# Daily conformity drinking motivations are associated with increased odds of consuming alcohol mixed with energy drinks

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## HIGHLIGHTS

- Compared motives on alcohol and energy drink (AmED) and other drinking occasions.
- Conformity motives are the most salient motive predicting AmEDs on a drinking day.
- Findings highlight AmEDs as a unique alcoholic beverage.

## ARTICLE INFO

## ABSTRACT

Recent research indicates that individuals drank more heavily and experienced more harms on days they consumed alcohol mixed with energy drinks (AmEDs). Limited research, thus far, has examined predictors of AmED use on a daily level. Drinking motives, or reasons for drinking, are shown to discern AmED users from non-users, but the extent to which daily drinking motives covary with AmED use has not been tested. The current study used a daily diary design to determine how motives differ between AmED and other drinking occasions. Participants included 122 college students (73.8% women) with a mean age of 20.39 years. Participants completed up to 14 daily surveys, resulting in 389 drinking days (40 days involved AmED use). Participants reported on their drinking motives at baseline as well as on each drinking day. Multilevel models revealed that, after controlling for other motives, AmED use was more likely on days where conformity motives were higher than usual and was less likely when enhancement motives were higher. Daily social and coping motives as well as all motives measured at baseline were unassociated with AmED use. Our findings suggest that conformity motives, or drinking to fit in with others, are the most salient drinking motive predicting AmED use on a drinking day. Given that conformity motives are often less associated with alcohol use outcomes in general, these findings highlight AmEDs as a unique alcoholic beverage. Clinicians and interventionists working with frequent AmED users should consider the unique conditions under which AmEDs are consumed.

## 1. Introduction

Individuals who consume alcohol mixed with energy drinks (AmEDs), such as Red Bull and vodka, are at greater risk for negative consequences from drinking, such as higher rates of substance use, driving under the influence, risky sexual behavior (see Linden & Lau-Barraco, 2014 for a review), and risk for injury (see Roemer & Stockwell, 2017). Individuals may experience greater risk from drinking AmEDs because energy drinks can mask the sedative effects of alcohol (Marczinski & Fillmore, 2006), potentially creating a risky situation in which the drinker is unaware of their actual level of intoxication. Our recent daily diary work extended our understanding of the potential real-world risks of AmEDs in within-subject studies. Specifically, findings revealed that individuals drank more heavily and experienced more alcohol-related harms on days in which they consumed AmEDs than other drinking occasions (Linden-Carmichael & Lau-Barraco, 2017a). Drinkers appear to anticipate these negative effects from drinking AmEDs (Jones, Barrie, & Berry, 2012), suggesting that they are motivated to consume AmEDs despite harms. In order to fully understand the drinking patterns of AmED users, additional research is needed to understand underlying reasons, or motivations for consuming AmEDs.

Drinking motives, or one's reasons for drinking alcohol, are strong predictors of alcohol use and alcohol-related problems (Cooper, 1994;

Kuntsche, Knibbe, Gmel, & Engels, 2005). The motivational model of alcohol use (Cooper, 1994; Cox & Klinger, 1988) proposes four primary motivations for drinking: social motives (drinking to be sociable), enhancement motives (drinking to increase positive affect), coping motives (drinking to reduce negative affect), and conformity motives (drinking to fit in with others). Generally, social and enhancement motives ("positive motives") are tied more so to drinking behavior whereas conformity and coping motives ("negative motives") are more strongly tied to alcohol-related harms (Cooper, 1994). The motivational model of alcohol use could be a useful conceptual basis for better understanding a drinker's reasons for consuming AmEDs. In prior studies, most researchers who examined motivations for AmED use have inquired about reasons attributable only to AmEDs, such as drinking to feel less tired (Marczinski, 2011) or more energetic (Peacock, Bruno, & Martin, 2013), rather than comparing reasons for drinking across different beverage types. Research on AmEDs and traditional drinking motives have suggested that users report more positive drinking motives than non-users (Kensinger, Woolsey, Divin, & Tapps, 2014) and that users are more motivated to drink than non-users in general, across all positive motives assessed (i.e., fun/social reasons, to relax, to improve self-image (Patrick, Macuada, & Maggs, 2016).

There are two major gaps in our knowledge of drinking motives and AmEDs. First, prior work has been limited to between-subject comparisons, such as comparing AmED users and non-users. Thus, our understanding of motives is limited to what factors may increase one's odds of being an AmED user, rather than why someone chooses to drink an AmED on a particular occasion. Second, prior work has inquired about reasons for drinking *in general* or over a large window of time. Such questions require participants to aggregate their responses across prior drinking occasions, which could produce inaccurate estimates and limit our understanding of the way in which drinking motives fluctuate over time.

The current study further explored data from our prior work that employed a within-subjects, daily diary approach comparing AmED and other drinking days on use, harms (Linden-Carmichael & Lau-Barraco, 2017a) and socio-environmental context of drinking (Linden-Carmichael & Lau-Barraco, 2017b) by determining the way in which drinking motives differ between use occasions. The motivational model of alcohol use was used as our framework as it is an empirically-based model that encompasses motivations for drinking that could be applicable across both AmED and non-AmED drinking occasions. Our primary aim was to determine which motives were uniquely associated with odds of using AmEDs. Based on prior research indicating that AmED users report stronger social and enhancement motives than non-users, we hypothesized that these motives would be stronger on days where individuals consumed AmEDs relative to days they drank other types of alcohol. As a secondary aim, we compared the relationships between (a) drinking motives as measured *daily* predicting daily AmED use and (b) drinking motives as measured at *baseline* predicting daily AmED use in order to determine which motives were more salient in predicting AmED use on a given drinking occasion.

## 2. Materials and methods

### 2.1. Participants and procedure

Participants consisted of young adult (18 to 25 year-old) college students who reported consuming caffeine mixed with alcohol at least once in the past week and engaging in heavy episodic drinking (4+/5+ drinks for women/men on one occasion) at least twice in the past month. To be eligible, participants also must have reported daily Internet access for two weeks. After providing informed consent, participants completed a baseline assessment remotely that took approximately 30 to 45 min to complete. If eligible, participants were e-mailed information regarding a follow-up 14-day daily diary study. Participants were provided with research credit in their courses for

completing the baseline assessment.

For the daily diary portion, participants were emailed a link and sent a text message reminder each day to complete a short survey on yesterday's drinking behavior. Consistent with prior research (e.g., Armeli, Todd, Conner, & Tennen, 2008), participants were asked to complete the daily survey between 2:30 to 7 pm each day to control for potential time of day effects. Daily surveys were scheduled to start on a Tuesday and end on a Monday to ensure that data were collected across two consecutive weekends. Each daily survey took approximately 5 min to complete. Participants were provided with the option to receive research credit or $10 for the daily diary study. If they completed all 14 days, they were entered into a raffle to win a $50 gift card. This study was approved by the university's Institutional Review Board. All APA ethical guidelines were followed (American Psychological Association, 2010).

Six hundred participants were screened, of which 363 were ineligible to participate (e.g., were over the age of 25). Only participants who completed at least two daily surveys and one drinking day were included in the current study. Of the 237 participants who were eligible, 115 completed no follow-up or too few of assessments and were thus not included in subsequent analyses. Participants who completed fewer than two surveys did not differ on gender, ethnicity, or baseline alcohol and caffeine use compared to those who completed two or more. Participants with fewer daily entries were, however, significantly younger ($M = 19.75$, $SD = 1.69$) than those who completed more surveys ($M = 20.32$, $SD = 2.04$), $t(226.10) = -2.34$, $p = 0.020$.

The final analytic sample consisted of 122 participants with a mean age of 20.39 ($SD = 2.08$) years. Ninety (73.8%) participants were women. 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. Class standing was 27.9% freshman, 23.8% sophomore, 13.9% junior, 32.8% senior, and 1.6% did not respond. Participants completed an average of 12.42 ($SD = 2.16$) daily reports out of 14. Only drinking episodes were included in study analyses. The final analytic sample provided 389 drinking days; 40 of which (10.3%) involved AmED use specifically.

### 2.2. Baseline measures

#### 2.2.1. Drinking motives

The Drinking Motives Questionnaire (DMQ-R; Cooper, 1994) was used to measure typical motivations for drinking. The 20-item scale consists of four subscales: coping (e.g., "To forget your worries"), conformity (e.g., "To fit in with a group you like"), social (e.g., "To be sociable"), and enhancement (e.g., "Because it gives you a pleasant feeling"). Response options ranged from 1 (*almost never/never*) to 5 (*all of the time*). Higher scores on each subscale indicate greater endorsement of that particular drinking motive.

### 2.3. Daily measures

#### 2.3.1. Drinking motives

The DMQ-R was adapted to reflect last night's motivations for drinking in general. Specifically, participants were asked, "Thinking about your drinking *last night*, how much would you say that you planned to drink for each of the following reasons?"

#### 2.3.2. AmED use

Participants reported the type of alcoholic drinks they consumed yesterday, including beer, wine, shots of liquor, non-caffeinated mixed drinks, caffeinated mixed drinks, and alcohol mixed with energy drinks specifically. AmED use was determined based on whether they indicated drinking at least one alcoholic beverage mixed with an energy drink (e.g., Red Bull and vodka). AmED use was coded as 0 (*did not drink AmEDs yesterday*) or 1 (*consumed at least one AmED yesterday*).