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# Parental instrumental feeding, negative affect, and binge eating among overweight individuals

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ABSTRACT

Parental instrumental feeding (i.e., rewarding children with food for perceived correct behaviors and punishing by taking away food for perceived incorrect behaviors) and negative affect are independently associated with binge eating in adulthood. However, less is known about interactions between these variables and binge eating. This study examined the relationship of retrospective reports of parental feeding practices and negative affect to binge eating. Participants were 165 overweight and obese undergraduate students at a large Mid-Atlantic University. High parental instrumental feeding strengthened the relationship between negative affect and binge eating. Also, individuals who reported low parental feeding practices reported similar binge eating regardless of negative affect. These findings suggest that overweight and obese individuals whose parents used more instrumental feeding practices are most likely to engage in binge eating in response to negative affect.

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## 1. Introduction

Binge eating involves eating significantly high quantities of food in a short period of time, with an associated loss of control and may be symptomatic of binge eating disorder (BED) (American Psychiatric Association, 2013). BED is often co-morbid with mood and anxiety disorders (Hudson, Hiripi, Pope, & Kessler, 2007) as well as obesity (Ghaderi, 2010). Due to the association between BED and obesity, development of BED could potentially increase risk for hypertension, diabetes, cardiovascular disease, and cancer (Cecchini et al., 2010). In fact, Dalton, Blundell, and Finlayson (2013) argue that comorbid binge eating and obesity may represent a subtype of obesity. A prominent theory, the affect regulation model, posits that feelings of negative affect precede binge eating behaviors (Polivy & Herman, 1993). Thus, individuals engage in binge eating to cope with negative affect. However, many individuals who experience negative affect do not engage in binge eating; therefore, it is important to examine other variables in the association between negative affect and binge eating. The current study examined the relationships of parental use of instrumental feeding (i.e., rewarding children with food for perceived correct behaviors and punishing by taking away food for perceived incorrect behaviors), negative affect, and binge eating in obese adults.

### 1.1. Binge eating and negative affect

Negative affect and mood encompass feelings of depression, anxiety, guilt, shame, and other negative emotions. As previously stated, the affect regulation model suggests that negative affect precipitates binge eating behaviors (Polivy & Herman, 1993). In a meta-analysis of studies that had used ecological momentary assessments of binge eating, Haedt-Matt and Keel (2011) concluded that negative affect does indeed occur prior to binge eating episodes as such negative affective states are associated with increased binge eating and may even be a primary cause of binge eating. Similarly, in a prospective study, depressive symptoms predicted the onset of binge eating in adolescent girls (Stice, Presnell, & Spangler, 2002). Lastly, in several cross-sectional studies of college students and bariatric patients, binge eating was significantly correlated with higher depression and anxiety (Fischer et al., 2007; Johnsen, Gorin, Stone, & le Grange, 2003; Sherry & Hall, 2009). Thus, a plethora of evidence supports the affect regulation model of binge eating. However, it is likely that the relationship between negative affect and binge eating is bi-directional.

### 1.2. Binge eating and instrumental feeding

Instrumental feeding is a parental feeding practice in which parents reward children with food for perceived correct behaviors and punish by taking away food for perceived incorrect behaviors. In children, instrumental feeding was associated with emotional eating, tendency to overeat (Rodgers et al., 2013), snacking (Rod Rodenburg, Kremers, Oenema, & van de Mheen, 2013; Sleddens, Kremers, De Vries, & Thijs, 2010), and bulimic symptomology (MacBrayer, Smith, McCarthy, Demos, & Simmons, 2001). Additionally, instrumental feeding was associated with appetite patterns such as food enjoyment and food responsiveness in children (Ainuki & Akamatsu, 2011). Furthermore, college students who retrospectively reported parents using instrumental feeding practices had a significantly higher body mass index (BMI)

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compared to individuals who reported parents seldom using instrumental feeding practices (Puhl & Schwartz, 2003). Regarding binge eating, in adulthood, individuals who reported that their parents used instrumental feeding practices indicated significantly greater binge eating in adulthood (Puhl & Schwartz, 2003).

### 1.3. Current study

Parental instrumental feeding is associated with maladaptive eating behaviors in childhood and, furthermore, binge eating in adulthood. Also, we know that negative affect is a primary antecedent to binge eating (Haedt-Matt & Keel, 2011). Because parental instrumental feeding is associated with maladaptive eating and appetite patterns, the use of instrumental feeding by parents may be an underlying mechanism associated with binge eating in response to negative affect. The current study was guided by two hypotheses. First, consistent with previous studies, it was hypothesized that higher negative affect and parental instrumental feeding would be associated with increased binge eating. Second, it was hypothesized that negative affect would moderate the relationship between retrospective parental instrumental feeding practices and binge eating. Specifically, reporting high parental instrumental feeding would strengthen the relationship between negative affect and binge eating. In addition, individuals who reported low negative affect, regardless of retrospective reports of parental instrumental feeding, would engage in low binge eating.

## 2. Method

### 2.1. Participants

Participants were 165 overweight and obese (i.e., BMI ≥ 25) undergraduate students at a large Mid-Atlantic University. BMI was calculated using participants' self-reported height and weight. All participants were recruited through the psychology department participant pool and received research credit for completing the online survey. The research was approved by the College's Human Subjects Committee and followed APA ethical guidelines. The sample consisted of more women ($n = 115$; 70%) than men ($n = 50$; 30%). Participants were mostly White (42%) or Black (36%) followed by participants who described themselves as "two or more races" (15%). The mean age of the sample was 24.20 ($SD = 8.54$); mean BMI was 30.80 ($SD = 5.81$).

### 2.2. Measures

#### 2.2.1. Parental instrumental feeding

The 3-item Comprehensive Feeding Practices Questionnaire — Food as reward subscale (Musher-Eizenman & Holub, 2007) was used to measure parental instrumental feeding (i.e., using food for reward and punishment). The responses ranged from 1 (*disagree*) to 5 (*agree*). Higher scores indicated more parental use of instrumental feeding. The scale was originally developed for parents to report on their use of instrumental feeding practices. For the current study, the scale was modified to have participants respond about their parent's or guardian's use of instrumental feeding practices. A sample item is "My parent(s)/guardian(s) offered me my favorite foods in exchange for good behavior." The Cronbach's alpha for the Comprehensive Feeding Practices Questionnaire — Reward subscale was .73 in the current study.

#### 2.2.2. Negative affect

The goal in this study was to assess the behavioral component of binge eating (i.e., eating behavior) without confounding affect (e.g., depression, anxiety, or body shame). Thus, to isolate binge eating behavior, we focused on the behavioral characteristics of binge eating (i.e., the act of consuming food). Using the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) definition of a binge eating episode, binge eating was measured by asking participants to indicate how many days in the past seven days they "rapidly consumed an excessive amount of food with an experience of loss of control." As a result, their response could range from 1 to 7. Validity of this measurement of binge eating is demonstrated by significant positive correlations with depressive symptoms, external eating, and emotional eating (Mason & Lewis, 2014).

#### 2.2.3. Binge eating

Five items from the Negative Affect subscale of the Positive and Negative Affect Schedule (PANAS-NA; Watson, Clark, & Tellegen, 1988) were used to measure negative affect in the past week. Respondents were asked to report how distressed, upset, shamed, nervous, and afraid they felt in the past week using a scale ranging from 1 (*very slightly/not at all*) to 5 (*extremely*). Higher scores indicated more negative affect. The PANAS-NA is a valid and reliable measure of negative affect in non-clinical samples (Crawford & Henry, 2004). The Cronbach's alpha for the PANAS-NA was .80 in the current study.

## 3. Results

### 3.1. Descriptive statistics

The variables included in the study were negative affect ($M = 10.49$, $SD = 4.00$), parental instrumental feeding, ($M = 8.05$, $SD = 3.26$), and binge eating ($M = .58$, $SD = 1.09$). Based on 1000 bootstrap samples, negative affect was significantly correlated with binge eating, $r(163) = .36$, 95% CI = [.18, .53]. Parental instrumental feeding was not significantly correlated with binge eating, $r(163) = .15$, 95% CI = [−.03, .33] or negative affect, $r(163) = .11$, 95% CI = [−.05, .28]. A MANOVA showed no significant differences on binge eating, negative affect, or instrumental feeding between overweight (BMI ≥ 25 < 30) and obese (BMI ≥ 30) groups, $F(3, 161) = .13$, $p = .94$ $^{2} = .002$.

### 3.2. Statistical analysis

All variables had complete data. Binge eating was positively skewed, so bootstrapping was used to accommodate the skewed distribution (Russell & Dean, 2000). Predictor variables were centered to reduce multicollinearity in a bootstrapped multiple regression analysis. A multiple regression was conducted of binge eating on negative affect, parental instrumental feeding, and the interaction between negative affect and parental instrumental feeding. Gender was included as a covariate. Offering partial support for the first hypothesis, negative affect was positively related to binge eating, but parental instrumental feeding was unrelated to binge eating. In support of the second hypothesis, a significant interaction was found for negative affect and parental instrumental feeding (see Table 1). The interaction is displayed in Fig. 1. High parental instrumental feeding strengthened the relationship between negative affect and binge eating. Also, low negative affect was associated with low binge eating regardless of level of instrumental feeding. The model explained 21% of the variance in binge eating and demonstrated a medium effect size.

**Table 1**
Interaction among negative affect and instrumental feeding predicting binge eating.

| | B | β | CI | R | $R^2$ | F |
|---|---|---|---|---|---|---|
| Gender | −.03 | −.03 | [−.20, .12] | .46 | .21 | 10.45* |
| Negative affect | .09 | .33 | [.05, .12] | | | |
| Instrumental feeding | .04 | .11 | [−.02, .08] | | | |
| Negative affect X instrumental feeding | .02 | .25 | [.01, .03] | | | |

Note: For predictors, CIs that do not include 0 are significant.
* $p < .001$.