



# The role of negative urgency in risky alcohol drinking and binge-eating in United Kingdom male and female students



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## ABSTRACT

Identifying students at risk of developing binge-eating and alcohol use disorders is a priority in the United Kingdom (UK). Although relationships between negative urgency (impulsive behavior during times of negative emotion), risky drinking, and binge-eating have been established in students from other countries, these links have yet to be replicated in male and female UK students. UK students aged 18–30 ( $n = 155$ ) completed the: (1) the Urgency, Pre-meditation, Perseverance, Sensation Seeking (UPPS-P) negative urgency subscale; (2) Alcohol Use Disorders Identification Test (AUDIT); and (3) Binge-Eating Scale (BES). For categorical analysis, participants were assigned to one of four groups as a function of AUDIT and BES clinical cut-off scores: (1) no risk (28%); (2) risky drinkers (47%); (3) binge-eaters (6%); and (4) risky drinkers + binge-eaters (19%). For dimensional analysis, across students with non-zero AUDIT and BES scores ( $n = 141$ ), BES, AUDIT, gender, and their interactions were entered as predictors in the same block of a regression. UPPS-P negative urgency was the dependent variable. Categorical results indicated that binge-eaters with and without risky drinking endorsed significantly higher negative urgency than students with no risk. Dimensional results showed that although higher BES and AUDIT scores were positively linked to higher negative urgency, but only the BES was significantly associated. Furthermore, BES shared substantially more variance with negative urgency than the AUDIT, and the BES-negative urgency relationship was stronger in male students than female students. High risk students may benefit the most from interventions that help regulate negative emotion.

## 1. Introduction

A growing number of students are diagnosed with binge-eating disorder (BED), which has a higher lifetime prevalence than other eating disorders (Guerdjikova, Mori, Casuto, & McElroy, 2017; Hudson, Hiripi, Pope, & Kessler, 2007), and a lower gender discrepancy in diagnosis, with 40% of BED diagnosed in men (Hay, Girosi, & Mond, 2015; Westerberg & Waitz, 2013). BED is characterized by binge-eating without compensation (i.e. purging), accompanied by feelings of loss of control, distress, and intense negative emotions (DSM-5; American Psychiatric Association, 2013). Although BED is distinguishable from alcohol use disorder (AUD), both problems reflect substance over-consumption, have been suggested to share some key features such as impulsivity, neuroticism, and reward dysfunction, and have the potential for overlapping negative emotional (e.g., anxiety, depression, guilt) and physical harm (e.g., gastrointestinal and sleep problems) (see

for example: Bujanda, 2000; Ferriter & Ray, 2011; Olguin et al., 2017; Rolland et al., 2017; Schulte, Grilo, & Gearhardt, 2016).

Problem alcohol consumption is common for students residing in the United Kingdom (UK), with 70–85% reporting weekly binge-drinking and 63–84% endorsing hazardous drinking; moreover, the gender gap in risky alcohol use appears to be closing, with women catching up to men (Davoren, Demant, Shiely, & Perry, 2016). Although women and men aged 16–24 report disconcerting binge-drinking rates in England (26% and 29% respectively), alcohol-related deaths are 2:1 male to female (15 compared to 7 per 100,000; National Health Survey (NHS), 2019). Alarming, between 2007 and 2017, there was a 16% increase in UK alcohol-specific deaths (National Health Survey (NHS), 2019).

It is estimated that up to half of individuals who abuse alcohol also engage in problematic binge-eating behaviors (Bahji et al., 2019; Gregorowski, Seedat, & Jordaan, 2013; Ulfvebrand, Birgegard, Norring,

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Hogdahl, & von Hausswolff-Juhlin, 2015). Although a multilevel approach (Penny & Armstrong-Hallam, 2010) advocates identifying those at risk for developing multiple problems and intervening based on their specific needs, there appears to be a dearth of appropriate screenings for eating disorders in the UK (BEAT, 2014). Early identification of AUD and BED is crucial, and since over 50% of UK patients wait for 3 + months to begin mental health treatment (Mind, 2013), development of effective screening measures should be prioritized to facilitate early intervention.

Heightened negative urgency, or the tendency to behave impulsively when experiencing (and/or attempting to avoid) negative emotions, appears to characterize both problem eating and drinking behaviors and may be an effective screening tool for AUD and BED vulnerability (Bardone-Cone, Butler, Balk, & Koller, 2016; Cyders, 2013; Fischer, Anderson, & Smith, 2004; Fischer, Smith, Annus, & Hendricks, 2007; Fischer, Smith, & Cyders, 2008; Jones, Chryssanthakis, & Groom, 2014; Lynam, Smith, Cyders, Fischer, & Whiteside, 2007; Verdejo-García, Bechara, Recknor, & Pérez-García, 2007). UK students who experience negative consequences from their drinking endorse higher levels of negative urgency (Jones et al., 2014). As such, students higher in negative urgency may be at risk of both AUD and BED, as both alcohol and food may be used as a maladaptive method to cope with negative emotions (Fischer et al., 2004). Within student samples in the United States (US): (1) women with heightened negative urgency endorse greater symptoms of BED and substance use disorders (Fischer, Settles, Collins, Gunn, & Smith, 2012); (2) men and women may share similar levels of negative urgency (Cyders, 2013); and (3) negative urgency is linked to both problem drinking and eating behaviors (Dir, Karyadi, & Cyders, 2013). As AUD and eating disorders show high rates of comorbidity (Khaylis, Trockel, & Taylor, 2009; Mikheeva & Tragesser, 2016; Sinha et al., 1996; Stewart, Brown, Devoulyte, Theakston, & Larsen, 2006), negative urgency may be a common mechanism by which young adults increase risk for both disorders (Luce, Engler, & Crowther, 2007; von Ranson, Iacono, & McGue, 2002).

Although relationships between negative urgency, risky drinking, and binge-eating have been established in students from other countries, and one meta-analysis suggests that heightened negative urgency presents at similar rates for men and women (Coskunpinar & Cyders, 2013), these links have yet to be replicated in male and female students in the UK. Additionally, although trends seem to be shifting, currently, men still consume more alcohol than women in the UK, and women are more likely to develop BED. Still, it is unclear if there may be gender differences in the degree to which negative urgency shares variance with risky drinking and binge-eating behaviors in UK students, which in turn will impact the success of employing negative urgency as a screening tool for AUD/BED vulnerability in the UK. This study aims to replicate prior findings of shared variance between negative urgency, risky drinking, and binge eating within UK students, evaluating gender as a moderator. We hypothesize that higher negative urgency will be positively associated with AUD and BED symptoms across students of both genders.

## 2. Materials and methods

### 2.1. Participants and recruitment

A total of 183 students completed a web-based survey advertised via the University of Nottingham's Research Participation Scheme and social media announcements posting access to the online link. In order to be included in the study, participants were required to be aged 18–30 years old, a student at a UK-based University and residing in the UK. Twenty-eight (15.3%) participants were excluded due to not residing in the UK ( $n = 19$ ), not being a student ( $n = 4$ ) or being aged over 30 ( $n = 5$ ), leaving a final sample of 155 participants: 18–30 year-olds ( $M = 20.28$ ,  $SD = 1.68$ ), 71.6% female ( $n = 111$ ) and 28.4% male

( $n = 44$ ).

### 2.2. Measures

**Negative urgency.** The Urgency, Pre-meditation, Perseverance, Sensation Seeking (UPPS-P) Scale (Lynam et al., 2007) contains 59 items to measure impulsivity traits. This study only collected data on the negative urgency subscale (Cronbach's alpha = 0.95), as it has been linked to alcohol abuse and binge eating (e.g., Fischer et al., 2012; VanderVeen et al., 2016). Items relate to regretted impulsive behavior, or lack of self-control, deriving from emotional distress (e.g., "Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse."). Scores are based on a scale from 1 (agree strongly) to 4 (disagree strongly).

**Alcohol use.** The Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) contains ten questions used to generate consumption (e.g., "How often do you have six or more drinks?"), harm (e.g., "How often during the last year have you had a feeling of guilt or remorse after drinking?") and dependence (e.g., "How often during the last year have you found you were not able to stop drinking once you started?") subscales and a total score. Items are rated on a 5-point Likert scale from 0 ("never") to 4 ("4 or more times a week"), with higher scores indicating a greater level of alcohol use. A score of 8 or more indicates an 'at risk' drinker (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). Cut-offs applied to this sample were: 0–7 low or no risk, 8–15 increasing risk, 16–19 high risk and 20–40 possible dependence (Cronbach's alpha = 0.86).

**Binge-eating.** The Binge-Eating Scale (BES; Gormally, Black, Daston, & Rardin, 1982) is a 16-item questionnaire assessing presence and severity of BED behaviors, emotions, and cognitions (Burton, Abbott, Modini, & Touyz, 2015; Greeno, Marcus, & Wing, 1995; Ricca et al., 2000) (e.g., "Usually about once a month, I eat such a quantity of food, I end up feeling very stuffed"). Individual items have three to four responses, which are rated on a continuum from 0 (no severity of binge-eating symptoms), to 3 (severe binge-eating symptoms). Based on the BES total score, which ranges from 0 to 46, participants were categorized into three groups according to established severity cut-offs, which are: none (score < 17), mild-moderate (score of 18–26), and severe (score > 27; Marcus, Wing, & Hopkins, 1988). The BES was used as a screening measure to classify those with scores greater than or equal to 17 as "binge-eaters" (Cronbach's alpha = 0.88).

### 2.3. Procedure

Ethical approval for the study was obtained from the Faculty Ethics Committee. The survey was created using Qualtrics (Qualtrics.com). Informed consent was obtained from all participants. Participants completed the survey (average time = 20 minutes) and were debriefed and signposted to appropriate support services.

### 2.4. Statistical analysis

Statistical analyses were performed in SPSS Version 24. Categorical and dimensional analyses were computed, with categorical analyses based on established clinical cut-offs to evaluate percentage of participants meeting criteria for comorbid binge-eating and drinking problems. Dimensional analyses evaluated relationships between binge-eating/drinking and negative urgency across the entire sample who had non-zero values for all measures.

**Categorical.** Risk groups were produced for binge-eating, alcohol use and presence of both based on BES and AUDIT cut-off scores. A one-way analysis of variance (ANOVA) tested differences on UPPS-P negative urgency between four groups: (1) no risk of binge-eating or alcohol problems (BES < 17 and AUDIT < 8;  $n = 44$ ); (2) risky drinkers (AUDIT > 8 but BES < 17;  $n = 73$ ); (3) binge-eaters (BES > 17 but AUDIT < 8;  $n = 9$ ), and (4) risky drinkers + binge-eaters (BES > 17

and AUDIT > 8;  $n = 29$ ). Levene's test evaluated the homogeneity of variance assumption, while Scheffe post-hoc tests were conducted to follow-up the overall  $F$  test. Partial  $\eta^2$  is reported as a measure of effect size.

**Dimensional.** Shapiro-Wilk tests were computed to assess the normality of distributions for men and women separately. A total of 14 participants (13F, 1M) endorsed an AUDIT score of '0' and were therefore removed from analysis. BES distributions did not approach normality for men ( $W = 0.94$ ,  $p = .02$ ) or women ( $W = 0.92$ ,  $p < .001$ ), while AUDIT distributions approached normality for men ( $p = .41$ ) but not women ( $W = 0.94$ ,  $p < .001$ ). Square-root transformations [SQRT(variable + 1)] were therefore applied to BES and AUDIT scores for the remaining 95 participants (all  $W$  tests  $p > .22$ ). Negative urgency scores were normally distributed for both genders and required no transformation. The following independent variables were entered in the same step of a multiple regression to predict negative urgency: BES, AUDIT, gender, BES\*gender, AUDIT\*gender, BES\*AUDIT, and BES\*AUDIT\*gender. All variables were standardized prior to regression entry and calculation of interaction terms. Residuals were relatively uncorrelated (Durbin-Watson = 1.98) and normally distributed (per visual histogram inspection). No multivariate outliers ( $\pm 3$  standard deviations) were detected.  $R^2$  is reported as a measure of effect size.

### 3. Results

**Categorical.** Levene's test indicated that groups showed similar variances for negative urgency ( $p = .46$ ). Fig. 1A demonstrates that groups differed on negative urgency,  $F(3, 151) = 16.00$ ,  $p < .001$ , partial  $\eta^2 = 0.24$ , and Scheffe tests demonstrated that risky drinkers + binge-eaters endorsed higher urgency scores than risky drinkers and those with no risk (both  $p < .001$ ). Binge-eaters also reported

higher urgency scores than those with no risk ( $p = .02$ ) but did not differ from risky drinkers with ( $p = .70$ ) or without binge-eating ( $p = .56$ ). Finally, risky drinkers endorsed higher urgency scores than students with no risk ( $p = .01$ ).

**Dimensional.** The overall regression model significantly related to negative urgency,  $F(7, 133) = 13.78$ ,  $p < .001$ , Adjusted  $R^2 = 0.39$ , and Fig. 1B illustrates that higher AUDIT scores ( $\beta = 0.14$ ,  $t = 1.88$ ,  $p = .06$ ) was positively related with higher negative urgency scores, although this was not significant. Main effects of BES scores ( $\beta = 0.54$ ,  $t = 7.39$ ,  $p < .001$ ) and gender ( $\beta = -0.26$ ,  $t = -3.33$ ,  $p < .01$ ) were qualified by a BES\*gender interaction ( $\beta = -0.18$ ,  $t = -2.26$ ,  $p = .03$ ), which showed that the relationship between BES and urgency was stronger in men ( $R^2 = 0.61$ ; Fig. 1C) than women ( $R^2 = 0.25$ ; Fig. 1D). In contrast, BES\*AUDIT ( $\beta = -0.05$ ,  $p = .51$ ), AUDIT\*gender ( $\beta = 0.11$ ,  $p = .18$ , and BES\*AUDIT\*gender ( $\beta = 0.05$ ,  $p = .55$ ) did not contribute significant variance to urgency.

### 4. Conclusions

This is the first study to explore relationships between negative urgency, risky drinking, and binge-eating in UK students. With respect to categorization of AUD/BED risk, two-thirds of our sample screened positive for AUD, one-fourth screened positive for BED, and almost one-fifth screened positive for comorbid AUD/BED. Pure BED and comorbid AUD/BED groups endorsed higher levels of negative urgency than the no-risk group. Negative urgency was only significantly positively correlated with BES, there was a positive association with AUDIT but this was not significant ( $p = .06$ ). This was partially consistent with our hypothesis, and BES shared more variance with negative urgency than AUDIT. Furthermore, the BES-negative urgency relationship shared significantly more variance within male than female students. Taken together, our findings replicate prior work suggesting that heightened

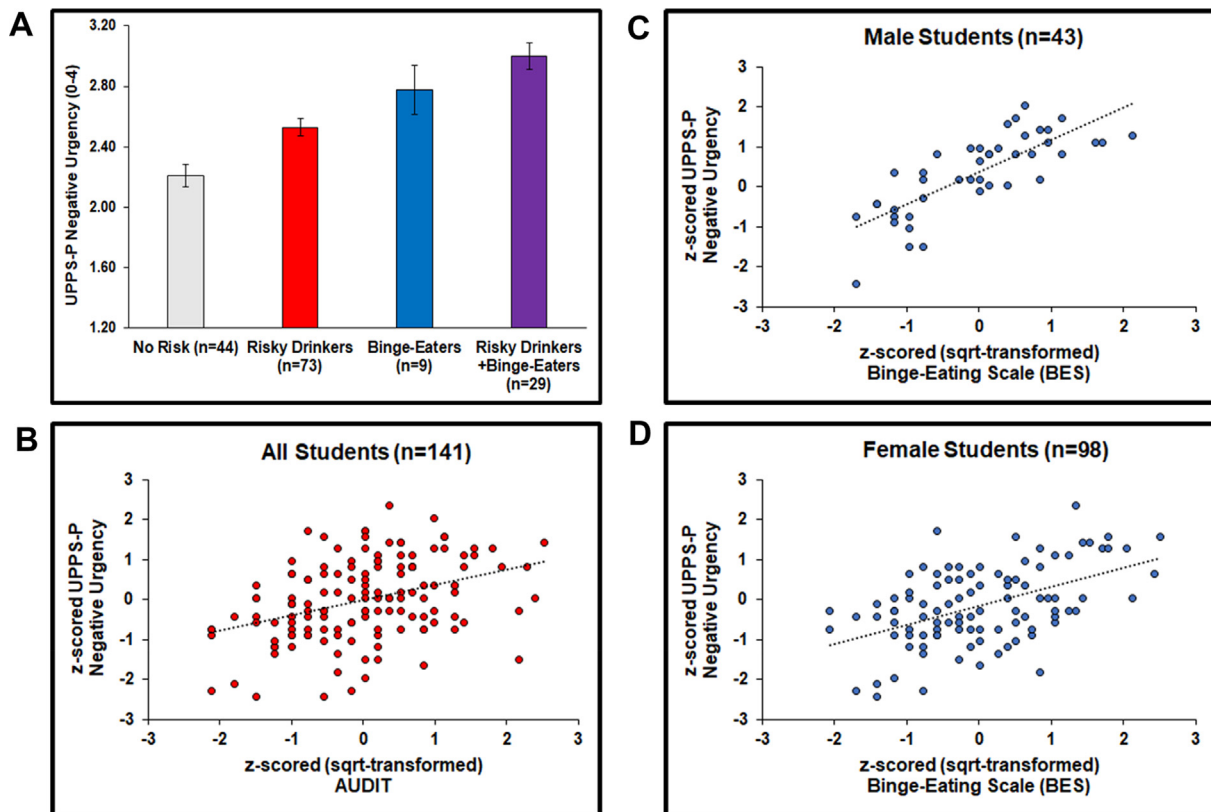


Fig. 1. (A) Categorical analysis: Group differences in negative urgency. Bars reflect one standard error. (B) Dimensional analysis: Relationship between Alcohol Use Disorders Identification Test (AUDIT) and negative urgency across male and female students. (C) Dimensional analysis: Relationship between Binge-Eating Scale (BES) and negative urgency in male students. (D) Dimensional analysis: Relationship between Binge-Eating Scale (BES) and negative urgency in female students.

negative urgency is associated with (and may underlie) problematic relationships with alcohol and food (Anestis, Bagge, Tull, & Joiner, 2011; Fischer et al., 2012; Pearson, Kite, & Henson, 2012); we also extend this work to show that negative urgency may be a stronger mechanism involved in binge-eating behaviors within male students. As this is a cross-sectional self-report study with UK University students, longitudinal research including more implicit assessment within a clinical population is warranted to determine whether heightened negative urgency predicts future development of binge-eating behaviors, especially in young men. Additionally, self-report clinical assessment data could be compared with behavioral data on impulsivity in future studies.

Results suggest that early screening for negative urgency in UK University students may have some benefits. For example, if further testing established a reliable cut-off score used in screening to flag a consultation with a mental health professional, further assessment and short-term therapy may allow vulnerable students to learn new skills to cope with stress and aversive mood states. Our data suggest this may be particularly beneficial for male students, although further research is needed to support such implementation. In addition to the survey-based assessments available, more implicit tools to detect higher levels of negative urgency could be preventative for those who are vulnerable. Interventions targeting adaptive regulation of negative emotion for those vulnerable to problems with alcohol and food can result in decreased clinical symptoms and successful long-term recovery (Patton et al., 2014; Reas, Williamson, Martin, & Zucker, 2000; Rodgers, Paxton, & McLean, 2014). Understanding the function of maladaptive eating and drinking behaviors may result in a more effective intervention (Jones et al., 2014). Compassion-focused therapy (CFT; Kelly, Cotter, & Mazzeo, 2014; Gilbert, 2005, 2009) could be a useful intervention tool for students engaging in binge-eating. As CFT improves self-compassion in early stages of eating disorder treatment (Kelly, Carter, & Borairi, 2014), techniques could be adapted for students to change a self-critical mindset, leading to awareness of the body's indicators to direct the intake of food (Webb & Hardin, 2016). Engaging with one's emotions may help reduce negative urgency, and the tendency to escape self-awareness or disengage emotionally during binge-eating.

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## Declaration of Competing Interest

The authors declare that they have no conflict of interest.

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## Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.abrep.2020.100274>.

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