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# An Analysis of the Factors Influencing Bored and Emotional Eating: Should Bored Eating Exist as a Separate Construct?

Erin Elizabeth Stuck

*University of South Carolina - Aiken*

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Should Bored Eating Exist as a Separate Construct?

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A Project  
presented to  
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of the Requirements for the Degree  
Master of Science

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by  
Erin Elizabeth Stuck

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**Abstract**

Emotional eating pertains to eating in response to negative emotional experiences, and can occur for a variety of reasons. Individuals may emotionally eat as a means of submerging themselves into positive reinforcing states, as a way of coping, or as a distraction from their negative emotional experience (Cialdini, 1973; Kemp, Bui, & Grier, 2013; and Spoor et al., 2006). Historically, emotional eating has included boredom. Recent research has suggested that bored eating may be a separate construct from emotional eating (Koball et al., 2012). Thus, the present study investigated the variables associated with both emotional eating and bored eating with the aim of discovering if bored eating should exist as a separate construct by inducing the both negative affective and bored emotional states. This is the first study to use food intake as a criterion variable in the exploration of bored eating. Results indicated there were differences between the two constructs in that individuals' food consumption during the bored emotional state was predicted by conscientiousness, and both conscientiousness and neuroticism appeared as predictor variables for emotional (negative affect) eating. This study contributes to the research examining bored eating outside of emotional eating behaviors.

AN ANALYSIS OF THE FACTORS INFLUENCING BORED OR EMOTIONAL EATING:  
SHOULD BORED EATING EXIST AS A SEPARATE CONSTRUCT?

There is no one single reason why individuals eat. Many theories attempt to explain why individuals choose to eat. Among these theories is the homeostatic theory that suggests eating occurs because fuel is needed to survive and individuals crave particular foods because certain nutrients are crucial for optimal functioning (Carroll et al., 2013). Social learning theory suggests that normal weight young women model other people's food intake especially when it is high-fat food (Hermans, Larsen, Herman, & Engels, 2009). Carroll et al. (2013) has suggested that eating is more of an instinctive process. For instance, research supports that individuals grab high calorie foods such as pizza or doughnuts when they are experiencing feelings such as stress because this is instinctive. The feelings of stress induce the individual's flight or fight response, and by grabbing the closest high-energy food, individuals are being effective in attaining an energy-producing source. Additionally, the instinctive concern for food scarcity is activated when in the presence of a buffet, and individuals take in more food than necessary based on their instincts. Because individuals are concerned about food becoming scarce, they consume larger quantities than needed. In a culture of food abundance in which instinctive responses such as the aforementioned are no longer necessary, overeating in response to unpleasant emotions may occur (Carroll et al., 2013).

### **Negative Affect Eating**

The body's natural response to emotional events is a loss in appetite (Evers, Stok, & Ridder, 2009; Larsen, van Strien, Eisinga, & Engels, 2006). Negative affect leads to a physiological state comparable to satiety because it instigates the release of appetite-inhibiting hormones and causes an assortment of gastric changes like those present in satiety (Evers et al.,

2009). Yet, there are those who eat more when experiencing negative affect. While there is a variety of research on the matter, it still remains difficult to pinpoint exactly which factors are most influential in emotional eating. Ultimately, there are a plethora of theories and factors that implicate a person's food intake level in reaction to emotional distress.

### **Affect Regulation Theory**

Nobody desires to feel badly, and most people would eagerly choose to feel good instead. Affect regulation theory suggests that when people are in poor emotional states, they attempt to improve these negative states; thus, the negative relief model was created by Cialdini (1973). This model states that individuals can alter their negative states by submerging themselves into a positive reinforcing state (Kemp, Bui, & Grier, 2013). This positive reinforcing state can be eating for many individuals. In some instances, individuals may eat to reduce their negative emotions and increase their positive feelings in return (Kemp et al., 2013). In summation, affect regulation theory suggests that emotional eaters overeat as a reaction to negative affect because they have learned that it relieves them from aversive mood states, and the negative relief model indicates food as the mechanism for improving their emotional state (Spoor et al., 2006).

Eating can serve as a coping mechanism for negative affect for some individuals because it can help to reduce aversive emotional states. Coping mechanisms include emotion-oriented coping, which is "a way of regulating emotions... [that] is particularly aimed...[at reducing] the negative emotions associated with the problem. This form of coping includes emotional responses, self-preoccupation and fantasizing" (Spoor et al., 2006, p. 369). In addition to emotion-oriented coping, there is avoidance coping, which pertains to "avoidance of stress by distracting oneself with a substitute task or by seeking social diversion, such as the company of others" (Spoor et al., 2006, p. 369). The aforementioned coping mechanisms have been associated with

disordered eating beliefs, dieting, and bingeing behaviors (Spoor et al., 2006). These coping mechanisms are utilized in emotional eating because food can be used to distract, numb, and soothe unpleasant emotional experiences (Kemp et al., 2011).

### **Escape Theory/Masking Theory**

An additional theory of emotional eating is escape theory, which suggests that eating can act as an escape from self-awareness (Evers, Stok, & Ridder, 2007). By eating, individuals take attention away from deeper cognitive levels and focus on the present environment. By doing so, they can avoid potentially ego-threatening information which is associated with an aversive self-awareness (Spoor et al., 2006). This external focus of attention also leads to reduced inhibitions, resulting in a greater likelihood that individuals will partake in bingeing episodes. Similarly, masking theory states that overeating may be an aim to misattribute stress to eating; thereby distracting the individuals from the actual source of distress they are struggling to deal with (Evers et al., 2007). In brief, if individuals are not in contact with the distressing stimulus, they can feel better, and eating is an attempt at that escape for some individuals.

### **Restraint Theory**

Research suggests that individuals who are more restrained eaters and are considered chronic dieters have shown to be vulnerable to eating in response to negative emotions (Evers et al., 2009). This falls under Restraint Theory, which states that individuals who are restrained eaters experience negative affect as a trigger for overeating. These individuals have a reduction in inhibition of restraint when experiencing negative emotions and engage in an increase in eating (Spoor et al., 2006).

### **Factors Associated with Emotional Eating**

**Difficulties in processing emotions.** Multiple theories related to emotional eating

insinuate that before overeating, individuals experience negative emotions that they cannot regulate effectively on their own. Thus, it is suggested that this dysregulation is responsible for the eating behaviors (Evers et al., 2009). Evers, Stok and Ridder's (2009) studies demonstrated that individuals who typically suppress their emotions in their day-to-day lives engaged in consumption of more food when faced with emotionality than those who rarely implemented suppression in their lives. In the second and third studies by these authors, individuals told to suppress their emotions also ate more comfort foods than those told to view a negative affect inducing clip objectively and those who were allowed to express their emotions (Evers et al., 2009). Their results suggest that unhelpful emotional regulation strategies can lead to increases in emotional eating.

Additionally, those who reported emotional eating also indicated a tendency to ruminate on negative emotions. This involves the repetition of thoughts that may not be conducive to helping the individual feel better (Kemp et al., 2013). As proposed by Kemp, Bui, and Grier (2013),

“Ruminative propensities may eventually lead to behaviors where individuals fantasize about how eating will allow them to escape negative feelings, and this fantasizing and excessive eating has been argued to serve as a means of avoiding one's true problems. Whereas the non-emotional eating informants indicated that they only thought about food when they felt hungry, many of the emotional eating informants expressed that they would use food as a solution to numb or distract themselves from their negative feelings” (p. 208).

As suggested, it appears that individuals who engage in emotional eating spend significantly more time thinking about food when under emotional distress than individuals who refrain from

these eating habits. Additionally, they rely heavily on food as a way to handling this emotional distress, and this focus on food leads to rumination (Kemp et al., 2013).

Lack of emotional awareness has also been linked to emotional eating. Focusing on emotional experiences and having clarity about those emotions has been connected to lower levels of emotional eating, and low levels of attention to emotion have been linked to higher levels of emotional eating (Moon & Berenbaum, 2009). For instance, studies done by Moon and Berenbaum (2009) suggest that elevated levels of emotional eating are linked to reduced emotional attention. Those who pay less attention to their emotions have been suggested to engage in emotional eating more often. Moreover, those who are emotionally distraught have a reduced self-awareness and their attention is focused solely on the immediate environment (Wagner, Boswell, Kelley, & Heatherton, 2012). This is why dieters may engage in the immediate goal of eating the tantalizing food placed in front of them rather than focusing on the long-term goal of their diet when they are feeling distraught (Wagner et al., 2012). Thus distraction, a lack of focus and awareness of one's actions while feeling emotional, is supposedly linked to an increase in emotional eating.

Emotional distress can cause an individual's brain's reward system for food and drugs to be sensitized, thus there is more value placed on these rewards when distress is experienced (Kemp et al., 2013; Wagner et al., 2012). Therefore, individuals who experience this can encounter an increased propensity to eat because their brains are essentially placing a larger value on these behaviors. Kemp, Bui, and Grier (2013) found that individuals who are reportedly non-emotional eaters have experienced decreased activity in the brain's reward regions when in negative emotional states while emotional eaters have endorsed greater activity in these regions as their brains have placed greater value on food while under emotional distress.



**Obesity.** Obese individuals increase food intake when presented with negative emotions. Emotions can be regarded as external or inappropriate cues for eating behavior because emotional arousal is not the naturally arising bodily experience associated with endorsements of hunger. Larsen, van Strien, Eisinga, and Engels (2006) suggest that emotional eating is oftentimes found in obese individuals because it is the consequence of early learning experiences in which food was used as a way of coping with psychological issues. Thus, this behavior is proposed to lead to poor interoceptive awareness in these individuals, which refers to difficulty correctly recognizing emotions and instinctive sensations pertaining to hunger and satiety (Larsen et al., 2006). Interoceptive awareness has been linked with emotional eating in females (Larsen et al., 2006). Additionally, it has also been linked to alexithymia, a construct encompassing multiple ideas such as trouble classifying subjective emotions and differentiating between feelings and the biological sensations of emotional arousal, and struggles with describing feelings to others (Larsen et al., 2006). Alexithymia has been strongly linked to emotional eating in obese men (Larsen et al., 2006). Further, obese individuals can experience struggles with differentiating between hunger and emotions due to use of food as a coping mechanism. Therefore, food acts as a method of coping for nutritional and emotional needs. As seen with emotional eating, the consumption can be at excess (Hernandez-Hons & Woolley, 2011).

Geliebter and Aversa (2003) conducted a study which examined if overweight individuals would eat more when experiencing negative emotions compared to underweight individuals, as the authors predicted. Participants in this study completed a questionnaire that asked if individuals eat much more, much less, or about the same food when they are experiencing assorted emotions, displayed on a scale 1-9 with the options of “not applicable” and “don't

know” (Geliebter & Aversa, 2003). Negative emotions and situations included, but were not limited to: sad, bored, anxious, depressed, frightened, under pressure, after an argument, alone, after losing money, and after a relationship is over. As expected, overweight individuals reported eating more in negative emotional states and situations compared to normal and underweight participants. The researchers also assessed eating when experiencing positive affect. The positive emotions and situations included, but were not limited to: happy, confident, enthusiastic, falling in love, and engaging in a hobby (Geliebter & Aversa, 2003). The opposite results occurred during the positive emotional states and situations. Overweight individuals reported eating less during these states when compared to normal and underweight participants (Geliebter & Aversa, 2003).

**Psychological factors.** The personality characteristics of neuroticism and conscientiousness have been linked to emotional eating habits (Heaven, Mulligan, Merrilees, Woods, & Fairouz, 2001). Neuroticism includes a propensity for experiencing depressive components, vulnerability to emotion, and apprehension, which are traits that have been related to eating for comfort from negative emotions (Elfhag & Morey, 2007). Of all the facets in neuroticism, impulsiveness has been identified as the most important component for explaining emotional eating. Impulsivity is considered a lack of control and resistance from desires, urges, cravings, and a reduced level of frustration tolerance (Elfhag & Morey, 2007). Neuroticism has been associated with emotional eating in males (Heaven et al., 2001). As previously mentioned, emotional eating has been linked to conscientiousness. Previous research has found that emotional eaters are not highly conscientious, and tend to have emotional instability (Heaven et al, 2001). Within conscientiousness, the self-discipline component has been connected to emotional eating. Individuals with low self-discipline tend to act more impulsively and are more

likely to engage in emotional eating. Additionally, low self-discipline and impulsivity are displays of poor self-control in individuals (Elfhag & Morey, 2007). Obese individuals have been shown to be more impulsive than average weight individuals in assorted behavioral measures and self-report studies (Elfhag & Morey, 2007). Thus, the importance for identifying the interaction of personality traits on food intake is crucial in understanding the propensity to emotionally eat.

Emotional and non-emotional eaters alike fall prey to prefactual thinking, which is the contemplation of fictitious substitutes for events in relation to consequences these particular events may have for an individual's future, and this thinking occurs before a decision is made (Kemp et al., 2013). One form of prefactual thinking is called hedonic rationalizations, which are the justifications individuals make for giving into a tempting experience, such as allowing oneself to eat an ice cream cone because the two-hour workout they engaged in means they deserve to eat it. Kemp, Bui, and Grier (2013) found that individuals who engage in emotional eating often make hedonic rationalizations about food choices which are suggestive of feeling deserving of the indulgence, allowing them to give into temptations.

**Social factors.** Various social factors influence emotional eating. For example, research suggests that those who were frequently offered food as a means of comfort when they were upset as children are 2.5 times more likely to engage in frequent emotional eating behaviors as young adults (Kemp et al., 2013). Furthermore, overconsumption of food has been related to social facilitation, meaning that when individuals are around others with whom they feel comfortable, they perceive there is a permission to eat more than when they are by themselves based on the social facilitation. Although this idea has been endorsed by both emotional and non-emotional eaters, non-emotional eaters have indicated an ability to control themselves while

eating in the company of others (Kemp et al., 2013). In addition to these notions, a study found that the factors of loneliness and the lack of social support during distressing experiences linked to coping attempts with food (Kemp et al., 2013). Thus, individuals perceiving a lack of social support may seek food more often as a means of coping with distress than individuals who have a strong support system available.

### **Positive Affect and Eating**

While it is no secret that some individuals increase food intake while experiencing negative emotions, there is less known about the effects of positive emotions on eating behavior. It has been found that individuals have a tendency to engage in the consumption of healthier foods while experiencing positive emotions and less healthy foods when experiencing negative emotions (Canetti, Bachar, & Berry, 2002; Desmet & Schifferstein, 2008). Additionally, there is a trend to consume larger meals when experiencing either positive or negative affect, and smaller meals under neutral affect (Canetti et al., 2002). Positive moods in conjunction with tempting foods may cause greater pleasure in eating, and thus lead to increased food intake (Evers, Adriaanse, de Ridder, & de Witt Huberts, 2013). However, positive emotions have shown varying effects on food intake including increasing, decreasing, and no effect on eating behaviors (Evers et al., 2013). Research is also lacking concerning what happens to food intake as individuals change from negative emotion to positive emotion. It would be beneficial to see if there is a pattern in eating when negative emotions are relieved with positive emotional experiences.

### **Eating When Bored Phenomenon**

Individuals are often emotional eaters, increasing their food intake in response to negative affect such as anger, fear, or anxiety (Heaven et al., 2001). Research on emotional eating

behaviors has historically left out the construct of eating when bored (Koball, Meers, Storfer-Isser, Domoff, & Musher-Eizenman, 2012). Research on boredom has been extremely limited and has only begun to surface in the last ten years (van Tilburg & Igou, 2012).

Boredom has been defined “variously as an active and aroused state of restlessness, as an under aroused state of restlessness, as an under aroused and passive emotion, or as a metacognitive process with people sensing they are bored when ‘they find they cannot keep their attention focused where it should be’” (Anda, 2012, p. 6). Like any other construct, boredom can be difficult to identify, but research suggests that acting bored usually involves individuals maintaining a collapsed upper body with their head leaning backwards, and these individuals do not participate in many movements of the rest of their body (van Tigburg & Igou, 2012). Aside from establishing a common body positioning and body movement seen in bored individuals, research has also found how individuals experiencing boredom will perceive their surroundings. Research has suggested that individuals who are bored make appraisals of their environment with minimal attention and effort. These individuals have reported having a clear conception of events occurring in their surroundings with few things on their minds (van Tilburg & Igou, 2012). Moreover, boredom research has implicated various behaviors motivated by the state of feeling bored. This includes behaviors geared toward reducing the level of how boring a given situation or activity is considered by engaging in activities such as seeking stimulation, challenges, or fun and engaging behaviors (van Tilburg & Igou, 2012). Van Tilburg and Igou (2012) suggest that “more than other negative affective experiences (sadness, anger, and frustration); boredom makes people feel unchallenged while they think that the situation [they are in] and their actions are meaningless” (p.181). Furthermore, boredom can influence individuals to seek meaning in activities, or to look for more meaningful activities than those in

which they are currently engaged. While boredom is often grouped with negative affect in studies that involve emotional affect, it is quite distinct from the negative emotions with which it is compiled, begging for the need to parse it out from these other affective states while conducting research in this domain.

Until recently, emotional eating research has neglected parsing out particular emotions when examining eating behaviors, such as through the lens of boredom. Boredom has been linked to compulsive behaviors such as eating (Anda, 2012). Leon and Chamberlain (1973) examined emotional arousal, eating patterns and body image among individuals who previously engaged in a weight loss program and had either gained less than 20% of their lost weight back (maintainers) or gained more than 20% of their lost weight back (regainers). These individuals were compared to a control group.

Participants in this study were given a history questionnaire containing mostly multiple-choice questions and comprised of forty items. These questions explored the participants' past experiences associated with food, the eating behaviors of other members of the individual's family, family mealtime experiences, information about eating and emotional state associations, and the situation in which individuals recognized that excessive eating was problematic (Leon & Chamberlain, 1973). When asked, "Were there any special times when you had a tendency to eat?" Twenty nine percent of individuals in the regainers group indicated several arousal states as related to eating such as happy, lonely, angry, bored or excited (Leon & Chamberlain, 1973). For the maintainers and the control group, 22.7% and 7.7% endorsed the same, respectively. More than 25% of both the regainers and maintainers groups endorsed eating when lonely or bored, separating themselves from the control group who predominantly indicated eating when hungry. The maintainers group reported the highest frequency of an association between eating and being

lonely or bored. This would suggest that individuals who were successfully able to keep the weight off from their weight loss program still associated the states of boredom and loneliness as highly linked to eating, indicating a need for examining what factors contribute to eating when bored in current and future research studies.

Another study, which examined the relationship between emotional experiences and level of food intake, had participants imagine that they were experiencing various emotions (Mehrabian, 1980). They rated how much they wanted to eat while experiencing those emotions by rating statements related to eating such as “I would not feel hungry,” “I would have a tremendous appetite and eat just about any food that was available,” and “I would not eat even if I felt hungry”. These statements were rated from -4 indicating “very strong disagreement” to +4 indicative of very strong agreement (Mehrabian, 1980). The most food consumption was endorsed for emotions these researchers considered unpleasant and unaroused such as unconcerned or bored, and the lowest reported food consumption was linked to emotions considered unpleasant and aroused such as anxious or angry, suggesting that food intake is greatest when individuals feel “bored, depressed, fatigued, uninterested, or unconcerned and ... is minimized when a person feels anxious, pained, fearful, tense, or guarded” (Mehrabian, 1980, p. 245). Therefore, there is support that emotional states such as boredom are different than other emotions that can be considered negative (e.g., anger) and indicate the need for research to parse them out in food related studies.

Boredom needs to be considered an entirely different construct in the realm of emotional eating as research suggests that individuals have distinctly identified with this construct outside of eating for other emotional reasons such as negative affect including depression, stress, and frustration. Research is scarce in the bored eating phenomenon, but research has suggested that

“more than 25% of normal weight and overweight participants endorsed eating more when ‘lonely or bored’” and that individuals reported exhibiting greater food intake while experiencing negative emotions considered low arousal such as boredom or concern compared to states of higher arousal such as anger (Koball et al., 2012, p. 521). Boredom proneness and low impulse control have also been linked to engaging in overeating (Koball et al., 2012). Lastly and perhaps most notable, participants have endorsed eating more as a reaction to feelings of boredom in comparison with other emotions such as anger, anxiety, and depression in Koball et al.’s (2012) study which examined the distinction between bored eating and other negative affective states. This study is the first and only one that has utilized a revised emotional eating scale with a focus on boredom. Based on this minimal research, there is a major gap in research regarding eating when bored, and the factors that affect one’s propensity to engage in bored eating. The present study aimed to fill this gap.

### **Present Study**

The construct of boredom has only recently been recognized as a construct separate from other negative emotional affective states in regard to emotional eating. Previously, boredom has been included under negative affect conditions in this research domain (Geliebter & Aversa, 2003). Thus, research on boredom as a separate construct implicated in emotional eating is severely limited with regards to our knowledge, with only one relevant study completed in the last decade. The present study aimed to examine bored eating as a construct distinct from emotional eating in response to negative affect more generally. The main objective of the present study was to examine if individuals engage in eating more while experiencing boredom than while experiencing negative emotional affect as proposed by Koball et al. (2012). A secondary aim of this study was to identify individual differences factors such as personality attributes,



emotional awareness, boredom proneness, and demographic characteristics which are related to emotional eating and bored eating, and to examine possible differences in variables predictive of both types of eating.

### **Hypothesis 1**

It was hypothesized that individuals in the boredom condition would eat more than those experiencing negative affective states as proposed by Koball et al. (2012). Moreover, it was hypothesized that there will be an interaction between boredom proneness score and participants' food intake in the bored condition, meaning that those in the boredom condition with higher boredom proneness scores would consume the most food.

### **Hypothesis 2**

A secondary hypothesis was that certain individual difference variables (e.g., personality attributes, emotional awareness, and BMI) would be predictive of the amount of eating in each affective condition.

**Hypothesis 2A.** It was hypothesized that food intake in the boredom condition would be predicted by neuroticism, boredom proneness, and emotional awareness (Koball et al., 2012). Additionally, it was hypothesized that since bored eating occurs for both normal weight and overweight individuals (Leon & Chamberlain, 1973), BMI would not be predictive of eating while bored. It was also hypothesized that the boredom subscale of the REES would be predictive of increased eating in the bored condition. More specifically, it was thought likely those individuals who endorsed eating while experiencing boredom in the REES would also eat more in the bored affect condition in the laboratory.

**Hypothesis 2B.** It was hypothesized that high neuroticism and low conscientiousness would be predictive of greater eating for those in the negative affect condition. More specifically,

it was hypothesized that food intake would be predicted by the sub-construct of impulsivity within neuroticism and also predicted by the sub-construct of self-discipline within conscientiousness. Additionally, it was hypothesized that higher BMI and lower emotional awareness would be predictive of increased eating in the negative affect condition. This hypothesis has been supported by previously mentioned research (Elfhag & Morey, 2007; Heaven et al., 2001). The subscale of depression (including eating under sad and upset conditions) from the Revised Emotional Eating Scale (REES) was expected to be predictive of food intake in the negative affect condition as well.

### **Exploratory Analyses**

There were exploratory analyses completed to examine if there was a difference in the amount of food consumed following the positive affect induction depending on whether individuals were in the negative affect or bored condition prior. For instance, it is possible that the positive affect induction served as a relief from the aforementioned conditions, and individuals may have engaged in greater eating following the second induction. Additionally, the individual difference variables discussed above were examined as possible predictors of food intake following the positive affect induction.

## **Method**

### **Participants**

The present study consisted of 110 undergraduate students (sample size acquired through G-Power) over the age of 18 from the University of South Carolina Aiken. Undergraduate students were eligible for participation. Students enrolled in the Introductory Psychology course were awarded class credit for participation in the study, and they were invited to sign up to participate in the present study through the SONA online program that offers a list of current

studies being conducted. Other interested undergraduate participants were eligible to win one of two twenty-five dollar Visa gift cards and were notified about the study through an informational flyer (see Appendix A).

## Measures

*Big Five Inventory (BFI-10; see Appendix B).* The Big Five Inventory is a 10-item personality measure which examines the five major personality domains including neuroticism, extraversion, openness to experience, agreeableness and conscientiousness (Rammstedt & John, 2007). Participants responded to personal statements measured on a 5-point Likert scale ranging from “disagree strongly” to “agree strongly.” This measure contains adequate retest reliabilities of .75, good external validity, and significant convergent validity correlations with the NEO-PI-R domain scales of .67 (Rammstedt & John, 2007).

*Boredom Proneness Scale (BPS; see Appendix C).* To measure trait boredom, the Boredom Proneness Scale will be incorporated. This is a measure with 28 true-false items such as “It takes a lot of change and variety to keep me really happy” (Vodanovich, 2003). The Boredom Proneness Scale has an internal consistency of .79, and reliability ranging from .72 to .77 (Vandovich, 2003).

*Demographics Questionnaire (EES; see Appendix D).* This questionnaire was created to gather meaningful demographic information about each participant (i.e., age, educational background, when and what they last ate, gender, height and weight). Responses were examined with forced-choice and open-ended response options. BMI was calculated based on the reported height and weight of the participants.

*Positive and Negative Affect Schedule (PANAS; see Appendix E).* This scale contains a list of words that describe various emotions. Individuals were asked to rate how much they were

feeling these emotions on a 5-point Likert scale ranging from “very slightly or not at all” to “extremely.” The positive affect subscale has a reliability of .86 and the negative affect subscale has a reliability of .87 (Watson, Clark & Tellegen, 1988). Both subscales have adequate validity (Watson, Clark & Tellegen, 1988). For the purposes of the study, there was also the addition of the words “bored,” “restless,” “average,” “unstimulated,” “unexcited,” and “disinterested” to measure boredom.

*Revised Emotional Eating Scale (REES;* see Appendix F). The original emotional eating scale was designed to examine eating under different emotional states within the subscales of depression, anxiety, and anger/frustration. It contains 25 items, and has good construct validity, criterion validity, and discriminant validity (Arno, Kenardy, & Agras, 1995). The Revised Emotional Eating Scale is a 31-item self-report measure that assesses desire to eat in response to emotions rated on a 5-point scale ranging from “no desire to eat” to “an overwhelming urge to eat” (Koball et al., 2012). The Revised Emotional Eating Scale’s boredom subscale is seen as a reliable addition to the original emotional eating scale because it has good internal consistency and has shown rates of endorsement that were even higher than other subscales within the original EES when implemented in Koball et al.’s (2012) study.

*Trait Meta-Mood Scale (TMMS;* see Appendix G). The TMMS was included to assess emotional awareness. This is a questionnaire that asks individuals to identify how much they agree or disagree with the included statements such as “I pay a lot of attention to how I feel” and this is answered on a 5-point scale ranging from strongly disagree to strongly agree (Moon & Berenbaum, 2009). This will show the link between emotional awareness and emotional eating, as they have been conversely related in previously discussed research. The Trait Meta-Mood Scale has adequate reliability and validity (Aradilla, Tomás, & Gómez, 2013).

## Procedure

Participants were told that this experiment is looking at the influence of mood on taste perception in an effort to disguise the true nature of the study. All participants read and signed the informed consent form (see Appendix H). Food was available for the participants to consume throughout the study. Foods such as Lay's potato chips and jellybeans were measured and placed into serving bowls, and they were counted and weighed prior to the experiment. The researcher used gloves when handling these foods, and they were placed in bowls in front of the participant. Fresh food was used for each participant. These foods were used because the Ingestive Behavior Laboratory suggested that these foods are popular and they do not call for the use of utensils (Martin et al., 2008). There was also the addition of grapes and carrots to the in order to provide healthier options. The food (one healthy option and one unhealthy option) was available at the start of and during the mood induction (described in detail below) and participants were be told to sample the foods because later they will have to complete a taste-rating questionnaire pertaining to the food. The food remaining after the first mood induction was counted, weighed, and evaluated for caloric value to examine intake.

Participants were randomly assigned to the boredom or negative mood inductions. Those in the boredom induction were asked to participate in the repetitive task of copying references from a Wikipedia entry about concrete (van Tilburg & Igou, 2012). They were instructed to take their time copying the references, and to continue until asked to stop. Individuals in the negative affect induction were asked to identify a recent event that makes them feel sad or unhappy when they think about it (Qiu & Yeung, 2008). They were asked to remember this event in as much detail as possible, to try to re-experience what they were feeling at the time, to write down a description of the event and their feelings, and to keep writing until asked to stop (Qiu & Yeung,

2008). Both writing tasks continued for 20 minutes. To assess the effectiveness of the affect induction, participants were asked to complete the PANAS following the mood induction task.

After the first induction, participants were given to PANAS to see if the induction was successful. At this time, the original food was taken out and the other two types of foods not already given were brought out so that the amount eaten can be evaluated. After completion of the PANAS, participants were given a positive mood induction task in which they were asked to identify a positive event that occurred recently and to describe it in the same manner as the negative affect condition. This was done in part to enhance the cover story of the study and to leave all participants in a positive mood. Participants then completed the PANAS once more to see if the induction was successful. Only exploratory analyses were conducted on the amount participants eat during/following the positive affect induction.

Finally, participants in each group completed the BFI-10, the BPS, the Demographic Questionnaire, the REES, the TMMS, and a “Taste Perception Rating Sheet” (see Appendix I) on which they rated the taste, texture and goodness of each food item, using a 7-point Likert Scale ranging from “not at all” to “extremely” (Adams & Leary, 2007). These measures were given in a counterbalanced order. At the end of the study, the researcher let participants know that there was more involved with the study than they were initially told, and if participants had questions related to the study, they were provided with contact information for the researcher.

## **Results**

### **Descriptive Statistics**

A total of 110 students enrolled in the University of South Carolina Aiken’s Psychology 101 course completed the present study, 53 of which were randomly assigned to the Bored Condition and 57 were exposed to the Negative Affect Condition. Of these individuals, 20.9%

were male ( $n=23$ ) and 79.1% were female ( $n=87$ ). The age of participants ranged from 18 to 53, averaging 19.3 years old. These individuals had a BMI range of 16.5 to 44.9 and an average of 25.6. There were 53.6% ( $n=59$ ) of individuals who reported their ethnicity as Caucasian, 35.5% ( $n=39$ ) individuals reported their ethnicity as African American/Black, 4.5% ( $n=5$ ) reported their ethnicity as Hispanic/Latino, 3.6% ( $n=4$ ) as “Other,” .9% ( $n=1$ ) as Asian/Pacific Islander, and 1.9% ( $n=1$ ) chose not to identify with only one of these ethnicities. Demographic information for the participants is displayed in Table 1. The total amount eaten at Time One ranged from 0 to 123 grams ( $M=30.75$ ,  $SD=27.67$ ), or 0 to 28 pieces of food ( $M=9.57$ ,  $SD=7.37$ ). The total amount eaten at Time Two ranged from 0 to 215 grams ( $M=52.41$ ,  $SD=45.68$ ), or 0 to 63 pieces of food ( $M=14.33$ ,  $SD=11.72$ ).

### **Preliminary Analyses**

Outliers were removed from the data set to examine the most accurate results. The results for grams and number of food items were turned into z-scores, and individuals ( $n=4$ ) more than two standard deviations away from the mean were removed. First analyses were completed in order to determine if the mood inductions were successful. Independent *t*-tests were conducted in order to compare individuals' PANAS scores on the subscale of “Negative Affect,” and the item of “Bored” based on condition (bored versus negative affect). On average, those in the bored condition scored a higher average rating for the item “Bored” on the PANAS ( $M = 2.70$ ,  $SE = .18$ ) than individuals in the negative affect condition ( $M = 1.84$ ,  $SE = .14$ ); this difference was significant  $t(108) = 3.72$ ,  $p = .000$ . Additionally, participants in the negative affect condition reported higher negative affect scores ( $M = 18.46$ ,  $SE = 1.0$ ) than those in the boredom condition ( $M = 13.30$ ,  $SE = .49$ ). This difference was significant  $t(108) = -4.52$ ,  $p = .000$ . A dependent sample *t*-test was run in order to test the success of the Positive Affect Phase by comparing the

participants' first PANAS positive affect subscale scores to their second PANAS positive affect subscale scores. Participants scored higher on the second positive affect subscale ( $M = 29.21$ ,  $SE = .92$ ) than their first ( $M = 24.36$ ,  $SE = .75$ ). This difference was also significant,  $t(111) = -4.85$ ,  $p = .000$ . This would suggest that all three mood inductions were successful.

To further investigate change from the first mood induction to the second, a repeated measures ANOVA was conducted on PANAS positive affect subscale scores. There was a statistically significant effect of time on PANAS positive scale scores,  $F(1,108) = 38.38$ ,  $p = .000$  (echoing the results of the test  $t$  reported above), and also an interaction between time and condition on PANAS positive scale scores,  $F(1,108) = 11.05$ ,  $p = .001$  such that the negative affect condition had a greater change between Time 1 and Time 2 than the bored condition. There was no significant main effect for condition,  $F(1,108) = 1.56$ ,  $p = .214$  (See Figure 1).

**Hypothesis 1: The bored condition would eat more than those in the negative affect condition.**

All food-related analyses were completed looking at both grams of food eaten and number of food items eaten during the various conditions. This was done because food items such as grapes and carrots weigh more than jellybeans and chips, thus the gram amount may not tell the whole story about amount of food eaten. Number of food items was a way to measure the amount eaten regardless of weight of the food. It was hypothesized that individuals subjected to the bored condition would eat more than those in the negative affect condition and that there would be an interaction between level of boredom proneness and amount eaten during the bored condition. Level of boredom proneness was created using a median split on BP scores to determine low boredom proneness as any score below 13, and high boredom proneness as any score between 13 and 20 (the highest score value). An ANOVA was run to examine differences in



food eaten during the two experimental conditions (bored and negative affect). This yielded no significant main effects of condition on grams eaten or on number of food items eaten,  $F(1,108) = 3.25, p = .074$  and  $F(1,108) = 0.56, p = .452$ , respectively. The main effect for grams eaten was approaching significance with the negative affect group eating more on average ( $M = 34.96$ ) than the bored condition ( $M = 26.23$ ). Additionally, no main effects for level of boredom proneness for either grams eaten  $F(1,108) = 0.06, p = .816$ , or number of food items eaten  $F(1,108) = 0.67, p = .417$  were present. There were also no significant interactions between level of BPS and condition for grams of food eaten or for number of food items eaten,  $F(1,108) = 0.80, p = .372$  and  $F(1,108) = 0.72, p = .309$ , respectively. This data is displayed below in Tables 2 and 3.

These analyses were also conducted using only female participants, as there were not enough male participants to sufficiently power gender analyses. With females only, there was a main effect of condition for grams eaten,  $F(1,85) = 6.24, p = .014$ . Again, the negative affect condition had a higher average amount eaten ( $M = 37.82$ ) than the bored condition ( $M = 24.88$ ) contrasting with the aforementioned hypothesis that those in the bored condition would eat more. The interaction between grams and level of boredom proneness was not significant,  $F(1,85) = 2.72, p = .103$ , although the means were somewhat consistent with predictions. There was still no main effect for level of boredom proneness,  $F(1,85) = 0.59, p = .445$ . For number of food items eaten using female participants only, there were no significant results. This additional data can be found in Tables 4 and 5.

### **Hypothesis 2A: Individual characteristic variables predictive of eating during the bored condition.**

Intercorrelations for all study variables are presented in Table 6. Not surprisingly, grams

eaten at Time One was highly correlated with number of food items eaten at Time One ( $r = .66$ ), and grams eaten at Time Two was correlated with number of food items eaten at Time One ( $r = .20$ ) and Time Two ( $r = .77$ ). Neuroticism was correlated with conscientiousness ( $r = -.24$ ) and level of boredom proneness ( $r = .22$ ). The various subscales of the Revised Emotional Eating Scale were correlated with one another as well. The REES subscale of depression was correlated with number of food items eaten at Time 2 ( $r = .27$ ). Attention to and clarity of feelings from the TMMS were also correlated with one another ( $r = .08$ ).

It was hypothesized that food intake during the boredom condition would be predicted by neuroticism, boredom proneness, the boredom subscale of the REES, and emotional awareness, but not BMI (Koball et al., 2012; Leon & Chamberlain, 1973). A hierarchical multiple regression was run using the variables level BMI and gender in Model 1, and adding the variables of boredom proneness, REES boredom subscale, and conscientiousness in Model 2 with the criterion variable grams eaten. These variables were chosen based on their relations with grams eaten during the bored condition. The models were not significant,  $F(2,49) = 0.42$ ,  $p = .659$ ,  $R^2 = .017$  and  $F(3,46) = 1.60$ ,  $p = .202$ ,  $R^2 = .110$ . In contrast to predictions, only conscientiousness was a significant predictor variable ( $p = .049$ ). Another hierarchical multiple regression was run using these same variables for the criterion variable of number of food items eaten during the bored condition. Only Model 2 reached marginal significance,  $F(2,49) = 0.06$ ,  $p = .941$ ,  $R^2 = .002$  and  $F(3,46) = 2.75$ ,  $p = .053$ ,  $R^2 = .154$ , and no predictor variables were significant. These results are displayed below in Tables 7 and 8.

**Hypothesis 2B: Individual characteristic variables predictive of eating during the negative affect condition.**

It was hypothesized that neuroticism, conscientiousness, body mass index (BMI),

emotional awareness, and the depression subscale of the Revised Emotional Eating Scale would be predictive of eating during the negative affect condition. A hierarchical multiple regression was run using the variables of gender and BMI in Model 1 and the variables of neuroticism and conscientiousness added in Model 2 with total grams eaten as the criterion variable. These variables were chosen based on their correlation with total grams eaten during the negative affect condition and their lack of correlation with one another. Model 1 did not reach significance,  $F(2,52) = 0.85, p = .433, R^2 = .032$ , but Model 2 was significant,  $F(2,50) = 4.50, p = .016, R^2 = .179$ . Conscientiousness was a significant predictor,  $p = .011$  while neuroticism approached significance,  $p = .076$ . This regression was also run using total number of food items eaten as the criterion variable with the addition of the REES subscale of depression entered into Model 2. Model 1 was not significant,  $F(2,52) = 2.34, p = .106, R^2 = .083$ , but Model 2 for this regression was significant,  $F(2,52) = 3.20, p = .031, R^2 = .149$ . Neuroticism was a significant predictor variable,  $p = .023$ . These results are in partial support of the aforementioned hypothesis that neuroticism and conscientiousness would predict eating behaviors during negative emotional states. The regression results for the negative affect condition are shown below in Tables 9 and 10.

### **Exploratory Analyses**

In order to investigate whether there was a difference in the amount of food eaten during the positive affect phase based on previous condition, a repeated measures ANOVA was run to examine differences in food consumed during the two experimental conditions (bored and negative affect). There was no main effect of condition for grams [ $F(1,108) = 0.92, p = .340$ ] or for number of food items eaten [ $F(1,108) = 0.80, p = .372$ ]. However, there was a significant main effect of time for total grams eaten. Participants in both conditions ate more grams of food

at Time Two (during the positive affect phase),  $F(1,108) = 18.02, p = .000$ . There was also a significant main effect of time for number of food items eaten as well,  $F(1,108) = 14.41, p = .000$ . There was no interaction between time and condition for grams or for number of food items eaten,  $F(1,108) = 0.57, p = .451$  and  $F(1,108) = 0.07, p = .794$ , respectively. These results can be found in Tables 11 and 12 and Figures 2 and 3.

Further exploratory analyses were completed in order to determine which variables accounted for the most variance in food eaten during the positive affect phase. Another hierarchical regression was run in the same format as previously mentioned with gender and BMI in Model 1, and the variables of attention to feelings, conscientiousness, and the REES subscale of depression were entered into the second model with total grams eaten at Time Two as the criterion variable. These were chosen based on correlation with the criterion variable during the positive affect phase. These models were not significant,  $F(2, 104) = 0.40, p = .675, R^2 = .008$  and  $F(3, 101) = 1.66, p = .181, R^2 = .054$ . Another regression was completed using the number of food items eaten at Time Two as the criterion variable. Model 1 was not significant,  $F(2,104) = 0.19, p = .826, R^2 = .004$ , however, Model 2 was significant,  $F(3,101) = 2.99, p = .034, R^2 = .085$ . The REES depression subscale was a highly significant predictor of number of food items consumed during the positive affect phase ( $p = .005$ ). These regression results can be seen in Tables 13 and 14.

## Discussion

The primary goal of the present study was to examine if individuals eat more while feeling bored in comparison to other negative emotional states (e.g., depression) as proposed by Koball et al. (2012). A secondary aim of this study was to identify individual differences factors such as personality attributes, emotional awareness, boredom proneness, and demographic

characteristics which are related to emotional eating and bored eating, and to examine possible differences in variables predictive of both types of eating. It was hypothesized that individuals in the boredom condition would eat more than those experiencing negative affective states as proposed by Koball et al. (2012). Moreover, it was predicted that there would be an interaction between boredom proneness scores and participants' food intake in the bored condition, meaning that those in the boredom condition with higher boredom proneness scores would consume the most food. On average, individuals ate about 31 grams or 10 pieces of food at Time One. Research results revealed that the difference in amount of food eaten between the two conditions approached statistical significance for grams eaten, and was not significant for number of food items eaten. This is inconsistent with previous research suggesting that individuals eat more when experiencing boredom because the average amount eaten was higher for the negative affect condition. There was also no interaction found between boredom proneness score and food intake as had been predicted. The results of this study may be different from that of Koball et al. (2012) because the present study actually tested the amount eaten by individuals in the laboratory after inducing emotional states (e.g., bored or negative affect) versus the retrospective self-report of eating during emotional states that was characteristic of Koball et al. (2012) who also used a sample of undergraduate students made up of 70% female participants.

It was hypothesized that food intake in the boredom condition would be predicted by neuroticism, boredom proneness, the boredom subscale of the REES, and emotional awareness, but not BMI (Koball et al., 2012; Leon & Chamberlain, 1973). In fact, conscientiousness was the only significant (negative) predictor of grams and number of food items eaten during the bored condition. It was also hypothesized that neuroticism, conscientiousness, body mass index (BMI), emotional awareness, and the depression subscale of the Revised Emotional Eating Scale would

be predictive of eating during the negative affect condition. In partial support of the hypothesis, neuroticism was a significant predictor variable of *number* of food items eaten during the negative affect condition, while conscientiousness was a significant negative predictor of *grams* eaten with neuroticism approaching significance.

Conscientiousness, defined as “doing a thorough job” (Rammstedt & John, 2007), has been shown to be negatively related to emotional eating. Emotional eaters are suggested to not be highly conscientious, and to have emotional instability (Heaven, Mulligan, Merrilees, Woods, & Fairouz, 2001). Within conscientiousness, the self-discipline component has been connected to emotional eating (Elfhag & Morey, 2007). Individuals with low self-discipline tend to act more impulsively and are more likely to engage in emotional eating. This falls in line with the results gathered from the present research, showing conscientiousness as a significant negative predictor variable for the negative affect eating condition. Previous research shows conscientiousness related to healthy behaviors such as quitting smoking and eating well. In conjunction, lower conscientiousness has been negatively correlated with less healthy behaviors such as unhealthy eating (Bogg & Roberts, 2004). This may explain its relation to eating under bored or negative affect conditions.

Neuroticism was also a significant predictor for negative affect eating. Neuroticism includes a propensity for experiencing vulnerability to emotion and apprehension, which are traits that have been related to eating for comfort from negative emotions (Elfhag & Morey, 2007). Thus, it is not surprising that neuroticism would be significantly predictive of emotional eating in the present study as well. Neuroticism was not a significant predictor for bored eating in the present study. This discrepancy provides some evidence for a distinction between bored and negative affect eating, suggesting that bored eating may not be experienced as an act of

impulsivity as emotional eating has been suggested in previous research, but more of a difficulty with self-control and self-discipline (Elfhag & Morey, 2007).

Participants ate an average of 52 grams, or 14 pieces of food, during the positive affect phase, showing an overall average increase in amount eaten over time across both groups. The positive affect phase may have been perceived as a relief for the individuals from their previous affective states. Additionally, individuals may have warmed up to the experiment, and felt a release in social pressure in which they felt they could eat more freely during the positive affect phase. The REES subscale of depression was a positive significant predictor for number of food items eaten during the positive affect phase, suggesting that an individual's endorsement of eating behaviors when experiencing emotions such as sadness is predictive of number of food items consumed during positive emotional states. The REES depression subscale and number of food items eaten during the positive affect phase was also positively correlated suggesting that the more an individual endorses eating when feeling depressed, the more they are likely to eat during feelings of happiness. This is definitely something to explore with future research because it suggests that the positive affect phase may have served as a release from the negative affect condition. It would be worthwhile to examine the relationship between feeling negative emotions and eating behaviors of those individuals once they no longer experience that negative emotion, but are experiencing a positive emotional experience instead. All individuals ate more in the positive affect phase as well, suggesting that they could potentially have become more comfortable with the researcher or the laboratory situation by that time as well. Future research could explore this by manipulating when participants experience the positive affect phase (at Time 1 or at Time 2).

There were several limitations to the present study. While the current study was

completed in a laboratory setting in order to increase internal validity by controlling for extraneous influences, this research design can be problematic when trying to observe individuals' natural behaviors because the setting is artificial. Additionally, the researcher was present for the length of the study in order to keep participants on task and to administer each step of the procedure. This could have made the participants less inclined to behave as they normally would during similar conditions without others present. For instance, some of the participants made comments about feeling uncomfortable about eating the "louder" foods (carrots and chips) because they felt some discomfort making noise in the quiet laboratory setting. It would have been ideal to monitor food intake without the participants being aware. Also, demand characteristics could have come into play during this study. Because the researcher was present and self-report measures were utilized, the participants may have felt pressured to please the researcher and may have behaved and responded in ways they thought were more socially desirable instead of responding genuinely. Additionally, all four foods were not present for each mood manipulation because they were presented in a counterbalanced order (e.g., grapes and chips at Time One and carrots and jellybeans at Time Two), thus it was impossible to examine each type of food item consumed during each time period. Participants may have preferred particular food items and ate based on preferences rather than emotional experiences, potentially impacting the results of present study. It is also unknown when the emotion was induced sufficiently during the affective conditions. For instance, those in the negative affect condition may have begun feeling negative emotions within five minutes of the condition, whereas it may have taken the bored condition fifteen minutes to start experiencing boredom. Thus, the negative affect condition may have had more time to eat following the mood induction than the bored condition. Additionally, the actual activities of the two conditions were different



such that individuals constantly had something to do during the bored condition (copy references) while those in the negative affect group may have taken breaks while writing about their recent events to think about what to write next, possibly making it easier for them to eat. Lastly, there may not have been enough power to detect true differences and relations among variables. The researcher did not consider the fact that the amount of participants would be split in half between the two experimental conditions, and that more participants would have been needed in order to have sufficient power. For the multiple regressions, G power analysis suggests that 230 participants would have been needed to have a 90% chance of rejecting the null hypothesis. In addition to including a larger sample size in general, future researchers should be sure to include an adequate number of male participants, so that gender analyses may be conducted.

In conclusion, the present study examined a wide variety of variables in relation to eating under the emotional conditions of negative affect, boredom, and positive affect. To our knowledge, this is only the second study to examine bored eating as a separate construct from emotional eating. The affect inductions seemed to be successful. Those in the negative affect condition scored higher on the PANAS positive affect scale during the positive affect phase than those who were previously in the bored condition. The negative affect group also experienced the greatest change in positive PANAS scale score from Time One to Time Two. The study was highly controlled in a laboratory setting, in contrast with the self-report information provided in the Koball et al., 2012 study. While the results may not have been completely in line with the presented hypotheses, there were differences among the two eating conditions (negative and bored) including neuroticism being a significant predictor of negative affect but not bored eating. There were also significant differences in grams eaten between the two conditions when females

only were included in analyses such that those in the negative affect condition ate more. Thus, future research should further investigate bored eating distinct from eating under negative affective states (e.g., depression). Future research should also further investigate eating during positive emotional states as research is limited in that area and some intriguing results were observed in the present study.

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Table 1

**Participant Demographics (N=110)**

Variable	Bored		Negative Affect	
	n	Percent	N	Percent
Gender				
Male	10	18.9	13	22.8
Female	43	81.1	44	77.2
Ethnicity				
Caucasian	28	37.7	31	54.4
AA/Black	20	52.8	19	33.3
Hispanic/Latino	3	5.7	2	3.5
Other	1	1.9	3	5.3
Asian/Pacific Islander	0	0.0	1	1.8
Level of BPS				
Low	23	43.4	22	38.6
High	30	56.6	35	61.4
Body Mass Index				
Underweight (under 18.5)	6	11.4	6	10.6
Normal (18.5-24.9)	25	47.5	24	42.8
Overweight (25-29.9)	13	24.7	13	23.4
Obese (over 30)	8	15.2	13	23.4

Note. Two participants did not disclose information for their body mass index.

Table 2. ANOVA Means for Condition, BPS, and Grams Eaten

<b>Average Grams of Food Eaten at Time 1</b>		
	<b>Bored</b>	<b>Negative</b>
<b>Low BPS</b>	24.22	38.68
<b>High BPS</b>	27.77	32.63



Table 3. ANOVA Means for Condition, BPS, and Food Items Eaten

<b>Average Number of Food Items Eaten at Time 1</b>		
	<b>Bored</b>	<b>Negative</b>
<b>Low BPS</b>	7.74	10.05
<b>High BPS</b>	10.13	10.00

Table 4. ANOVA Means for BPS, Condition, and Grams Eaten (Women Only)

<b>Average Number of Food Items Eaten at Time 1</b>		
	<b>Bored</b>	<b>Negative</b>
<b>Low BPS</b>	21.72	47.31
<b>High BPS</b>	27.16	32.39

Table 5. ANOVA Means for BPS, Condition, and Food Items Eaten (Women Only)

<b>Average Number of Food Items Eaten at Time 1</b>		
	<b>Bored</b>	<b>Negative</b>
<b>Low BPS</b>	7.56	11.94
<b>High BPS</b>	10.52	10.39

Table 6

## Intercorrelations for Multiple Regression Variables

	Attn	BMI	BPS	Conscientiousness	Clarity	Neuroticism	REES anger	REES bored	REES dep	Repair	Time1 Grams	Time1 Count	Time2 Grams	Time2 Count
Attn.	-	-.043	-.160	.015	.081	.129	-.002	.206*	.134	.278*	.080	.107	.048	.060
BMI	-.043	-	-.160	-.078	.147	-.183	-.014	-.088	.143	.057	.041	.100	.070	-.036
BPS	.063	-.160	-	-.110	.194*	.215*	-.047	.070	-.110	-.076	-.016	.080	.052	.047
Conscientiousness	.015	-.078	-.110	-	.345**	.236*	-.109	-.149	-.032	.331*	.032	-.121	-.146	-.052
Clarity	.081	.147	-.194*	.345**	-	.356**	-.169	-.060	-.169	.397*	.038	-.063	-.017	.034
Gender	.195*	.014	.072	-.174	-.030	.199*	.060	.122	.072	-.091	.047	.147	-.046	-.041
Neuroticism	.129	-.183	.215	-.236*	.356**	-	.063	.025	.172	.364*	.071	.266*	.095	.091
REES anger	-.002	-.014	-.047	-.109	-.169	.063	-	.331**	.344**	.056	.006	.142	.105	.080
REES bored	.206*	-.088	.070	-.149	-.060	.025	.331**	-	.357**	.182	.039	.000	.130	.145
REES dep	.134	.143	-.110	-.032	-.169	.172	.344**	.357**	-	.141	.051	.082	.178	.274*
Repair	.278*	.057	-.076	.331**	.397**	.364**	.056	.182	.141	-	.054	-.055	-.101	-.008
Time1 grams	.080	.041	-.016	.032	.038	.071	.006	.039	.051	.054	-	.660**	-.013	.115
Time1 count	.107	.100	.080	-.121	-.063	.266**	.142	.000	.082	-.055	.660**	-	.203*	.126
Time2 grams	.048	.070	.052	-.146	-.017	.095	.105	.130	.179	-.101	-.013	.203*	-	.767*
Time2 count	.060	-.036	.047	-.052	.034	.091	.080	.145	.274**	-.008	.115	.126	.767*	-

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 7  
Coefficient Variables Resulting from Bored Condition Multiple Regression Analysis

Model	Standardized Coefficients		
	Beta	<i>t</i>	Sig.
1 Constant	2.180	.034	
BMI	-0.054	-0.380	.706
Gender	-0.120	-0.848	.400
2 Constant		2.867	.006
BMI	-0.003	-0.024	.981
Gender	-0.154	-1.089	.282
BPllevel	0.046	0.317	.752
Conscientiousness	-0.295	-2.020	.049
REESbored	-0.155	-1.071	.290

Note. Dependent variable: total grams eaten during the bored condition.

Table 8  
Coefficient Variables Resulting from Bored Condition Multiple Regression Analysis

Model	Standardized Coefficients		
	Beta	<i>t</i>	Sig.
1 Constant		1.111	.272
BMI	0.017	0.122	.903
Gender	0.047	0.329	.743
2 Constant		2.400	.021
BMI	0.096	0.680	.500
Gender	0.004	0.030	.976
BPlvel	0.125	0.881	.383
Conscientiousness	-0.353	-2.475	.017
REESbored	-0.193	-1.370	.177

Note. Dependent variable : total food items eaten during the bored condition.

Table 9  
Coefficient Variables Resulting from Negative Affect Condition Multiple Regression Analysis

Model	Standardized Coefficients		
	Beta	<i>t</i>	Sig.
1 Constant		0.298	.767
BMI	0.076	0.554	.582
Gender	0.157	1.149	.256
2 Constant		-2.175	.034
BMI	0.195	1.451	.153
Gender	0.176	1.326	.191
Conscientiousness	0.358	2.624	.011
Neuroticism	0.241	1.811	.076

Note. Dependent variable : total grams eaten during the negative affect condition.

Table 10  
Coefficient Variables Resulting from Negative Affect Condition Multiple Regression Analysis

Model	Standardized Coefficients		
	Beta	<i>t</i>	Sig.
1 Constant		-0.302	.764
BMI	0.158	1.185	.242
Gender	0.232	1.746	.087
2 Constant		-2.194	.033
BMI	0.243	1.722	.091
Gender	0.206	1.587	.119
Conscientiousness	0.220	1.597	.117
Neuroticism	0.336	2.351	.023
REESdep	0.055	0.381	.705

Note. Dependent variable : total food items eaten during the negative affect condition.



Table 11

Analysis of Variance for Grams Eaten By Condition and Time

Variable	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Condition	1	1294.70	.918	.340
Time	1	26093.41	18.02	.000
Condition*Time	1	828.38	.572	.451

Table 12  
Analysis of Variance for Number of Food Items Eaten By Condition and Time

Variable	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Condition	1	85.93	.803	.372
Time	1	1235.46	14.41	.000
Condition*Time	1	5.89	.069	.794

Table 13  
Coefficient Variables Resulting from Positive Affect Phase Multiple Regression Analysis

Model	Standardized Coefficients		
	Beta	<i>t</i>	Sig.
1 Constant		1.918	.058
BMI	0.072	0.732	.466
Gender	-0.050	-0.512	.610
2 Constant		1.376	.172
BMI	0.040	0.415	.679
Gender	-0.095	-0.946	.346
Attention	0.051	0.509	.612
Conscientiousness	-0.131	-1.329	.187
REESdep	0.164	1.656	.101

Note. Dependent variable : total grams eaten at Time Two.

Table 14  
Coefficient Variables Resulting from Positive Affect Phase Multiple Regression Analysis

Model	Standardized Coefficients		
	Beta	<i>t</i>	Sig.
1 Constant		2.746	.007
BMI	-0.041	-0.423	.673
Gender	-0.044	-0.448	.655
2 Constant		1.322	.189
BMI	-0.084	-0.865	.389
Gender	-0.075	-0.800	.425
Attention	0.029	0.292	.771
Conscientiousness	-0.050	-0.517	.606
REESdep	0.280	2.874	.005

Note. Dependent variable : total food items eaten at Time Two.

Figure 1. PANAS Positive Scale Score

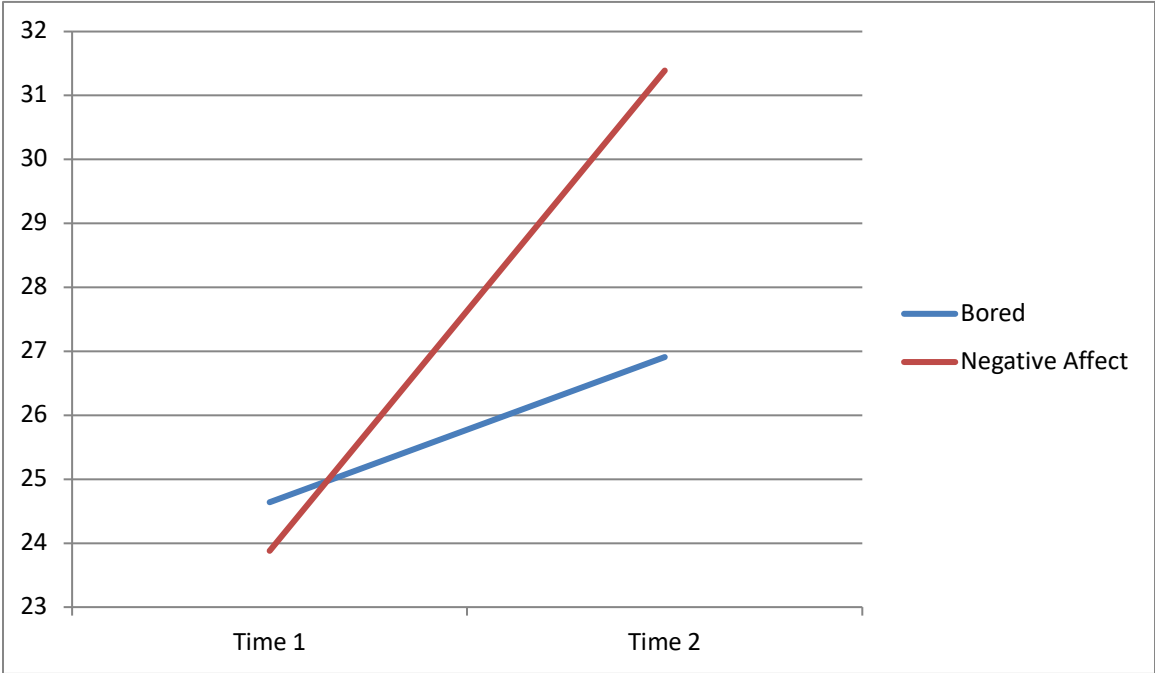


Figure 2. Mean Values for Grams Eaten at Time 1 and Time 2

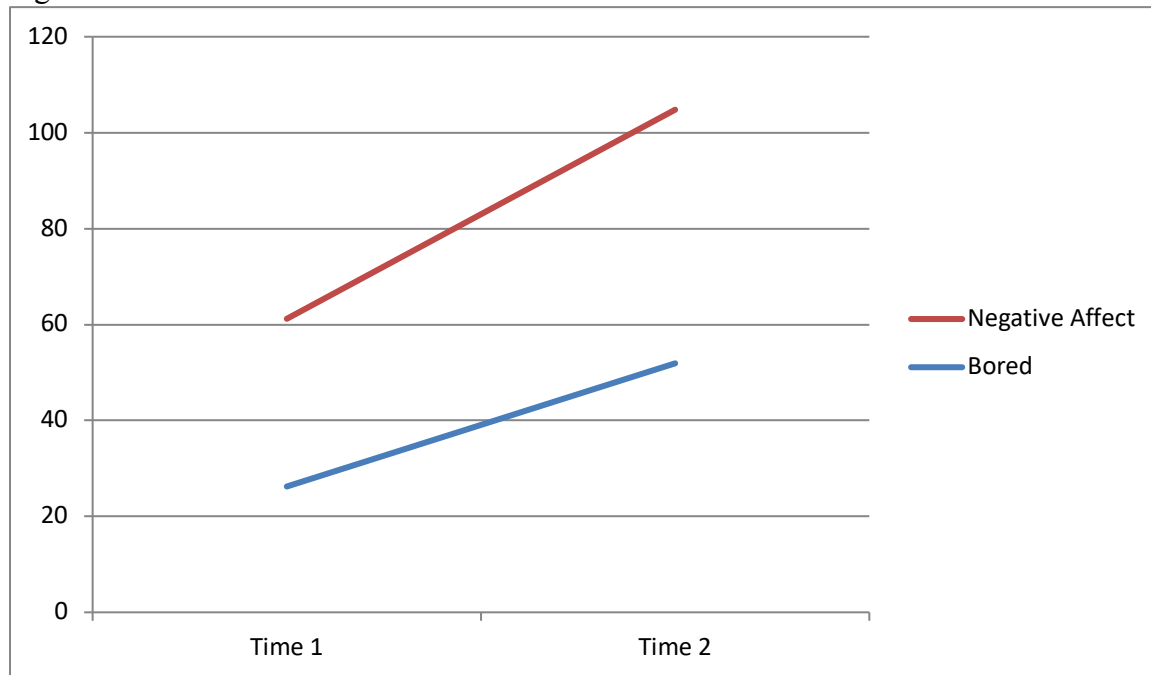
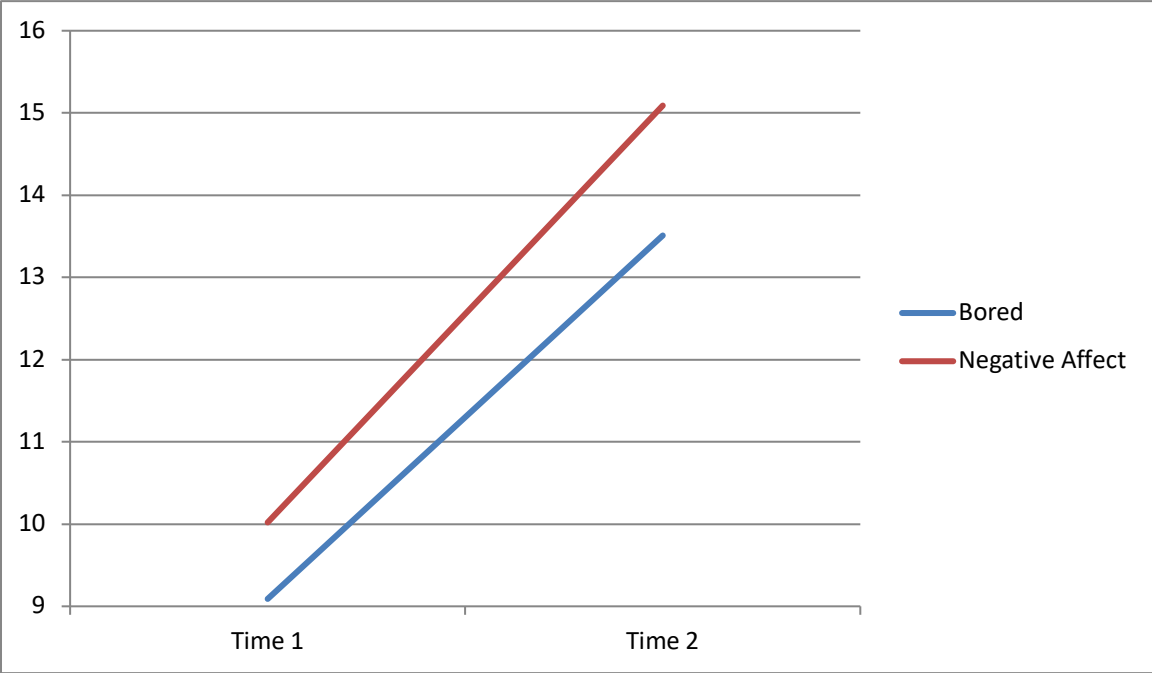


Figure 3. Mean Values for Food Items Eaten at Time 1 and Time 2



Appendix A:  
Recruitment Flyer



# Attention Students!

Students needed for research study! You will be eligible to win one of two \$25 Visa Gift Cards!!

**Information about the study:**

- Examining the effects of emotion on food perception
- Participants are asked to complete relevant questionnaires
- One-time session, approximately 1 hour long

**Eligibility:**

- At least 18 years old
- Not enrolled in Psychology 101

**Compensation:**

- Participants will be entered into a raffle to win one of two \$25 Visa Gift Cards

If you would like more information about the study or if you're interested in being a part of this study, please e-mail Erin Pratt at [prattee@email.usca.edu](mailto:prattee@email.usca.edu) or Dr. Maureen Carrigan at [MaureeC@usca.edu](mailto:MaureeC@usca.edu).

**Food Perception Study**  
Contact Erin Pratt,  
[prattee@email.usca.edu](mailto:prattee@email.usca.edu)

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Appendix B:  
Big Five Inventory-10 (BFI-10)

Instruction: How well do the following statements describe your personality?

I see myself as someone who...	Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly
...is reserved	(1)	(2)	(3)	(4)	(5)
...is generally trusting	(1)	(2)	(3)	(4)	(5)
...tends to be lazy	(1)	(2)	(3)	(4)	(5)
...is relaxed, handles stress well	(1)	(2)	(3)	(4)	(5)
...has few artistic interests	(1)	(2)	(3)	(4)	(5)
...is outgoing, sociable	(1)	(2)	(3)	(4)	(5)
...tends to find fault with others	(1)	(2)	(3)	(4)	(5)
...does a thorough job	(1)	(2)	(3)	(4)	(5)
...gets nervous easily	(1)	(2)	(3)	(4)	(5)
...has an active imagination	(1)	(2)	(3)	(4)	(5)

Appendix C:  
Boredom Proneness Scale

## Boredom Proneness Scale

The statements can be answered using a true-false response (the original format used) or with a 7-point format from "1" (highly disagree) to "7" (highly agree) used in recent research.

- \_\_\_\_\_ 1. It is easy for me to concentrate on my activities.
- \_\_\_\_\_ 2. Frequently when I am working I find myself worrying about other things.
- \_\_\_\_\_ 3. Time always seems to be passing slowly.
- \_\_\_\_\_ 4. I often find myself at "loose ends", not knowing what to do.
- \_\_\_\_\_ 5. I am often trapped in situations where I have to do meaningless things.
- \_\_\_\_\_ 6. Having to look at someone's home movies or travel slides bores me tremendously.
- \_\_\_\_\_ 7. I have projects in mind all the time, things to do.
- \_\_\_\_\_ 8. I find it easy to entertain myself.
- \_\_\_\_\_ 9. Many things I have to do are repetitive and monotonous.
- \_\_\_\_\_ 10. It takes more stimulation to get me going than most people.
- \_\_\_\_\_ 11. I get a kick out of most things I do.
- \_\_\_\_\_ 12. I am seldom excited about my work
- \_\_\_\_\_ 13. In any situation I can usually find something to do or see to keep me interested.
- \_\_\_\_\_ 14. Much of the time I just sit around doing nothing.
- \_\_\_\_\_ 15. I am good at waiting patiently.
- \_\_\_\_\_ 16. I often find myself with nothing to do, time on my hands.
- \_\_\_\_\_ 17. In situations where I have to wait, such as a line I get very restless.
- \_\_\_\_\_ 18. I often wake up with a new idea.
- \_\_\_\_\_ 19. It would be very hard for me to find a job that is exciting enough.
- \_\_\_\_\_ 20. I would like more challenging things to do in life.
- \_\_\_\_\_ 21. I feel that I am working below my abilities most of the time.
- \_\_\_\_\_ 22. Many people would say that I am a creative or imaginative person.
- \_\_\_\_\_ 23. I have so many interests, I don't have time to do everything.

- \_\_\_\_\_ 24. Among my friends, I am the one who keeps doing something the longest.
- \_\_\_\_\_ 25. Unless I am doing something exciting, even dangerous, I feel half-dead and dull.
- \_\_\_\_\_ 26. It takes a lot of change and variety to keep me really happy.
- \_\_\_\_\_ 27. It seems that the same things are on television or the movies all the time, it's getting old.
- \_\_\_\_\_ 28. When I was young, I was often in monotonous and tiresome situations.

Appendix D:  
Demographic Questionnaire

**Please answer these questions by marking one line or filling the blank.**

1. Gender: Male \_\_\_\_\_ Female \_\_\_\_\_

2. Years of age: \_\_\_\_\_

3. In which group do you mostly place yourself?

\_\_\_\_\_ 1) African-American/Black  
\_\_\_\_\_ 2) American Indian/Alaskan Native  
\_\_\_\_\_ 3) Asian/Pacific Islander

\_\_\_\_\_ 4) Caucasian  
\_\_\_\_\_ 5) Hispanic/Latino  
\_\_\_\_\_ 6) Other \_\_\_\_\_

4. Height: \_\_\_\_\_

5. Weight: \_\_\_\_\_

6. Years of Education: \_\_\_\_\_

7. When did you last eat? \_\_\_\_\_

8. What did you last eat? \_\_\_\_\_

Appendix E:  
The PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

interested	_____
distressed	_____
excited	_____
upset	_____
strong	_____
unexcited	_____
guilty	_____
scared	_____
hostile	_____
enthusiastic	_____
unstimulated	_____
proud	_____
irritable	_____
alert	_____
ashamed	_____
restless	_____
inspired	_____
nervous	_____
determined	_____
attentive	_____
disinterested	_____
jittery	_____
active	_____
afraid	_____
average	_____
bored	_____

Appendix F:  
Revised Emotional Eating Scale

We all respond to different emotions in different ways. Some types of feelings lead people to experience an urge to eat. Please indicate the extent to which the following feelings lead you to feel an urge to eat by checking the appropriate box.

	No Desire to Eat	A Small Desire to Eat	A Moderate Desire to Eat	A Strong Urge to Eat	An Overwhelming Urge to Eat
Resentful					
Discouraged					
Shaky					
Worn Out					
Inadequate					
Excited					
Rebellious					
Blue					
Jittery					
Sad					
Uneasy					
Irritated					
Jealous					
Worried					
Frustrated					
Lonely					
Furious					
On edge					
Confused					
Nervous					
Angry					
Guilty					
Bored					
Helpless					
Upset					
Blah					
Nothing to do					
Unstimulated					
Unexcited					
Restless					
Disinterested					

Appendix G:  
Trait Meta Mood Scale

Please read each statement and decide whether you agree with it.  
Place a number in the blank line next to each statement using the following scale:

- 5 = strongly agree
- 4 = somewhat agree
- 3 = neither agree nor disagree
- 2 = somewhat disagree
- 1 = strongly disagree

- \_\_\_ 1. The variety of human feelings makes life more interesting.
- \_\_\_ 2. I try to think good thoughts no matter how badly I feel.
- \_\_\_ 3. I don't have much energy when I am happy.
- \_\_\_ 4. People would be better off if they felt less and thought more.
- \_\_\_ 5. I usually don't have much energy when I'm sad.
- \_\_\_ 6. When I'm angry, I usually let myself feel that way.
- \_\_\_ 7. I don't think it's worth paying attention to your emotions or moods.
- \_\_\_ 8. I don't usually care much about what I'm feeling.
- \_\_\_ 9. Sometimes I can't tell what my feelings are.
- \_\_\_ 10. If I find myself getting mad, I try to calm myself down.
- \_\_\_ 11. I have lots of energy when I feel sad.
- \_\_\_ 12. I am rarely confused about how I feel.
- \_\_\_ 13. I think about my mood constantly.
- \_\_\_ 14. I don't let my feelings interfere with what I am thinking.
- \_\_\_ 15. Feelings give direction to life.
- \_\_\_ 16. Although I am sometimes sad, I have a mostly optimistic outlook.
- \_\_\_ 17. When I am upset I realize that the "good things in life" are illusions.

- 18. I believe in acting from the heart.
- 19. I can never tell how I feel.
- 20. When I am happy, I realize how foolish most of my worries are.
- 21. I believe it's healthy to feel whatever emotion you feel.
- 22. The best way for me to handle my feelings is to experience them to the fullest.
- 23. When I become upset I remind myself of all the pleasures in life.
- 24. My belief and opinions always seem to change depending on how I feel.
- 25. I usually have lots of energy when I'm happy.
- 26. I am often aware of my feelings on a matter.
- 27. When I'm depressed, I can't help but think of bad thoughts.
- 28. I am usually confused about how I feel.
- 29. One should never be guided by emotions.
- 30. If I'm in too good a mood, I remind myself of reality to bring myself down.
- 31. I never give into my emotions.
- 32. Although I am sometimes happy, I have a mostly pessimistic outlook.
- 33. I feel at ease about my emotions.
- 34. It's important to block out some feelings in order to preserve your sanity.
- 35. I pay a lot of attention to how I feel.
- 36. When I'm in a good mood, I'm optimistic about the future.
- 37. I can't make sense out of my feelings.
- 38. I don't pay much attention to my feelings.
- 39. Whenever I'm in a bad mood, I'm pessimistic about the future.
- 40. I never worry about being in too good a mood.



- 41. I often think about my feelings
- 42. I am usually very clear about my feelings.
- 43. No matter how badly I feel, I try to think about pleasant things.
- 44. Feelings are a weakness humans have.
- 45. I usually know my feelings about a matter.
- 46. It is usually a waste of time to think about your emotions.
- 47. When I am happy I sometimes remind myself of everything that could go wrong.
- 48. I almost always know exactly how I am feeling.

Appendix H:  
Consent Form



**Individual Differences in Food Perception**

Erin E. Pratt, B.A.

**Introduction**

You are invited to participate in a research study conducted by Erin E. Pratt. I am a graduate student in the Psychology Department of University of South Carolina Aiken. I am conducting a research study as part of the requirements for my Master of Science degree in Applied Clinical Psychology, and I would like to invite you to participate.

The purpose of the study is to explore the relationship between emotional experiences and taste perception. This form explains what you will be asked to do if you decide to participate in this study. Please read it carefully and feel free to ask any questions you like before you make a decision about participating.

**Eligibility to Participate**

Approximately 110 young adults will participate in the current study. You must meet the following criteria: 1) fluent in English; 2) be able to provide informed written or verbal consent; and 3) be an undergraduate student at the University of South Carolina Aiken at least 18 years of age.

**Description of Study Procedures**

If you qualify and agree to participate, you will take part in 1 session with a time length of approximately 1 hour. At the beginning of the session you will be asked to review the informed consent and sign your name indicating completion of this review. Food will be available for consumption throughout the study, and you will be asked questions about your taste experiences at the end of the study.

During the study you will be assigned a written activity to complete for 20 minutes. Immediately following this activity, you will complete a short questionnaire. This assignment activity and completion of a questionnaire will be repeated once more during the study visit. Following these activities, you will be given six questionnaires related to your individual characteristics and behaviors.

**Risks and Discomforts**

Although all assessments and information will be kept confidential, there is a risk of loss of confidentiality. The means in which your confidentiality will be protected are discussed in more detail below.

**Benefits of Participation**

Taking part in this study is not likely to benefit you personally. However, this research may help us understand the association between emotional experiences and taste perception.

**Participant Compensation**

Participants will receive 1 course credit per hour of participation in the study. Those not enrolled in Psychology 101 will be eligible to win one of two \$25 Visa gift cards.

**Data Confidentiality and Participant Identification**

Your name will not be used in any publication that may result from this study. The USC Office of Research Compliance may request access to this form to ensure procedures designed to protect research participants are being properly followed

Your name will not be recorded or connected with any of the study materials. Instead, a randomly assigned participant number will be used. Any information that is obtained in connection with this study and that could identify you will remain confidential and will not be released or disclosed without your further consent, except as specifically required by law.

**Voluntary Withdrawal**

Participation in this study is voluntary. You are free to withdraw your consent and discontinue participation in the study at any time throughout the study without negative consequences to your relationship with the University of South Carolina. In the event that you do withdraw from this study, the information you have already provided will be kept in a confidential manner.

**Contact Persons**

Faculty and researchers of the University of South Carolina Aiken are conducting this research. For more information concerning this research, you may contact:

Dr. Maureen Carrigan  
Department of Psychology  
Phone Number (Office): 803-641-3545  
Email Address: [MaureeC@usca.edu](mailto:MaureeC@usca.edu)

Erin E. Pratt  
Department of Psychology  
Phone Number (Cell): 585-943-3759  
Email Address: [prattee@email.usca.edu](mailto:prattee@email.usca.edu)

If you have any questions about your rights as a research subject contact, Lisa Marie Johnson, IRB Manager, Office of Research Compliance, 1600 Hampton Street, Suite 414 Columbia, SC 29208, Phone: (803) 777-7095 or [LisaJ@mailbox.sc.edu](mailto:LisaJ@mailbox.sc.edu). The Office of Research Compliance is an administrative office that supports the USC Institutional Review Board. The Institutional Review Board (IRB) consists of representatives from a variety of scientific disciplines, non-scientists, and community members for the primary purpose of protecting the rights and welfare

of human subjects enrolled in research studies.

**Participant Signatures**

I have read this informed consent form and have been given a chance to ask questions about this research study. These questions have been answered to my satisfaction. I agree to participate in this study. I have received (or will receive) a copy of this form for my own records.

Participant \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_

Investigator \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_

Appendix I:  
Taste Perception Rating Sheet

Please rate each food.

- 1 = "Not at all"
- 2 = "A little"
- 3 = "Some"
- 4 = "Average"
- 5 = "Moderate"
- 6 = "A lot"
- 7 = "Extremely"

Food 1:

Taste: \_\_\_\_\_

Texture: \_\_\_\_\_

Goodness: \_\_\_\_\_

Sweetness: \_\_\_\_\_

Saltiness: \_\_\_\_\_

Food 2:

Taste: \_\_\_\_\_

Texture: \_\_\_\_\_

Goodness: \_\_\_\_\_

Sweetness: \_\_\_\_\_

Saltiness: \_\_\_\_\_

Food 3:

Taste: \_\_\_\_\_

Texture: \_\_\_\_\_

Goodness: \_\_\_\_\_

Sweetness: \_\_\_\_\_

Saltiness: \_\_\_\_\_