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Exploring female university students' beliefs about binge eating

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### Abstract

Binge eating (BE) among female university students is rising in prevalence and few studies have considered the role of social cognitive processes in decisions to engage in BE. This study adopted a Theory of Planned Behavior (TPB) belief-based approach to examine the beliefs that underpin female university students' intentions to BE. Participants ( $N=250$ ) completed self-report questionnaires assessing BE intentions and the TPB behavioral (advantages and disadvantages of binge eating), normative (important others approving/disapproving of binge eating), and control (barriers toward and motivators for binge eating) belief measures. For analyses, participants were grouped based on a median split of the overall intention score into those with higher and lower intentions to binge eat. Differences in the TPB beliefs about BE between these two groups were then assessed. Female students with higher intentions to binge eat differed significantly in their endorsement of the likely beliefs related to BE, compared to female students with lower intentions to binge eat. The results suggest that interventions to decrease BE in the female student population should reduce the associated advantages (e.g., stress relief, feelings of comfort), enhance perceptions of disapproval for BE from important others (e.g., partner, friends), provide education about the health implications to strengthen the perceived barriers discouraging BE, and suggest healthy alternatives to overcome the factors (e.g., being alone, boredom) motivating BE.

**Keywords:** Binge eating, theory of planned behavior, beliefs, female university students

## Introduction

Eating disorders are an increasing and worldwide phenomenon associated with physical and psychological burden which present a significant challenge to public health (Austin, 2012; Becker, Plasencia, Kilpela, Briggs & Stewart, 2014). Disordered eating behaviors, of which binge eating is one such behavior, serve as key risk factors for the development of eating disorders (Abebe, Lien, Torgersen & von Soest, 2012). Binge eating (BE) is a maladaptive eating pattern that characteristically involves the recurrent consumption of large amounts of food without compensatory weight control behaviors (e.g., self-induced vomiting) (Beglin & Fairburn, 1992). Numerous adverse implications have been linked with this distinctive eating pattern including comorbid psychopathology (e.g., depression and anxiety; Grilo, White, & Masheb, 2009; Wheeler, Greiner, & Boulton, 2005), decreased psychosocial wellbeing (e.g., low self-esteem; Hudson, Hiripi, Pop, & Kessler, 2007), and medical complications including type II diabetes and hypertension due to the elevated risk for obesity (Kenardy, Mensch, Bowen, & Pearson, 1994; Stice, Presnell, & Sprangler, 2002). Even when BE is not considered to be of clinical severity (i.e., Binge Eating Disorder) the psychological and health implications remain serious and debilitating (Masheb & Grilo, 2000).

Research in the North American university/college setting with non-clinical, student samples cite prevalence estimates ranging from 32% (USA e.g., Keel, Baxter, Heatherton, & Joiner, 2007) to a substantial 60% (Canada e.g., Barker & Galambos, 2007; USA e.g., Delinsky & Wilson, 2007) of female students engaging in BE. The peak in the onset and severity of female students' BE has been suggested to reflect a combination of risk factors including adolescent and young adult women being at a vulnerable developmental period for the onset of depression and eating disorders, and the unique social and academic stressors associated with the university or college environment (Barker & Galambos, 2007; Killen et al., 1996; Striegel-Moore, Silberstein, Frensch, & Rodin, 1989). In consideration of the high prevalence of BE behavior reported by female students, an exploration of the beliefs

underlying this disordered eating behavior is critical for developing prevention and intervention programs aimed at reducing the aversive health implications of BE for female students. Understanding the beliefs associated with BE is essential for behavior change efforts as beliefs are the cognitive structures that organize experience and behavior, ultimately influencing the development and maintenance of eating disorders (Cooper, 2005; Waller, Kennerley & Ohanian, 2007).

Although limited empirical investigations have examined the role of beliefs in understanding BE behavior among the female university/college population, research conducted by Wilson, Perrin, Rosselli, Striegel-Moore, DeBar and Kraemer (2009) demonstrated the influence of beliefs regarding treatment and risk factors of BE behavior in male and female members of a health maintenance organization in the Northwestern United States. In this study, the beliefs differentiating individuals who engaged in BE behavior from those who did not were that treatment options for BE were ineffective, and that the risk factors of food addiction and weight heritability maintained BE behavior. However in contrast to expectations, the beliefs regarding the seriousness of BE and dieting ineffectiveness for reducing BE did not distinguish individuals who engaged in BE from those who did not. Together, the results suggest the importance of examining the role of beliefs in the development of and motivation for BE, and that making comparisons between those who are more and less likely to be motivated to engage in BE may inform the formulation of interventions or strategies to reduce BE behavior. One framework that has been applied successfully to identify the beliefs that can be used to inform behavior change interventions is the theory of planned behavior.

#### Theoretical framework

The TPB (Ajzen, 1991) is a social cognitive decision making model which has demonstrated predictive utility across a variety of behavioral domains, including eating behaviors such as consuming a low fat diet (Armitage & Conner, 1999). A person's intentions

are proposed to be the central determinant of their behavior. Intentions are informed by a person's attitude (positive or negative evaluation of performing a behavior), subjective norm (perceived social approval or pressure to engage in a behavior), and perceived behavioral control (perceived ease or difficulty of carrying out a behavior) (Ajzen, 1991). Of relevance to the current study, these three constructs of attitude, subjective norm, and perceived behavioral control are informed by underlying behavioral, normative, and control beliefs, respectively. More specifically, behavioral beliefs are an individuals' perception of the advantages and disadvantages of performing a behavior. Normative beliefs represent the specific referents who the individual believes would approve or disapprove of behavioral performance, and control beliefs reflect the perceived barriers and motivators for behavioral performance. It is these beliefs that can be used to differentiate individuals who have higher and lower intentions to perform a target behavior, allowing interventions to be designed that encourage behavior change in each group (e.g., Johnston & White, 2003; White, Hyde, O'Connor, Naumann & Hawkes, 2010).

The present study

As part of a larger research project examining the utility of the TPB within the context of female university students' BE behavior, the current study aimed to identify the behavioral (advantages and disadvantages), normative (important people approving or disapproving), and control (barriers and motivators) beliefs about BE that are most important and relevant to female university students. Such belief based analyses provide potential future targets for intervention programs aimed at reducing BE. It was hypothesized that the identified TPB behavioral, normative, and control beliefs would differentiate between those female university students with higher intentions to BE and those with lower intentions to BE.

## Method

### Participants and Procedure

Ethical clearance was obtained from the University's Ethics Committee prior to data collection. Eligibility criteria required university enrolment, female gender, absence of a history of a diagnosed eating disorder (i.e., Binge Eating Disorder, Anorexia Nervosa, or Bulimia Nervosa), and not currently pregnant. Participation in the survey was anonymous and submission of a completed questionnaire was considered as consent to participate.

#### Elicitation Study

Participants for the elicitation study were a convenience sample of 15 female university students between the ages of 17 and 43 years ( $M = 26.73$  years,  $SD = 7.12$ ). The majority of participants were of Caucasian ethnicity ( $n = 15$ ) and within the normal 18.5 to 25 kg Body Mass Index (BMI) weight category ( $M = 21.06$  kg/m<sup>2</sup>,  $SD = 2.11$ ; Department of Health and Ageing [Commonwealth of Australia], 2010). Six participants were currently participating in an informal weight loss program (e.g., weight control strategy without the use of a formal program such as Weight Watchers, or assistance from medical professionals), and two participants reported the use of compensatory weight control strategies following BE behavior (e.g., self-induced vomiting, laxative use). BE frequency of the pilot participants was high with almost half of participants ( $n = 7$ ) reporting at least one BE episode in the previous fortnight.

Participants completed a paper-based self report questionnaire with items assessing demographic characteristics (e.g., age, BMI, ethnicity, diet), BE behavior in the previous fortnight, and 10 open ended statements, as specified by Ajzen (2006) to elicit the TPB behavioral, normative, and control beliefs regarding BE. Participant responses were content analyzed to determine the most common behavioral, normative, and control beliefs to be used as a measure of beliefs in the main questionnaire. To encourage participation, an incentive was provided in the form of entry into a prize draw to win a \$20 movie voucher.

#### Main Study

Participants in the main study were 258 female university students aged between 17 and 48 years ( $M = 21.63$  years,  $SD = 6.22$ ). The majority of participants were Caucasian (81%).

Participants were within the normal BMI weight category of 18.5 to 25 kg/m<sup>2</sup> ( $M = 22.71$  kg/m<sup>2</sup>,  $SD = 3.88$ ) (Department of Health and Ageing [Commonwealth of Australia], 2010). The prevalence of dieting in the sample was high, with 61% of participants currently trying to lose weight with an informal diet. Furthermore, compensatory weight control behaviors were reported by 26% of the sample. The demographic characteristics of the main study were therefore similar to those of the elicitation participants.

Eight participants did not meet the eligibility criteria and were subsequently removed, leaving 252 participants remaining for analyses. Participants were recruited from psychology courses, university common areas, and announcements through email and the university student website. Self report questionnaires in either paper or online format were used to assess demographic characteristics (e.g., age, BMI, ethnicity), the TPB behavioral, normative, and control belief measures, and intentions to binge eat in the next fortnight. To encourage participation, either course credit or entry into a prize draw to win a \$50 MYER voucher was provided as a thank you for participants' time investment.

## Measures

**Intention.** To assess BE intentions in the next fortnight, participants indicated the extent to which they agreed with four items (e.g., "I intend to binge eat in the next fortnight") on a 7 point scale (1 = *Strongly disagree*, 7 = *Strongly agree*). Responses were averaged to create the intentions scale, with higher scores indicating higher intentions to engage in BE behavior in the following fortnight (Cronbach's alpha = .75).

**TPB belief measures.** All behavioral, normative, control beliefs related to BE in the next fortnight were developed in accordance with TPB recommendations (Ajzen, 2006) and scored on a 7 point scale (1 = *Extremely unlikely*, 7 = *Extremely likely*). Behavioral beliefs were assessed with 11 items asking participants to rate how likely four advantages (e.g., enjoying the taste of the food) and seven disadvantages (e.g., gaining weight) would occur if they engaged in BE. Normative beliefs were assessed with seven items asking participants to

rate how likely the important referents (e.g., partner, people who are image-conscious such as models or dancers) would think that they should engage in BE. Control beliefs were assessed with 12 items asking participants to rate how likely six barriers (e.g., knowledge about the health risks of BE) would prevent them from and six motivating factors (e.g., feeling upset or stressed) would encourage them to binge eat.

## Results

### Descriptive Analysis

Due to missing data in excess of 5%, two participants were excluded from analysis, with all subsequent analyses conducted on the remaining 250 participants. Female students' BE intentions for the following fortnight were moderately low ( $M = 2.32$ ,  $SD = 1.20$ ).

### MANOVA Comparison of BE Beliefs for Higher and Lower Intenders

In accordance with TPB recommendations (Ajzen, 1991), MANOVAs were performed to examine differences in the beliefs of female students with higher intentions to binge eat and those with lower intentions to binge eat. For the purposes of analyses, four separate MANOVAs were conducted, one each for behavioural beliefs, normative beliefs, and the two aspects of control beliefs (barriers and motivators). The MANOVAs were conducted with intention as the independent variable, and the specific set of belief-based measures as the dependent variables. To distinguish between the two groups of intenders a dichotomous variable was created by dividing the BE intentions score at the median ( $Mdn = 2.26$ , Range = 1 to 7). Participants scoring at the median or below were classified as lower intenders and coded as 1. Participants scoring above the median were classified as higher intenders and coded as 2. Bonferroni adjustments were applied for each analysis to control for Familywise Type I error.

**Behavioural Beliefs.** For the first MANOVA, according to Wilk's criterion, a significant multivariate effect for BE intention on behavioral beliefs was found,  $F(11, 224) = 3.428$ ,  $p <$

.001,  $\eta^2 = .14$ , suggesting that higher and lower intenders differed in their assessment of the positive and negative outcomes of BE. This difference was explored further at the univariate level (Table 1). Results revealed that higher intenders were significantly more likely than lower intenders to believe that BE would result in the positive outcomes of enjoying the food, experiencing feelings of comfort, and experiencing relief from anxiety or stress. However, higher and lower intenders did not differ in their assessment of the disadvantages of BE.

Normative beliefs. The second MANOVA revealed a significant multivariate effect of intention on normative beliefs for BE,  $F(7, 233) = 3.428, p < .001, \eta^2 = .12$ . Univariate analyses were conducted to explore this difference further and demonstrated that participants with higher intentions were more likely to perceive five of the seven referent groups as more likely to approve of their the decision to binge eat, than participants with lower BE intentions (Table 1). Participants did not differ in their belief about the referent groups of people who binge eat and people focused on their image.

Control motivator and control barrier beliefs. The third and fourth MANOVA were conducted to determine differences between the intention groups on their control barrier and control motivator beliefs, respectively (Table 1). A significant multivariate effect was found for the higher and lower intention groups on control barrier beliefs,  $F(6, 237) = 9.17, p < .001, \eta^2 = .19$ , and control motivator beliefs,  $F(6, 237) = 8.86, p < .001, \eta^2 = .18$ . Univariate analyses to explore the differences further revealed that higher intenders, compared to lower intenders, were significantly less likely to report knowledge about the health risks and discomfort associated with feeling full from BE as barriers to BE. In comparison to lower intenders, higher intenders reported being more encouraged to binge eat by all the motivating factors including when large amounts of food are available either at home or when they are eating out, when they experience emotions of boredom, stress and loneliness, and when they are in the presence of others who are also BE.

## Discussion

The purpose of the current study was to examine the behavioral, normative, and control beliefs about BE that are most important and relevant to female university students. Using a TPB framework, this study provided preliminary evidence for the utility of a belief-based approach to identify beliefs that differentiate between female university students with higher and lower intentions to binge eat. Overall, the results revealed that behavioral beliefs about BE, normative referents approving of BE, and control beliefs related to BE differed between those with higher and lower BE intentions. The results suggest important beliefs to target when formulating individual level and broader public health population-based intervention strategies to combat BE in this population.

Behavioral belief differences emerged between female students with higher and lower intentions to binge eat in relation to the advantages, but not the disadvantages, of BE. Specifically, higher intenders were significantly more likely to believe that BE would result in the positive outcomes of enjoying the food eaten, feeling comfort, and feeling relief from stress and anxiety. This finding is consistent with previous research on BE suggesting that individuals binge eat because it provides temporary relief from negative emotions (Mitchell & Mazzeo, 2004; Wolfe, Wood-Baker, Smith & Kelly-Weeder, 2000). In contrast, the costs associated with BE such as gaining weight and feeling guilty were considered to be equally disadvantageous by both higher and lower intenders. Together these results suggest that behavior change efforts should focus on reducing the positive outcomes associated with BE. By contrast highlighting the disadvantages of BE would not be a worthwhile strategy to reduce BE because all participants, regardless of their intentions to BE, had a high level of awareness about these disadvantages. Such strategies to reduce the perceived benefits of BE could include education and training on an individual basis through counselling programs or via university wide training to inform students of more adaptive and healthy ways to experience the positive outcomes they associate with BE. Examples include, enjoying food through cooking meals

from scratch with fresh ingredients (Grilo et al., 2009), and feeling comfort and relief from stress through exercise or meditation rather than BE (Barker & Galambos, 2009).

Normative beliefs also distinguished between female students with higher and lower BE intentions. Overall, perceived support from important others was generally quite low (below 3 on the 7 point scale); however, female students with higher BE intentions, compared to those with lower intentions, still perceived partners, family, friends, and health professionals as being more supportive of BE. These results suggest the need for intervention strategies to reduce perceptions of normative support for BE by strengthening the belief that important others such as family and friends discourage BE. This strategy may also be amenable to a public health intervention approach to develop more culturally appropriate norms (e.g., in the university or college context) which promote healthy eating behaviors and reduce support for disordered eating behaviors such as BE (Wilfley, Agras, & Taylor, 2013).

Control beliefs regarding BE also significantly distinguished female students with higher and lower BE intentions. Female students with higher BE intentions were less likely to perceive the health risks and physical discomfort associated with BE as barriers preventing BE. However, higher and lower intenders were equally likely to believe that an unavailability of food, financial costs, gaining weight, and being around people who disapprove of BE would pose challenges for BE behavior. In terms of motivators for BE, female students with higher intentions believed that all listed motivators would encourage them to binge eat, compared to female students with lower BE intentions.

Interventions targeting BE should, therefore, aim to increase awareness of the severe health and psychological implications of BE. Particularly, the lower perceptions of health risks associated with BE among female students with higher intentions to binge eat may reflect a lack of knowledge about the detrimental effects of BE on health. Furthermore, the findings highlight the need for behavior change interventions to reduce the motivations for BE by equipping female students with alternate coping mechanisms to BE so that they can

successfully overcome their urge to binge eat when they feel tempted by the availability of large amounts of tasty food, are in the presence of others who are BE, or when they are experiencing feelings of boredom, stress, and loneliness. In this regard, Wilfley and colleagues (2013) suggest one environmental intervention at the university level may be to change the quality and availability of food to assist with healthier food choices.

This study contributes to the paucity of existing literature about the BE beliefs that may serve as potential targets to reduce the prevalence of BE behavior among the female university/college population. The use of a theoretical framework is also a strength of this study. Despite these strengths, there are limitations that should be acknowledged and considered in any interpretation of the results. These limitations relate to the self report nature of the study and the focus on intentions to binge eat rather than an actual assessment of BE behavior. Future studies exploring the beliefs that may contribute to decisions to binge eat in the female university student population should include both a self-report and a more objective assessment of BE behavior such as a diary to record daily eating behaviors. Future research may also wish to consider the differences in beliefs about BE for male students to determine if there are differences in these BE beliefs on the basis of gender.

The implications of the present study relate specifically to the development of effective and tailored theory based interventions for BE, ultimately serving to address the high prevalence of the disordered eating behavior in the female university student population. While the study identified a range of beliefs to target to encourage a reduction in BE, the finding that higher intenders endorsed all listed motivators as encouraging them to binge eat and no barriers preventing them from BE is concerning. These results highlight the need for a greater understanding of the beliefs or external factors that may assist female students to successfully limit or overcome their BE tendencies.

## Conclusions

Overall, the current study provided support for the TPB as an applicable framework for understanding female university students' beliefs about and intentions to engage in BE behavior, clearly an important research area due to health implications associated with BE and the high prevalence rates of BE behavior in female student populations. These findings should go some way to assist in the formulation of future intervention strategies to reduce BE intentions and ultimately behavior and highlight, particularly, the need to identify the factors that assist female students to overcome their desire to binge eat to cope with negative affect and stress in the university and home environment.

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Table 1

*Mean Values for Behavioral, Normative, and Control Beliefs according to Lower and Higher Intentions to Engage in Binge Eating*

	Behavioral Belief	
	Lower intenders ( <i>n</i> = 133)	Higher intenders ( <i>n</i> = 117)
<i>Advantages</i>		
Experience a feeling of comfort or improved mood	3.05 (1.73)	3.96 (1.69) <sup>a</sup>
Enjoying the taste of the food	4.53 (2.01)	5.33 (1.40) <sup>a</sup>
Feel relief from anxiety or stress	3.17 (1.81)	3.89 (1.74) <sup>a</sup>
Satisfying an urge or craving	4.55 (1.77)	5.08 (1.57)
<i>Disadvantages</i>		
Gaining weight	4.54 (2.20)	4.85 (1.85)
Feel shame afterwards	4.12 (2.38)	4.73 (2.05)
Feeling a loss of control	4.32 (2.39)	4.89 (2.05)
Feeling guilty	4.62 (2.31)	5.00 (2.02)
Feeling too full or unwell	4.64 (2.22)	4.96 (1.91)
Feeling embarrassed	4.17 (2.31)	4.47 (1.91)
Experiencing health problems	3.25 (1.92)	3.11 (1.57)
Normative beliefs		
	Lower intenders ( <i>n</i> = 135)	Higher intenders ( <i>n</i> = 115)
Partner	1.43 (1.08)	2.37(1.98) <sup>b</sup>
Friends	1.70 (1.38)	2.63 (1.48) <sup>b</sup>
Family members	1.54 (1.68)	2.39 (1.44) <sup>b</sup>
Parents	1.55 (1.27)	2.33 (1.46) <sup>b</sup>
Doctors and other health professionals (e.g., dietician, psychologist)	1.37 (0.95)	1.92 (1.28) <sup>b</sup>
People focused on their image (e.g., models, dancers)	1.90 (1.61)	2.44 (1.66)

	Control beliefs	
	Lower intenders ( <i>n</i> = 126)	Higher intenders ( <i>n</i> = 124)
Other people who binge eat	2.56 (1.87)	3.07 (1.85)
<i>Barriers</i>		
Knowledge about the health risks/negative effects on the body	5.37 (1.74)	4.09 (1.87) <sup>c</sup>
The discomfort associated with feeling full	5.10 (1.62)	4.35 (1.67) <sup>c</sup>
Not having food available	4.66 (2.02)	5.11 (1.76)
The financial cost	4.58 (1.91)	4.19 (1.81)
Having other people around who disapprove (e.g., family, friends)	5.12 (1.86)	4.82 (1.75)
Being concerned about gaining weight	5.37 (1.97)	5.46 (1.55)
<i>Motivators</i>		
Feeling bored	4.27 (1.81)	5.64 (1.32) <sup>c</sup>
Being alone (e.g., home alone)	3.89 (2.00)	5.26 (1.68) <sup>c</sup>
Having access to large amounts of food (e.g., in the cupboard, a buffet or "all you can eat" style restaurant)	4.64 (1.95)	5.79 (1.35) <sup>c</sup>
Having access to tasty/sweet food in the house (e.g., snacks, sweets)	4.78 (1.87)	5.87 (1.32) <sup>c</sup>
Feeling upset or stressed	4.13 (1.98)	5.21 (1.70) <sup>c</sup>
Having other people around who are eating lots of food (e.g., party) or binge eating	4.37 (1.96)	5.17 (1.58) <sup>c</sup>

<sup>a</sup>*p* < .005. <sup>b</sup>*p* < .007. <sup>c</sup>*p* < .008.