THE RELATIONSHIP BETWEEN EMOTIONAL EATING, EMOTION
REGULATION, AND MATERNAL PARENTING BEHAVIORS IN AFRICAN-
AMERICAN FEMALE CAREGIVER-ADOLESCENT DYADS

by

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The Relationship between Emotional Eating, Emotion Regulation, and Maternal Parenting Behaviors in African-American Female Caregiver-Adolescent Dyads

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Abstract

Emotional eating has been associated with an array of symptoms of psychopathology, yet most studies have conceptualized emotional eating as a function of weight status rather than dysregulated emotions. This study is the first study to explore the relationships between emotional eating, emotion regulation, and parenting behaviors in a sample of African-American adolescents and their female caregivers. Eighty-five African-American adolescent-parent dyads were recruited from an urban primary care clinic and completed questionnaires assessing emotional eating, emotion regulation, and parenting behaviors. Findings showed that African-American adolescents reported more frequently eating in response to depressed emotions compared to anger, anxiety and/or frustration. No relationship was found between adolescents’ emotion regulation skills and emotional eating. Adolescents’ emotional eating was not related to weight status. Higher levels of maternal emotional eating and maternal parenting behaviors characterized by higher levels of firm control predicted higher levels of emotional eating in adolescents.
The Relationship between Emotional Eating, Emotion Regulation, and Maternal Parenting Behaviors in African-American Female Caregiver-Adolescent Dyads

Emotional eating is defined as eating in response to an emotional state rather than to hunger cues (Geliebter & Aversa, 2003). Previous literature has primarily viewed emotional eating as either a symptom of eating disorders or a behavior of overweight/obese patients. However, others have conceptualized emotional eating as a means to regulate affect (Kaplan & Kaplan, 1957). Emotional eating has been associated with various indicators of psychopathology including symptoms of anxiety and depression, negative self-concept, body dissatisfaction, feelings of physical incompetence, difficulties in interpersonal relationships, overeating, and bulimic behaviors (Braet & Van Strien, 1997; Hill, Draper, & Stack, 1994; Van Strien, Schippers, & Cox, 1995; Van Strien, 1996; Waller & Osman, 1998; Wardle et al., 1992). Research has also found that negative emotional states have been linked to poorer dietary patterns (Gibson, 2006); these diets are in turn linked to poor health outcomes (Hermansen, 2000; van Dam, Grievink, Ocke, & Feskens, 2003). Therefore, eating in response to negative emotions may have deleterious effects on health over time.

There is also a well-established literature documenting the relationship of emotion regulation to psychopathology. Poor emotion regulation strategies have been linked with externalizing symptoms (Cummings, Iannotti, & Zahn-Waxler, 1989; Gardner, Dishion, & Connell, 2008) and internalizing symptoms (Schultz, Izard, Ackerman, & Youngstrom, 2001) in childhood. As both emotional eating and emotion regulation are linked with symptoms of psychopathology, emotional eating can be conceptualized as a strategy to
regulate emotion. Emotional eating may be a maladaptive means to regulate negative affect or to increase positive affect. Poor psychological functioning in childhood may lead to the use of poor emotion regulation strategies, such as emotional eating. Emotional eating is an important correlate of psychopathology and may play a role in how people regulate negative self-feelings. However, the nature of emotional eating is not well understood in African-American culture.

**Ethnic Differences Emotional Eating and Emotion Regulation**

Previous research in adults indicates that behavior problems related to emotional eating differ across cultures (Waller & Matoba, 1999). Studies also demonstrate that different ethnic groups rely on different emotion regulation strategies (Butler, Lee, & Gross, 2007; Gross & John, 2003). Therefore, it may be important to examine emotion regulation within specific cultural groups. The purpose of this study is to describe emotional eating in African-American adolescent-parent dyads as well as to explore the relationships between emotional eating, emotion regulation, and parenting behaviors in an African-American sample.

The nature of emotional eating is not well understood in African-American culture. In a study examining the cross-cultural differences of emotional eating between British and Japanese women, findings indicated that women of British descent tend to display poorer eating attitudes and were heavier compared to Japanese women living in Japan or in England. Likewise, British women with higher levels of emotional eating were more likely to report higher levels of eating disturbances around dieting and bulimic behaviors (Waller & Matoba, 1999).
Emotional eating has been examined in a number of ethnicities. The majority of studies do not provide general levels of emotional eating or examine the types of emotions that precipitate eating. Most studies instead examine emotional eating in relation to weight status. Findings from a study investigating risk factors related to obesity and overweight status in American Indian youth ages 8 to 12 years showed that body mass index (BMI) was not predictive of emotional eating in American Indian children (Jollie-Trottier, Holm, & McDonald, 2008). Similar to their findings, emotional eating was not related to weight status in Italian preadolescent youth (Caccialanza, et al., 2004). In contrast, Hill, Draper, and Stack (1994) found higher levels of emotional eating in British girls who were more underweight compared to healthy weight individuals and the lowest levels of emotional eating in girls who were overweight. A study of Belgian children and adolescents also found that levels of emotional eating varied by age and weight status (Braet et al., 2008). In a sample of German children who reported on levels of loss of control over eating, emotional eating was related to emotion regulation but the relationship between emotional eating and weight was not reported in the study (Czaja, Rief, & Hilbert, 2009). The inconsistent findings from these studies suggest that the relationship between emotional eating and weight vary across cultures.

Despite a number of studies examining emotional eating in various cultures, only one study could be located that included African-American adolescents. In this study, the Emotional Eating Scale for Children and Adolescents (EESC), one measure of emotional eating in adolescents, was validated in a U.S. sample by Tanofsky-Kraff et al. (2007). Sixty percent of the sample was Caucasian, approximately one-third African-American, and 6% Hispanic. Participants were previously enrolled in metabolic studies examining
natural hormone levels in youth. Families interested in participating in this study responded to advertisements and thus may be a self-selected sample of participants.

Levels of emotional eating as reported by adolescents using the EES-C are generally low across studies (Snoek, Engels, Janssens, & van Strien, 2007; Tanofsky-Kraff, et al., 2007; van Strien, Frijters, Bergers, & Defares, 1986), indicating that adolescents do not report high levels of eating in response to emotions. To date, no study has explored emotional eating in urban African-American adolescent-parent dyads to our knowledge.

**Emotional Eating in Children and Adolescents**

*Weight and Emotional Eating*

Most studies examining emotional eating have compared individuals who are overweight or obese to those of healthy weight. As previously noted, results of studies are contradictory with some studies finding a relationship between weight and emotional eating in children and adolescents (Braet et al., 2008; Hill et al., 1994) and others finding no such association (Jollie-Trottierm, Holm, & Mcdonald, 2008; Caccialanza et al., 2004). Likewise, findings have been mixed in determining which weight status is associated with the highest levels of emotional eating. For example, higher levels of parent-reported emotional eating were found in children ages 9-12 years who are overweight or obese relative to healthy weight children (Braet and Van Strien, 1997). In contrast, Hill and colleagues (1994) did not find differences in parent-reported child emotional eating between preadolescent children who were overweight and healthy weight children, despite employing methods comparable to those used by Braet and Van Strien’s (1997). Similarly, Wardle and colleagues (1992) found no significant
relationship between adolescents’ weight status and levels of emotional eating in a self-report study of adolescents ages 11-18 years.

The methodological challenges encountered in conducting these studies may make it difficult to determine the true nature of emotional eating in children and adolescents. First, child-report of emotional eating may not be the most valid indicator of how often children are engaging in emotional eating due to either their difficulty in identifying certain emotions or bias in their self-report. Second, previous studies are limited in their conceptualization of emotional eating as a characteristic of overweight and obese individuals. Past studies have compared obese and overweight children to healthy weight children and hypothesized that overweight/obese children would have higher levels of emotional eating, but inconsistent or even contradictory findings suggest that this hypothesis may not be a viable one. It is possible that these conflicting results are found because emotional eating is present among children in all weight categories, not just in the obese category. Many factors may contribute to overweight status, including the types of foods that the child eats, portion sizes, exercise, and genetics (Davis, et al., 2007; Silventoinen, Rokholm, Kaprio, & Sorensen, 2009). Thus, overweight status may not relate to a child’s emotions but rather to life styles involving consumption of energy-dense foods that are high in fat and sugar, little exercise, and sedentary behaviors. Similarly, a healthy weight child may eat in response to emotions, but may exercise frequently, have low global screen time and/or have a high metabolism, which compensates for the emotional eating. Thus, the lack of consensus among previous research studies on emotional eating may be attributed to the presence of
emotional eating across all weight categories rather than only in specific weight categories.

Emotional eating is not necessarily a symptom stemming from weight status, but is found in individuals across weight categories. Even if not linked specifically to overweight, acquired patterns of emotional eating in childhood are concerning, as these dietary behaviors may persist into adulthood and have adverse effects on health over time. Negative emotions have been linked to poorer dietary habits. Specifically, higher levels of negative affect are positively associated with hunger cravings for foods with high amounts of sugar and fat, as well as preferences for more energy dense meals (Gibson, 2006). Foods that are high in saturated fat have been linked to poor cardiovascular health (Hermansen, 2000). Likewise, findings from a study examining the relationships between dietary patterns and health outcomes revealed that food intake characterized by high levels of saturated fat and processed sugar was negatively associated with high density lipoprotein (HDL) cholesterol and positively associated with levels of total cholesterol concentration, blood sugar levels, and increased systolic blood pressure in women (van Dam, et al., 2003). Furthermore, diets in high in saturated fat and sugar are associated with higher amounts of total cholesterol concentration, independent of weight status (van Dam, et al., 2003). Therefore, establishing adaptive emotion regulation strategies early in life may lead to healthier diet patterns, and thus prevent the development of chronic illness associated with poor nutrition that can occur even in individuals with a healthy weight. Unfortunately, no study has examined the associations between emotion regulation and emotional eating in a nonclinical sample of children and adolescents.
Sex and Age Differences

Studies on emotional eating describe different findings with regard to gender and age. In several studies, sex differences were found (Braet et al., 2008; Snoek, et al., 2007; Tanofsky-Kraff, et al., 2007), with female children and adolescents reporting higher levels of emotional eating than male adolescents. Almost as many studies fail to find any sex differences in emotional eating (Caccialanza et al., 2004; Hill Draper Stack, 1994; Braet & van Strien, 1997). Similar to the literature on sex, studies do not identify a clear relationship between age and emotional eating in children and adolescents. Wardle and colleagues (1992) found age-related differences in emotional eating. Specifically, emotional eating levels were higher in older adolescents, ages 16-18, compared to younger adolescents, ages 12-13. Braet and colleagues’ (2008) study found group differences for gender and age differences related to emotional eating. Female adolescents who were overweight reported more emotional eating compared to the healthy weight group, however this pattern was not found for adolescent males. The pattern for boys and girls under the age of 13 was also different; those in the overweight group reported less emotional eating compared to the healthy weight group. These findings suggest that emotional eating levels vary by age and by gender in children and adolescents. In contrast, Snoek and colleagues (2007) did not find age-related differences in levels of emotional eating. These findings do not provide a consensus on the relationship between age and emotional eating. Mixed findings on sex and age differences in relation to emotional eating may be due to small sample sizes or samples characteristics (e.g., weight status, eating behavior patterns, etc.) or due to different measures of emotional eating.
However, the ability to of children and adolescents to report accurately about their own emotional eating patterns has been consistently documented in the literature. Research has demonstrated that children under the age of 12 have difficulty distinguishing between emotions, such as discouragement, sadness, and irritability or in identifying how much they eat in response to these complex emotions (Braet & Van Strien, 1997). In addition, children may not be able to distinguish between their eating intentions and actual eating behavior. This calls into question the results of studies employing child report in samples of children under the age of 12 years and may account for contradictory results found in this age group.

Braet and colleagues (2008) also investigated children’s ability to identify and understand emotions under the age of 12 years, and found that an interview format was needed to explain the difference between similar emotions. Even in an interview format, children who were overweight or obese reported less emotional eating than children with a healthy weight status. It may be that younger adolescents respond in a similar manner to younger children, in that they have difficulty identifying and/or reporting nuanced differences in emotions (e.g. irritated, discouraged). Therefore, younger children and adolescents may be engaging in emotional eating at the same levels as older adolescents, but may be unaware of their emotional eating. Another possible explanation is that the self-reports of children and younger adolescents are influenced by overweight stereotypes. Older adolescents may be more adept at identifying and reporting eating in response to more sophisticated emotions. Therefore, previous studies using child self-report, with or without an interview format, may not yield accurate or valid research results.
Emotional Eating in Adults

Obesity and Emotional Eating

Because the literature on emotional eating in children is limited, a discussion of adult studies of emotional eating is warranted. These studies, like those involving children and adolescents, have also yielded mixed results. Some studies have demonstrated a positive association between emotional eating and higher weight status (Blair, Lewis, & & Booth, 1990; Konttinen, Haukkala, Sarlio-Lahteenkorva, Silventoinen, & Jousilahti, 2009; Van Strien, Frijters, Roosen, Knuiman-Hijl, & Defares, 1985) and others have not (Abramson & Wunderlich, 1972; Allison & Heshka, 1993; Fitzgibbon, Stolley, & Kirschenbaum, 1993; Geliebter & Aversa, 2003). The contradictory findings of previous research may be related to past conceptualizations of emotional eating. Similar to the literature on emotional eating in children, previous research in adults focused primarily on comparing obese and healthy weight individuals on levels of emotional eating. Likewise, studies exploring emotional eating in adults have been limited by examining eating only in response to negative emotions (Abramson & Wunderlich, 1972; Arnow, Kenardy, & Agras, 1995; Blair, Lewis, & & Booth, 1990; Konttinen, Haukkala, Sarlio-Lahteenkorva, Silventoinen, & Jousilahti, 2009; Van Strien & Ouwens, 2003). Slochower and colleagues (1976) classified emotions into distinct emotions, such as anger or irritation, and diffuse emotions, which refer to idleness, boredom, or loneliness. Participants were classified into obese and healthy weight categories according to the Metropolitan Life Insurance weight norms (See Slochower et al., 1976 for full description). These researchers found in a series of experiments that overweight individuals tend to eat in response to diffuse emotions, such
as boredom or idleness, rather than in response to more distinct emotions, such as anger or sadness (Slochower, 1983; Slochower, 1976; Slochower & Kaplan, 1980; Slochower, Kaplan, & Mann, 1981). Participants who were overweight had more difficulty identifying their emotions than participants of healthy weight (Slochower, 1976). However, these studies used a categorical approach by focusing on the absence or presence of obesity in the sample, rather than studying emotional eating across all weight categories. In addition, the sample was comprised only of males recruited from a college student population (Slochower, 1976). This sample may not adequately represent the general population of healthy and overweight individuals.

**Healthy Weight and Emotional Eating**

Emotional eating has also been studied in healthy weight adults. In a self-report study of a nonclinical sample of men and women, Macht (1999) found that different emotions led to different eating behaviors. More specifically, eating style behaviors change when feeling four different emotions (anger, fear, sadness and joy). A factor analysis narrowed the emotional eating responses to 1) eating due to hunger feelings, 2) impulsive eating, which refers to eating fast and in a careless manner 3) sensory eating, or eating more intense, flavorful, or acidic foods and 4) hedonic eating, or eating because the food tastes pleasant or is considered healthy. When individuals felt anger or joy, they most often reported eating due to hunger. In contrast, the emotion of anger tended to elicit impulsive and sensory eating behaviors. When feeling joy, individuals reported much higher levels of hedonic eating compared to hunger, impulsive, or sensory eating. Although this study demonstrates different eating behavior patterns in response to different emotional states, no studies have looked at whether individuals who report
emotional eating have difficulty with emotion regulation. However, the Macht study demonstrated that emotional eating does occur in the general population (rather than only in overweight and obese individuals), and that behaviors around eating change depending on the type of emotion.

Two studies have also explored eating in response to emotions. Macht, Haupt, and Ellgring (2005) explored whether eating functions to alleviate stress, distract persons from stressful emotions, or relax individuals experiencing stress-induced emotions. In a sample of young to middle-aged adult students, self-reported emotions and eating behaviors were obtained from a group that had an exam and control group with no exam three to four weeks before the date of the exam (baseline) and again three to four days prior to the test date. Their results indicated that students who were taking an exam did not differ in self-reported feelings. However, students taking exams three days before the test reported increased feelings of tension, fear and stress compared to the control group. The group taking the exam reported that they ate to distract themselves from these feelings rather than eating to feel better or to relax. Although this study contributes to our understanding of what motivates people to eat in response to stress, tension, and fear, global constructs of stress do not adequately describe different types of emotions.

In a second study, Macht and Simons (2000) identified four emotional states using a cluster analysis that distinguished four emotional states from low levels of emotion: 1) anger/dominance, 2) tension/fear, 3) relaxation/joy, and 4) unemotional. The results of their study showed the people were motivated to eat most often in response to the emotion states of anger/dominance and tension/fear. Contrary to the results of the first field study, individuals who felt joy did not report higher levels of hedonic eating.
The results from both of these field studies demonstrate that emotional eating occurs in nonclinical populations. In addition, both of these studies show that eating can occur in response to emotions, such as eating as a distraction from negative feelings. However, the sample of these studies was rather small (N’s of 42 and 23) and consisted only of college age students, which may not adequately represent the general population. Further, these studies did not measure whether individuals who engage in emotional eating have poor general emotion regulation skills.

To date, only one study has explored emotional eating in a nonclinical cross-cultural sample. Waller and Matoba (1999) compared levels of emotional eating in a nonclinical sample of adult women living in Japan, Japanese women who immigrated from Japan to the United Kingdom (UK), and a group of British women who resided in the UK their entire lives. Distinct cultural differences were found between emotional eating and pathological eating across cultures. Emotional eating was correlated with symptoms of disordered eating in both the British and Japanese women residing in the UK. In contrast, emotional eating was not related to such symptoms in Japanese women living in Japan. Results from this study suggest that the relationship between emotional eating and psychopathology varies depending upon culture. These findings provide preliminary evidence that emotional eating occurs independent of psychopathology. Thus, emotional eating is not necessarily related to eating disorders and is present in nonclinical populations. Emotional eating may be related to an individual’s ability to regulate their emotions rather than to difficulties with symptoms of eating disorders.

**Emotional Eating and Emotion Regulation**
To date, only one study could be located that explored emotion regulation in children who reported eating in the absence of hunger. Czaja and her colleagues (2009) explored children’s ability to regulate emotions in boys and girls who evidenced binge eating behaviors, or loss of control (LOC) over eating, using self-report measures. Loss of control over eating and emotional eating are both symptoms of binge-eating disorder. Using a measure adapted for children 7 to 12 years of age, the researchers found that children with binge-eating behaviors characterized by loss of control, as defined by the presence of a minimum of one episode of loss of control over eating in the prior three months, evidenced poorer emotion regulation compared to children who did not report binge-eating behavior. Findings indicated that children who reported LOC binge eating behaviors had the greatest difficulty with regulating feelings of anxiety. Notably, higher levels of emotional eating were associated with greater use of maladaptive emotion regulation skills. Taken together, this suggests that children who eat in the absence of hunger may have poorer emotion regulation skills and more difficulty regulating negative affect.

Evidence from recent studies also supports an association between poor emotion regulation skills and disordered eating attitudes. Recent research in preadolescent girls evidenced a relationship between emotion regulation, bulimic symptoms, and body dissatisfaction. Sim and Zeman (2005) demonstrated that negative affect partially mediated the relationship between body dissatisfaction and bulimic symptoms (See Figure 1). The relationship between body dissatisfaction and bulimic behaviors was partially, but not completely, reduced when controlling for negative affect, poor emotional awareness, and an inability to cope with negative emotions. Hence, girls
reporting body dissatisfaction may also be vulnerable to poor emotion regulation strategies, which may in turn exacerbate bulimic behaviors.

Building on their previous study examining the mediational model of negative affect, Sim and Zeman (2006) conducted another study to investigate whether specific emotion regulation strategies can discriminate between body dissatisfaction and disordered eating attitudes. This study demonstrated that negative affect, rather than emotional awareness, predicted body dissatisfaction (Sim & Zeman, 2006). In contrast, poor emotional awareness predicted disordered bulimic and dieting behaviors. Taken together, their research supports the idea that poor emotion regulation skills are linked to disordered eating behaviors. Although both of Sim and Zeman’s studies focus on bulimic behaviors, bulimic tendencies and emotional eating behaviors overlap significantly in that individuals who binge eat often report eating in response to emotional cues or situational characteristics rather than to hunger cues, which are symptoms of binge eating-disorders (Lindeman & Stark, 2001). Thus, it is plausible that girls who report high levels of negative affect and maladaptive emotion regulation strategies may also be more vulnerable to emotional eating behaviors.

Along the same lines, Van Strien, Engels, Leeuwe, and Snoek (2005) found that emotional eating and interoceptive awareness account for a significant proportion of the relationship between negative affect and overeating in a study of clinical and nonclinical female adolescents. Interoceptive awareness is the ability to distinguish between emotions and bodily sensations of hunger. Theoretically, misidentifying negative affect as the sensation of hunger can lead to engaging in emotional eating in response to stress. Thus, if one feels emotional distress, it may be mistaken for feeling hungry and therefore
one eats to satiate that feeling. Although this study contributes to our understanding of the relationship between negative affect and overeating, it fails to address the question of how one learns to respond to negative affect by eating.

Research also documents associations of emotional eating with negative affect and higher levels of psychopathology are linked with emotional eating. In a self-report study of female adults, high levels of emotional eating were associated with low psychological well-being, low self-esteem, body-image vulnerability, and feelings of inadequacy (Lindeman & Stark, 2001). An inability to regulate high negative affect is related to the development of depressive disorders and psychopathology (Kovacs, Joormann, & Gotlib, 2008). Therefore, it is plausible that children who use eating as a way to regulate their emotions have poor general emotion regulation skills.

**Socialization of Emotion Regulation**

Children learn to regulate their emotions from the influences of parents, siblings, peers, and culture (Saarni, 1988). This process is called socialization of emotion. A substantial literature has established the importance of family context and familial influences in the development of emotion regulation strategies (Morris, Silk, Steinberg, Myers, & Robinson, 2007). In a comprehensive review, Eisenberg, Cumberland, and Spinrad (1998) identified three major aspects of socialization: parental reactions and responses to children’s display of emotion, parental discussion of emotion, and the expression of emotion. The strategies used to regulate emotion are influenced by familial and parent-child interactions. Parent restrictiveness on children’s emotional expression helps them learn when to express emotions and which emotion regulation strategies are culturally appropriate (Shipman, Zeman, Nesin, & Fitzgerald, 2003). Emotional eating, as
an emotion regulation strategy, may be learned through the process of socialization. When caregivers do not consistently support and validate their child’s emotions, children may fail to learn appropriate emotion regulation strategies (Shipman & Zeman, 2001). Parent-child interactions, through parental support and validation of emotional expression in children, may influence the development of emotional eating in childhood.

Parent/caregiver emotional expression may also help children learn to regulate their emotions. Parental expression impacts children’s emotion regulation by providing models for the child to imitate and opportunities to see how others in the family react emotionally to specific events or circumstances (Cassidy, Parke, Butkovsky, & Braungart, 1992; Eisenberg, Cumberland, and Spinrad, 1998). Parental expression in the family is positively associated with emotional expressiveness in children (Halberstadt, Crisp, & Eaton, 1999). Thus, parental expression is an important factor in the development of emotion regulation strategies.

To date, no studies could be located that have examined the socialization of emotional eating in children. If children learn to soothe or regulate their emotions through eating, then parent-child interactions and emotional expression may be the two most salient components of socialization to study in relation to emotional eating.

**Parenting Behaviors and Disinhibited Eating**

Although no studies have currently explored parenting behaviors as they relate to emotional eating, studies have examined parenting behaviors in individuals with disinhibited eating. Similar to emotional eating, disinhibited eating is defined as overeating occurring in the absence of hunger but is different from emotional eating in that there is no associated affect (Stunkard & Messick, 1985). Parenting factors have
been studied as contributors to disinhibited eating in children. Carper, Fisher, and Birch (2000) found that when girls reported more parental pressure to eat, they were three times more likely to report disinhibited eating in response to emotions compared to girls who reported less parental pressure to eat. Thus, parental pressure to eat may contribute to children engaging in disinhibited eating. In addition, when parents implement restrictive feeding practices with their children, disinhibited eating increases in children (Joyce & Zimmer-Gembeck, 2009). Parental styles are also associated with children’s disinhibited eating. When parents were coercive or when feeding practices were unpredictable and inconsistent, the relationship between parental restriction and disinhibited eating was stronger (Joyce & Zimmer-Gembeck, 2009). This literature suggests that parents and parenting styles may influence their children’s dietary practices.

Parents also serve as models for eating behaviors. In a study examining parent and child reports of disinhibited eating, the relationship between mother’s and daughter’s weight status was mediated by the presence of disinhibited eating in mothers (Cutting, Fisher, Grimm-Thomas, & Birch, 1999). In this meditational model, maternal BMI and maternal disinhibited eating predicted the daughter’s weight status, and maternal BMI predicted maternal disinhibited eating. The authors posited that the children learned these eating patterns by observing their mothers. Thus, female caregivers who engage in uncontrolled eating may model dietary practices for their children.

**Theory**

To help guide research in emotional eating, Macht (2008) proposed a five-factor model integrating affective processes with eating behaviors (See Figure 2). His framework identifies multiple paths that lead to emotional eating. The first factor consists
of food-induced emotions in which eating sweet, sugary foods can produce positive feelings and thus elicit a strong urge to eat. The second factor refers to suppressed food intake as a consequence of intense emotional feelings, since physiological responses to emotional arousal naturally inhibit food digestion. The third factor involves cognitive control over eating, which is posited to be impaired when individuals engage in restrained eating. The fourth factor is the act of eating to regulate emotions. Within this pathway, individuals use eating as a way to reduce their emotions. The fifth factor, described as the congruency effect, refers to the influence of emotions on the motivation to eat. The congruency effect suggests that negative information is more easily accessible during negative moods than positive information, and thus, negative emotions reduce individual’s drive to eat and pleasantness associated with eating.

Previous theory on emotional eating initially hypothesized that mothers use food as a way to reduce distress in an infant (Bruch, 1969). Bruch (1969) suggested that parents have difficulty differentiating between the infant’s need for food and nonverbal emotional displays in emotion. Because of this difficulty, mothers provide children with food at times when they are experiencing hunger but also at times when they are experiencing negative affect and are in need of comfort. In response, children learn that food provides comfort at times of emotional distress and do not learn the ability to distinguish between feeling hunger and feeling negative affect. According to this theory, deficiencies in the ability to distinguish between hunger and negative affect and the use of eating as a way to comfort oneself during times of emotional distress contribute to the development of obesity in children.
However, Bruch’s theory was developed primarily to explain emotional eating in persons who are overweight. Because emotional eating is not present exclusively in these individuals, the present study posits that emotional eating stems from poor general emotion regulation and can occur in any weight category. Bruch’s theory is useful in accounting for the initial development of emotional eating in children, whereas Macht’s five-factor model describes various relationships underlying emotions and eating behaviors. Drawing on both theories, children and adolescents who report high levels of emotional eating may have poor emotion regulation skills and learn to emotionally eat as a way to regulate emotions based upon familial influences during childhood. In this hybrid model, parental influence is conceptualized as mediating the relationship between emotion regulation and emotional eating (See Figure 3).

**Value Added Contribution**

This is the first study to describe emotional eating in an urban African-American sample of adolescents and female caregivers. Most studies have focused on emotional eating in the context of individuals’ body weight or BMI, typically comparing individuals who are overweight/obese to healthy weight children or adults. Past findings indicate that emotional eating is found across all weight categories and is not always uniquely associated with obesity (Van Strien, Frijters, Bergers, & DeFares, 1986; Geliebter & Aversa, 2003). Furthermore, although conditions related to emotional eating, such as binge eating disorder and disinhibited eating, have been widely researched, studies of these conditions have not addressed emotional eating as it relates to emotion regulation and to parenting characteristics. To date, no studies of parent-adolescent dyads have examined emotional eating as a strategy for emotion regulation that may also be
associated with parenting characteristics. The findings of this study may further our conceptual understanding of emotional eating by examining the relationships between emotion regulation strategies and emotional eating. These findings may inform interventions designed to encourage healthier eating in adolescents. Previous models of emotional eating suggest that this behavior is maladaptive, however it may be the way in which adolescents choose to regulate emotions that lead to poor dietary patterns.

**Study Aims**

The primary goal of this study was to examine emotional eating, general emotion regulation, and parenting characteristics in urban African-American parent-adolescent dyads across the weight spectrum. The aims of this investigation were to: (1) describe emotional eating in African-American adolescents; (2) investigate the possibility that high levels of emotional eating are related to maladaptive emotion regulation strategies; (3) determine if weight status is related to emotional eating; (4) examine parental correlates of children’s emotional eating; and (5) explore the influence of two mediational factors, including parental emotional eating and the child’s ability to regulate his/her emotions, on the relationship between parents’ emotion regulation and emotional eating in children (See Figure 3).

**Hypotheses**

The main hypotheses for the present study were as follows:

1. Previous literature indicates that disordered eating behaviors are related to poor emotion regulation in children (Czaja et al., 2009) and adults (Evers, Stok, de Ridder, 2010). Therefore, it is predicted that higher levels of emotional eating in parents and adolescents will be associated with lower emotion regulation.
2. As previous studies have found emotional eating present across all weight
categories (Van Strien, Frijters, Bergers, & DeFares, 1986; Geliebter & Aversa,
2003), it is predicted that no relationship will be found between children’s BMI z-
scores and their level of emotional eating.

3. Based on the role that parental modeling and socialization plays in the
development of child emotion regulation skills (Morris, Silk, Steinberg, Myers, &
Robinson, 2007; Eisenberg, Cumberland, and Spinrad, 1998), it is predicted that
higher levels of emotional eating and poorer adaptive emotion regulation
strategies in parents will predict higher levels of emotional eating in adolescents.
Given previous literature suggesting that negative parenting characteristics
influence eating behaviors (Joyce & Zimmer-Gembeck, 2009), it is predicted that
lower parental emotional availability as well as greater parental rejection,
psychological control, and lax behavioral control will predict higher levels of
emotional eating in adolescents.

4. Based on Macht’s (2008) integrative model linking affective processes to
emotional eating and Bruch’s (1969) theory on the development of emotional
eating in infants, it is predicted that parent emotional eating and adolescent
emotional regulation will mediate the association of parents’ emotion regulation
and parenting characteristics (i.e., lower emotional availability; greater parental
rejection, psychological control, and lax behavioral control) with emotional eating
in adolescents.
Methods

Participants Characteristics

The study sample was comprised of adolescents (ages 12-17 years old) and parents who were recruited from a primary care pediatric clinic that serves a predominantly low income, urban, African-American population. Demographic information is summarized in Table 1. A total of 100 adolescent-parent were recruited for the study. Four families chose to discontinue participation in the study due to time constraints. After families were approached, the RAs verified that the families met eligibility criteria (See Table 2 for a list of eligibility criteria). Research assistants facilitated the informed consent process with parents and adolescents. Parents signed consent forms and adolescents 15 years or older signed their caregiver’s consent forms and children 12-14 years old signed assent forms.

The original sample was comprised of 34 male adolescents (34% of the sample) and 66 female adolescents (66% of the sample), 89 female caregivers (89%) and 11 fathers/grandparents/legal guardians (11%). Thus, females comprised the majority of both the parent and adolescent sample. Due to the small number of parents/guardians who did not identify themselves as mothers, parent-adolescent dyads where the participating parent/guardian did not identify themselves as the adolescent’s mother were excluded from all analyses. However, female caregivers who were not necessarily the adolescent’s biological mother may have identified themselves as the adolescent’s mother due to cultural differences in maternal relations. For example, children/adolescents may refer to aunts and grandmothers who serve as the primary caregiver as their mother because this caregiver is serving the maternal role. Therefore, it is likely that our sample of self-
reported mothers may actually be a mixture of biological mothers and female caregivers who self-identified as mothers. Likewise, female caregiver-adolescent dyads who did not identify themselves as African-American were excluded in statistical analyses given that the majority of the sample identified themselves as African-American (90%). Consequently, only African-American female caregiver-adolescent dyads were included in analysis.  

The final sample consisted of 31 male children and 54 female children. The self-reported age of adolescents ranged from 12 to 17 years of age with a mean age of 14.7 (SD=1.7). The self-reported age of the female caregivers ranged from 28 to 88 years of age, with a mean age of 40.5 (SD=10.5). Fifty-three percent of female caregivers reported their marital status as single, 13% reported married, and 10% reported divorced.

**Procedure**

Participants were approached in the waiting room of an urban primary care pediatric clinic before their scheduled pediatric visit. The informed consent document was reviewed with the adolescent and their parent. Once written consent was obtained, parents and adolescents were asked to complete questionnaire packets assessing demographics, emotional eating, physical activity, and family relationships. In addition, height and weight were collected during the clinic visit in a private hallway located between clinic rooms or was obtained from a chart review of adolescent’s medical records. Adolescent participants were compensated for their time with a $10 gift card.

**Measures**

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1 The mean age for parents/legal guardians in the original sample was 40.17, ranging from 19 to 88 years of age. Sixty-four percent of parents/legal guardians from the original sample reported their marital status as single, 17% reported married, and 12% reported divorced; 5% did not specify a marital status.
1. Emotional Eating Scale for Children (EESC; Tanofsky-Kraff, et al., 2007): The Emotional Eating Scale (EESC) was designed to assess eating in response to specific emotions or feelings, such as anger or sadness (Tanofsky-Kraff, et al., 2007). The EESC is validated for children and adolescents 8 to 17 years of age. The EESC is 25-item self-report measure designed to assess youth’s drive to ameliorate negative affect by consuming food. The EES-C has a Likert five-point item response format ranging from no desire to overwhelming urge to eat. Mean scores range from 0 to 4, with higher scores indicating a stronger urge to eat in response to a negative mood state. Three subscales are derived from the EESC by taking the means of those items: anger/anxiety/frustration (EESC-AAF) is comprised of 14 items, depression (EESC-Dep) is comprised of 10 items, and feeling unsettled (EESC-UNS) has four items. The internal consistency for AAF, DEP, and UNS scales in this study were .95, .92, and .84, respectively. This questionnaire was used to identify levels of emotional eating in a nonclinical sample.

2. Emotion Regulation Checklist (Shields & Cicchetti, 1997): The Emotion Regulation Checklist is 24-item parent report of a child’s ability to self-regulate (Shields & Cicchetti, 1997). This measure is designed to measure different processes of emotion regulation, specifically affective lability, flexibility, valence, intensity, and situational appropriateness. Items on the checklist are weighted both positively and negatively on a four-point Likert scale, ranging from 1-rarely/never like this child to 4-almost always like this child. Internal consistency was .89, .79,
and .82 for lability/negative affect, emotion regulation, the overall ERC score, respectively. Lability/Negative affect and emotion regulation were considered alternative aspects of emotion regulation.

**Parent Emotional Regulation/Emotional Eating**

1. Emotional Eating Scale (EES; Arnow, Kenardy, & Agras, 1995): The Emotional Eating Scale is a questionnaire that measures eating in response to feeling emotion (EES; Arnow, Kenardy, & Agras, 1995). The 25-item self-report questionnaire assesses eating behavior in response to three specific negative affect states: anger/frustration, anxiety, and depression. Respondents are asked to indicate which types of feelings lead them to have urges to eat in response to an array of emotions, such as discouragement or feelings of inadequacy or excitement. The EES has a Likert five-point item response format, ranging from no desire to eat to an overwhelming urge to eat. Scores on the EES are computed by summing items within each scale and range from 0 to 100, with higher scores indicated higher levels of emotional eating. The internal consistency for this measure was .84, .88, and .79 for the EES subscales of Anger, Anxiety, and Depression, respectively.

2. Emotion Regulation Questionnaire (ERQ; Gross & John, 2003): The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) was designed to assess individual differences in the process of emotion regulation. The 10-item self-report questionnaire assesses two aspects of the emotion regulation process: suppression and reappraisal. Respondents are asked to rate how they regulate their emotions from 1-strongly disagree to 7-strongly agree based on questions such as
“When I want to feel more positive emotion, I change what I am thinking about.” Respondents are also asked how they manage their emotional expression based on questions such as “When I am feeling positive emotions, I am careful not to express them.”

Internal consistency for the cognitive reappraisal factor was previously reported as .72, .79, and .64 among young adult men, young adult women, and middle-aged women, respectively (John & Gross, 2004). Internal consistency for the suppression factor was .67, .69, and .64 for young adult men, young adult women, and middle-aged women, respectively (John & Gross, 2004). Test-retest reliability for the ERQ for the college sample of men and women is .70 over 3 months (John & Gross, 2004). Additionally, the ERQ was shown to have high convergent and discriminant validity with emotion regulation success, inauthenticity, coping, and mood regulation (Gross & John, 2003). Internal consistency for the present study was .47 and .82 for cognitive reappraisal and emotional suppression, respectively.

**Parenting Behaviors/Socialization of Emotion**

1. Children’s Report of Parent Behavior (CRPBI-30; Schludermann & Schludermann, 1988): The Children’s Report of Parent Behavior (CRPBI-30; Schludermann & Schludermann, 1988), a shortened version of the CRPBI (Schaefer, 1965), measures three dimensions of parent-child relations: acceptance/rejection, psychological control/psychological autonomy, and firm control/lax control. Adolescents are asked to rate the extent to which a statement reflects their mother’s or father’s parenting style. All questions begin with “My
mother (father) is a parent who…” and the adolescent responds to statements, such as “makes me feel better after talking over my worries with her (him)” and “is very strict with me.” The item-response format ranges from 1-not like yourself to 3-a lot like yourself. The CRPBI-30 is appropriate for children 7 to 17 years of age. Internal consistency for the CRPBI-30 scales ranged from .72 to .97 for the present study.

2. Parent Attitude Toward Children’s Expressiveness Scale (PACES; Saarni, 1989): The PACES questionnaire was designed to assess the degree to which parents are accepting or rejecting of their adolescent’s display of emotion (Saarni, 1989). The scale consists of a total of 20 multiple-choice items. Each question has the stem “If my school age child…” and parents choose one of four answers that elucidate how the parents would respond in that hypothetical situation. The response format is a 4-point Likert scale, ranging from accepting to controlling (i.e. 1 = “smile understandingly at my child;” 2 = “ignore it;” 3 = “frown at my child,” 4 = “frown and also tell my child to be quiet”). High scores indicate a more controlling response toward the child whereas low scores indicate a more accepting or permissive approach to parenting. Previous research with PACES has demonstrated strong construct validity and discriminant validity and internal consistency. In addition, test-retest reliability is .77 over a four week interval, and internal consistency was .76 for a sample of mothers and fathers (Saarni, 1989). Internal consistency for this measure was .49 for the present study.

3. Lum Emotional Availability of Parents Scale (LEAP; Lum & Phares, 2005): The Lum Emotional Availability of Parents Scale (LEAP; Lum & Phares, 2005; Lum,
Phares, & Roberts, 1996) was developed to measure parental emotional availability through child report. Emotional availability is defined as the level of emotional involvement, responsiveness, and sensitivity shown by the parent toward the child. The LEAP measure consists of 15 items. The questionnaire asks a child to rate their mother’s and father’s behavior for each statement on a scale from 1-Never to 6-Always. The LEAP measure is appropriate for participants as young as 9 years of age. Test-retest reliability for the LEAP scale is .97 for mothers and .96 for fathers (Lum & Phares, 2005). Convergent validity of this measure has been established with the Children’s Report of Parent Behavior-Revised, the Parental Bonding Instrument, and the My Memories of Upbringing (Lum & Phares, 2005). Internal consistency in the present study was .97 for mothers.

**Binge Eating**

1. **Questionnaire on Eating and Weight Patterns-Adolescent Version Patterns (QEWP-A; Johnson, Grieve, Adams, & Sandy, 1999):** The adolescent version of the Questionnaire of Eating and Weight Patterns (QEWP-A; (Johnson, Grieve, Adams, & Sandy, 1999) was developed to assess the level of binge-eating symptoms in preadolescents and adolescents. The QEWP-A is a 12-item questionnaire based off the original QEWP (Spitzer, et al., 1992) that was designed to assess behavioral criteria and symptoms (i.e., loss of control over eating, frequency of binges, etc.) related to binge eating disorder. The revisions of the QEWP involved 1) the substitution of words for more age appropriate synonyms for the adolescent version of the questionnaire and 2) items 9 and 12
were combined to form a single question with two parts. Levels of binge eating were assessed based on whether adolescents met criteria for Binge Eating Syndrome according to Spitzer and colleagues’ criteria (1992): 1) eating a large amount in the past 6 months in which the overeating occurred within a 2 hour time period and item 2) a feeling of loss of control while consuming a large amount of food at least twice a week (For additional scoring criteria, see (Spitzer, et al., 1992) 3). Items related to feelings of distress while eating were not included in binge eating scores. Binge eating syndrome for the QEWP has demonstrated adequate reliability with internal consistency at .75 in a community sample (Spitzer at al., 1992). Johnson and colleagues (1999) found good concurrent validity for the QEWP-A in a nonclinical binge-eating group, which included episodic overeating, binge eating, binge eating syndrome, and binge eating syndrome plus significant distress. Participants with subclinical levels of binging scored lower on the children’s version of the Eating Attitudes Test than adolescents diagnosed with binge eating syndrome and scored higher than adolescents reporting no problematic eating behaviors. The reliability of the QEWP-A for subclinical levels of binge eating was stable for males over a three-week time period, but less stable for females (Johnson, Kirk, & Reed, 2001). The QEWP-A was included to distinguish emotional eating from binge eating behaviors.

*Physical Measurement*

1. **Body Mass Index** Body Mass Index (BMI) is a body weight measurement that is adjusted for height and age. BMI is calculated based on the height and weight,
using the equation weight (in kilograms) divided by height squared (in meters), or kg/m\(^2\). The parent’s BMI was collected through self-report of their height and weight. The child’s BMI was collected either by taking height and weight measurements during the visit or by collecting adolescents’ anthropometric data recorded by nurses at that visit on the medical record chart. The researchers classified children’s BMI in accordance with the most recent Expert Committee recommendations (Barlow & Committee, 2007), in which BMI-for-age percentiles were computed based on Centers for Disease Control (CDC) norms. BMI less than the fifth percentile is classified as underweight, BMI between the fifth percentile and 84\(^{th}\) percentile is classified as healthy weight, BMI between 85\(^{th}\)-94\(^{th}\) percentile as overweight, and a BMI greater than or equal to the 95\(^{th}\) percentile classified as obese (Barlow & Committee, 2007). BMI z-scores were used in analyses.

**Data Analysis Plan**

Descriptive and inferential statistics were computed using SPSS 19.0 with significance levels set at p<.05. Means and standard deviations were calculated for continuous data. Frequencies were computed for categorical variables. Preliminary correlational relationships between emotional eating in adolescents and background characteristics (i.e., age, sex) were analyzed to determine whether these variables needed to be included as covariates in regression analyses. Correlational analyses were also conducted on questionnaire scales to examine collinearity.

Descriptive statistics were used to describe emotional eating in adolescents and female caregivers. Linear regressions with age predicting the emotional eating subscales
were conducted to determine if age should be included as a covariate in subsequent analyses. Independent samples t-tests were conducted to test for sex differences of emotional eating in adolescents. Means and standard deviations were computed to assess levels of eating in response to emotions in adolescents and their female caregivers. One-way analysis of variance (ANOVA) with follow-up paired t-tests were used to compare mean levels of emotional eating in response to different emotions in adolescents and female caregivers. After examining the assumptions necessary for such analyses (e.g., normality, multicollinearity, homoscedasticity, independent errors, linearity), a series of regressions were used to investigate predictors of emotional eating (EESC) in adolescents. Background characteristics (i.e., age, sex) and binge-eating behaviors were controlled for in all regressions. Binge eating was included as a covariate in all regression analyses as well. Hierarchical linear regression was used to test the first hypothesis. An exploratory factor analysis (without rotation) indicated that EESC items loaded onto one factor, rather than the three previously identified subscales (Anger/Anxiety/Frustration [AAF], Depression, Unsettled) (Table 3). Therefore, a composite mean was created and used as the outcome variable for emotional eating in adolescents. The predictor variables were the Lability/Negativity scale and the Emotion Regulation scale on the ERC. Associations of each of the adolescent emotion regulation variables with the EES composite were examined in separate regressions after controlling for background characteristics and binge eating.

To test the second hypothesis, a hierarchical linear regression was used to determine whether weight status predicted emotional eating in adolescents. The outcome variable was the EESC composite mean. The predictor variable was the computed
adolescent BMI z-score. Background characteristics were entered into the first block followed by BMI z-scores in the second block.

Linear regression was used to test the third hypothesis, in which the outcome variable was the EESC composite mean. Given the significant positive correlations among EES subscales, a composite sum of the EES was created of the three EES subscales. The regression included the following maternal parenting variables reported by female caregivers or adolescents as predictors: 1) EES composite mean; 2) ERQ cognitive reappraisal and emotional suppression subscales; 3) PACES total subscale; 4) maternal LEAP subscale, and 5) CRPBI maternal acceptance/rejection, psychological control/psychological autonomy, and firm control/lax control subscales. Associations of each of the maternal parenting variables with the EES composite were again examined in a regression, after controlling for sex, age and binge eating.

Mediational analyses were conducted in accordance with Baron and Kenny’s model to test the fourth hypothesis. According to Baron and Kennedy (1986), four conditions must be met in order for mediation to be present. First, the mediators (emotional eating in parents, child emotion regulation) must be significantly associated with the predictors (parent emotion regulation/parenting behaviors). Second, the mediators must also be significantly associated with the outcome variable (emotional eating in adolescents). Third, poor emotion regulation in parents must be significantly associated with higher levels of emotional eating in adolescents. Finally, the relationship between the mediators and the outcome variable must evidence a decline in the strength of the relationship after controlling for the mediators. Three regressions were used to test the mediation: 1) parent emotion regulation/parenting behaviors predicting emotional
eating in adolescents; 2) parent emotion regulation/parenting behaviors predicting mediators (i.e. adolescent emotion regulation, parental emotional eating); 3) mediators predicting emotional eating adolescents, controlling for parent emotion regulation/parenting behaviors. Mediation was established by examining whether the relationship between parent emotion regulation/parenting behaviors and child emotional eating was significantly reduced in the third regression using the Sobel test.

**Results**

**Normality and Exploratory Factor Analysis**

The data met assumptions for normality for emotional eating in response to depression (skewness z-score=.82, kurtosis z-score= 0.12), unsettled (skewness z-score=.90, kurtosis z-score= -.21), and for the composite (skewness z-score= 1.34, kurtosis z-score= 1.34). Skewness and kurtosis z-scores for emotional eating in response to anger/anxiety/frustration were 2.62 and 2.06, respectively. The skewness value indicates an uneven distribution of anger/anxiety/frustration scores that fall mostly on the left. The kurtosis value for this subscale suggests a leptokurtic shape of the distribution. Results from the exploratory factor analysis indicate that all items loaded most highly onto the first factor, which lends support for creating a composite variable (Table 3). Results met requirements for assumptions of regression analysis (e.g., multicollinearity, homoscedasticity, independent errors, etc.).

**Descriptive Statistics of Emotional Eating**

The means for emotional eating as reported by adolescents were 0.80 (SD=.90) for AAF, 0.96 (SD=.91) for depression, and .84 (SD=.92) for unsettled emotions. Results
from an ANOVA indicated a significant main effect for levels of eating in response to
different emotions in adolescents, $F(2,168)= 3.14$, $p<.05$, partial $\eta^2 = .04$. Follow up
paired samples t-test indicated that adolescents reported higher levels of eating in
response to depression vs. AAF on the EESC ($t(85)= -4.11$, $p=.000$). There were no
differences between levels of eating in response to AAF vs. unsettled emotion ($t(85)= - .55$, $p=.59$) or depression vs. unsettled emotion ($t(85)= 1.53$, $p=.13$). Adolescents
reported similar degrees of emotional eating when comparing unsettled emotion to AAF
or Depression, however eating in response to depression was more frequently endorsed
than eating in response to AAF.

The level of emotional eating in parents significantly differed depending on the
type of negative emotion. Parent-reported means of emotional eating were $5.96$
(SD=6.62) for anger, $5.63$ (SD=5.06) for anxiety, and $4.21$ (SD=3.72) for depression.
Results from an ANOVA indicated a significant main effect for levels of eating in
response to different emotions in parents, $F(2,158)= 7.76$, $p<.01$, partial $\eta^2 = .09$. Follow
up paired samples t-tests indicated that female caregivers more frequently endorsed
eating in response to anger ($t(80)= 3.04$, $p=.003$) and anxiety ($t(80)= 3.31$, $p=.001$) than
in response to depression. No differences were found between levels of eating in response
to anger vs. anxiety ($t(80)= .86$, $p=.391$).

Table 4 shows the correlations among variables. Age was not significantly
predictive of eating in response to AAF ($\Delta R^2= .01$, $F= 1.62$, $p=.21$) or depression ($\Delta R^2= .01$, $F= 1.83$, $p=.18$), however the relation of age to unsettled emotion approached
significance ($\Delta R^2= .03$, $F= 3.67$, $p=.06$). An independent samples t-test revealed no sex
differences in levels of eating in response to AAF ($t(83)= .88, p=.38$), depression ($t(83)= .29, p=.77$), or unsettled ($t(83)= 1.51, p=.14$) emotions.

**Descriptive Analyses of BMI**

The distribution of BMI across weight categories is shown in Table 5 for adolescents and in Table 6 for female caregivers. The majority of adolescents’ BMI fell in the healthy weight category according to BMI for age percentiles charts. The mean BMI for female adolescents was 24.37 (SD=6.74) and 24.04 (SD=7.9) for male adolescents. An independent samples t-test did not indicate sex differences in adolescents’ BMI ($t(78)= -.20, p=.84$).

**Hypothesis 1: Higher levels of emotional eating in adolescents will be positively associated with fewer adaptive emotion regulation skills in adolescents.**

Contrary to hypothesis 1, neither the Lability/Negativity nor Emotion Regulation subscales of the ERC were predictive of emotional eating in adolescents when controlling for demographic characteristics and binge eating (Table 7).

**Hypothesis 2: There will not be a relationship between children’s BMI z-scores and their level of emotional eating.**

Results did not indicate a link between higher levels of emotional eating and higher levels of BMI when controlling for binge eating and background characteristics (Table 8).

**Hypothesis 3: Parental and parenting variables will predict higher levels of emotional eating in adolescents.**

Higher levels of maternal emotional eating and maternal firm control were associated with higher levels of emotional eating in adolescents. However, associations
with emotional eating in adolescents were not found for other maternal variables, including cognitive reappraisal, emotional suppression, acceptance of emotional expression, acceptance/rejection, and psychological control/autonomy (Table 9).

**Hypothesis 4: Parental emotional eating and parenting behaviors will mediate the association between parents’ emotion regulation and emotional eating in adolescents.**

The meditational model was not supported by regression results. After controlling for demographic characteristics, neither cognitive reappraisal (b = -.08, p = .61) nor emotional suppression (b = .11, p = .51) predicted emotional eating in adolescents. The coefficient for maternal firm control (b = .27, p = .03) was significant in the first regression relating maternal parental behaviors to adolescents’ emotional eating; this factor was not associated with lability/negative emotion (b = .18, p = .16), emotion regulation (b = .00, p = .99), or parents’ emotional eating (b = -.10, p = .44). All other maternal parenting variables did not predict emotional eating in adolescents.

**Discussion**

The current study was the first to our knowledge to examine the role of maternal and adolescent emotion regulation skills in adolescents’ emotional eating behaviors in African-American families. Although the findings did not support many of the study hypotheses, the results provide new information on factors related to emotional eating in African-American adolescents and their female caregivers. The findings showed that African-American adolescents reported higher levels of eating in response to depression compared to feelings of anger, anxiety, or frustration. It may be that food consumption
alleviates feelings of sadness in African-American adolescents more successfully than it alleviates anxiety, anger, or frustration. In contrast to adolescents, female caregivers more frequently endorsed eating in response to feelings of anger, frustration, and anxiety compared to depression.

Consistent with these findings, past research indicates that negative mood, such as sadness, elicits attentional bias towards food and is related to increases in self-reported appetite (Hepworth, Mogg, Brignell, & Bradley, 2010). It may be that African-American adolescents may report higher levels of emotional eating in response to depressed feelings due to attentional bias related to that emotion. The differences between female caregivers and adolescents may be related to age differences, in that emotional eating may serve a different purpose in adolescents than in adults.

However, the findings from this study do not support the hypothesis that maladaptive emotion regulation skills in adolescents predict higher levels of emotional eating (hypothesis 1). This was surprising given that several studies found associations between emotion regulation and increased food consumption in adults (Evers, Stok, & de Ridder, 2010). Maladaptive emotion regulation strategies have also been positively associated with emotional eating in preadolescent children (Czaja, Rief, & Hilbert, 2009). One possible reason for the lack of association of emotional eating and emotion regulation is that the former variable was obtained from adolescent self-report and the latter from parent report. Previous research found low associations between adolescent and parent report of emotional eating (Snoek, et al., 2007), which suggests the need for experimental studies to determine accurate levels of emotional eating as well as individuals’ insights into their levels of emotional eating. Collection of data on emotion
regulation from the parent may thus have partially responsible for failure to confirm this hypothesis. A further possibility is that emotional eating in African American adolescents is not related to their emotion regulation more generally but may instead reflect a culturally appropriate behavior. Rather than viewing emotional eating as a maladaptive response to emotions, emotional eating may be a normative and potentially adaptive response to emotions in African-American culture. Assessments of adolescent psychopathology and investigations of normative patterns of eating in this population would be useful in exploring this possibility.

In this set of analyses, there was no link between higher levels of emotional eating and higher levels of BMI. It should be noted, however, that this study was underpowered to detect what might be a small effect in terms of low BMI and high levels of emotional eating. Consistent with findings from other studies examining emotional eating and weight status in youth (Caccialanza, et al., 2004; Tanofsky-Kraff, et al., 2007), these analyses fail to provide strong evidence that suggest a unique relationship between emotional eating and obesity and provide contradictory evidence to the notion that only adolescents who are overweight or obese emotionally eat.

The findings also offer support for the hypothesis that maternal parenting behaviors predict emotional eating (hypothesis 3). Emotional eating in adolescents was associated with higher levels of maternal emotional eating and with maternal parenting characterized by higher levels of firm control. Similar patterns emerged from a recent study examining parenting practices in relation to emotional eating in a Dutch sample of adolescents and their parents (Snoek, et al., 2007). Findings suggested that when parents reported on parenting behaviors, these variables were not related to adolescents’ levels of
emotional eating. However, adolescent report of parenting behaviors was associated with adolescents’ emotional eating (Snoek, et al., 2007). Specifically, lower levels of maternal support and higher levels of psychological control were associated with higher levels of emotional eating in younger adolescents. In addition, behavioral control, which is similar to firm control, was positively associated with emotional eating in older adolescents (Snoek, et al., 2007). The findings from this study are also consistent with positive associations found between restrictive feeding practices and disinhibited eating (Joyce & Zimmer-Gembeck, 2009). It may be that parents who set overly strict behavioral limits may provide an environment that inhibits adaptive emotional expression and that emotional eating occurs in an effort to cope with negative feelings.

The expectation that parents’ emotional eating and children’s emotion regulation skills mediate the relationship between parenting behaviors/parent emotion regulation skills and levels of emotional eating in adolescents (hypothesis 4) was not supported. It may be that emotional eating is influenced by other factors in African-American families. Given that African-American adolescents tend to spend more time with a wider array of family members, emotional eating and emotion regulation behaviors of multiple caregivers besides female caregivers may influence emotional eating in African-American adolescents. In turn, adolescents may develop a broader base of emotion regulation skills. Other studies have examined these behaviors primarily in two-parent Caucasian households with different patterns of familial relationships (Brown & Ogden, 2004; Snoek, et al., 2007).

The present results failed to confirm the gender differences found in some previous studies (Snoek, et al., 2007; Tanofsky-Kraff, et al., 2007), which suggest girls
report more emotional eating than boys. Tanofsky and colleagues’ study was comprised primarily of Caucasian children and adolescents. The sample in Snoek and colleagues’ study (2007) included Dutch adolescents from intact nuclear families, with both biological parents living together. The family structure of Caucasian and Dutch adolescents may lead to more time spent with both mothers and fathers. As a consequence, Caucasian and Dutch adolescents may have greater exposure to the modeling and socialization of emotional eating in males and females from both parents. In contrast, African-American adolescents spend more time with their mothers/female caregivers and extended relatives, and very little time with their fathers (Larson, Richards, Sims, & Dworkin, 2001). Thus, African-American male and female adolescents may be more likely to acquire similar patterns of emotional eating from their female caregivers. Alternatively, the study may have lacked power for detection of gender differences due to the relatively small proportion of male compared to female adolescents in the sample (36% vs. 64%). Similar to findings by Snoek and colleagues (2007), the results also failed to indicate age differences in levels of emotional eating.

Limitations and Future Directions

The results of this study need to be interpreted in the context of several methodological limitations. First, it is not clear whether this sample was representative of African-American female caregivers and adolescents. Socioeconomic status (SES) and employment status were not collected from parents. The primary care clinic from which participants were recruited primarily serves low-income families whose ethnicity is mostly African-American; however without a proxy for SES, it is unclear whether the parents and adolescents of this sample is typical of the broader population of African-
American families. Likewise, because the sample was comprised entirely of African-Americans, the findings cannot be generalized to other ethnic populations. In addition, too few fathers participated to include their data in the analyses. More generally, the sample was relatively small and may have been underpowered to explore the relationship between adolescents’ weight status and emotional eating. With a larger sample size, this study may have found a significant association between lower weight status and higher levels of emotional eating. The sample was also limited to the adolescent age range. Age differences in emotional eating or the factors associated with this behavior may have emerged had we included children as well as adolescents.

Second, because the findings consist of correlations between measures from a cross-sectional data set, they must be interpreted with caution. Scores for eating in response to anxiety/anger/frustration were not normally distributed. Adolescents do not seem to use the upper end of the EESC scales for most items on the scale, and therefore it may be that only the lower end of the scale should be used in a community sample of adolescents. Levels of emotional eating as reported by adolescents are generally low (Snoek, et al., 2007; Tanofsky-Kraff, et al., 2007; van Strien, et al., 1986) and this behavior may be less of a risk factor for current problems in eating or emotional regulation than for the development of these problems later in life. Although emotional eating and weight status have not been associated in adolescents, higher levels of emotional eating have been linked to later increases in food consumption (Evers, et al., 2010). Furthermore, emotional eating has been found to related to increased intake of foods that are higher in sugar and fat as well as foods with greater energy density.
(Gibson, 2006). It is well known that dietary habits learned in childhood tend to persist into adulthood (Mikkila, Rasanen, Raitakari, Pietinen, & Viikan, 2005).

Third, the results of this study are based on questionnaire data. Adolescents reporting on emotional eating may not be accurate in their report of emotional eating if they do not have insight into their own eating behaviors or emotions. Similarly, female caregivers may not accurately report adolescents’ ability to regulate their emotions. One especially important limitation in this regard is the fact that ratings of adolescents’ emotion regulation were collected from parents while ratings of emotional eating were obtained from adolescents’ self-report. In addition, the reliabilities on two of the parent measures were very low. The PACES questionnaire, to our knowledge, has not been validated in a predominantly African-American sample of parents, which may have contributed to the low internal consistency. The ERQ has been shown to be a reliable measure in samples with African-American women, with internal consistency of .80 for the cognitive reappraisal scale (Gross & John, 2003). Their sample, however, consisted of undergraduate students whose literacy rates are most likely higher compared to the community sample in the present study. Anecdotally, numerous patients asked for clarification on these measures. The lack of reliability may have been due to difficulty in understanding items on the questionnaires.

Despite these limitations, this is the first study to describe patterns of emotional eating in a sample of African-American adolescent-parent dyads. It is also the first study to explore the nature of parenting variables of African-American female caregivers in relation to emotional eating in African-American adolescents. Directions for future research include the use of clinical interviews rather than or in addition to questionnaires,
collection of adolescent self-reports and experimental studies of both emotion regulation and emotional eating, collection of information on adolescent psychopathology, inclusion of a broader age range, and examination of the effects of family structure and the influences of multiple family members on eating behaviors. The number of household guardians or the amount of time spent with adolescents may influence levels of emotional eating in African-American culture. Research examining the amount of time spent with families suggest that young urban African-American adolescents spend more time with extended family members compared to European American adolescents (Larson, et al., 2001). Examining emotional eating in relation to African-American fathers, as well as family structure, may provide a better understanding of the nature of emotional eating in this culture by exploring the nature of emotional eating between both parents and between African-American fathers and their child. A longitudinal study examining emotional eating, food intake, and weight status would also further knowledge about the influence of parents on the development of emotional eating, as well as future mental and physical health. This study design would also clarify the sequential pattern of factors related to emotional eating. If emotional eating is a precursor to the later development of poor emotion regulation, the hypothesized association between emotional eating and emotion regulation may become evident only by following adolescents over time.
Table 1. Participant Demographic Characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Parents (n=100)</th>
<th>Adolescent (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographic characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females, n (%)</td>
<td>92 (98%)</td>
<td>63 (65%)</td>
</tr>
<tr>
<td>Age, M (SD)</td>
<td>40.2 (10.6)</td>
<td>14.7 (1.7)</td>
</tr>
<tr>
<td>Ethnicity, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American</td>
<td>90 (90%)</td>
<td>94 (94%)</td>
</tr>
<tr>
<td>Caucasian</td>
<td>4 (4%)</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Interracial/Multiracial</td>
<td>1 (1%)</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Marital Status, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>64 (64%)</td>
<td>-</td>
</tr>
<tr>
<td>Married</td>
<td>17 (17%)</td>
<td>-</td>
</tr>
<tr>
<td>Divorced</td>
<td>12 (12%)</td>
<td>-</td>
</tr>
</tbody>
</table>
### Table 2. Eligibility Criteria for Enrolling Participants

<table>
<thead>
<tr>
<th>Inclusion</th>
<th>Exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Adolescents must be between the ages of 11 and 17 years</td>
<td>1) Inability to read English (parent or child)</td>
</tr>
<tr>
<td>2) Patient is visiting the RAP clinic for services</td>
<td>2) If the adolescent has a developmental delay severe enough that he or she is unable to comprehend the questions (this will be evaluated by asking the parent whether the child receives special services in school, has an Individualized Education Plan, or is in special education classes)</td>
</tr>
<tr>
<td>3) Adolescent and parent are able to complete the questionnaires fairly independently with some assistance as needed to clarify certain questions</td>
<td>3) Adolescent has a genetic disorder (Prader-Willi Syndrome) that causes obesity and effects satiety.</td>
</tr>
</tbody>
</table>
**Table 3.** Rotated Factor Matrix of Emotional Eating Scale for Children and Adolescents

<table>
<thead>
<tr>
<th></th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>worried</td>
<td>.793</td>
<td>-.235</td>
<td>.145</td>
<td>.125</td>
</tr>
<tr>
<td>upset</td>
<td>.793</td>
<td>-.279</td>
<td>.112</td>
<td>-.127</td>
</tr>
<tr>
<td>uneasy</td>
<td>.789</td>
<td>.113</td>
<td>.022</td>
<td>.048</td>
</tr>
<tr>
<td>shaky</td>
<td>.781</td>
<td>.171</td>
<td>-.043</td>
<td>-.496</td>
</tr>
<tr>
<td>stressed out</td>
<td>.774</td>
<td>-.297</td>
<td>-.122</td>
<td>.209</td>
</tr>
<tr>
<td>angry</td>
<td>.774</td>
<td>-.417</td>
<td>-.031</td>
<td>-.072</td>
</tr>
<tr>
<td>discouraged</td>
<td>.762</td>
<td>.143</td>
<td>.005</td>
<td>-.182</td>
</tr>
<tr>
<td>irritated</td>
<td>.760</td>
<td>-.073</td>
<td>-.097</td>
<td>.179</td>
</tr>
<tr>
<td>frustrated</td>
<td>.759</td>
<td>-.361</td>
<td>-.328</td>
<td>.040</td>
</tr>
<tr>
<td>lonely</td>
<td>.750</td>
<td>-.053</td>
<td>.177</td>
<td>.149</td>
</tr>
<tr>
<td>furious</td>
<td>.749</td>
<td>-.218</td>
<td>-.138</td>
<td>.066</td>
</tr>
<tr>
<td>sad</td>
<td>.747</td>
<td>-.315</td>
<td>-.060</td>
<td>-.141</td>
</tr>
<tr>
<td>disobedient</td>
<td>.737</td>
<td>.267</td>
<td>-.060</td>
<td>-.058</td>
</tr>
<tr>
<td>confused</td>
<td>.736</td>
<td>.035</td>
<td>.194</td>
<td>-.140</td>
</tr>
<tr>
<td>guilty</td>
<td>.734</td>
<td>.279</td>
<td>.078</td>
<td>.071</td>
</tr>
<tr>
<td>jealous</td>
<td>.719</td>
<td>.341</td>
<td>-.288</td>
<td>.069</td>
</tr>
<tr>
<td>helpless</td>
<td>.707</td>
<td>.205</td>
<td>-.247</td>
<td>-.128</td>
</tr>
<tr>
<td>nervous</td>
<td>.688</td>
<td>-.027</td>
<td>.440</td>
<td>-.154</td>
</tr>
<tr>
<td>excited</td>
<td>.677</td>
<td>.341</td>
<td>-.203</td>
<td>-.093</td>
</tr>
<tr>
<td>down</td>
<td>.675</td>
<td>-.268</td>
<td>.264</td>
<td>.044</td>
</tr>
<tr>
<td>on edge</td>
<td>.667</td>
<td>-.126</td>
<td>-.097</td>
<td>.064</td>
</tr>
<tr>
<td>resentful</td>
<td>.659</td>
<td>.063</td>
<td>-.287</td>
<td>.130</td>
</tr>
<tr>
<td>not doing enough</td>
<td>.606</td>
<td>.050</td>
<td>.302</td>
<td>-.074</td>
</tr>
<tr>
<td>bored</td>
<td>.551</td>
<td>.326</td>
<td>.380</td>
<td>.293</td>
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<tr>
<td>worn out</td>
<td>.520</td>
<td>.184</td>
<td>-.002</td>
<td>.300</td>
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<tr>
<td>---</td>
<td>---</td>
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<td></td>
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<tr>
<td>12</td>
<td>53</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>24</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>35</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>46</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>57</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>68</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>79</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>91</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>102</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>113</td>
<td>25</td>
<td></td>
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</tr>
<tr>
<td>1</td>
<td>124</td>
<td>26</td>
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</tr>
</tbody>
</table>

**Table 4:** Inter-correlation Matrix: Covariates, Outcomes & Predictors
### Table 5. Distribution of Adolescents’ Weight Status

<table>
<thead>
<tr>
<th>BMI Category</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female</strong></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>0%</td>
</tr>
<tr>
<td>Healthy weight</td>
<td>43%</td>
</tr>
<tr>
<td>Overweight</td>
<td>11%</td>
</tr>
<tr>
<td>Obese</td>
<td>12%</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>3%</td>
</tr>
<tr>
<td>Healthy weight</td>
<td>17%</td>
</tr>
<tr>
<td>Overweight</td>
<td>8%</td>
</tr>
<tr>
<td>Obese</td>
<td>7%</td>
</tr>
</tbody>
</table>

Note: Distribution of weight status in adolescents according to the Centers for Disease Control and Prevention 2000 standards (Kuczmarski, Ogden, & Guo, 2002).
Table 6. Distribution of Female Caregivers’ Reported Weight Status

<table>
<thead>
<tr>
<th>BMI</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>0%</td>
</tr>
<tr>
<td>Healthy weight</td>
<td>18%</td>
</tr>
<tr>
<td>Overweight</td>
<td>24%</td>
</tr>
<tr>
<td>Obese</td>
<td>58%</td>
</tr>
</tbody>
</table>
Table 7. Results of Hierarchical Regression Relating Background Factors, Lability/Negative Emotion, and Emotion Regulation to Emotional Eating in Adolescents

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Standardized β</th>
<th>p</th>
<th>R²</th>
<th>p</th>
<th>R² Δ</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent Age</td>
<td>-.169</td>
<td>.127</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent Sex</td>
<td>-.135</td>
<td>.225</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge Eating</td>
<td>.268</td>
<td>.018</td>
<td>.111</td>
<td>.032</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent Age</td>
<td>-.170</td>
<td>.130</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Sex</td>
<td>-.134</td>
<td>.233</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge Eating</td>
<td>.266</td>
<td>.022</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negativity/Lability</td>
<td>.010</td>
<td>.927</td>
<td>.111</td>
<td>.068</td>
<td>.000</td>
<td>.927</td>
</tr>
<tr>
<td><strong>Step 2:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent Age</td>
<td>-.170</td>
<td>.129</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Sex</td>
<td>-.134</td>
<td>.232</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge Eating</td>
<td>.267</td>
<td>.019</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Emotion Regulation</td>
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<td>.901</td>
<td>.111</td>
<td>.068</td>
<td>.000</td>
<td>.901</td>
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</tbody>
</table>
Table 8. Results of Hierarchical Regression Relating Background Factors and Adolescent BMI to Emotional Eating in Adolescents

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Standardized β</th>
<th>p</th>
<th>R² p</th>
<th>R² Δ p</th>
<th>R² Δ p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent Age</td>
<td>-.163</td>
<td>.148</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent Sex</td>
<td>-.095</td>
<td>.400</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Binge Eating</td>
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<td>.016</td>
<td>.107</td>
<td>.041</td>
<td></td>
</tr>
<tr>
<td>Step 2:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent Age</td>
<td>-.144</td>
<td>.205</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Sex</td>
<td>-.091</td>
<td>.422</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge Eating</td>
<td>.272</td>
<td>.018</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent BMI</td>
<td>-.134</td>
<td>.236</td>
<td>.125</td>
<td>.047</td>
<td>.018</td>
</tr>
</tbody>
</table>
Table 9. Results of Hierarchical Regression Relating Background Factors and Parenting Variables to Emotional Eating in Adolescents

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Standardized β</th>
<th>p</th>
<th>R²</th>
<th>p</th>
<th>R² Δ</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent Age</td>
<td>-.163</td>
<td>.147</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent Sex</td>
<td>-.151</td>
<td>.180</td>
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<td></td>
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<tr>
<td>Binge Eating</td>
<td>.267</td>
<td>.020</td>
<td>.112</td>
<td>.034</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent Age</td>
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<td>.203</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Child Sex</td>
<td>-.194</td>
<td>.092</td>
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<tr>
<td>Binge Eating</td>
<td>.189</td>
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<td>Maternal Emotional Eating</td>
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<td>.037</td>
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<td>Maternal Firm Control</td>
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<td>.040</td>
<td>.205</td>
<td>.006</td>
<td>.092</td>
<td>.022</td>
</tr>
</tbody>
</table>
Figure 1. Negative Affect Partially Mediating the Relationship Between Body Dissatisfaction, Negative Affect, and Bulimic Symptoms (Sim & Zeman, 2005)
Figure 2. Macht’s (2008) Five-Factor Model of Emotional Eating
Figure 3. Hypothesized Model of Parental Emotional Eating and Adolescent Emotion Regulation Mediating the Relationship Between Parenting Variables and Adolescent Emotional Eating
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role of the parenting context. *Appetite*, 52, 726-734.


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