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The roles of child temperament, parent stress, and parenting style in family mealtimes

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ABSTRACT

Family mealtimes are associated with benefits for children, including healthy eating, fewer behavior problems, and healthy psychological well-being. However, the interactions during family mealtimes, and the parent and child characteristics, which may affect both the family mealtime environment and the associated benefits in children are not fully understood. The goal of this study was to examine the role of child and parent characteristics on the family mealtime environment. We tested several mediation models to explain how child temperament (negative affectivity), parent stress, and the dimensions of parent feeding style (responsiveness and demandingness) interact and influence each other to impact the structure and quality of the mealtime environment. Parents (68 mothers; 82 fathers) of children between 2 and 6 years completed an online survey. Measures included the Children's Behavior Questionnaire, Perceived Stress Scale, Caregiver's Feeding Styles Questionnaire, and The Meals in Our Household Questionnaire. Child negative affectivity was associated with poorer mealtime quality and structure. These associations were mediated through parent responsiveness, but not demandingness. The role of demandingness in family mealtimes may depend on parent responsiveness. When examined together in a serial mediation model, child negative affectivity increased parent stress, which reduced responsiveness, and led to poorer mealtime quality and structure. These results emphasize the complex relationships between child temperament, parent stress, and the dimensions of parenting styles that occur within the mealtime context. This line of research is essential for understanding family mealtime dynamics and informing future studies aimed at creating positive interactions between parents and children during mealtimes.

1. Introduction

Family mealtimes are associated with multiple physical health and developmental benefits for young children, including healthy weight, diet, and eating behaviors, improved psychological well-being, better cognitive and social development, and fewer behavioral problems (Berge et al., 2013; Elgar et al., 2013; Harbec & Pagani, 2018; Lora et al., 2014). Family mealtimes are characterized by routines and rituals that provide a consistent time, location, and structure for families to gather and communicate (Fiese et al., 2006; Skeer et al., 2018). Quality mealtime environments give parents and children a structured opportunity to socialize and provide parents an extended time to engage in warm and encouraging parenting practices (Fiese et al., 2006). When parents utilize such parenting practices, family mealtimes may be a source of positive interaction, promoting both positive social behaviors and eating behaviors in their children.

Specific dimensions of family mealtime environments that may contribute to positive family and child outcomes are the frequency, structure, and quality of the mealtime (Berge et al., 2013; Hammons & Fiese, 2011; Harbec & Pagani, 2018). Mealtime frequency refers to how often families eat a meal together. Frequent family mealtimes are related to lower levels of childhood overweight and reduced prevalence of aggressive and oppositional behavior (Hammons & Fiese, 2011; Harbec & Pagani, 2018). The structure of family meals refers to the consistent routines and rituals that makeup the family mealtime (Anderson et al., 2012). A structured family mealtime consists of the family eating together at a table at a consistent time, with everyone eating the same meal, with little to no distractions (Fiese et al., 2006). Mealtimes that are less structured and interrupted with distractions are related to fewer family connections, less communication, and greater intake of unhealthy foods (Fiese et al., 2015).

The quality of the family mealtime includes both the nutritional quality of the meal and the quality of parenting practices and child behaviors during the meal. Quality family mealtimes that consist of

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positive parenting practices and parent-child interactions are related to less aggressive behavior, oppositional behavior, and delinquency in children (Harbec & Pagani, 2018). On the other hand, mealtimes during which parents rely on coercive feeding practices, such as the use of food as a reward and dietary restraint, are related to greater food fussiness, lower enjoyment of food, poor eating habits in children, negative parent-child interactions, and higher child weight and BMI (Bjørklund et al., 2018; Zhou et al., 2019).

While the frequency of family mealtimes is an important predictor of positive health and behavioral outcomes in children, it fails to capture the dynamic context and interactions between children and their parents within the family mealtime environment. It is likely that the structure and the quality of the mealtime environment are the elements that provide socialization opportunities for families, foster communication, and support family connectedness (Fiese et al., 2006, 2012).

1.1. Predictors of family mealtime quality and structure

The ecological systems theory (Bronfenbrenner & Morris, 2007) and the transactional model (Sameroff, 2010) provide a framework for studying the multidirectional interactions of parent and child characteristics that influence each other and the overall structure and quality of the mealtime environment. The parent-child dynamic involves consistent reciprocal transactions occurring over time, with both the parent and child acting on each other throughout development. Not only are children affected by parents, but parents are affected by children. As parents influence their children's eating habits, children also influence their parents' feeding behaviors, in a way that both are constantly evolving and developing (Mallan et al., 2018). As such, both characteristics of the child and parent may influence the structure and quality of family mealtime environments. Therefore, the goal of the current study was to identify the child and parent characteristics, and the potential influences of each, that predict the structure and the quality of mealtime environments. Specifically, we considered parenting feeding style, child temperament, and parent stress.

1.1.1. Dimensions of parenting feeding style

General parenting style is defined as the broad emotional climate that parents create when interacting with their child, and it is often characterized by the dimensions of responsiveness and demandingness (Durbin et al., 1993). When applied specifically to the feeding environment, parenting feeding style characterizes how parents encourage their children to behave and eat (Hughes et al., 2005). Responsiveness is a child-centered approach, where the parent focuses on the child's needs within the eating environment. Responsive feeding and maternal warmth during mealtimes are associated with easier child behaviors and less food fussiness (Finnane et al., 2017). This may in turn improve both mealtime quality and child health behaviors (Boles et al., 2013).

Demandingness involves the control parents have on the mealtime environment, such as making demands on the child's eating behavior and supervising child eating (Hughes et al., 2005). The role of demandingness in parent-child interactions and child outcomes is mixed. Parental demandingness may provide the routines and rituals associated with the structure of mealtimes. For instance, mothers who engage in feeding styles higher in demandingness report having more frequent family meals (Tovar et al., 2012; Berge et al., 2010). However, high demandingness is also associated with parent-centered or coercive behaviors such as restriction of food, instrumental feeding, and harsh disciplines (Horn et al., 2011; Jackson & Choi, 2018; Kidwell, Kozikowski, Roth, Lundahl, & Nelson, 2018). Therefore, the positive and negative facets of demandingness may have differential effects on the mealtime environment.

The dimensions of responsiveness and demandingness have been categorized into four feeding styles: indulgent (high responsiveness, low demandingness), authoritative (high responsiveness, high demandingness), authoritarian (low responsiveness, high demandingness), and uninvolved (low responsiveness, low demandingness; Hughes et al., 2012). Both responsiveness and demandingness are important in promoting mealtime function. For instance, authoritative feeding style, which involves high levels of both responsiveness and demandingness within the eating environment, predicts healthier child outcomes, including higher dietary quality, better school performance, and more positive feeding environments (Arlinghaus et al., 2018; Patrick et al., 2005). However, while feeding style categories are useful in clinical and applied purposes, using the continuous dimensions may be more useful for statistical and research purposes due to variability across samples (Power et al., 2019; Tovar et al., 2012; Lopez et al., 2022). For example, when using a sample median to define cutoff points for categories, a parent may fit a certain feeding style in one sample but fit a different feeding style in another sample that uses a different median cutoff point (Hughes et al., 2012; Kiang & Ip, 2018; Ip et al., 2018). This may lead to problems in categorizing feeding styles and limit the full variability across both dimensions. Therefore, we utilized the continuous dimensions of responsiveness and demandingness in the current study.

1.1.2. Child temperament

A general principle in the child temperament literature, which is consistent with the transactional framework, is that a child's temperament interacts with their environment to shape their development (Stifter & Moding, 2019). Child temperament may directly affect parent-child interactions and therefore the quality of the mealtime environment. Consistent with this, child temperament has been found to be related to parent-child interactions during mealtimes in various populations, including in infants (Garstein et al., 2013), adolescents (Boles et al., 2013), and children with feeding disorders (Aviram et al., 2014).

Child temperament is defined as individual differences in emotionality, reactivity, and self-regulation (Sanson et al., 2004). Negative affectivity is a dimension of temperament which encompasses increased emotional reactivity. Children higher in negative affectivity experience more frequent and intense negative emotions (Rothbart et al., 2001). Negative affectivity is consistently related to child health, eating behaviors, and feeding environments, and child temperament characterized by negative affectivity translates to fussy eating and food avoidance within the feeding environment (Sanson et al., 2004). Children with higher negative affectivity are more likely to be picky eaters (Kidwell et al., 2018), have more feeding problems during mealtimes (Hughes & Shewchuk, 2012), and demonstrate greater food fussiness (Harris et al., 2018). This can contribute to less mealtime structure. When children are picky or fussy eaters, parents are more likely to prepare alternate meals for them and less likely to sit down to a meal together (Searle et al., 2020).

These individual differences in child temperament may evoke differential parenting practices, behaviors, and emotions within the mealtime environment (Stifter & Moding, 2019). For instance, when a child is more reactive, displays greater fussiness or outbursts of negative affectivity during a mealtime, the parent may adapt their parenting behaviors to appease the child in that moment, using parenting practices that are less responsive to the child's needs (e.g., offering food to soothe the child, rather than offering comfort), and are more demanding and controlling on the child (e.g., using restriction, coercive control, or pressure to eat). Previous studies have shown that negative affectivity in children is associated with non-responsive feeding practices (Horn et al., 2011), and parents use more instrumental feeding (e.g., using food as a reward to control behavior) and emotional feeding (e.g., using food to soothe), with children higher in negative affectivity (Kidwell et al., 2018). Accordingly, we would expect negative affectivity in young children to influence the parent-child dynamics that shape mealtime structure and quality.

1.1.3. Parent stress

The amount of stress a parent experiences may also affect the

structure and quality of the family mealtime environment. Stress can be defined as the perceived excess of environmental demands and a reduced ability to cope (Cohen et al., 1995). According to the ecological framework, parents are embedded within environmental contexts that may influence the amount of stress a parent experiences (e.g., stress from work, finances, governmental programs and resources, cultural climate and values, etc.). Outside of feeding interactions and mealtime environments, parents who are stressed are less likely to engage in warm and responsive parenting (van Gampelaere et al., 2020) and more likely to use harsh discipline practices and authoritarian parenting styles that are characterized by high demandingness and control (Jackson & Choi, 2018). Parents may in turn bring this stress to the family table and mealtimes.

The relationship between parent stress and parent responsiveness and demandingness within the family mealtime environment has received less attention, but we would expect similar patterns within this context. High levels of parental stress have been related to increased child intake of sweets (Mason et al., 2019). Additionally, parents who are stressed are less likely to serve home cooked meals (Berge et al., 2020). Therefore, it is important to consider the role of parent stress during family mealtimes and within the parent-child interactions that make up mealtimes.

1.2. Current study

The goal of the current study was to test several models that explain how the two dimensions of parent feeding style, child temperament, and parent stress interact and potentially impact the mealtime environment. This study is unique in that it incorporates parent responsiveness and demandingness, child negative affectivity, and parent stress to explain the variability in both the structure and quality of family mealtimes during early childhood using mediation models and conditional processes.

The conditional processes for the models tested are outlined by Hayes (2017) and utilize linear regression analyses to create predictive models of parallel mediation and serial mediation. While this study is correlational in nature and cannot determine directionality or causality, it is common to conceptualize these models with directional and predictive terms (see Hayes, 2017). Given that child temperament may affect the child's environment, including parenting practices (Stifter & Moding, 2019), we tested two specific models.

1.2.1. Model 1: Child negative affectivity and the dimensions of parent feeding style

The first aim was to investigate the mediating role of parent feeding style (i.e., responsiveness and demandingness) in the relationship between child negative affectivity and family mealtime structure and quality. We expected high levels of child negative affectivity to predict family mealtimes characterized by poorer quality and less structure. We also expected that the child's negative affectivity would elicit less responsiveness and increased demands from the parents during mealtimes. To test this, we examined a model in which child negative affectivity would predict poorer mealtime structure and quality, with the dimensions of parent feeding style (demandingness and responsiveness) as mediators. We hypothesized that higher negative affectivity in the child would decrease the parent's ability to be responsive to the child, which in turn would lead to poorer mealtime structure and quality. We also hypothesized that higher negative affectivity in the child would increase parent demandingness during feeding interactions, which in turn would affect mealtime quality. However, given the mixed findings with demandingness, the association between demandingness and mealtime structure may depend on responsiveness and/or the type of parental demands.

1.2.2. Model 2: Child negative affectivity, parent stress, and the dimensions of parent feeding style

Parent affect and child affect reciprocally influence each other (Carson & Parke, 1996; Stifter & Moding, 2019), and in general, stress and negative emotions are higher among parents of children with high negative affectivity (Hughes & Shewchuk, 2012). Therefore, the second aim of the current study was to investigate how child negative affectivity, parent stress, and parent feeding style (demandingness and responsiveness) interact to predict mealtime structure and quality. For this, we tested a serial mediation model in which we hypothesized that child negative affectivity would increase parental stress. This increase in parental stress would then decrease the parent's ability to be responsive to their child during feeding interactions, leading to less structure and poorer quality of family mealtimes.

2. Method

2.1. Participants

Parents of a child between 2 and 6 years of age were recruited through Amazon Mechanical Turk (MTurk), as part of a larger study on parents' ability to create healthy environments for young children. All procedures were approved by a University IRB, and all participants underwent an informed consent process. Participants were compensated $4.00 upon completing the survey.

MTurk provides qualifications of "workers" or participants in order to increase the likelihood of collecting quality data in research. This is specifically measured through the (1) HIT approval rate and (2) number of approved HITs. HITs are the individual tasks or surveys that an individual completes through MTurk. Each HIT is either approved or rejected. An approved HIT indicates that the requester has determined the responses as accurate. For the current study, participants were only eligible if their minimum HIT approval rate was 98%, they had at least 10,000 approved HITs, and they were located in the United States. Eligible participants were invited to complete a short prescreen survey. Those who indicated that they were a parent and had a child between the ages of two to six years were invited to participate in the full study.

A total of 204 participants were recruited. Data were excluded from analyses for participants who completed the study in less than 400 s (n = 27), did not consent (n = 1), or answered the attention check incorrectly (n = 2). Data were also excluded if the questionnaires were completed by someone other than the child's parent (e.g., aunt, grandparent; n = 5), the questionnaires used in the current analyses were incomplete (n = 9), or the child's age reported in the full study was outside of the required age range (n = 10; e.g., because a parent reported on a child other than their 2 to 6 year old).

The final sample included 150 children between the ages of 2.07–6.97 years (M = 4.75, SD = 1.18). The questionnaires were completed by 68 mothers (45.3%) and 82 fathers (54.7%) between 22 and 62 years of age. Approximately 29% of the sample participated in a food assistance program. There was a significant difference in racial categories between mothers and fathers, with more fathers identifying as Black or African American (17.1%) and more mothers identifying as Asian (13.2%). Mothers also reported higher responsiveness than fathers on the Caregiver's Feeding Styles Questionnaire. There were no other significant differences in demographic information, child temperament, caregiver feeding style, perceived stress, or family mealtime quality between fathers and mothers. Final sample characteristics by parent gender are described in Table 1.

2.2. Measures

2.2.1. Children's Behavior Questionnaire

Child temperament, including Negative Affectivity, was measured using the Very Short Form of the Children's Behavior Questionnaire (CBQ-VSF; Putnam & Rothbart, 2006). The CBQ-VSF is a parent-report

Table 1
Sample characteristics and comparisons of variables between mothers and fathers.

N(%) or mean (SD)	Total Sample (N = 150)	Mothers (n = 68)	Fathers (n = 82)
Sample Characteristics			
Parent's Age (years)	34.85 (7.18)	34.57 (6.54)	35.09 (7.70)
Child's Age (years)	4.75 (1.18)	4.57 (1.19)	4.89 (1.16)
Racial Categories*			
American Indian or Alaska Native	1 (0.7%)	1 (1.5%)	0 (0.0%)
Asian	12 (8.0%)	9 (13.2%)	3 (3.7%)
Black or African American	18 (12.0%)	4 (5.9%)	14 (17.1%)
Hispanic or Latino	6 (4.0%)	1 (1.5%)	5 (6.1%)
Middle Eastern or North African	1 (0.7%)	1 (1.5%)	0 (0.0%)
White	105 (70.0%)	47 (69.1%)	58 (70.7%)
More than one race	6 (4.0%)	4 (5.9%)	2 (2.4%)
Other	1 (0.7%)	1 (1.5%)	0 (0.0%)
Education Level			
High School or GED	15 (10.0%)	7 (10.3%)	8 (9.8%)
Vocational Education or Some College	11 (7.3%)	6 (8.8%)	5 (6.1%)
College Degree or Higher	124 (82.7%)	56 (82.4%)	69 (84.1%)
Marital Status			
Single	12 (8.0%)	6 (8.8%)	6 (7.3%)
In Relationship with Partner	6 (4.0%)	2 (2.9%)	4 (4.9%)
Living with Partner	19 (12.7%)	8 (11.8%)	11 (13.4%)
Married	111 (74.0%)	51 (75.0%)	60 (73.2%)
Divorced	1 (0.7%)	1 (1.5%)	0 (0.0%)
Not Reported	1 (0.7%)	0 (0.0%)	1 (1.2%)
Number of Children in Family under 6 Years	1.10 (0.36)	1.16 (0.48)	1.05 (0.22)
Participate in Food Assistance Program[1]	43 (28.7%)	19 (27.9%)	24 (29.3%)
Variables Tested in the Mediation Models			
Antecedents (X) and Mediators (M)			
Child Negative Affectivity		3.82 (1.15)	3.82 (1.11)
Parent Perceived Stress		21.88 (8.82)	22.02 (9.58)
Parent Feeding Style – Responsiveness*		23.91 (4.68)	21.88 (4.89)
Parent Feeding Style – Demandingness		2.96 (0.59)	2.81 (0.64)
Mealtime Outcomes (Y)			
Use of Food as a Reward		1.56 (0.89)	1.75 (0.86)
Frequency of Problematic Child Mealtime Behaviors		1.38 (0.77)	1.33 (0.88)
Intensity of Problematic Child Mealtime Behaviors		1.09 (0.84)	1.17 (1.00)
Parental Concern about Child's Diet		1.19 (1.11)	1.49 (1.20)
Structure of Family Meals		2.80 (0.60)	2.69 (0.61)

Note. Comparisons between mothers and fathers were conducted using Independent Samples t-Tests for continuous variables and Chi-Square for categorical variables. Differences between mothers and fathers are marked as follows: $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

[1] Food assistance programs include Supplemental Nutrition Assistance Program (SNAP) n = 29, Woman, Infants, and Children (WIC) n = 18; Free or reduced-price school lunch program n = 22; Free or reduced-price school breakfast program n = 14; Afterschool snack or meal program n = 16; Backpack weekend food program n = 6. Some families participated in more than one of these programs.

measure of temperament for children up to eight years of age. Parents rate their child's behavior on a 7-point scale (1 = extremely untrue of your child to 7 = extremely true of your child) on 36 items. Scores on the CBQ-VSF are used to calculate three factors of temperament: Surgency, Effortful Control, and Negative Affectivity. Negative Affectivity was the factor of interest in the current study. This scale has been associated with child weight outcomes and parent feeding styles (Hughes et al., 2008). The Negative Affectivity subscale in the current study had good internal consistency (α = 0.81), and it has been used in a variety of populations (Putnam & Rothbart, 2006).

2.2.2. The Perceived Stress Scale

The Perceived Stress Scale (PSS; Cohen, 1994) was used to measure parent Perceived Stress. The PSS is a self-report measure of the degree to which various situations in a person's life are perceived as stressful during the last month. The scale is composed of 14 items scored on a 5-point scale from 0 (never) to 4 (very often). The PSS has shown good internal consistency (α > 0.70) in various studies (Cohen, 1994), and good test-retest reliability after four weeks (Lee, 2012). This study has shown predictive validity and has been associated with child obesity risk (Shonkoff et al., 2017). Cronbach's alpha for the current study was 0.86. Scores are summed, with higher scores indicating higher stress. Low stress ranges from 0 to 18, moderate stress ranges from 19 to 37, and high stress ranges from 38 to 56. The majority (63.5%) of the participants in the current study reported being moderately stressed, with 34% reporting low stress and 2.5% high stress.

2.2.3. Caregiver's Feeding Styles Questionnaire

The Caregiver's Feeding Styles Questionnaire (CFSQ; Hughes et al., 2005) was used to determine parent feeding styles. The CFSQ is composed of 19 questions and assesses two dimensions: Responsiveness and Demandingness. Demandingness is obtained by calculating the average of all 19 questions, and Responsiveness is obtained by dividing the average of the seven child-centered questions by the average of all 19 questions. Both factors are measured on a 5-point scale, from 1 (never) to 5 (always). The CFSQ has been validated in children ages 3–12 years of a variety of SES populations (Hughes et al., 2005). The scale has demonstrated strong test-retest reliability (r = 0.85, 0.82), convergent validity, and internal consistency (α = 0.71 to 0.85; Hughes et al., 2005). This questionnaire has also shown predictive validity for child outcomes associated with eating (Arlinghause et al., 2018). The alpha level of the current study (αchild-centered = 0.75; αparent-centered = 0.87) is consistent with the literature.

2.2.4. Meals in our Household Questionnaire

The Meals in our Household Questionnaire (Anderson et al., 2012) was used to assess the components that characterize mealtimes. In the current study, we were interested in five of the six subscales that assess the quality and structure of the family mealtime environment. Four subscales characterize the quality of mealtimes, and one characterizes the structure. The 6-item subscale 'Use of Food as a Reward' measures how often parents use food to influence their child's behavior (0 = never to 4 = very often). 'Frequency of Problematic Child Mealtime Behaviors' is a 10-item subscale that measures the frequency of various problem behaviors during meals (0 = never to 4 = very often). 'Intensity of Problematic Child Mealtime Behaviors' measures how much of a problem these behaviors are for parents during mealtimes on a scale from 0 (not a problem) to 3 (large problem). 'Parental Concern about Child's Diet' is 17 items that assesses the level of concern parents have about the quality of their child's diet (0 = not at all concerned to 5 = extremely concerned). 'Structure of Family Meals' is 10-items that measure the frequency of routines, consistency, and distractions during mealtimes (0 = never to 4 = always). Cronbach alpha for the current study was high for all the subscales (α's ranged from 0.85 to 0.96).

2.3. Data analysis

2.3.1. Preliminary analysis

Statistical analyses were conducted using SPSS 27 (IBM Corp, 2019) with the PROCESS v4 macro (Hayes, 2017). Hypotheses and the data analysis plan for each were specified a priori. Assumptions for linearity, homoscedasticity, normality, and independence were checked and met. Prior to testing the mediation models, demographic variables associated with the those in our mediation models were considered as covariates.

Parent gender was related to Responsiveness (Table 1). Models were run with parent gender as a covariate, but this did not change the overall results of the models, and therefore, models reported here do not include parent gender as a covariate.

2.3.2. Model 1: Responsiveness and demandingness as parallel mediators between child negative affectivity and family mealtime outcomes

We used a parallel mediation model, PROCESS model 4 (Hayes, 2017), to test two simultaneous mediators, Responsiveness and Demandingness, (mediator variables: *M*) in the association between child Negative Affectivity (antecedent variable: *X*) and mealtime quality and structure (outcome variables: *Y*). This model computes the effect of *X* on *M* for each mediator (a_1 and a_2 pathways), the effect of M_1 and M_2 on *Y* (b_1 and b_2 pathways), the effect of *X* on *Y* (*c* or total effect), and the effect of *X* on *Y* controlling for M_1 and M_2 (the *c'* or direct effect). To determine if mediation has occurred, there is an indirect effect, which is the total effect (*c*) minus the direct effect (*c'*). When the 95% confidence interval (CI) for the indirect effect does not include zero, it is interpreted to mean that mediation has occurred (that *X* predicts *Y* through *M*). The results indicate full mediation when the indirect pathway is significant and the *c'* pathway (direct effect between *X* and *Y*) is not significant.

We first hypothesized that the total effect (*c*) of child Negative Affectivity (*X*) on mealtime quality and structure (*Y*) would be significant. We specifically hypothesized that child Negative Affectivity (*X*) would be positively associated with the four mealtime quality outcomes (*Y*): Use of Food as a Reward, Frequency of Problematic Child Mealtime Behaviors, Intensity of Problematic Child Mealtime Behaviors, and Parental Concern about Child's Diet, and *negatively* associated with the one mealtime structure outcome (*Y*): Structure of Family Meals.

Next, we predicted significant indirect effects of child Negative Affectivity (*X*) on mealtime quality and structure (*Y*) through each mediator (Responsiveness and Demandingness). Specifically, we hypothesized that the association between child Negative Affectivity and each mealtime quality and structure variable would be mediated through less parent Responsiveness (M_1). We also hypothesized that the association between Negative Affectivity (*X*) and each mealtime quality and structure variable (*Y*) would be mediated through parent Demandingness (M_2). However, given the mixed findings with parent demandingness, the direction of this association may depend on responsiveness and/or the type of parental demands. There were a total of five models tested, one for each of the five mealtime outcomes. See Fig. 1.

2.3.3. Model 2: Parent perceived stress and parent feeding style as serial mediators between child negative affectivity and family mealtime outcomes

We used serial mediation, PROCESS model 6 (Hayes, 2017), to test the effect of child Negative Affectivity on mealtime quality and structure through the serial mediators of parent Perceived Stress and Parent Feeding Style. The serial mediation model tests for a direct effect and three indirect effects in the relationship between the antecedent child Negative Affectivity (*X*) and mealtime quality and structure (*Y*). The effect of child Negative Affectivity (*X*) on mealtime quality and structure (*Y*) is reported as the total effect (*c*) and is made up of the sum of the direct effect (*c'*) and the three indirect effects (*c*). The direct effect (*c'*) is the effect of child Negative Affectivity (*X*) on mealtime quality and structure (*Y*) while controlling for both mediators, parent Perceived Stress (M_1) and parent feeding style (M_2). The indirect effect of child Negative Affectivity (*X*) on mealtime quality and structure (*Y*) through the single mediator parent Perceived Stress (M_1) includes pathways a_1 and b_1 (a_1b_1). The indirect effect of child Negative Affectivity (*X*) on mealtime quality and structure through the single mediator parent feeding style (M_2) includes pathways a_2 and b_2 (a_2b_2). We were most interested in testing for the third indirect effect, which includes both mediators in serial. The indirect effect for child Negative Affectivity (*X*) on mealtime quality and structure (*Y*) through parent Perceived Stress (M_1) and parent feeding style (M_2) in serial includes pathways a_1, *d*, and b_2 (a_1db_2). If the 95% CI for any given indirect effect does not include zero, it is interpreted to mean that child Negative Affectivity (*X*) predicts mealtime quality and structure (*Y*) through the mediator(s) (M_1 and/or M_2).

In Model 2, we hypothesized that there would be a significant indirect effect for a_1db_2 indicating that child Negative Affectivity (*X*) would predict greater parent Perceived Stress (M_1), which in turn would predict less parent Responsiveness (M_2), which would then predict mealtime quality and structure (*Y*) in serial ($X \rightarrow M_1 \rightarrow M_2 \rightarrow Y$). Specifically, we expected parent Responsiveness would be *negatively* associated with four mealtime quality outcomes (*Y*): Use of Food as a Reward, Frequency of Problematic Child Mealtime Behaviors, Intensity of Problematic Child Mealtime Behaviors, and Parental Concern about Child's Diet, and *positively* associated with the one mealtime structure outcome (*Y*): Structure of Family Meals. There were a total of five models tested, one for each of the five mealtime outcomes. See Fig. 2.

3. Results

3.1. Model 1

3.1.1. Overall results

The results for each of the mealtime outcomes (four mealtime quality outcomes and one mealtime structure outcome) followed the same overall pattern. Therefore, the results of all the models are presented together. The coefficients for each model are described in Table 2. As hypothesized, child Negative Affectivity positively predicted mealtime quality (Use of Food as a Reward, Frequency of Problematic Child Mealtime Behaviors, Intensity of Problematic Child Mealtime Behaviors, and Parental Concern about Child's Diet) and negatively predicted Structure of Family Meals (*c*). Child Negative Affectivity predicted less parent Responsiveness (a_1) and more parent Demandingness (a_2). Parent

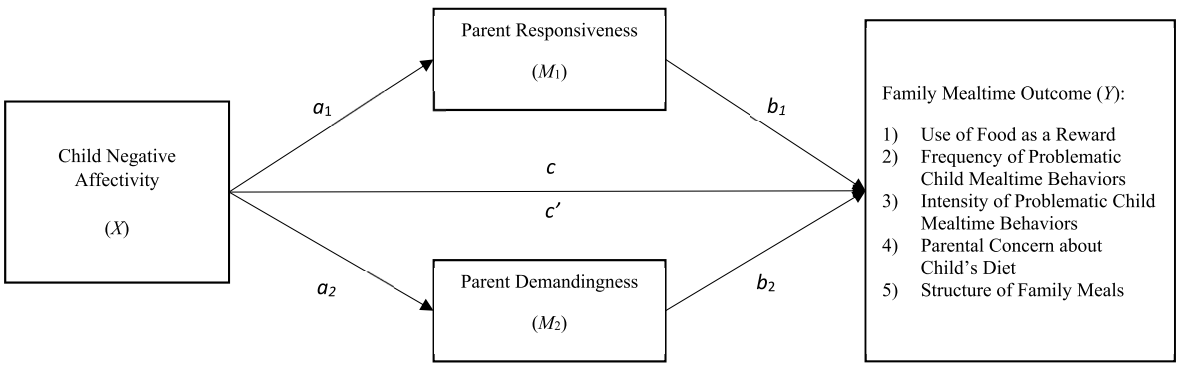

Fig. 1. Model 1 where Parent Responsiveness and Demandingness are Tested as Parallel Mediators in the Relationship between Child Negative Affectivity and Family Mealtime Outcomes.

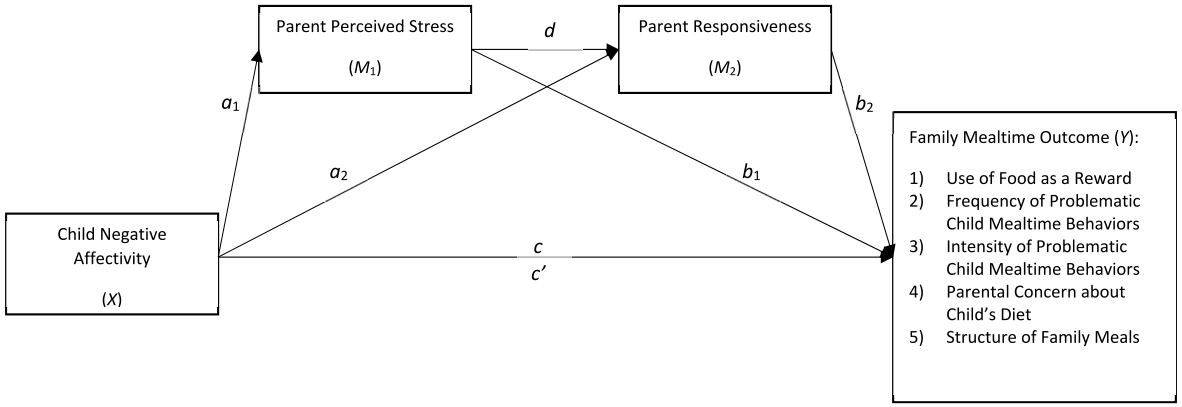

Fig. 2. Model 2 where Parent Perceived Stress and Parent Responsiveness are Tested as Serial Mediators in the Relationship between Child Negative Affectivity and Family Mealtime Outcomes.

Table 2
Pathway coefficients for models 1 and 2.

	Model 1 Parallel Mediation (X = Child Temperament)			Model 2 Serial Mediation (X = Child Temperament)		
	B	SE	T	B	SE	T
Model Pathways: Consistent for Each Mealtime Outcome						
a_1	−.47***	.07	−6.46	.47***	.07	6.40
a_2	.33***	.08	4.23	−.36***	.08	−4.45
d	–	–	–	−.24*	.08	−3.05
Model Pathways: Unique for Each Mealtime Outcome						
Use of Food as a Reward (Y)						
b_1	−.19*	.08	−2.30	−.06	.09	−.71
b_2	.14	.08	1.77	−.23	.09	−2.66
c	.42***	.07	5.60	.42***	.07	5.60
c'	.28**	.08	3.34	.34**	.09	3.84
Indirect Effect (M_1)	**.09, 95% CI [.002, .19]**			**.03, 95% CI [.002, .07]**		
Indirect Effect (M_2)	.05, 95% CI [-.01, .11]			–		
Frequency of Problematic Child Behaviors (Y)						
b_1	−.24**	.07	−3.32	.28**	.07	4.00
b_2	.11	.07	1.61	−.19*	.07	−2.67
c	.58***	.07	8.77	.58***	.07	8.77
c'	.43***	.07	5.85	.36***	.07	4.93
Indirect Effect (M_1)	**.11, 95% CI [.04, .21]**			**.02, 95% CI [.002, .05]**		
Indirect Effect (M_2)	.04, 95% CI [-.02, .10]			–		
Intensity of Problematic Child Behaviors (Y)						
b_1	−.30***	.07	−4.21	.22*	.07	3.18
b_2	.09	.07	1.32	−.26**	.07	−3.66
c	.59***	.07	9.00	.59***	.07	9.00
c'	.43**	.07	5.89	.37*	.07	5.08
Indirect Effect (M_1)	**.14, 95% CI [.07, .22]**			**.03, 95% [.008, .06]**		
Indirect Effect (M_2)	.03, 95% CI [-.03, .08]			–		
Parental Concern for Child's Diet (Y)						
b_1	−.27**	.08	−3.47	.16*	.08	2.04
b_2	.11	.07	1.51	−.25**	.08	−3.15
c	.48***	.07	6.60	.48***	.07	6.60
c'	.31***	.08	3.88	.28**	.08	3.43
Indirect Effect (M_1)	**.13, 95% CI [.06, .21]**			**.03, 95% CI [.007, .06]**		
Indirect Effect (M_2)	.04, 95% CI [-.01, .10]				–	
Structure of Family Meals (Y)						
b_1	.48***	.08	6.11	−.28**	.08	−3.70
b_2	.01	.07	.19	.41***	.08	5.33
c	−.37***	.08	−4.84	−.37***	.08	−4.85
c'	−.15	.08	−1.88	−.05	.08	−.60
Indirect Effect (M_1)	**−.22, 95% CI [-.32, -.14]**			**−.05, 95% CI [-.09, -.01]**		
Indirect Effect (M_2)	.004, 95% CI [-.04, .06]				–	

Note: Statistical significance for pathway coefficients is indicated as follows *$p < .05$, **$p < .01$, ***$p < .001$. Indirect effects in bold font are considered statistically significant (95% confidence interval [CI] does not include 0). See Figs. 1 and 2 for specific models.

Responsiveness was negatively related to the four mealtime quality outcomes and positively related to Structure of Family Meals (b_1). Parent Demandingness (b_2) did not significantly predict any of the five mealtime outcomes.

The indirect effect between child Negative Affectivity and the four mealtime quality outcomes through Responsiveness (M_1), but not Demandingness (M_2), was significant, indicating that parent Responsiveness is a partial mediator. These results indicate that higher child Negative Affectivity is associated with Use of Food as a Reward, both greater Frequency and Intensity of Problematic Child Mealtime Behaviors, and more Parental Concern about Child's Diet, with each of these associations partially mediated by a decrease in parent Responsiveness. The association between child Negative Affectivity and Structure of Family Meals was fully mediated by Responsiveness.

3.1.2. Additional analyses to explore the interaction between demandingness and responsiveness

In Model 1, demandingness increased with increased child Negative Affectivity (*a*2), but it was not a significant mediator for any of the mealtime outcomes. It is possible that Demandingness is dependent on Responsiveness. To test this, we ran an exploratory analysis using Hayes PROCESS Model 14. In this model, we tested the association of Negative Affectivity (*X*) with the mealtime quality and structure outcomes (*Y*), with demandingness as the mediator (*M*), and responsiveness as a moderator (*W*) of pathway *b* between demandingness and mealtime structure and quality. For these analyses, the conditional effect of Demandingness was evaluated at Low Responsiveness (−1 SD) and High Responsiveness (+1 SD).

Results of this model indicated an interaction between Demandingness and Responsiveness for three of the five mealtime outcomes: Structure of Family Meals, Frequency of Problematic Child Mealtime Behaviors, and Intensity of Problematic Child Mealtime Behaviors. Specifically, Demandingness positively predicted Structure of Family Meals, $F(1, 145) = 6.80$, $p = .01$, when Responsiveness was high ($\beta = .27$, $p = .03$), but not when Responsiveness was low ($\beta = -.09$, $p = .27$); Furthermore, the indirect effect between Child Negative Affectivity (*X*) and Structure of Family Meals (*Y*) was significant when Responsiveness was high ($\beta = .09$, 95% CI [0.02, 0.18]), but not when Responsiveness was low ($\beta = -.03$, 95% CI [-0.09, 0.02])

For Frequency of Problematic Child Mealtime Behaviors, $F(1,145) = 3.63$, $p = .059$, and Intensity of Problematic Child Mealtime Behaviors, $F(1,145) = 3.01$, $p = .08$, the interaction between Responsiveness and Demandingness approached significance. The conditional effects indicated that Demandingness positively predicted Frequency of Problematic Child when Responsiveness was low ($\beta = .18$, $p = .02$), but not when Responsiveness was high ($\beta = .12$, $p = .55$). Similarly, Demandingness positively predicted Intensity of Problematic Child Mealtime Behaviors when Responsiveness was low ($\beta = .15$, $p = .05$), but not when Responsiveness was high ($\beta = -.07$, $p = .53$).

3.2. Model 2

Given that Responsiveness, but not Demandingness, was consistently a significant mediator in the parallel mediation models (Model 1), we only included the dimension of Responsiveness in Model 2 as a measure of parent feeding style. Consistent with the parallel mediation models, the total effects were significant with child Negative Affectivity (*X*) positively associated with the four mealtime quality outcomes (*Y*): Use of Food as a Reward, Frequency of Problematic Child Mealtime Behaviors, Intensity of Problematic Child Mealtime Behaviors, and Parental Concern about Child's Diet, and *negatively* associated with the one mealtime structure outcome (*Y*): Structure of Family Meals (*c*). The coefficients for each pathway in Model 2 are described in Table 2. Since we were primarily interested in testing for the indirect effect of serial mediation, those results are described here. The results for each of the mealtime outcomes followed the same overall pattern for serial mediation. Therefore, the results of all the models are presented together.

For each mealtime quality and structure outcome (*Y*), the indirect effect for serial mediation (a_1db_2) was significant, and in each of these models, the direct effect (*c'*) remained significant. This means that higher child Negative Affectivity was associated with increased Use of Food as a Reward, both greater Frequency and Intensity of Problematic Child Mealtime Behaviors, more Parental Concern about Child's Diet, and less Structure of Family Meals. Each of these relationships was partially mediated by increased parent Perceived Stress and decreased parent Responsiveness in serial.

4. Discussion

The first goal of this study was to investigate the associations between child negative affectivity and the two dimensions of parent feeding style (responsiveness and demandingness) in predicting mealtime quality and structure in families with young children. As hypothesized in Model 1, child negative affectivity led to less parent responsiveness, which in turn led to poorer mealtime structure and quality. However, contrary to our hypotheses, parent demandingness was not a significant mediator in the relationship between child negative affectivity and mealtime quality and structure.

The finding that demandingness was not a mediator was somewhat unexpected as parenting practices higher in structure and demandingness become increasingly important during early childhood (Balantekin et al., 2020). Authoritative feeding styles, characterized by both responsiveness and demandingness, have been linked to positive outcomes, both in the feeding environment and in general parent-child interactions (Arlinghaus et al., 2018; Patrick et al., 2005). Additionally, in a meta-analysis of caregiver feeding styles, demandingness was shown to be negatively associated with child BMI (Lopez et al., 2022). One potential explanation for why demandingness did not mediate the relationship between either child negative affectivity and family mealtimes in the current study may be related to how the construct of demandingness within the feeding context is defined.

Vaughn et al., (2016) define coercive control and structure as two distinct categories of food parenting practices. While both are related to parent demandingness, coercive control includes maladaptive demands such as pressure and intrusiveness. Structure, on the other hand, are those parenting demands that support the child's competence within the feeding environment and include positive parenting practices such as limit-setting, monitoring, modeling, and routines. Specifically during the period of early childhood, positive parenting practices that fall under structure include offering guided choices at mealtimes, offering food at regular times, and modeling healthy eating behaviors (Balantekin et al., 2020). In the current study, it is noteworthy that demandingness did not predict mealtime structure. This could suggest that our measure of demandingness may not have been reflective of the supportive aspects of demandingness during mealtimes. Future studies will need to include distinct and clear definitions of feeding demandingness that distinguish coercive control and structure.

Another potential explanation for why demandingness was not a significant mediator is that the effects of demandingness are dependent on parental responsiveness. The exploratory analyses in the current study demonstrated that high levels of demandingness predicted higher mealtime structure, but only when responsiveness was also high. This may indicate that demandingness, when paired with responsiveness, is consistent with the construct of structure. Conversely, when responsiveness was low, high levels of demandingness predicted both higher frequency and intensity of problematic child behaviors during mealtimes, suggesting that when responsiveness is low, high demandingness may more accurately reflect coercive control.

Although these results were exploratory, they are consistent with studies that demonstrate that the combination of high levels of both responsiveness and demandingness is important in supporting positive

child outcomes and parent-child interactions. For instance, an indulgent feeding style, which is high only in responsiveness is associated with both technological and nontechnological distractions during mealtimes (Ventura & Teitelbaum, 2017; Saltzman et al., 2019), which may disrupt both the quality of parent-child interactions and the mealtime structure. On the other hand, an authoritarian feeding style, which is high only in demandingness, has been associated with both poorer mealtime quality and child behavioral and dietary outcomes (Lohaus et al., 2009; Carnell et al., 2014). Continued research is needed to explain the interaction between responsiveness and the type of demandingness (control vs structure) and how these dimensions work together to influence mealtime structure and quality. Larger sample sizes than that used in the current study will be needed to further delineate the interactions between these parenting dimensions within the family mealtime environment.

The second aim of the study was to describe the complex nature of the associations between child negative affectivity, parent stress, and parent responsiveness in predicting mealtime structure and quality. In Model 2, where we examined child negative affectivity and parent stress together, child negative affectivity increased parent stress, which reduced parent responsiveness, in turn, leading to poorer mealtime structure and quality. These findings are consistent with previous literature that demonstrate a bidirectional relationship between child and parent characteristics (Harris et al., 2018). Child negative affectivity has been shown to increase parent stress (Östberg & Hagekull, 2000), and child characteristics have also been shown to elicit differential feeding practices from parents, such as pressure to eat and restriction of food (Horn et al., 2011).

These findings have several key implications. First, they emphasize the role of the child in shaping the mealtime environment and the need to consider the transactional and bidirectional interactions that take place between the child and parent. Characteristics of the child, such as negative affectivity, may influence the routines, structure, quality, and overall environment of the family mealtime (Stifter & Moding, 2019). Future research should utilize longitudinal and observational methods to further understand these transactional relationships between parents and children during mealtimes. Second, these results highlight the variability in the contexts surrounding family mealtimes, including the nature of the child's temperament and the amount of stress a parent is experiencing. Continued research should be aimed at identifying support strategies for parents that are specific to these differential contexts. Third, experimental research should investigate the effects of increasing parent feeding responsiveness across challenging contexts to creating healthy family mealtime environments. In the current study, parent feeding responsiveness consistently predicted better family mealtime environments, and parents were most responsive in contexts where child negative affectivity and parental stress were lowest. Finally, research should focus on defining effective strategies that promote supportive forms of demandingness to help counter maladaptive strategies, such as using food as reward. Parents under higher stress or parents with children higher in negative affectivity may benefit from integrating more supportive, rather than coercive, approaches during feeding and mealtimes (Arlinghaus et al., 2018).

Research targeted at assisting parents with such strategies during challenging situations may also improve the overall family dynamic in general. However, it is not clear from the current study whether the parent-child dynamics are specific to the family mealtime environment or whether these family dynamics extrapolate to the overall family functioning. Interventions aimed at increasing general parent responsiveness, rather than just feeding responsiveness, may be beneficial to the overall family functioning, such as improved mealtime environments and decreased parent stress. Future directions should test the efficacy of various types of interventions whether aimed at coping with environmental stressors both within and outside the family, improving responsive *feeding* styles versus *general* parenting styles, or employing supportive, rather than coercive, feeding demands. For instance, in an intervention aimed at teaching parents to feed their infants using responsive feeding practices, parents were also taught *general* soothing and parenting techniques. This led to parents using food less often as a means to soothe or comfort their child (Savage et al., 2018). Future research will be needed to distinguish whether general parenting techniques, feeding-specific interventions, or a combination of the two are most effective in improving the mealtime environment during early childhood, particularly for families where child negative affectivity is high.

This study is unique in that it included both mothers and fathers in the sample. Much of the literature on family mealtimes fails to address the father's role in the feeding environment. However, fathers are becoming increasingly involved in child rearing processes, including feeding (Mallan et al., 2014). Mothers and fathers have been shown to utilize different feeding practices, with fathers engaging in lower levels of monitoring and higher levels of control and pressure to eat (Daniels et al., 2020; Haycraft & Blissett, 2008). The current study partially supported this literature, showing mothers to be more responsive than fathers; however, this difference between mothers and fathers was not related to any of our results. It may be that fathers engage in responsive behaviors less often, but that they utilize more of the positive aspects of demandingness. More research is needed to identify potential differences between mothers and fathers within the feeding and mealtime environments.

There are several limitations to this study. For one, this was a correlational and cross-sectional study. Therefore, we cannot assume causation between any of our variables. Although, it is common to use directional terms to describe the relationships between variables in mediational models (Hayes, 2017), we cannot be certain about the direction or cause between variables without experimental data. Longitudinal and experimental studies will be essential. This study also used self-report measures, which is not always a direct correlation to observable behavior (Blissett et al., 2019) and may be subject to bias (Bergmeier et al., 2015.). Further, the current study did not account for shared method variance, since all the measures were self-report from the same respondent, which may also impact the interpretation of the results (LaGrange & Cole, 2008). Another consideration is that the parents who completed the survey may not be the primary caregivers, and the effects we observed may depend on the parents' specific caregiving role. Finally, this sample was limited in its diversity, including predominately white, college-educated, married caregivers. This limits generalizability to other groups, such as those who may experience higher rates of food insecurity and overweight/obesity. Future studies should examine the quality of family mealtimes across more diverse samples, socioeconomic statuses, and cultural differences in feeding styles (Chen & Kennedy, 2004).

Overall, this line of research is essential for understanding family mealtime dynamics and creating positive interactions between parents and children during mealtimes. Depending on the overall quality and structure of the mealtime environment, these patterns over time may create a reliable environment for intricate parent-child interactions to develop and grow in complexity and to support the child's physical, behavioral, social, and mental development.

Ethical statement

All procedures were approved by the IRB at the University of North Florida (Protocol #408309-11). Informed consent was obtained from all participants.

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Author contributions

LNB and AJF were involved in the conceptualization, methodology, formal analysis, data curation, and writing (original draft and review and editing). DOW and JSD were involved in the conceptualization, methodology, writing (review and editing), and funding acquisition.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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References

Anderson, S. E., Must, A., Curtin, C., & Bandini, L. G. (2012). Meals in our household: Reliability and initial validation of a questionnaire to assess child mealtime behaviors and family mealtime environments. *Journal of the Academy of Nutrition and Dietetics, 112*(2), 276–284. https://doi.org/10.1016/J.JADA.2011.08.035

Arlinghaus, K. R., Vollrath, K., Hernandez, D. C., Momin, S. R., O'connor, T. M., Power, T. G., & Hughes, S. O. (2018). Authoritative parent feeding style is associated with better child dietary quality at dinner among low-income minority families. *The American Journal of Clinical Nutrition, 108*(4), 730–736. https://doi.org/10.1093/ajcn/nqy142

Balantekin, K. N., Anzman-Frasca, S., Francis, L. A., Ventura, A. K., Fisher, J. O., & Johnson, S. L. (2020). Positive parenting approaches and their association with child eating and weight: A narrative review from infancy to adolescence. *Pediatric obesity, 15*(10), Article e12722.

Berge, J. M., Fertig, A. R., Trofholz, A., Neumark-Sztainer, D., Rogers, E., & Loth, K. (2020). Associations between parental stress, parent feeding practices, and child eating behaviors within the context of food insecurity. *Preventive Medicine Reports, 19*. https://doi.org/10.1016/J.PMEDR.2020.101146

Berge, J. M., Jin, S. W., Hannan, P., & Neumark-Sztainer, D. (2013). Structural and interpersonal characteristics of family meals: Associations with adolescent body mass index and dietary patterns. *Journal of the Academy of Nutrition and Dietetics, 113*(6), 816–822. https://doi.org/10.1016/J.JAND.2013.02.004

Berge, J. M., Wall, M., Neumark-Sztainer, D., Larson, N., & Story, M. (2010). Parenting style and family meals: Cross-sectional and 5-year longitudinal associations. *Journal of the American Dietetic Association, 110*(7), 1036–1042.

Bergmeier, H., Skouteris, H., & Hetherington, M. (2015). Systematic research review of observational approaches used to evaluate mother-child mealtime interactions during preschool years 1-4. *The American Journal of Clinical Nutrition, 101*(1), 7–15. https://doi.org/10.3945/ajcn.114.092114

Bjørklund, O., Belsky, J., Wichstrøm, L., & Steinsbekk, S. (2018). Predictors of eating behavior in middle childhood: A hybrid fixed effects model. *Developmental Psychology, 54*(6), 1099–1110. https://doi.org/10.1037/DEV0000504

Blissett, J., Farrow, C., & Haycraft, E. (2019). Relationships between observations and parental reports of 3–5-year-old children's emotional eating using the Children's Eating Behaviour Questionnaire. *Appetite, 141*(1), Article 104323. https://doi.org/10.1016/J.APPET.2019.104323

Boles, R. E., Reiter-Purtill, J., & Zeller, M. H. (2013). Persistently obese youth: Interactions between parenting styles and feeding practices with child temperament. *Clinical Pediatrics, 52*(12), 1098–1106. https://doi.org/10.1177/0009922813497091

Bronfenbrenner, U., & Morris, P. A. (2007). The bioecological model of human development. *Handbook of child psychology, 1*.

Carnell, S., Benson, L., Driggin, E., & Kolbe, L. (2014). Parent feeding behavior and child appetite: associations depend on feeding style. *The International Journal of Eating Disorders, 47*(7), 705–709. https://doi.org/10.1002/eat.22324

Carson, J. L., & Parke, R. D. (1996). Reciprocal negative affect in parent-child interactions and children's peer competency. *Child Development, 67*(5), 2217–2226. https://doi.org/10.1111/J.1467-8624.1996.TB01853.X

Chen, J. L., & Kennedy, C. (2004). Family functioning, parenting style, and Chinese children's weight status. *Journal of Family Nursing, 10*(2), 262–279.

Cohen, S. (1994). *Perceived stress scale*. Mind Garden. *Inc. Retrieved from* www.mindgarden.com.

Cohen, S., Kessler, R. C., & Gordon, L. U. (1995). Strategies for measuring stress in psychiatric and physical disorders. In S. Cohen, R. C. Kessler, & L. U. Gordon (Eds.), *Measuring Stress* (pp. 3–28). New York: Oxford University Press.

Daniels, L. A., Mallan, K. M., Jansen, E., Nicholson, J. M., Magarey, A. M., & Thorpe, K. (2020). Comparison of early feeding practices in mother–father dyads and possible generalization of an efficacious maternal intervention to fathers' feeding practices: A secondary analysis. *International Journal of Environmental Research and Public Health, 17*(17), 6075. https://doi.org/10.3390/IJERPH17176075

Durbin, D. L., Darling, N., Steinberg, L., & Brown, B. B. (1993). Parenting style and peer group membership among European-American adolescents. *Journal of Research on Adolescence, 3*(1), 87–100. https://doi.org/10.1207/S15327795JRA0301_5

Elgar, F. J., Craig, W. B., & Trites, S. J. (2013). Family dinners, communication, and mental health in Canadian adolescents. *Journal of Adolescent Health, 52*(4), 433–438. https://doi.org/10.1016/j.jadohealth.2012.07.012

Fiese, B. H., Foley, K. P., & Spagnola, M. (2006). Routine and ritual elements in family mealtimes: Contexts for child well-being and family identity. *New Directions for Child and Adolescent Development, 111*, 67–89. https://doi.org/10.1002/CD.156, 2006.

Fiese, B. H., Hammons, A., & Grigsby-Toussaint, D. (2012). Family mealtimes: A contextual approach to understanding childhood obesity. *Economics and Human Biology, 10*(4), 365–374. https://doi.org/10.1016/J.EHB.2012.04.004

Fiese, B. H., Jones, B. L., & Jarick, J. M. (2015). Family mealtime dynamics and food consumption: An experimental approach to understanding distractions. *Couple and Family Psychology: Research and Practice, 4*(4), 199–211. https://doi.org/10.1037/CFP0000047

Finnane, J. M., Jansen, E., Mallan, K. M., & Daniels, L. A. (2017). Mealtime structure and responsive feeding practices are associated with less food fussiness and more food enjoyment in children. *Journal of Nutrition Education and Behavior, 49*(1), 11–18. https://doi.org/10.1016/j.jneb.2016.08.007

Hammons, A. J., & Fiese, B. H. (2011). Is frequency of shared family meals related to the nutritional health of children and adolescents? *Pediatrics, 127*(6), e1565–e1574. https://doi.org/10.1542/PEDS.2010-1440

Harbec, M.-J., & Pagani, L. S. (2018). Associations between early family meal environment quality and later well-being in school-age children. *Journal of Developmental and Behavioral Pediatrics, 39*(2), 136–143.

Harris, H. A., Jansen, E., Mallan, K. M., Daniels, L., & Thorpe, K. (2018). Concern explaining nonresponsive feeding: A study of mothers' and fathers' response to their child's fussy eating. *Journal of Nutrition Education and Behavior, 50*(8), 757–764. https://doi.org/10.1016/J.JNEB.2018.05.021

Haycraft, E., & Blissett, J. (2008). Predictors of paternal and maternal controlling feeding practices with 2-to 5-year-old children. *Journal of Nutrition Education and Behavior, 44*(5), 390–397. https://doi.org/10.1016/j.jneb.2010.03.001

Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Publications.

Horn, M. G., Galloway, A. T., Webb, R. M., & Gagnon, S. G. (2011). The role of child temperament in parental child feeding practices and attitudes using a sibling design. *Appetite, 57*(2), 510–516. https://doi.org/10.1016/J.APPET.2011.06.015

Hughes, S. O., Cross, M. B., Hennessy, E., Tovar, A., Economos, C. D., & Power, T. G. (2012). Caregiver's Feeding Styles Questionnaire. Establishing cutoff points. *Appetite, 58*(1), 393–395. https://doi.org/10.1016/j.appet.2011.11.011

Hughes, S. O., Power, T. G., Orlet Fisher, J., Mueller, S., & Nicklas, T. A. (2005). Revisiting a neglected construct: Parenting styles in a child-feeding context. *Appetite, 44*(1), 83–92. https://doi.org/10.1016/J.APPET.2004.08.007

Hughes, S. O., & Shewchuk, R. M. (2012). Child temperament, parent emotions, and perceptions of the child's feeding experience. *International Journal of Behavioral Nutrition and Physical Activity, 9*(1), 1–9. https://doi.org/10.1186/1479-5868-9-64/TABLES/3

Hughes, S. O., Shewchuk, R. M., Baskin, M. L., Nicklas, T. A., & Qu, H. (2008). Indulgent feeding style and children's weight status in preschool. *Journal of Developmental and Behavioral Pediatrics, 29*(5), 403–410. https://doi.org/10.1097/DBP.0b013e318182a976

IBM Corp. Released. (2020). *IBM SPSS statistics for windows, version 27.0*. Armonk, NY: IBM Corp.

Jackson, A. P., & Choi, J. K. (2018). Parenting stress, harsh parenting, and children's behavior. *Journal of Family Medicine & Community Health, 5*(3), 1150.

Kidwell, K. M., Kozikowski, C., Roth, T., Lundahl, A., & Nelson, T. D. (2018). Concurrent and longitudinal associations among temperament, parental feeding styles, and selective eating in a preschool sample. *Journal of Pediatric Psychology, 43*(5), 572–583. https://doi.org/10.1093/jpepsy/jsx148

LaGrange, B., & Cole, D. A. (2008). An expansion of the trait-state-occasion model: Accounting for shared method variance. *Structural Equation Modeling: A Multidisciplinary Journal, 15*(2), 241–271.

Lee, E. H. (2012). Review of the psychometric evidence of the perceived stress scale. *Asian Nursing Research, 6*(4), 121–127. https://doi.org/10.1016/J.ANR.2012.08.004

Lohaus, A., Vierhaus, M., & Ball, J. (2009). Parenting styles and health-related behavior in childhood and early adolescence: Results of a longitudinal study. *The Journal of Early Adolescence, 29*(4), 449–475. https://doi.org/10.1177/0272431608322954

Lopez, B. A., Nicholson, J. S., Garcia, R. N., Johnson, H. R., Power, T. G., & Hughes, S. O. (2022). Review and meta-analysis for the caregiver's feeding styles questionnaire administered to low-income families. *Eating Behaviors, 46*. https://doi.org/10.1016/j.eatbeh.2022.101659

Lora, K., Sisson, S., DeGrace, B., & Morris, A. (2014). Frequency of family meals and 6–11-year-old children's social behaviors. *Journal of Family Psychology, 28*(4), 577. https://doi.org/10.1037/fam0000014

Mallan, K. M., Jansen, E., Harris, H., Llewellyn, C., Fildes, A., & Daniels, L. A. (2018). Feeding a fussy eater: Examining longitudinal bidirectional relationships between

child fussy eating and maternal feeding practices. *Journal of Pediatric Psychology, 43*(10), 1138–1146. https://doi.org/10.1093/jpepsy/jsy053

Mallan, K. M., Nothard, M., Thorpe, K., Nicholson, J. M., Wilson, A., Scuffham, P. A., & Daniels, L. A. (2014). The role of fathers in child feeding: Perceived responsibility and predictors of participation. *Child: Care, Health and Development, 40*(5), 715–722. https://doi.org/10.1111/cch.12088

Mason, T. B., O'Connor, S. G., Schembre, S. M., Huh, J., Chu, D., & Dunton, G. F. (2019). Momentary affect, stress coping, and food intake in mother-child dyads. *Health Psychology, 38*(3), 238–247. https://doi.org/10.1037/HEA0000714

Östberg, M., & Hagekull, B. (2000). A structural modeling approach to the understanding of parenting stress. *Journal of Clinical Child Psychology, 29*(4), 615–625. https://doi.org/10.1207/S15374424JCCP2904_13

Patrick, H., Nicklas, T. A., Hughes, S. O., & Morales, M. (2005). The benefits of authoritative feeding style: Caregiver feeding styles and children's food consumption patterns. *Appetite, 44*(2), 243–249. https://doi.org/10.1016/j.appet.2002.07.001

Putnam, S. P., & Rothbart, M. K. (2006). Development of short and very short forms of the Children's Behavior Questionnaire. *Journal of Personality Assessment, 87*(1), 102–112. https://doi.org/10.1207/s15327752jpa8701_09

Rothbart, M., Chew, K., & Gartsein, M. A. (2001). Assessment of temperament in early development. In L. T. Singer, & P. S. Zeskind (Eds.), *Biobehavioral assessment of the infant* (pp. 190–208). The Guliford Press.

Saltzman, J. A., Musaad, S., Bost, K. K., McBride, B. A., & Fiese, B. H. (2019). Associations between father availability, mealtime distractions and routines, and maternal feeding responsiveness: An observational study. *Journal Of Family Psychology: JFP : Journal Of The Division Of Family Psychology Of The American Psychological Association (Division 43), 33*(4), 465–475. https://doi.org/10.1037/fam0000519

Sameroff, A. (2010). A unified theory of development: A dialectic integration of nature and nurture. *Journal of Child Development, 81*(1), 6–22. https://doi.org/10.1111/j.1467-8624.2009.01378.x

Sanson, A., Hemphill, S. A., & Smart, D. (2004). Connections between temperament and social development: A review. *Social Development, 13*(1), 142–170. https://doi.org/10.1046/j.1467-9507.2004.00261.x

Savage, J. S., Hohman, E. E., Marini, M. E., Shelly, A., Paul, I. M., & Birch, L. L. (2018). INSIGHT responsive parenting intervention and infant feeding practices: Randomized clinical trial. *International Journal of Behavioral Nutrition and Physical Activity, 15*(1), 1–11. https://doi.org/10.1186/S12966-018-0700-6

Searle, B. R. E., Harris, H. A., Thorpe, K., & Jansen, E. (2020). What children bring to the table: The association of temperament and child fussy eating with maternal and paternal mealtime structure. *Appetite, 151*. https://doi.org/10.1016/J.APPET.2020.104680

Shonkoff, E. T., Dunton, G. F., Chou, C. P., Leventhal, A. M., Bluthenthal, R., & Pentz, M. A. (2017). Direct and indirect effects of parent stress on child obesity risk and added sugar intake in a sample of Southern California adolescents. *Public Health Nutrition, 20*(18), 3285–3294.

Skeer, M. R., Kendrin Sonneville, R., Bhushan Deshpande, R., Matthew Goodridge, C., & Folta, S. C. (2018). Going beyond frequency: A qualitative study to explore new dimensions for the measurement of family meals. *Journal of Child and Family Studies, 27*(4), 1075–1087. https://doi.org/10.1007/s10826-017-0967-2

Stifter, C. A., & Moding, K. J. (2019). Temperament in obesity-related research: Concepts, challenges, and considerations for future research. *Appetite, 141*, Article 104308. https://doi.org/10.1016/J.APPET.2019.05.039

Tovar, A., Hennessy, E., Pirie, A., Must, A., Gute, D. M., Hyatt, R. R., Kamins, C. L., Hughes, S. O., Boulos, R., Sliwa, S., Galvão, H., & Economos, C. D. (2012). Feeding styles and child weight status among recent immigrant mother-child dyads. *International Journal of Behavioral Nutrition and Physical Activity, 9*, 1–8. https://doi.org/10.1186/1479-5868-9-62

Van Gampelaere, C., Luyckx, K., Goethals, E. R., van der Straaten, S., Laridaen, J., Casteels, K., … Goubert, L. (2020). Parental stress, anxiety and trait mindfulness: Associations with parent–child mealtime interactions in children with type 1 diabetes. *Journal of Behavioral Medicine, 43*(3), 448–459. https://doi.org/10.1007/s10865-020-00144-3

Vaughn, A. E., Ward, D. S., Fisher, J. O., Faith, M. S., Hughes, S. O., Kremers, S. P. J., Musher-Eizenman, D. R., O'Connor, T. M., Patrick, H., & Power, T. G. (2016). Fundamental constructs in food parenting practices: A content map to guide future research. *Nutrition Reviews, 74*(2), 98–117. https://doi.org/10.1093/nutrit/nuv061

Ventura, A. K., & Teitelbaum, S. (2017). Maternal Distraction During Breast- and Bottle Feeding Among WIC and non-WIC Mothers. *Journal of Nutrition Education and Behavior, 49*(7), S169–S176.e1. https://doi.org/10.1016/J.JNEB.2017.04.004

Zhou, Z., Liew, J., Yeh, Y.-C., & Perez, M. (2019). Appetitive traits and weight in children: Evidence for parents' controlling feeding practices as mediating mechanisms. *The Journal of Genetic Psychology, 181*(1), 1–13. https://doi.org/10.1080/00221325.2019.1682506