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Temperament as Risk and Protective Factors in Obesogenic Eating: Relations Among Parent Temperament, Child Temperament, and Child Food Preference and Eating

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Abstract

Children's food preferences and eating behaviors have implications for their health and weight status, serving as risk or protective factors for obesity. Although parent and child factors influence children's eating, few studies have examined parent and child temperament simultaneously in relation to child food preference and eating behaviors. The authors addressed this research gap. Participants were 115 ethnically diverse children between 4 and 6 years old and their parents. Measures included parental temperament traits, parental anxiety, child temperament traits, and child food preference and eating behaviors observed using a laboratory procedure. Results show that children preferred candies over grapes, and that aspects of both child and adult temperament were related to child eating behaviors. Child surgency was linked to eating more candies, while child effortful control was linked to eating more grapes. Parent effortful control was related to children's preference toward grapes. No relations were found between child eating behaviors and child or parent negative affectivity and parental anxiety. Overall, findings suggest that highly impulsive and poorly self-regulated children may be at risk for obesogenic eating habits.

Keywords

temperament; eating behavior; food preference; self-control; self-regulation

Childhood obesity is widely acknowledged as a global public health issue (Ogden, Carroll, Kit, & Flegal, 2014). A growing body of literature points to eating behavior as an important and modifiable factor to study for understanding childhood overweight and obesity (French, Epstein, Jeffery, Blundell, & Wardle, 2012). Although prior studies have examined relations between children's temperament, emotion, and eating behaviors, few

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studies have simultaneously studied the temperaments of parents and their children in relation to child eating behaviors.

Surgency, effortful control, and negative affectivity are three broad dimensions of temperament (Rothbart, 2007; Rothbart, Ahadi, & Evans, 2000), and each dimension has been linked to eating behaviors. Preschoolers' surgency is linked to food responsiveness and food enjoyment (Leung et al., 2016), while adaptability (a temperament trait related to effortful control; see Liew, Cao, Hughes, & Deutz, 2018) is linked to low food enjoyment (Bergmeier, Skouteris, Horwood, Hooley, & Richardson, 2014). Children's negative affectivity is linked to low food enjoyment and to high emotional overeating (Haycraft, Farrow, Meyer, Powell, & Blissett, 2011).

Prior studies have focused on child temperament and child eating, but relations between parent temperament and child eating behaviors have been underresearched. Thus, the primary aim of this study is to explore how child temperament and parent temperament and emotionality may uniquely and jointly influence child eating behaviors. Parents' temperament and emotionality may influence the way they interact with their children, including parental feeding practices that can shape child eating behaviors. For example, maternal anxiety has been linked to preschoolers' food fussiness (de Barse et al., 2016).

Method

Participants

Recruitment and study protocols were approved by the university Institutional Review Board. Participants were 115 children who were 4–6 years old (47.8% boys, $M_{age} = 4.80$ years, $SD = 0.87$ years) and their primary caregiver (majority were biological mothers). Child ethnicity was coded as Hispanic (18.3%) and non-Hispanic (81.7%). Child race was coded as Caucasian (74.6%), African American (17.5%), and Asian (7.9%).

Measures

Parent temperament—Parent temperament was assessed with the Adult Temperament Questionnaire (Rothbart, Ahadi, & Evans, 2000) that consists of 77 items completed by parents using a 7-point Likert-type scale ranging from 1 (*extremely untrue*) to 7 (*extremely true*). Only the subscales of effortful control (e.g., “It is easy for me to inhibit fun behavior that would be inappropriate.”) and negative affectivity (e.g., “I become easily frightened.”) are included in the present study. Cronbach's alphas were .81 and .70 for these two subscales, respectively.

Parental anxiety—Parental anxiety was assessed using the 21-item Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988). Parents rated the severity of their symptoms (e.g., nervous, unsteady) in the past week on a 4-point Likert-type scale ranging from 0 (*not at all*) to 3 (*severe*). Cronbach's alpha for the measure is .92.

Child temperament—Child temperament was assessed with the Children's Behavior Questionnaire (Rothbart, Ahadi, Hershey, & Fisher, 2001) that consists of a 94 items completed by parents on a 7-Likert-type point scale for children 3–7 years old, with

responses ranging from 1 (*extremely untrue of your child*) to 7 (*extremely true of your child*). It consists of 94 items and three factors: negative affectivity (e.g., “Is likely to cry when even a little bit hurt”), surgency (e.g., “Often rushes into new situations”), and effortful control (e.g., “Enjoys just being talked to”). Cronbach’s alphas ranged from .64 to .92.

Child eating behaviors—Parents were instructed not to feed their children at least two hours before their scheduled lab visit. To standardize children’s hunger or fullness level, children were given a standard small box of dry cereal (i.e., Cheerios), a small bottle of water, and a mixed fruit cup consisting of fruits such as peaches, pears, and pineapple (selected based on Food and Drug Administration–approved guidelines) upon arrival at the lab. Children were given 5 min to eat and drink as much as they liked or until they felt full. Children then participated in tasks that assessed their executive functioning and emotion regulation (not included in the present study) for approximately 45 min before the eating task. For the eating task, children were left alone for 5 min in a room with a bowl of 30 M&M chocolate candies and a bowl of 20 grapes placed in front of them (M&M’s are smaller than grapes, so more M&M’s than grapes were placed in bowls so the amount of food per bowl was similar). Children were asked to stay in the room and that they could eat the snacks if they want. The number of candies and the number of grapes that were consumed was counted by the experimenter. M&M’s and grapes were selected for this task for several reasons: chocolate and grapes were among the 10 most preferred foods by children, regardless of gender (Cooke & Wardle, 2005); these foods are both small and round; and the amount of each food eaten can be easily counted or quantified.

Results

Descriptive statistics are presented in Table 1. Due to the different numbers of M&M’s and grapes presented to the participants, food preference was calculated as the percentage of M&M’s consumed minus that of grapes. A child was categorized as having a similar preference when the difference between the percentages of M&M consumed and grapes consumed was less than 5%. The majority of children (56.5%) showed preference toward candies, while 19.1% of children showed preference toward grapes. About 24.3% of children showed similar preferences toward these two snacks.

Three multivariate analyses of variance were conducted to examine age, gender, and racial or ethnic differences in child eating variables (i.e., total M&M consumed, total grapes consumed, and food preference). No age, gender, or racial or ethnic differences were found in any of the child eating variables.

Pearson correlations amongst major variables were conducted. Results are summarized in Table 1. Parent negative affectivity and anxiety were positively related to one another, and both were negatively related to parent effortful control. Child effortful control was negatively related to child surgency, and child and parent effortful control were positively related to one another. Child negative affectivity was positively related to parent negative affectivity and anxiety, and negatively related to parent effortful control. For child eating behaviors, children who were high on surgency and low on effortful control consumed more

M&M's. Parent effortful control was negatively associated with child preference toward candies.

Discussion

For eating behaviors and food preferences, our findings show that children preferred candies over grapes. Child eating behavior was related to child temperament traits of effortful control and surgency. Results suggest that highly impulsive and poorly self-regulated children are at risk for obesogenic eating behaviors. This is consistent with prior research showing that obese children experience more difficulty with impulse control than lean children, as obese children are comparatively more reactive to reward and are worse at response inhibition (Nederkorn, Braet, Van Eijs, Tanghe, & Jansen, 2006). Of note is that in a different study on this sample, the children found the candies and a popular toy similarly attractive or desirable as indicated by their approach behaviors to the edible and inedible stimuli (Lin, Liew, & Perez, 2019). Thus, our data show that highly surgent and poorly self-controlled children may be susceptible to temptations or hedonically appealing experiences, including edible and inedible rewards. Interestingly, children's temperament of negative affectivity was not related to child eating behavior. One potential reason is that more emotional temperaments are related to both emotional over- and undereating (Haycraft et al., 2011), so there is a lack of definite tendency in the relation.

In the present study, parent effortful control was negatively related to child preference for candies. Adults who have high self-control tend to have fewer unhealthy snacking habits and consume fewer unhealthy snacks (Adriaanse, Kroese, Gillebaart, & De Ridder, 2014). The combination of our findings on parent effortful control and child eating and those from prior studies on adult self-control and adult eating habits suggests that parents with higher effortful control may more readily inhibit impulse to purchase unhealthy foods or snacks and, in turn, model or feed their children more healthful food options. Thus, parental feeding could be an entry point for prevention and intervention to reduce childhood overweight or obesity.

In sum, results highlight child temperament of surgency as a relevant risk factor in children's obesogenic eating behavior. Also, child and parent temperament of effortful control may serve as protective factors against children's obesogenic eating behavior. However, results are based on cross-sectional data and longitudinal designs are needed to explore the direction of influences between study variables.

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Table 1.

Descriptive statistics and Pearson correlation results for major variables.

	1	2	3	4	5	6	7	8	9
1. Parent negative affectivity	1								
2. Parent effortful control	-.56***	1							
3. Parent anxiety	.49***	-.39***	1						
4. Child negative affectivity	.27**	-.37***	.33**	1					
5. Child effortful control	-.04	.32***	-.01	-.14	1				
6. Child surgency	-.07	.01	-.03	-.06	-.26**	1			
7. Total M&M's consumed	-.09	-.09	.02	-.01	-.20*	.29**	1		
8. Total grapes consumed	-.17	.18	.09	-.06	-.17	.10	.18	1	
9. Food preference	.08	-.21*	-.06	.04	-.01	.12	.57***	-.73***	1
<i>M</i>	3.94	4.83	26.99	3.97	5.29	4.76	21.13	9.21	0.24
<i>SD</i>	0.69	0.79	8.83	0.70	0.67	0.88	9.20	7.53	0.44

*
p .05.**
p .01.***
p .001.