).

The present study demonstrates that context is an important correlate of pandemic-related drinking. The COVID-19 pandemic is a time of increasing social isolation, which provides fewer social opportunities for drinking. College students are more likely to drink in greater quantities when with peers (Thrul et al., 2017) and often affiliate with heavily drinking peer networks that include close friends who serve as "drinking buddies" (Lau-Barraco & Linden, 2014; Reifman et al., 2006). Thus, the forced and voluntary social isolation may have reduced the number of drinking partners, especially for those who returned home to live with parents.

More research is needed to examine the contexts of drinking during COVID-19.

The findings from this study should be evaluated with consideration of several limitations. First, this was a sample who agreed to be re-contacted from three state universities and may not generalize to the larger population of college students. Also, some of the participants were no longer in college, but sensitivity analysis indicated that being in college made no difference (see footnote 3). Most of the participants in this sample were age 21 or older, and results might differ for younger college students (although age 21 was not a significant moderator of residential change; see footnote 3). In addition, at enrollment, all students in the larger study had used alcohol and cannabis in the past year, and thus the current findings may not reflect drinking patterns for non–cannabis users. Last, the data on pre-closure drinking were collected retrospectively about drinking 2 months earlier. Despite these potential issues, this study makes an important contribution to the literature by demonstrating that the COVID-19 pandemic was associated with reduced heavy drinking among college students and that moving back to living with parents may have provided additional protection.

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