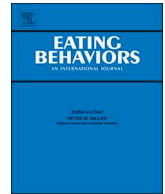




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## What does it mean to overeat?

Emma V. Long<sup>a</sup>, Lenny R. Vartanian<sup>a,\*</sup>, C. Peter Herman<sup>b</sup>, Janet Polivy<sup>b</sup><sup>a</sup> School of Psychology, UNSW Sydney, Sydney, NSW 2052, Australia<sup>b</sup> Department of Psychology, University of Toronto, Toronto, ON M5S 3G3, Canada

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## ABSTRACT

“Overeating” is a significant public health concern, but little is known about how lay people conceptualize overeating. This study explored participants' conceptions of overeating. Participants were 175 university students and 296 community members (56% women) who were asked to rate the extent to which several statements reflected the concept of “overeating” (1 = *Does not capture the meaning at all*; 7 = *Captures the meaning perfectly*). Results showed that eating outside of hunger was viewed as being most strongly linked to the conceptualization of overeating; mindless eating, eating more than some normative amount, and a lack of restriction were all moderately linked to the conceptualization of overeating; and the quality of the food/eating style was rated as least relevant to the conceptualization of overeating. Participants with a higher BMI, participants who perceived themselves as fat, restrained eaters, and participants with an indication of eating pathology rated all of the constructs as more relevant to the concept of overeating than did their respective counterparts, but their overall pattern of responding was the same. The present research provides some initial insights into people's thoughts on what it means to “overeat,” which is important given that simply believing that one has overeaten (regardless of the actual amount consumed) can have adverse psychological and behavioral consequences. These insights provide an avenue for future research to explore whether lay conceptions could be more adaptively reshaped to reduce the negative effects of perceived overeating.

## 1. Introduction

Overeating and its effects on people's health and wellbeing are currently of great concern, with a focus on how overeating contributes to weight gain and obesity (e.g., Prentice, 2001; Swinburn, Sacks, & Ravussin, 2009). Overeating is also associated with several other adverse psychological and behavioral outcomes, including the use of unhealthy weight-control techniques, poor self-esteem, body dissatisfaction, and depressive symptoms (Goldschmidt et al., 2015; Skinner, Haines, Austin, & Field, 2012). Just thinking about overeating, even in the absence of actual food consumption, increases the likelihood of initiating “fat talk” (i.e., self-disparaging comments about one's body, which lead to problematic outcomes such as body dissatisfaction, eating pathology, and depressive symptoms; Shannon & Mills, 2015, 2019). Finally, there are social repercussions to overeating in that individuals are often evaluated less favorably by others if they have overeaten (e.g., Vartanian, Herman, & Polivy, 2007).

The adverse behavioral and emotional effects of overeating arise not only after people eat an objectively large amount of food, but even when people simply *think* that they have overeaten. For example, when chronic dieters are led to believe that they have broken their diets, they

subsequently overindulge (e.g., Herman & Mack, 1975; Mills & Palandra, 2008). Other research suggests that how much one eats *relative to others* can influence psychological and behavioral outcomes. One study in which participants were led to believe that they had eaten more or less than previous “participants” found that, although there were no significant differences in subsequent caloric intake between groups, participants who believed that they had overeaten reported higher levels of dietary concern and guilt than did those who thought that they had undereaten (Ruddock & Hardman, 2018). In another study, restrained eaters who thought that they had eaten more than another participant increased their subsequent intake of cookies (compared to unrestrained eaters; Polivy, Herman, & Deo, 2010). It seems then that the term “overeating” can have more than one definition, depending on aspects of the person and the eating situation (e.g., Polivy & Herman, 2020).

Given that people's beliefs about whether or not they have overeaten can be variable and can elicit negative outcomes, it is important to examine what people believe constitutes “overeating.” Recent research has examined people's definitions of eating an “appropriate” amount (Vartanian, Herman, & Polivy, 2016) as well as eating in “moderation” (vanDellen, Isherwood, & Delose, 2016). However,

\* Corresponding author.

E-mail address: [l.vartanian@unsw.edu.au](mailto:l.vartanian@unsw.edu.au) (L.R. Vartanian).

research has not investigated how members of the general public conceptualize “overeating” and it is unclear whether the definitions held by lay people align with the definitions that researchers and clinicians use. The present study was designed to investigate people’s beliefs about what it means to overeat, and to explore whether those beliefs vary for individuals differing in relevant constructs (e.g., dietary restraint, eating pathology). Because this study is exploratory in nature, no specific hypotheses were made.

## 2. Method

### 2.1. Participants

Two separate samples were recruited to increase the generalizability of our results. Participants were excluded ( $n = 47$ ) if they failed at least one of the three attention-check questions (i.e., questions directing participants to select a specific response), leaving a combined total of 471 participants across the two samples. The first sample consisted of 175 undergraduate students (121 women; 54 men) at a large Australian university who were recruited from a first-year psychology course. Their mean age was 19.59 years ( $SD = 3.12$ ) and their mean body mass index (BMI;  $\text{kg}/\text{m}^2$ ) was 22.61 ( $SD = 4.97$ ). With regards to ethnicity, 51.4% identified as Asian, 41.7% identified as White/Caucasian, 1.7% identified as Aboriginal/Pacific Islander, and 5.1% identified as “other” ethnicities. The second sample consisted of 296 community members residing in the United States (144 women; 152 men) who were recruited through Amazon’s Mechanical Turk. Their mean age was 37.41 years ( $SD = 10.67$ ) and their mean BMI was 27.28 ( $SD = 7.19$ ). In terms of ethnicity, 83.1% identified as White/Caucasian, 8.1% identified as Black/African American, 4.1% identified as Asian, 3.0% identified as Hispanic/Latino(a), 0.3% identified as American Indian/Alaska Native, and 1.4% identified as “other” ethnicities. This study was approved by the university’s ethics committee.

### 2.2. Materials and procedure

All participants completed the study online. A reCAPTCHA and three attention-check questions were included in the questionnaire to eliminate the potential influence of bots. After providing informed consent, participants completed the following measures:

#### 2.2.1. Demographics

Participants reported their age, sex, ethnicity, and height and weight (which were used to calculate BMI).

#### 2.2.2. Conceptualization of overeating

Participants were asked to rate the extent to which a number of statements “captured the meaning of overeating.” Each statement was rated on a 7-point scale ranging from 1 = *Does not capture the meaning at all* to 7 = *Captures the meaning perfectly*. The specific items were generated in consultation with a range of experts in the areas of eating behavior, eating disorders, and dietetics. In total, 33 items were developed, covering a broad range of constructs. After the study was completed, these items were grouped conceptually into six main themes so that the data could be presented more clearly and succinctly (see Table 1). The themes were: eating outside hunger ( $\alpha = 0.80$ ), a lack of restriction of food intake ( $\alpha = 0.81$ ), the quality of food consumed/eating style ( $\alpha = 0.75$ ), eating more than some normative amount (“supra-normative”;  $\alpha = 0.84$ ), mindless eating ( $\alpha = 0.81$ ), and the emotional consequences of eating ( $\alpha = 0.87$ ).

#### 2.2.3. Individual difference measures

We also examined participant characteristics that could conceivably be related to how people conceptualize overeating. Participants were classified according to their self-reported sex (men vs. women) and BMI ( $< 25$  vs.  $\geq 25$ ; derived from self-reported height and weight). Self-

**Table 1**  
Overeating Themes and their Respective Items.

Theme	Items
Outside hunger	Continuing to eat when no longer hungry. Not being able to resist tasty food even if you are full. Eating beyond the point of fullness. Eating until you feel uncomfortable or sick. Putting the taste of food over fullness.
Lack of restriction	Eating when you know you are not hungry. Eating more than you intended to. Eating more than is nutritionally required. Eating the entire portion of what you were served. Eating more than you need. Having more than one serving of food. Eating outside of planned meals and snacks. Eating that leads to weight gain. Eating when one hasn’t been burning enough calories recently.
Quality	Eating more than you wanted to. Eating foods that aren’t good for you. Eating faster than usual. Eating an item that one shouldn’t eat (i.e., a “forbidden food”).
Supra-normative	Eating more than other people at the meal. Eating much more than an average person would eat under similar circumstances. Eating more than you usually eat (in similar situations). Eating an amount that others would consider excessive. Eating much more than the suggested serving size on a package of food. Eating more than is appropriate for the situation.
Mindless eating	Eating mindlessly. Eating for emotional reasons. Eating just for something to do. Eating without knowing why you are eating.
Emotional consequences	Feeling guilty about how much you have eaten. Feeling ashamed about how much you have eaten. Feeling upset after you’ve eaten. Feeling out of control while eating. Feeling regret about eating as much as you did.

perceived weight was measured by asking participants “How would you describe your weight using the following scale?” (1 = *Very thin*, 7 = *Very fat*), and participants were grouped as: self-perceived as “fat” (scores on the rating scale of 6–7) vs. “neither thin nor fat” (scores of 3–5) vs. “thin” (scores of 1–2). Participants also completed the Restraint Scale (Herman & Polivy, 1980;  $\alpha = 0.77$ ), a 10-item measure of dieting concerns, eating behaviors, and weight fluctuations. Participants who score 15 or above are classified as restrained eaters and participants who score 14 or below are classified as unrestrained eaters. We also included a measure of eating pathology, the SCOFF questionnaire (Morgan, Reid, & Lacey, 1999;  $\alpha = 0.58$ ). The SCOFF questionnaire contains five items and was designed as a simple screening instrument for eating disorders (specifically anorexia nervosa and bulimia nervosa). A score of 2 or more indicates that the individual is likely to have an eating pathology whereas a score of  $< 2$  indicates no likely eating pathology.

### 2.3. Statistical analyses

To examine whether the pattern of results was the same across the two samples, we first conducted a repeated-measures ANOVA with “sample” included as an additional factor. There was no significant interaction between sample and participants’ mean ratings of the overeating themes ( $p = .332$ ). We then conducted an ANCOVA controlling for participant demographics (age, BMI, ethnicity) and found that the pattern of results did not change. Given that there were no notable differences between the samples, the following analyses were all conducted on the combined sample of participants.

To test whether endorsements of the six themes were significantly different from each other, a repeated-measures ANOVA with Bonferroni-corrected follow-up contrasts was conducted. To assess whether participants perceived each dimension to be relevant or irrelevant to a definition of overeating in an absolute sense, one-sample *t*-tests were conducted to compare ratings for each theme to the mid-point of the rating scale (i.e., a rating of 4). The conceptual overlap between the six themes was assessed by examining the bivariate correlations between each of the themes. Finally, we investigated whether individual differences (sex, BMI, self-perceived weight, level of dietary restraint, and eating pathology) altered the overall pattern of results. To do so, we conducted five separate repeated-measures ANOVAs, each time including one of the individual difference variables as a between-subjects factor in the ANOVA.

### 3. Results

Means for the six themes are displayed in Fig. 1. Because Mauchly's test revealed that the assumption of sphericity was not met ( $\chi^2(14) = 376.36, p < .001$ ), degrees of freedom were corrected using the Huynh-Feldt estimate of sphericity ( $\hat{\epsilon} = 0.82$ ). A repeated-measures ANOVA found significant differences among the six themes,  $F(4.09, 1920.29) = 399.47, p < .001, \eta_p^2 = 0.46$ . Bonferroni-corrected follow-up contrasts demonstrated that all themes were significantly different from each other (all *ps* < 0.023), except for the supra-normative and mindless eating groups (*p* > .999). The items related to eating outside of hunger were the most highly rated with respect to how well they captured the meaning of overeating, followed by items related to mindless eating and eating more than some normative amount, then items related to a lack of restriction, and then items related to the emotional consequences of eating. Items related to the quality of the food/eating style were the least highly rated.

As displayed in Fig. 1, one-sample *t*-tests revealed that items related to eating outside hunger, a lack of restriction, eating more than some normative amount, and mindless eating were rated as being relevant to the concept of overeating (all *ps* < 0.001); items related to the quality of the food/eating style were perceived as being irrelevant (*p* < .001); and items related to the emotional consequences of eating were neither

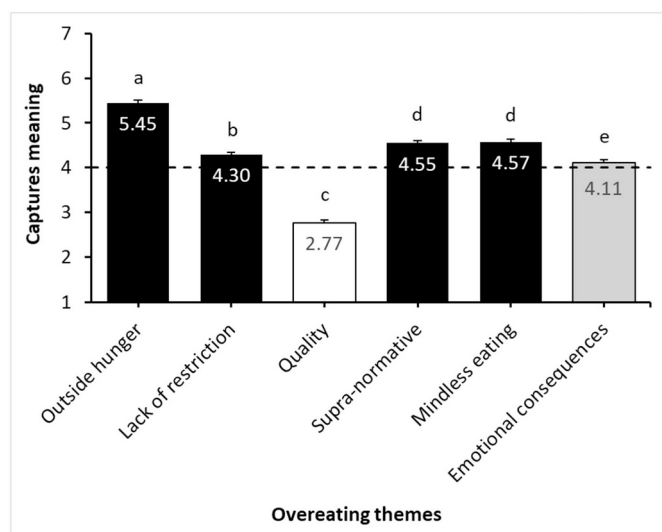


Fig. 1. Mean ratings for the six overeating themes. Error bars represent standard errors. Bars with different superscripts are significantly different from each other at *p* < .05. The horizontal dashed line represents the mid-point of the rating scale. Black bars are significantly higher than the mid-point of the scale at *p* < .05; the gray bar is not significantly different from the mid-point of the scale; the white bar is significantly lower than the mid-point of the scale at *p* < .05.

Table 2

Bivariate correlations among the six themes.

Themes	1	2	3	4	5	6
1 Outside hunger	–					
2 Lack of restriction	0.562	–				
3 Quality	0.150	0.521	–			
4 Supra-normative	0.473	0.757	0.456	–		
5 Mindless eating	0.547	0.513	0.426	0.418	–	
6 Emotional consequences	0.435	0.484	0.488	0.437	0.519	–

Note: All correlations are significant at *p* < .01.

relevant nor irrelevant to participants' conceptualizations of overeating (*p* = .125).

A correlation analysis revealed that all six of the dimensions were positively correlated with one another, but the magnitude of the correlations did vary, indicating that the dimensions are related but somewhat distinct concepts. The smallest correlation was between quality and eating outside of hunger, and the largest correlation was observed between eating more than some normative amount and a lack of restriction (see Table 2 for the correlation matrix).

Finally, we investigated the potential role of individual differences in construals of overeating. Including each of the individual difference characteristics as a between-subjects factor in separate analyses revealed that there were main effects of BMI ( $F(1, 469) = 6.65, p = .010, \eta_p^2 = 0.01$ ), self-perceived weight ( $F(2, 468) = 4.27, p = .015, \eta_p^2 = 0.02$ ), restraint ( $F(1, 469) = 30.50, p < .001, \eta_p^2 = 0.06$ ), and eating pathology ( $F(1, 469) = 9.36, p = .002, \eta_p^2 = 0.02$ ) on participants' ratings of the six themes. Participants with a BMI  $\geq 25$ , or who perceived themselves to be fat, or were restrained eaters, or who had an indication of eating pathology, rated each of the themes of overeating more highly than did participants with a BMI < 25, who perceived themselves to be neither thin nor fat, were unrestrained eaters, or who had no indication of eating pathology, respectively. The overall pattern, however, mirrored the pattern shown in Fig. 1 (see online Supplementary Figs. S1–S5). There was no main effect of sex ( $F(1, 469) = 2.70, p = .101, \eta_p^2 = 0.01$ ) on participants' ratings, and there were no significant interactions between any of the individual difference variables and ratings of the six themes (all *ps* > 0.210).

### 4. Discussion

The purpose of the present study was to examine lay people's beliefs about what it means to "overeat." Participants perceived eating outside hunger as the most relevant aspect of their conceptualization of overeating, and rated the quality of the food/eating style as the least relevant aspect of their conceptualization of overeating. Participants also moderately agreed that a lack of restriction, eating more than some normative amount, and mindless eating were relevant to their conceptualization of overeating.

Given that people typically cite their level of hunger as a primary reason for eating as much as they do (Vartanian, Herman, & Wansink, 2008), and also cite hunger as the most appropriate reason for eating as much as one does (Spanos, Vartanian, Herman, & Polivy, 2015), it makes sense that participants in the current study would cite eating outside hunger as the principal defining feature of overeating. However, it is surprising that a lack of restriction was only moderately linked to conceptions of overeating, especially given that violating one's personal dietary limits has been found to lead to negative consequences (such as feelings of guilt and disappointment; Polivy & Herman, 2020), and given that public health messaging often focuses on reducing overeating by restricting portion sizes. These findings highlight the value of understanding lay people's definitions of a particular concept because they may not accord with the definitions used by professionals in the field.

Participants in this study viewed eating more than some normative

amount as being moderately connected to the concept of overeating. The relevance of normative cues is consistent with the Theory of Normal Eating (Herman, Polivy, Pliner, & Vartanian, 2019), which asserts that people look to the behavior of others to define what constitutes “excessive” consumption. Interestingly, although participants regarded normative cues as relevant to the concept of excessive eating, another study found that people view normative cues as being *irrelevant* to the definition of appropriate eating (Vartanian et al., 2016). This distinction mirrors people's explanations for their own food intake: people are generally willing to acknowledge (or blame) social influences when they feel that they have overeaten, but otherwise deny social influences on their own food intake (e.g., Vartanian, Spanos, Herman, & Polivy, 2017).

The current study also found that people with a higher BMI, people who perceived themselves as fat, restrained eaters, and people with an indication of eating pathology rated all of the constructs as more relevant to the concept of overeating than did their respective counterparts. Previous research has shown that restrained eaters and individuals with a higher BMI report overeating more frequently than do unrestrained eaters and individuals with a lower BMI (van Strien, Herman, & Verheijden, 2009). Our results suggest that this may in part be due to differences in the tendency to label an eating occasion as overeating. Given that people's belief that they have eaten excessively is enough to generate adverse outcomes, if particular groups perceive a greater proportion of situations to involve overeating, then they may well be more likely to experience negative consequences (such as body dissatisfaction, disinhibition, and increased use of unhealthy weight-control tactics).

The present findings also support previous research into the relative importance of the objective amount consumed as compared to other indicators of overeating when defining what constitutes a binge-eating episode. The *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association, 2013) requires that an individual must have consumed an objectively large amount of food in order to meet the criteria for a binge-eating episode. However, previous research has found that feeling a loss of control around eating may be a more relevant indicator of binge eating than is the actual amount consumed (e.g., Latner & Clyne, 2008). Our finding that people who experience greater difficulty around eating view a wide variety of dimensions (such as experiencing emotional consequences and a lack of restriction; see Supplementary Figs. S3 and S4) as relevant indicators of overeating highlights the importance of considering the subjective experience.

A particular strength of this study is the use of two distinct samples that varied in mean age, BMI, and ethnicity, thereby increasing the generalizability of the findings. However, the results should be considered in light of some limitations. Because this research aimed to investigate people's beliefs about overeating, we utilized self-report in the form of rating scales and did not connect these beliefs to actual consumption behaviors. Interestingly, it should be noted that rating overeating in the abstract appears to differ in some ways from experiencing actual overeating. Participants in the current study perceived the quality of the food to be irrelevant to the concept of overeating, despite the fact that people's food intake in various studies has been shown to be affected by their perceptions of the food's quality. For example, one study found that restrained eaters did not increase their subsequent food intake when they were given a preload of a food they perceived to be “permissible” (cottage cheese), but restrained eaters who ate a “forbidden” (yet isocaloric) preload (milkshake) went on to overindulge (Knight & Boland, 1989). Another study found that participants who believed that they were eating a “healthy” snack ate approximately 35% more than did participants who thought they were eating an “unhealthy” snack, despite the fact that all of the participants were eating exactly the same cookies (Provencher, Polivy, & Herman, 2009). Thus, future research should examine the potential mismatch between people's conceptualizations of overeating and their actual

eating behavior and concurrent thoughts.

The present study, along with studies on people's definitions of appropriate eating (Vartanian et al., 2016) and moderate eating (vanDellen et al., 2016) provide insights into how lay people conceptualize their food intake. Future research could further examine: (1) the gap between lay and researcher definitions of overeating (cf. Polivy & Herman, 2020), (2) inconsistencies between people's conceptions of overeating and more objective indicators of overeating (such as consumption during an ad lib test meal), (3) what determines whether or not someone labels an eating occasion as overeating, and (4) whether lay conceptualizations of overeating could be refined as a means of reducing the negative psychological and behavioral consequences of perceiving oneself as having overeaten even when one's food intake was reasonable and appropriate.

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### Contributors

LRV, CPH, and JP contributed to the design of the study. EVL conducted the analyses and wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

### Declaration of competing interest

All authors declare that they have no conflicts of interest.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.eatbeh.2020.101390>.

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