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Alcohol mixed with Energy Drinks: Daily Context of Use

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Abstract

Background—The link between use of alcohol mixed with energy drinks (AmEDs) and alcohol-related harms is well established, but limited research has examined the context in which AmEDs are consumed. Identifying the social and environmental characteristics of use may illuminate whether AmEDs are used in settings that could increase the likelihood of engaging in risky behaviors or experiencing harms. The present study used a two-week daily diary assessment to compare days in which AmEDs were consumed (“AmED days”) and days where other types of alcohol were used (“non-AmED days”) on where, when, and with whom drinking occurred.

Methods—Participants were 122 (90 women) heavy drinking college students who reported mixing caffeine with alcohol at least once in the past week. Data were collected across 389 drinking days; 40 of these days involved AmED use.

Results—Multilevel modeling findings revealed that odds of drinking AmEDs were higher on days where individuals drank at a bar or club and drank at home relative to other locations. In addition, odds of pre-gaming were higher on AmED days as compared to non-AmED days. AmED use was linked with *lower* odds of drinking game behavior.

Conclusions—Overall, AmEDs appear to be consumed in potentially risky contexts. In combination with prior findings that AmED days are linked with heavier alcohol use and more harms experienced, these findings support the unique nature of AmED consumption in terms of the factors that may predict or maintain potentially hazardous drinking patterns.

Keywords

Alcohol and energy drinks; pre-gaming; drinking contexts; college students

Introduction

Alcohol mixed with energy drinks (AmEDs), such as Red Bull and vodka, are popular on college campuses. Approximately 75% of college students indicate using AmEDs at least once in their lifetime (Berger et al., 2013) and 24% report using at least once in the past

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month (O'Brien et al., 2008). Relative to other types of alcohol, drinkers feel less intoxicated when consuming AmEDs (Marczinski and Fillmore, 2006). Many college students report consuming AmEDs in particular to be able to drink more, feel less tired while drinking (Marczinski, 2011), and feel more energetic (Peacock et al., 2013). Despite its popularity, drinking AmEDs can be associated with heavy drinking and harms (see Linden and Lau-Barraco, 2014 for a review). AmEDs may be particularly problematic as its use has been shown to produce the same level of intoxication as other types of alcohol but the sedative effects of alcohol are masked by the caffeine (Marczinski and Fillmore, 2006). Although the link between AmED consumption and negative outcomes is well established, there is still much information about AmED consumption that remains unknown, such as the context in which AmEDs are consumed.

Social learning theory (Bandura, 1969, 1977; Maisto et al., 1999) posits that socio-environmental factors can be crucial determinants of one's drinking behavior. Such contextual factors include the location, the attributes of the setting, or the social environment. For instance, drinking in environments such as bars and nightclubs is associated with particularly heavy alcohol consumption and drinking-related risks (e.g., Nyaronga et al., 2009; Rossow, 1996). Further, social contexts are tied with alcohol use outcomes (Beck et al., 2013), as people tend to drink heavier in large groups as compared to when drinking alone or with one other person (see McCarty, 1985).

In relation to AmED use specifically, our knowledge of the context in which they are consumed is lacking. The limited, mostly qualitative research available on AmED context suggests that AmEDs are usually consumed late in the evening (Peacock et al., 2013) at bars and nightclubs (Jones et al., 2012; Peacock et al., 2013; Pennay and Lubman, 2012). For example, in a study of Australian adults, Peacock and colleagues found that 42% of their sample reported typically consuming AmEDs in nightclubs and 30% in bars and pubs. In addition, focus groups expressed that AmEDs are often consumed while pre-gaming, or drinking prior to the main drinking event to provide them with energy to start the evening and continue partying (Jones et al., 2012; Pennay and Lubman, 2012). Thus, some may be using AmEDs while pre-gaming in order to stay awake and keep drinking. Relatedly, AmEDs are viewed as beverages that are consumed in a social context. Qualitatively, participants have indicated that AmEDs are a social bonding activity and that AmEDs make them feel popular (Jones et al., 2012). Based on this preliminary information, it appears that AmEDs tend to be consumed in the social contexts, namely bars and clubs as well as while engaging in risky drinking activities. Importantly, each of these situations is tied to heavy drinking and harms on their own (e.g., LaBrie et al., 2011; Rossow, 1996). While these prior studies have provided useful preliminary information on AmED use patterns, research to date has not statistically compared occasions where individuals drank AmEDs relative to other types of alcohol, taking into account within-person differences with respect to where an individual *typically* drinks any type of alcohol. In addition, prior research was conducted with Australian participants who were asked about their AmED use behavior in general or in the past six months, which limits our knowledge of U.S. cultural patterns with limited recall biases.

Identifying the characteristics of use (e.g., location) may illustrate whether AmEDs are used in a setting that increases the likelihood of engaging in risky behaviors. Further, the way in which individuals consume AmEDs (e.g., when pre-gaming, socially) may reflect their motivations for consuming it or their beliefs about its effects. Ultimately, this information would aid in more efficacious prevention policies and the development of strategies to prevent problematic AmED use. Consequently, the current study aimed to identify the contextual factors surrounding AmED use through daily diaries. In particular, we examined the social and environmental characteristics in which AmEDs are consumed by comparing days in which participants mixed alcohol and energy drinks (“AmED days”) and days in which they consumed other types of alcohol (“non-AmED days”). Days were compared in terms of where, when, and with whom drinking occurred. It was hypothesized that drinking at a bar/club, while pre-gaming, while playing drinking games, and with others would be more common on AmED days than non-AmED days. As a secondary aim, we sought to examine the unique relative contributions of drinking contexts that were significantly associated with AmED use.

Materials and Methods

Participants and Procedure

Participants were college students from a mid-sized public university. Eligibility criteria were: (1) between the ages of 18 and 25 years old, (2) consumed caffeine mixed with alcohol at least once in the past week, (3) engaged in heavy episodic drinking at least twice in the past month, and (4) had daily Internet access. Participants were recruited through a university psychology research pool and were asked to complete an online initial assessment to collect baseline information and determine eligibility. If eligible, participants were asked to complete a short, daily online assessment each day for 14 consecutive days. The baseline assessment took approximately 30–45 minutes to complete. The daily diary portion of the study was collected online and could be completed on any device. Each day for 14 days participants were sent an email reminder along with a survey link to that particular day’s survey. Participants also received a text message reminder at 2:30 pm to complete the survey. Each daily survey took approximately five minutes to complete.

Participants were compensated with research credit in their courses for completing the initial assessment and were given the option of additional research credit or \$10 for completing the daily assessments. Those who completed all 14 days were entered into a raffle to win a \$50 gift card. The current study was approved by the university’s Institutional Review Board and all APA ethical guidelines were followed (APA, 2010).

After excluding participants who did not meet initial study inclusion criteria ($n = 363$), completed fewer than two daily surveys ($n = 96$), and did not drink during the 14 days ($n = 19$), the final analytic sample consisted of 122 participants. Participants who completed fewer than two surveys, compared to those who completed two or more, did not differ with respect to sex, ethnicity, or baseline alcohol and caffeine use; however, these participants were significantly younger ($M = 19.75$, $SD = 1.69$) than those who completed more surveys ($M = 20.32$, $SD = 2.04$), $t(226.10) = -2.34$, $p = .020$. The mean age was 20.39 ($SD = 2.08$) years with 52.5% under the age of 21. Class standing was 27.9% freshman, 23.8%

sophomore, 13.9% junior, 32.8% senior, and 1.6% did not respond. Ethnicity was 54.9% Caucasian/White, 27.9% African American/Black, 6.6% self-reported “other” or biracial, 5.7% Hispanic, 3.3% Asian, and 1.6% Native American. The sample for analysis completed an average of 12.42 ($SD = 2.16$) daily reports out of 14. Out of all daily reports collected, only drinking days ($n = 389$) were included in analyses. AmED use occurred on 40 (10.3%) of drinking days.

Daily Measures

The daily assessment consisted of reporting on the previous night’s drinking.

AmED use—Participants indicated the type of alcoholic drinks they consumed for each beverage last night (i.e., beers, glasses of wine, shots, mixed drinks, and alcohol and energy drinks). AmED use was determined based on whether they consumed alcohol mixed with an energy drink last night (e.g., Red Bull and vodka), coded as 0 (*did not drink AmEDs last night*) or 1 (*consumed at least one AmED last night*). Only energy drinks (rather than other types of caffeine), such as Red Bull, were classified as energy drink mixers.

Location—Participants were asked about their location for drinking last night (i.e., home, work, friend’s house, restaurant, bar/club). They could select multiple locations. Responses on each drinking day were coded as either 1 (*consumed alcohol in this location*) or 0 (*did not consume alcohol in this location*) for each location. If a participant indicated drinking in a particular location, they received a follow-up question inquiring about the type of beverage(s) consumed.

Risky drinking activities—Participants were asked if they engaged in pre-gaming or drinking game behaviors the night prior. Responses were coded as yes (1) or no (0) separately for pre-gaming and drinking games. Similar to location, participants were asked what type of beverage(s) they consumed while pre-gaming and playing drinking games.

Social context—Participants reported on their social drinking context with response options of 1 (*I drank alone*), 2 (*I drank with others but was not interacting with them and others were not drinking*), 3 (*I drank with others but was not interacting with them and others were drinking*), and 4 (*I drank with others and was interacting with others who were drinking also*). Response options 2 and 3 were rarely recorded (2.3% and 2.6% of days, respectively). Thus, only options 1 and 4 were examined and were subsequently recoded as 0 (*I drank alone*) and 1 (*I drank with others with whom I was interacting*).

Results

In Table 1, we report the frequency of drinking (a) an AmED or (b) another type of alcoholic beverage within each location as well as while pre-gaming and playing drinking games. We also report the percentage of days where individuals drank around others for both AmED days and non-AmED days.

Given the multilevel structure of the data (i.e., daily or level-1 predictors nested within people or level-2 units) and the unbalanced nature of the predictor variables (i.e., each

individual had a different number of daily observations), multilevel modeling was used to assess the likelihood of drinking in a particular context (i.e., location, while pre-gaming/ playing drinking games, drinking with others) predicting whether AmEDs were used on a particular day. Because all outcomes were dichotomous, a zero-inflated Bernoulli distribution was specified for analyses. Multilevel modeling was conducted using HLM 7.01 software (Raudenbush et al., 2013). An example equation involving whether an individual pre-gamed (0 = did not pregame, 1 = pregame) predicting whether they consumed any AmEDs (0 = non-AmED day, 1 = AmED day) on a particular drinking day is provided in which drinking days (t) were nested within people (i). In addition, these associations were tested after controlling for daily-level or within-person (level 1) predictors and person-level or between-person (level 2) predictors. A level 1 covariate included whether it was considered a weekend by college student culture (0 = weekday [Monday thru Wednesday], 1 = [Thursday thru Sunday]). Level 2 covariates included participant age, sex (0 = female, 1 = male), and typical amount of AmEDs used each day aggregated throughout the 2-week period. Continuous level 2 variables (i.e., age, typical AmED use) were grand-mean centered to reflect the average value for the entire sample. Other level 1 and level 2 variables were not centered as they are dichotomous.

Level-1 model:

$$\text{Log} [\text{AmED use}_{ti}] = \pi_{0i} + \pi_{1i} * (\text{Pre- game}_{ti}) + \pi_{2i} * (\text{Weekend}_{ti})$$

Level-2 model:

$$\begin{aligned} \pi_{0i} &= \beta_{00} + \beta_{01} * (\text{Age}_i - \overline{\text{Age}}.) + (\text{Male}_i) + (\text{Typical AmED use}_i - \overline{\text{Typical AmED use}}.) + u_{0i} \\ \pi_{1i} &= \beta_{10} \\ \pi_{2i} &= \beta_{20} \end{aligned}$$

The equation provided above was tested separately for each drinking context as a predictor (i.e., whether they drank in each location, whether they pre-gamed, whether they played drinking games, and whether they drank with others).

Multilevel modeling results via odds ratios are reported in Tables 2 and 3. As can be seen in Table 2, drinking at home or drinking in a bar/club predicted greater odds of drinking an AmED on a particular day, after controlling for participant age, sex, and typical AmED use as well as day of the week. These findings can be interpreted, for example, that if an individual drank at a bar on a particular day, they were at 2.66 greater odds of drinking an AmED than another type of alcoholic beverage. As shown in Table 3, findings indicated that on days where individuals engaged in pre-gaming, they were at greater odds of using an AmED but on days where individuals engaged in drinking games, they were at *lower* odds of drinking an AmED. Social context was unassociated with odds of consuming an AmED. The intraclass correlation (ICC) for each model ranged from 0.89 to 0.95, indicating that 89% or more of the variance in odds of an individual consuming AmEDs is due to between-individual differences.

To determine the relative contribution of each drinking context predicting the odds of drinking AmEDs, all relevant predictors were included as level 1 predictors of AmED use. Specifically, whether an individual drank at home, whether an individual drank at a bar/club, and whether an individual pre-gamed were simultaneously entered into a multilevel model predicting whether an individual used AmEDs. After controlling for covariates, it appeared that drinking at home (OR = 2.85, CI = 1.24–6.55), drinking in a bar/club (OR = 3.34, CI = 1.27–8.77), and pre-gaming (OR = 16.72, CI = 6.36–43.94) all contributed unique variance in predicting odds of using AmEDs.

Discussion

Scant research has examined the predictors of AmED use patterns. Based on social learning theory, social and environmental factors can greatly influence one's drinking behavior. Given the lack of knowledge on the influence of context in relation to AmED use behavior, the current study used a within-subjects daily diary design to compare drinking days where individuals consumed AmEDs and days where they consumed other types of alcohol. These drinking days were compared in terms of where, when, and with whom drinking occurred.

To determine if there were differences in *where* AmEDs versus other types of alcohol were consumed, the drinking locations on AmED days were compared to non-AmED days. Findings suggested that odds of drinking at all locations were similar on both types of days except for drinking at a bar or club. In particular, the odds of drinking AmEDs as opposed to other types of alcohol were higher on days where individuals drank at a bar or club as opposed to other locations (i.e., home, work, friend's house, restaurant). Descriptively, drinking occurred in bars on 29.3% of AmED days relative to 13.3% of non-AmED days. The link between AmED use and bars or clubs is consistent with prior cross-sectional work conducted in Australia (Peacock et al., 2013). These findings are important as bars and clubs are known to be associated with increased risk for harms, such as alcohol-related aggression (e.g., Rossow, 1996). Specific to AmED use, recent research found that within bar environments, heavier AmED use was linked with higher levels of physical and verbal aggressive behavior after controlling for the amount of alcohol consumed and individual differences (Miller et al., 2016). Thus, the consumption of AmEDs at a bar or club may pose unique risks.

We also found that the odds of drinking AmEDs were higher if the individual reported drinking at home on a particular day. Our other finding that pre-gaming was linked with AmED use may shed light on this unexpected result, such that individuals are likely pre-gaming at home before going to a bar. The link between pre-gaming and AmED behavior is in line with prior qualitative studies suggesting that AmEDs are often consumed prior to the main drinking event in order to stay energized and party for longer without getting tired (Jones et al., 2012; Pennay and Lubman, 2012). Pre-gaming in itself can be a risky drinking activity that is related to drinking heavily and experiencing negative alcohol-related outcomes such as blacking out (LaBrie et al., 2011; Pedersen and LaBrie, 2007). Pre-gaming with AmEDs may be a particularly risky situation, given that AmEDs can reduce the feeling of sedative effects or feelings of intoxication without reducing actual intoxication (Marczinski and Fillmore, 2006). That is, if individuals are consuming AmEDs while pre-

gaming, they may be even more likely to drink heavily throughout the rest of the night because they may not feel the sedative effects of alcohol, which could have normally caused a person to cease drinking.

Interestingly, although pre-gaming was more likely to occur on AmED days, drinking games were *less* likely to occur on AmED days than non-AmED days. These conflicting findings may be explained by the distinction between pre-gaming and drinking games. Prior work has found that although these risky drinking activities may be inherently related, they tend not to occur at the same time and pre-gaming appears to be more strongly associated with level of intoxication (Borsari et al., 2007). This apparent discrepancy in risk may be attributed to one's drinking intentions for pre-gaming versus drinking games. As posited by Kenney and colleagues (2010), individuals may have different motivations when engaging in each activity. That is, because the premise of pre-gaming is for individuals to drink in preparation to continue drinking elsewhere, they may be more driven to become intoxicated than if playing drinking games with friends. Similarly, on days where individuals drink AmEDs, their drinking intentions may be more in line with what pre-gaming can offer (i.e., getting intoxicated or buzzed; Marczinski, 2011) as opposed to drinking games. Additionally, some drinking games involve beer specifically (e.g., beer pong), which may account for less AmED use when playing drinking games.

Regarding *with whom* AmEDs were consumed, it was found that AmED use was unassociated with odds of drinking with others. This finding is surprising, given that drinking in public venues (i.e., bars or clubs) and pre-gaming are more likely to occur on AmED days as opposed to non-AmED days, which are generally social environments. This null result is also surprising given prior work indicating that perceptions of others' AmED use is a predictor of one's own use (Varvil-Weld et al., 2013) and that drinking certain types of AmEDs can be a social bonding activity (Jones et al., 2012). Social drinking may have been unrelated to AmED use for two reasons. First, there was a lack of variability across days where individuals reported drinking alone (participants reported drinking with others on 77.3% of drinking days). Second, the current study only inquired about drinking socially at some point during the day, which may not capture individuals drinking – and potentially drinking AmEDs – together. Future work may benefit from a more in-depth daily diary examination regarding the social nature of AmED use *while* individuals are drinking. Given that the drinking group composition, such as sex, group size, and typical drinking behavior of other members may impact one's own use (e.g., Collins and Marlatt, 1981; Cooper et al., 1979; Lewis et al., 2011), it may also be useful to obtain more details about the drinking group in particular.

The present research extended prior daily diary work investigating AmED use and harms (Linden-Carmichael and Lau-Barraco, under review) by examining AmED drinking patterns more in depth. As a result of the preliminary knowledge that AmED days differ from non-AmED days in terms of potentially risky contexts, more intensive longitudinal designs may be needed to examine study associations further. The use of ecological momentary assessments (EMA) in which participants report on their behavior in real-time, such as via smartphones, can gather in-depth information while an individual is drinking within these contexts. For example, the current study found a link between pre-gaming and AmED use.

We also found, descriptively, that participants reported pre-gaming on 17.1% of AmED days relative to 10.6% of non-AmED days. In addition, given our findings that AmED use is more likely to occur on days where they drank at a bar (and, descriptively, AmEDs are used more often at a bar than non-AmEDs), it is possible that some individuals pre-gamed using AmEDs and continued drinking AmEDs at a bar. Other individuals may have pre-gamed with other types of alcohol and decided to use AmEDs at a bar later to stay awake and continue partying (e.g., Jones et al., 2012). It is possible that because drinking AmEDs may reduce feelings of intoxication, individuals may consume *even more* alcohol throughout the rest of the evening if they consumed AmEDs while pre-gaming. Use of EMA and across more AmED and pre-gaming occasions could reveal the way in which AmED drinking episodes unfold throughout the evening, and the potential risk they may incur related to where they drank.

Another avenue for future research would be to use a larger sample across more days in order to partition the influence of certain risky situations to determine the unique influence of AmEDs on alcohol-related harms. Prior work derived from these data indicates that individuals drank more and experienced more harms on days in which AmEDs were consumed relative to days in which they consumed other types of alcohol (Linden-Carmichael and Lau-Barraco, under review). The present research identified several variables that were associated with one's odds of consuming AmEDs, including drinking context. Because these socio-environmental factors alone have been shown to associate with alcohol use outcomes, it remains unclear whether: (a) these factors are the ultimate driving force behind the previously established AmED-negative consequences relationship, (b) AmED use is associated regardless of these factors (e.g., the context in which it is consumed), or (c) these factors exacerbate this link. A more large-scale study comparing variations in AmED days could provide further insight into this association.

The findings from the current study may aid in intervention and prevention efforts for AmED users. In particular, information gathered on the socio-environmental context of AmED consumption may be useful knowledge when working with college student drinkers. For example, information about AmEDs could be incorporated into existing alcohol brief motivational interventions (BMIs), such as the Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff et al., 1999). These types of interventions often include personalized feedback on the students' drinking habits, sometimes including information about social and other risk factors. In addition to providing information regarding the potential risks associated with AmED use, it may be useful for interventionists to know more information about the context in which AmEDs are consumed when working with students who are frequent AmED users. Given that pre-gaming behavior and drinking location uniquely predicted AmED use, both contexts may be relevant components for intervention work targeting more frequent AmED users.

The current study is limited in a few ways. First, the study design does not allow for causal inferences between AmED use and drinking contexts. Second, our sample consisted primarily of women (74%), which is consistent with the demographics of the psychology research pool at the university from which the data were collected. Future work may benefit from collecting data from a random sample of individuals in order to protect against

potential self-selection biases and in order to enhance generalizability. Third, the current study had a limited number of days in which AmEDs were consumed ($n = 40$); a larger scale study involving more AmED days may provide further insight into study findings. Relatedly, AmED use was examined dichotomously; future work could benefit from examining the number of AmEDs consumed within each of these contexts rather than whether individuals drank in certain contexts on AmED days. Lastly, because of the way social context was measured, we are unable to make inferences that individuals drank AmEDs or other types of beverages around others.

Despite limitations, this study was the first to demonstrate daily associations between AmED use and context, showing that AmED days were more likely to involve drinking at a bar or club, to involve pre-gaming, and, relatedly, to involve drinking at home. In combination with prior work, these findings further support the unique nature of AmED consumption in terms of not only the harms experienced but also the factors that may predict or maintain drinking patterns.

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Table 1

Frequency of Drinking Locations for AmED Days and Alcohol-only Days

	AmED Days (<i>n</i> = 40)	Alcohol-only Days (<i>n</i> = 349)
Location (% of days)		
Home	53.7%	55.4%
Work	2.5%	1.3%
Restaurant	12.2%	14.9%
Friend's house	26.2%	34.4%
Bar/club	29.3%	13.3%
Risky drinking activities (% of days)		
Drinking games	4.8%	12.0%
Pre-gaming	17.1%	10.6%
Drank with others (% of days)	92.5%	75.6%

Note. AmED = alcohol mixed with energy drinks. The percentages reported for locations and risky drinking activities refer to the type of beverage that was consumed within the respective context. Social context refers to the percentage of days where individuals drank with others at some point during the day; not necessarily that a particular beverage was consumed in the presence of others.

Table 2
Multilevel Models of Drinking Locations Predicting Odds of Drinking Alcohol mixed with Energy Drinks

	Home OR (CI)	Work OR (CI)	Friend's House OR (CI)	Restaurant OR (CI)	Bar/club OR (CI)
Intercept	0.02 (0.01–0.06) ***	0.03 (0.02–0.08) ***	0.04 (0.02–0.09) ***	0.04 (0.02–0.08) ***	0.03 (0.02–0.08) ***
Level 1: Daily level					
Drinking location	2.44 (1.12–5.30) *	9.14 (0.49–171.30)	1.03 (0.51–2.08)	2.12 (0.93–4.86)	2.66 (1.13–6.29) *
Weekend	1.28 (0.67–2.47)	1.23 (0.65–2.33)	1.14 (0.60–2.18)	1.03 (0.55–1.94)	1.08 (0.57–2.05)
Level 2: Person-level					
Age	0.90 (0.69–1.17)	0.94 (0.73–1.21)	0.94 (0.73–1.21)	0.90 (0.70–1.17)	0.91 (0.71–1.17)
Male	0.15 (0.03–0.74) *	0.18 (0.04–0.88) *	0.17 (0.04–0.80) *	0.17 (0.04–0.81) *	0.18 (0.04–0.86) *
Typical AmED use	23.99 (11.08–51.96) ***	22.17 (10.33–47.57) ***	21.77 (10.50–45.11) ***	23.19 (11.10–48.46) ***	20.08 (9.66–41.76) ***

Note. AmED = alcohol mixed with energy drinks. OR = odds ratio from Bernoulli multilevel modeling distribution. CI = confidence interval. Separate models were conducted with AmED (0 = did not drink AmEDs during this drinking episode, 1 = consumed at least one AmED) as the outcome and whether they drank in a particular location as the predictor. "Weekend" is measured as 0 = weekday, 1 = weekend. "Sex" is measured as 0 = female, 1 = male.

 $p < .001$.

**
 $p < .01$.

*
 $p < .05$.

Table 3
Multilevel Models of Drinking Context Predicting Odds of Drinking Alcohol mixed with Energy Drinks

	Pre-gaming OR (CI)	Drinking Games OR (CI)	Drank with Others OR (CI)
Intercept	0.02 (0.01–0.05) ***	0.04 (0.02–0.10) ***	0.02 (0.01–0.07) ***
Level 1: Daily level			
Drinking context	18.14 (7.25–45.38) ***	0.16 (0.04–0.70) *	2.40 (0.89–6.48)
Weekend	0.77 (0.41–1.47)	1.11 (0.59–2.08)	1.17 (0.60–2.26)
Level 2: Person level			
Age	1.05 (0.76–1.45)	0.92 (0.71–1.18)	0.96 (0.75–1.23)
Male	0.12 (0.02–0.81) *	0.19 (0.04–0.89) *	0.19 (0.04–0.83) *
Typical AmED use	31.43 (12.35–80.00) ***	22.68 (10.74–47.89) ***	19.28 (9.40–39.54) ***

Note. AmED = alcohol mixed with energy drinks. OR = odds ratio from Bernoulli multilevel modeling distribution. CI = confidence interval. Separate models were conducted with AmED (0 = did not drink AmEDs during this drinking episode, 1 = consumed at least one AmED) as the outcome and whether they drank within each context (whether pre-gamed, played drinking games, drank with others) as the predictor. “Weekend” is measured as 0 = weekday, 1 = weekend. “Sex” is measured as 0 = female, 1 = male.

 $p < .001$.

**
 $p < .01$.

*
 $p < .05$.