



# The effects of happiness and sadness on Children's snack consumption<sup>☆</sup>

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## ABSTRACT

Children appear to engage in emotional eating (i.e., eating in response to negative and positive emotions), but existing research has predominantly relied on parent-report and child-report, which may not necessarily reflect children's actual emotional eating behaviors. This study examined the effects of happiness and sadness on children's observed snack consumption and examined whether child characteristics (i.e., weight, gender, and age) interact with mood to predict snack consumption. To elicit mood, children ( $N = 91$ ;  $M_{ages} = 6.8$  years; 48 boys) were randomly assigned to one of the three mood induction conditions (happy, sad, or neutral); children's snack consumption was observed and measured after mood induction. Findings showed that children in the sad condition consumed more energy from chocolate, followed by children in the happy condition, and then the neutral condition. However, the reverse pattern was observed for goldfish crackers: children in the neutral condition consumed more energy from this savory snack than children in the happy condition, followed by children in sad condition. Child weight status and gender did not interact with mood to predict snack consumption. Child age did interact with mood: older children consumed more chocolates in the sad condition compared to younger children. Child age was not related to snack consumption in the happy and neutral conditions. This study suggests that emotional eating in response to positive and negative emotions is evident during early childhood, but that this is behavior is developing during this period.

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## 1. Introduction

Overeating, especially in response to negative emotional arousal, such as sadness, anger, frustration, or boredom (i.e., negative emotional eating), has been extensively examined during adulthood (Geliebter & Aversa, 2003; van Strien, Frijters, Bergers, & Defares, 1986; Van Strien et al., 2013). Adults who engage in negative emotional eating tend to have more negative physical (e.g., overweight, binge eating (Geliebter & Aversa, 2003); and psychological outcomes (e.g., depression; (Ouwens, van Strien, & van Leeuwe, 2009). Adolescents and children also eat in response to emotional arousal as reported by parents (van Strien et al., 1986; Tan & Holub, 2015; Topham et al., 2011; van Strien & Oosterveld,

2008) and self-report (Braet & Van Strien, 1997; Nguyen-Rodriguez, Chou, Unger, & Spruijt-Metz, 2008; Tanofsky-Kraff et al., 2007). However, although negative emotional eating appears to be present during childhood, existing work has predominantly relied on parent-report and child-report, which may not necessarily reflect children's actual, observed emotional eating.

To our knowledge, only one study has observed emotional eating during early childhood (Blissett, Haycraft, & Farrow, 2010), but this study exclusively focused on emotional eating in response to negative emotions (in this case, children's emotional eating was examined in response to frustration). Their findings suggested that 3- to 5- year olds consumed more of one type of food (breadsticks) in the sad condition compared to preschoolers in the neutral condition (Blissett et al., 2010). Nonetheless, because this study had a small sample size (12 preschoolers in the mood-inducing condition, 13 in the control group), more research is needed (Blissett et al., 2010). In addition, observational research conducted examining emotional eating in older children and adolescents is also limited, but highlights the nuances seen in this research. In all the studies

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we reviewed, the effect of food consumption in response to mood appears to vary depending on individual child or family factors. Specifically, it was found that individual or family factors, such as gender, dietary restraint, tendency to binge eat, or parental rejection, moderated the relationship between the mood induction condition and eating behaviors (Goldschmidt, Tanofsky-Kraff, & Wilfley, 2011; Hilbert, Tuschen-Caffier, & Czaja, 2010; Kelly et al., 2015; Vandewalle, Moens, Bosmans, & Braet, 2017). Since little is known about the effect of mood induction on eating behaviors in young children, the current study examined whether mood induction was related to food consumption in young children, while also considering whether the child characteristics of weight status, gender, and age would moderate this relationship.

### 1.1. Child characteristics and emotional eating

Little is known about how individual differences in children, such as weight, gender, and age, relate to children's emotional eating. Findings with adults show a positive association between weight status and negative emotional eating (Geliebter & Aversa, 2003; Koenders & van Strien, 2011; Nolan, Halperin, & Geliebter, 2010; van Strien et al., 1986). Some studies have found that children who are overweight engage in more emotional eating than children who are average weight (Braet & Van Strien, 1997; Webber, Hill, Saxton, Van Jaarsveld, & Wardle, 2008); however, other studies have failed to demonstrate the relationship between weight status and emotional eating in children (Blissett et al., 2010; Nguyen-Rodriguez et al., 2008; Tanofsky-Kraff et al., 2007; van Strien & Bazelier, 2007).

The role of child gender on emotional eating is also unclear. Some studies suggest that adolescent girls report more emotional eating than adolescent boys (Tanofsky-Kraff et al., 2007; Wardle et al., 1992), but some studies fail to replicate these findings among adolescents and children (Blissett et al., 2010; Braet & Van Strien, 1997; Nguyen-Rodriguez, Unger, & Spruijt-Metz, 2009; Tan & Holub, 2015; van Strien & Bazelier, 2007; van Strien & Oosterveld, 2008).

The developmental course of emotional eating behavior is unknown, as well. Some longitudinal and cross-sectional studies suggest that emotional eating increases with age for children and adolescents (Ashcroft, Semmler, Carnell, Van Jaarsveld, & Wardle, 2008; Wardle et al., 1992), yet other studies find that younger children (7- to 9-years old) reported more emotional eating than older children (10- to 12-years old (Wardle et al., 1992; van Strien & Bazelier, 2007). In addition, other studies find no age-related differences in emotional eating (Tan & Holub, 2015). Taken together, the associations between child characteristics (i.e., weight, gender, and age) and emotional eating are unclear. However, these child characteristics are potential moderators of the relationship between mood induction and emotional eating.

### 1.2. Positive emotional eating

Recent work with adults highlight the importance of considering that individuals also eat in response to positive emotions, such as happiness and excitement (Evers, Adriaanse, de Ridder, & de Witt Huberts, 2013; Geliebter & Aversa, 2003; Nolan et al., 2010). Yet, findings with adults are mixed. One experimental study found that caloric intake did not differ when participants were induced with positive, negative, or neutral moods (Bongers, Jansen, Havermans, Roefs, & Nederkoorn, 2013). Although mean differences were not found across consumption conditions, self-reported emotional eating scores were related to greater caloric intake in the positive condition. In another experimental study, both positive emotions and negative emotions induced the same

amount of calorie consumption compared to control conditions (Evers et al., 2013). This suggests that positive emotions, not just negative emotions, evoke food consumption. Nonetheless, research has yet to examine through observation children's tendency to eat in response to positive emotions. It is highly plausible that children eat when they are happy given the way children are socialized with food. For example, children are conditioned to associate positive events and moods with eating at birthday parties, at holiday gatherings, and at school functions where a reward for a job well done is a treat. However, less is known about whether positively or negatively valenced emotions differentially predict children's eating. It is possible that children are more responsive to negative emotional arousal given that prior work suggests that children eat more in response to sadness, especially when they have been socialized to use foods to cope with emotional arousal (Blissett et al., 2010; Tan & Holub, 2015; Topham et al., 2011), but additional research is needed.

In addition, little is known about whether child characteristics (i.e., weight, gender, and age) are related to positive emotional eating. To our knowledge, only a handful of studies have examined individual differences in positive emotional eating among adults. These suggest that men reported engaging in positive emotional eating more than women and that lower weight status (body mass index) is related to higher positive emotional eating scores (Geliebter & Aversa, 2003; Nolan et al., 2010). However, it is unknown whether these findings will generalize to children.

### 1.3. The current study

The current study experimentally induced negative (sadness), positive (happiness), and neutral moods in children to examine their eating behavior in response to induced mood. The goals of this study were: 1) to observe children's snack consumption across these three conditions and 2) to examine whether the effect of emotional arousal on children's snack consumption differed by child characteristics (i.e., age, gender, and weight status). We hypothesized that children would consume more snacks in response to negative affect than positive affect. Given the mixed findings regarding child characteristics and negative emotional eating, and that there is little research on positive emotional eating during childhood, we did not have specific hypotheses related to whether child characteristics would moderate children's eating in response to negative and positive emotions.

## 2. Method

### 2.1. Participants

Ninety-five children were recruited through multiple methods, including flyers to elementary schools, child care centers, pre-schools, and extracurricular activity centers (e.g., dancing, martial arts), as well as the university online recruitment system to participate in a study about children's eating behaviors. Four children were excluded due to refusal to participate in the experimental manipulation ( $n = 2$ ) and dietary restrictions ( $n = 2$ ). The mean age of the remaining children (48 boys, 43 girls) who participated was 6.8 years ( $SD = 1.2$ ; Range: 4.5 to 9.0). Most children were Caucasian (40.7%) followed by Hispanic (18.7%), Biracial (18.7%), Asian (14.3%), African American (6.6%) and Middle Eastern (1.0%). Children's height and weight were measured and converted into age and gender specific body mass index z-score (BMIz) based on standardized growth charts from the Centers for Disease Control and Prevention (NutStat Program; Dean et al., 2007). The mean child BMIz was 0.38 ( $SD = 1.0$ ). The study protocol was reviewed and approved by the University [blinded] Institutional Review

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