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Abstract

Past research suggests an association between parents’ and children’s emotional eating, but research has yet to examine mechanisms underlying this association. Objective The current study examined whether feeding for emotion regulation mediates the association between parents’ and children’s emotional eating, and whether this association is moderated by children’s self-regulation in eating. Method 95 parents reported on their own and their children’s emotional eating, their children’s self-regulation in eating, as well as their feeding practices. Results Findings revealed that feeding for emotion regulation mediated the association between parents’ and children’s emotional eating when children’s self-regulation in eating was low, but not when self-regulation in eating was high. Conclusion The current findings demonstrate the complexity of the link between parents’ and children’s emotional eating, suggesting practitioners should consider both feeding practices and children’s self-regulation in eating when designing intervention programs.

Key words: children; emotional eating; feeding practices; mediation; moderation; self-regulation.

Curbing childhood obesity is a priority for researchers, practitioners, and parents because of the numerous health-related and psychosocial outcomes associated with being obese (Schwartz & Brownell, 2007). Although there are many biological and ecological factors associated with childhood obesity, eating in response to emotional arousal puts children at risk. When a child engages in emotional eating, he or she is consuming food based on external cues (i.e., feeling happy, sad, or bored), and ignoring his or her internal physiological cues related to hunger and fullness (Bruch, 1964; van Strien, Frijters, Bergers, & Defares, 1986). Emotional eating can occur either in response to positive emotions (e.g., after receiving good news) or negative emotions (e.g., after a personal tragedy or loss; Braet, 2008; Geliebter & Aversa, 2003; Nolan, Halperin, & Geliebter, 2010). The focus of the current study is on children’s emotional eating in response to negative emotions, as this type of emotional eating appears particularly problematic and is associated with greater consumption of foods and higher weight status (Braet, 2008; Carper, Fisher, & Birch, 2000; Elfhag, Tholin, & Rasmussen, 2008). Further, emotional eating is also predictive of binge eating for preadolescents and adults, so emotional eating during early childhood may serve as an indicator of future problematic eating behavior (Allen, Byrne, La Puma, McLean, & Davis, 2008; Eldredge & Agras, 1996).

Extant research suggests that parents’ emotional eating is positively associated with their children’s emotional eating (Jahnke & Warschburger, 2008)—highlighting the possible role of genetics and the socialization of these behaviors, yet few studies have examined the mechanisms underlying the association between parents’ and children’s emotional eating. Thus, the current study examined whether parents might socialize emotional eating through their use of emotion regulation feeding practices (i.e., using foods to soothe emotional arousal). In addition, because little is known about child factors that might contribute to emotional eating, the current study also...
examined the role that children’s self-regulation in eating (i.e., eating when hungry, stopping when full) might play in these relationships.

The Mediating Role of Emotion Regulation Feeding Practices

A simple explanation for the association between parents’ and children’s emotional eating is modeling. Nonetheless, Bruch’s (1964) work suggests that the parent–child feeding relationship also plays a role in the development of children’s emotional eating. According to Bruch (1964), when parents use foods to comfort a crying child, children may learn to associate food with comfort, leading to problematic eating behaviors. Current research demonstrates that emotion regulation feeding practices are associated with increased snack intake in children (Sledsens, Kremers, De Vries, & Thijs, 2010). Further, experimental research shows that children with parents who are high in feeding for emotion regulation consume more calories when negative mood is induced than when it is not, whereas children with parents who are low in feeding for emotion regulation show the opposite pattern (Blissett, Haycraft, & Farrow, 2010). Recent research also shows that emotion regulation feeding practices predict children’s emotional eating, above and beyond controlling feeding practices (i.e., pressure, instrumental, and restriction), parenting styles, and maternal psychopathology (Braden et al., 2014).

Parents who are emotional eaters use more emotion regulation feeding practices with their children than parents who are not emotional eaters (Wardle, Sanderson, Guthrie, Rapoport, & Plomin, 2002). Although it is unclear why this happens, parents’ own eating appears to influence the parent–child feeding relationship. Yet, to date, no studies have examined parents’ eating behaviors and feeding practices simultaneously in relation to children’s emotional eating. It is likely that parents who are emotional eaters will use more emotion regulation feeding practices, encouraging children to engage in emotional eating. In other words, the complex relationship among parents’ emotional eating, feeding practices, and children’s emotional eating may be more accurately represented by a mediational model, in which the link between parents’ and children’s emotional eating is explained by the use of feeding for emotion regulation, but this has yet to be examined.

The Moderating Role of Children’s Self-Regulation in Eating

There are individual differences in children’s self-regulation in eating (Schachter, 1971; Tan & Holub, 2011). Individuals who self-regulate their food intake are sensitive to their internal cues of hunger and satiety; individuals who are poor in self-regulation rely on external cues (e.g., the availability of foods, the presence of others) to initiate and stop eating. Research shows that adults who engage in external eating (e.g., eating in response to the smell of sizzling steak) are more likely to eat in response to negative emotional arousal (Goossens, Braet, & Decaluwe, 2007; van Strien et al., 1986). Adolescents’ and children’s reports of emotional and external eating are also positively correlated (Braet & van Strien, 1997; Tanofsky-Kraff et al., 2008). In addition, recent research suggests that lower self-regulation in eating is associated with unhealthy eating, putting children and adults at risk for unhealthy weight outcomes (Denny, Loth, Eisenberg, & Neumark-Sztainer, 2013; Tan & Chow, 2014; Tan & Holub, 2011).

Moreover, children’s own characteristics, such as self-regulating while eating, may buffer against the negative effects of parental behaviors on child outcomes. For example, research suggests that children with low self-control who experienced high levels of controlling feeding practices engaged in more unhealthy eating behaviors than children with high self-control (Rollins, Loken, Savage, & Birch, 2014). These findings suggest that children with low self-control are more susceptible to parental influences or socialization. Nonetheless, past research has not examined children’s self-regulation in eating in relation to emotion regulation feeding practices and children’s emotional eating.

The Current Study

The current study proposes to test an integrated moderated mediation model (Figure 1) to better understand the association between parents’ and children’s emotional eating. The simultaneous consideration of both emotion regulation feeding practices and children’s self-regulation in eating illustrates the complex processes by which children acquire eating habits. The first part of the model examines whether emotion regulation feeding practices will mediate the association between parents’ and children’s emotional eating. It is hypothesized that this feeding practice will mediate this relation. The second part of the model includes children’s self-regulation in eating as a moderator to understand whether this important child factor influences this association. It is hypothesized that the positive association between emotion regulation feeding practices and children’s emotional eating will be stronger for children low in self-regulation in eating than children high in self-regulation in eating. If children’s self-regulation in eating moderates the association between emotion regulation feeding practices and children’s emotional eating, it is also likely that emotion regulation feeding practices will conditionally influence the strength of the indirect association between parents’ and children’s emotional eating. Specifically, it is hypothesized that emotion regulation feeding practices will mediate the indirect effect when self-regulation in eating is low, but not when it is high—demonstrating a pattern of moderated mediation between the study variables (Figure 1).

Method

Participants

A total of 95 parent–child dyads were recruited to participate in this study. Parents were recruited through child care centers, preschools, and extracurricular activity centers (e.g., music, dance), as well as the university online recruitment system. The majority of participating parents were mothers (93%) with a mean age of 36.7 years (SD = 6.2; range: 23–54). About an equal numbers of boys (n = 49) and girls (n = 46) participated. The mean age of the children who participated was 6.7 years (SD = 1.2; range: 4.5–9.0). Children were White (43%), Hispanic (18%), Biracial (17%), Asian (15%), Black (6%), and Middle Eastern (1%). Children’s heights and weights were measured and converted into age- and gender-specific body mass index (BMI) z-scores based on standardized growth charts from the Centers for Disease Control and Prevention (NutStat Program; Dean et al., 2007). The mean BMI z-score was 0.36 (SD = 1.0; range: −3.19 to 3.06). Most of the parents (90%) reported that they eat dinner with the child at least 5 days a week. The institutional review board of The University of Texas at Dallas approved this study.

Measures

Children’s Self-Regulation in Eating

The Self-Regulation in Eating Questionnaire was used to measure children’s regulation of food intake based on internal cues of satiety.
Concurrent validity for this measure was demonstrated in past research, which has found these scores to be positively associated with children’s weight status (Tan & Holub, 2011). Parents responded to eight items using a 5-point Likert scale \( (1 = \text{disagree}, 5 = \text{agree}) \). An example item is “My child stops eating when s/he is full.” Higher scores reflect greater self-regulation in eating. For this study, the internal consistency of this scale was 0.77.

**Children’s Emotional Eating**

The parent version of the Dutch Eating Behavior Questionnaire (DEBQ) was used to measure children’s emotional eating (Braet & van Strien, 1997). Parents completed the 13-item emotional eating subscale (e.g., Does your child have the desire to eat when he/she is emotionally upset?). The concurrent validity of this scale has been demonstrated by a positive correlation between this subscale and children’s weight status (Braet et al., 2007). Parents responded to items using a 5-point Likert scale \( (1 = \text{never}, 5 = \text{very often}) \). Parents could also respond with “not relevant” if they believed that their child did not experience that emotion. When parents responded that items were not applicable, these items did not contribute to the composite score, as suggested by Braet and van Strien (1997). Higher scores indicate greater emotional eating. The internal consistency of this subscale was 0.92.

**Parents’ Emotional Eating**

To measure parents’ own negative emotional eating, the DEBQ (van Strien et al., 1986) was used. The emotional eating subscale consists of 13 items (e.g., Do you have a desire to eat when you are emotionally upset?). Concurrent validity was demonstrated for this subscale because reports of emotional eating on the DEBQ were positively correlated with the consumption of high fat foods (Wallis & Hetherington, 2009). Parents responded to items using a 5-point Likert scale \( (1 = \text{never}, 5 = \text{very often}) \). Higher scores indicate more emotional eating. For this study, the internal consistency of this subscale was 0.96.

**Feeding for Emotion Regulation**

The Comprehensive Feeding Practices Questionnaire (Musher-Eizenman & Holub, 2007) was used to measure parents’ feeding practices. The subscale of emotion regulation consists of three items and was used to measure parents’ use of food to regulate children’s negative emotional states. The concurrent validity of this subscale was demonstrated by a positive association between parents’ reports of emotion regulation feeding practices and observed children’s emotional eating (Blissett et al., 2010). An example item is “When this child gets fussy, is giving him/her something to eat or drink the first thing you do?”. Parents were asked to answer the questions as honestly as possible with the target child in mind and responded to items using a 5-point Likert scale \( (1 = \text{never}, 5 = \text{always}) \). Higher scores indicate greater use of feeding for emotion regulation. For this study, the internal consistency of this subscale was .78.

**Data Analyses**

The current study’s hypotheses were tested in two steps. First, a simple mediation model was tested using an application provided by Preacher and Hayes (2004). Using the PROCESS SPSS (Model 4) computational tool (Hayes, 2013), the indirect effect was estimated using bootstrap procedures (samples = 5,000). This examined whether the association between parents’ and children’s emotional eating is mediated by emotion regulation feeding practices. Second, the proposed moderator variable (i.e., self-regulation in eating) was included in the model and the overall moderated mediation hypothesis was tested. The PROCESS SPSS (Model 14) computational tool (Hayes, 2013) using bootstrap procedures (samples = 5,000) was used to estimate the significance of conditional indirect effects at different values of the moderator variable (self-regulation in eating). This examined whether (1) the association between emotion regulation feeding practices and children’s emotional eating is moderated by self-regulation in eating and (2) the strength of the hypothesized indirect (mediation) effect is conditional on the value of the moderator, which is also known as conditional indirect effects (Preacher, Rucker, & Hayes, 2007). Based on Aiken and West’s (1991) recommendation, all predictors were standardized.

**Results**

**Preliminary Analyses**

Correlational analyses were conducted between demographic variables (age and weight status) and key study variables (self-regulation in eating, children’s emotional eating, parents’ emotional eating, and feeding for emotion regulation; see Table I). Results showed that child weight was negatively associated with self-regulation in eating and that child age was negatively associated with emotion regulation feeding practices. No other significant correlations were found between age or weight and key study variables, all \( p \) values > .05. Independent samples \( t \) tests were conducted to examine whether boys and girls differed in key study variables. There were no gender differences in key study variables, all \( p \) values > .05. Thus, subsequent analyses were conducted by controlling child age.
and weight, as these variables were associated with some key study variables.

Primary Analyses

Tests of Mediation

It was expected that feeding for emotion regulation would mediate the association between parents’ and children’s emotional eating. Supporting the hypothesis, the link between parents’ and children’s emotional eating was significantly mediated by emotion regulation feeding practices, while controlling for child age and weight status, $b_{\text{indirect}} = .05, SE = .03, CI_{95}: 0.01–0.12, p < .05$ (see Figure 2).

Tests of Moderated Mediation

It was expected that the association between emotion regulation feeding practices and children’s emotional eating would be stronger for children low in self-regulation in eating than for children high in self-regulation in eating (i.e., moderated mediation). Results indicated that the cross-product term between emotion regulation feeding practices and children’s self-regulation in eating was significantly related to children’s emotional eating (see the upper half of Table II). To examine whether the interaction conformed to the hypothesized pattern, simple slopes were plotted at 1 SD above and below the mean of children’s self-regulation in eating as recommended by Aiken and West (1991; Figure 3). Consistent with the expectation, the slope of the relationship between emotion regulation feeding practices and children’s emotional eating was significant for children low in self-regulation in eating ($b = .244, SE = .069, p = .001$), whereas the slope was not significant for children high in self-regulation in eating ($b = -.035, SE = .105, p = .742$).

Even though these results demonstrate that children’s self-regulation in eating interacts with emotion regulation feeding practices to predict children’s emotional eating, these analyses did not directly assess the conditional indirect effects model as illustrated in Figure 1. Hence, the conditional indirect effect of parents’ emotional eating on children’s emotional eating (through emotion regulation feeding practices) was examined at three values of children’s self-regulation in eating: 1 SD below the mean, the mean, and 1 SD above the mean (see the lower half of Table II). Findings revealed that the indirect and positive effect of parents’ emotional eating on children’s emotional eating through emotion regulation feeding practices was observed when levels of children’s self-regulation in eating was low ($b = .09, SE = .06, p = .001$), but not when children’s self-regulation in eating was moderate or high ($b = -.01, SE = .05, p > .05$).

Discussion

This study broadens the focus of parent–child emotional eating research by presenting a more complex portrayal of how parents’ emotional eating is related to children’s emotional eating. The integrated moderated mediation model examined here incorporates parental feeding practices and children’s characteristics to better understand the complex processes by which children develop emotional eating. Findings show a conditional indirect relationship between parents’ and children’s emotional eating that was mediated by emotion regulation feeding practices and moderated by children’s self-regulation in eating. In other words, results suggest that the
parental practice of feeding for emotion regulation explains the association between children’s and parents’ emotional eating, but only for children who are low in self-regulation in eating.

First, the hypothesis that emotion regulation feeding practices would mediate the association between parents’ and children’s emotional eating was supported. Parents who are emotional eaters may believe that using foods to cope with emotionality is effective, so they engage in more emotion regulation feeding practices with their children. It is also possible that parents who use emotion regulation feeding practices lack adaptive ways to respond to their children’s emotional arousal. Specifically, parents who lack adaptive coping skills may attempt to use foods to diminish their children’s emotional arousal, instead of using more adaptive coping strategies (e.g., validating their children’s emotional arousal). Past research suggests that individuals who engage in emotion-oriented coping (i.e., trying to mitigate negative emotions) report more emotional eating than individuals who engage in task-oriented coping (i.e., trying to solve the problem; Spoor, Bekker, van Strien, & van Heck, 2007). Future research using observational or qualitative methods might help to uncover the reasons why parents use emotion regulation feeding practices. Research also demonstrates that when adults are taught emotion regulation skills, their emotional eating is reduced (Arnow, Kenardy, & Agras, 1995). Therefore, interventions aimed at lessening children’s emotional eating might be best targeted at teaching parents (as well as children) alternative emotion regulation strategies.

Second, it was hypothesized that children’s self-regulation in eating would attenuate the indirect relationship between parents’ and children’s emotional eating. Findings from this study provided support for the hypothesized moderated mediation model, illustrating that the magnitude of the indirect effect was contingent on children’s self-regulation in eating.

<table>
<thead>
<tr>
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<th>B</th>
<th>SE</th>
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<th>p</th>
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<td>2.44</td>
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<thead>
<tr>
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<th>Boot LL CI</th>
<th>Boot UL CI</th>
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<tbody>
<tr>
<td>Children’s emotional eating, ( R^2 = 0.25, F(6, 84) = 4.56, p &lt; .001 )</td>
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<tr>
<td>Emotion regulation feeding (emotion regulation)</td>
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<td>0.06</td>
<td>1.28</td>
</tr>
<tr>
<td>Emotion regulation \times self-regulation</td>
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<td>0.06</td>
<td>-2.39</td>
</tr>
</tbody>
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**Table II. Regression Results for Conditional Indirect Effect**

Note. \( n = 91 \) participants. Unstandardized regression coefficients are reported. Bootstrap sample size = 5,000.

**Figure 3.** The moderating role of children’s self-regulation in eating between emotion regulation feeding practices and children’s emotional eating.

*Note. Emo. Reg. Feeding = emotion regulation feeding practices, Low self-regulation in eating = one standard deviation below the mean, High self-regulation in eating = one standard deviation above the mean.*
association between parents’ emotional eating and emotion regulation feeding practices, the association between emotion regulation feeding practices and children’s emotional eating is weaker when children have high self-regulation in eating.

These findings have implications for parents because children’s self-regulation in eating can also be influenced by parental feeding practices. For example, children with parents who use controlling feeding practices have lower self-regulation in eating than children with parents who do not (Fisher & Birch, 2002). Also, when children are taught to focus on their internal cues of hunger and satiety when eating, they are better at regulating their food intake (Birch, McPhee, Shoba, Steinberg, & Krehbiel, 1987). Thus, parents should encourage children to eat only when they are hungry, and stop eating when they are full, as this might help to reduce unhealthy eating behaviors, including emotional eating.

Limitations and Future Directions

It is important to note that the current study was correlational in nature and did not allow us to draw causal explanations among the variables. It is certainly possible that children’s emotional eating may precede parents’ emotional eating or feeding practices. Nevertheless, past longitudinal research suggests that parents’ eating behaviors predict children’s eating behaviors 5 years later, even after controlling for children’s eating at Time 1 (Arcan et al., 2007). Future research could consider using longitudinal, observational, or experimental designs to better understand the complex dynamic between parents’ and children’s emotional eating. For example, it could be that when children’s moods are improved because of food consumption, it reinforces parents’ use of foods for regulating their own emotional arousal, which might reinforce their children’s emotional eating, subsequently impairing children’s self-regulation in eating. In other words, parents and children may reinforce each other’s behaviors, which may exacerbate the effects of emotional eating over time.

Another limitation of this study is shared method variance. It is unknown if the findings reflect actual associations or parents’ perceptions. It may be that parents who perceive that their children lack self-regulation in eating or perceive their children as emotional eaters will overstate emotion regulation feeding practices. However, observational research provides evidence that other parental feeding practices predict children’s actual eating behaviors as measured by Eating in the Absence of Hunger paradigm (Birch, Fisher, & Davison, 2003). Nevertheless, future research should use multiple methods to understand children’s emotional eating. For example, future research may consider using behavioral observation or child reports to measure children’s emotional eating and self-regulation in eating.

Most of the parents who participated in this study were mothers. Research suggests that females engage in more emotional eating than males (van Strien et al., 1986), which could influence current findings. Future research should consider including a larger sample of fathers to determine if fathers and mothers predict children’s outcomes differently. Similarly, this study did not consider other parent characteristics that might be related to emotional eating. For example, higher weight status is related to more emotional eating in adults (Geliebter & Aversa, 2003). However, other research has found that maternal weight status was not associated with mothers’ emotion regulation feeding practices (Wardle et al., 2002), and it is unclear what parent characteristics might be associated with these feeding practices. Thus, future research should consider examining parents’ characteristics that might be related to parents’ and children’s emotional eating, as well as emotion regulation feeding practices.

Conclusion and Implications

Despite these limitations, the current study’s findings demonstrate complex processes in the association between parents’ and children’s emotional eating. Specifically, results suggest that the association between parents’ and children’s emotional eating is reduced for children who self-regulate while eating. This integrated model explained 25% of the variance in children’s emotional eating, which is a relatively large effect (Cohen, 1992). Interventions focusing on children’s emotional eating are limited as most child interventions have the broad goal to curb childhood obesity or increase healthy habits (Waters et al., 2011). However, findings from this study suggest that a comprehensive intervention program that targets both parents and children simultaneously would be the most effective in reducing children’s emotional eating. Goals of such a program could be to (1) inform parents about the effects of their own emotional eating and feeding practices on children’s emotional eating, (2) teach parents to use other strategies to regulate children’s emotional arousal, instead of emotion regulation feeding practices, and (3) teach children to use internal cues when eating (i.e., self-regulation) to ameliorate risk for emotional eating. In sum, the current findings illustrate that practitioners could create cost-effective intervention programs by targeting families who are at risk, such as those with children who are low in self-regulation in eating and have parents who engage in emotional eating and emotion regulation feeding practices.

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Conflicts of interest: None declared.

References


