

Self-Determination Theory and Food-Related Parenting: The Parent Socioemotional Context of Feeding Questionnaire

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There has been wide application of Self-Determination Theory (SDT) to understanding motivation and regulation of eating and weight. Yet, there are no measures of the socioemotional-contextual family conditions in the eating domain, which are identified in SDT and should influence development of eating behavior in young children. Two studies were conducted to develop and validate a measure to assess the SDT socioemotional-contextual dimensions of food-related parenting. These dimensions were derived from extensions of SDT, which argue that autonomy support, warmth, and appropriate structure (as well as low coercion, hostility, and chaos) are the conditions that will fulfill children's psychological needs for autonomy, relatedness and competence, resulting in more intrinsic motivation and better self-regulation of behavior. In the first study, 230 parents completed the food-related parenting items in reference to their 4- to 8-year-old children, and the factor structure and construct and convergent validity of the items were examined. Generally consistent with SDT, factors suggested 4 food-related socioemotional parenting contexts of supportiveness (autonomy support/warmth), coerciveness (coercion/hostility), structure, and chaos. In a second study of 221 parents, a 24-item Parent Socioemotional Context of Feeding Questionnaire (PSCFQ) was confirmed to have a 4-factor structure. In each study, good reliability was found for each subscale. Construct, convergent, and divergent validity were supported by small to moderate correlations with aspects of child feeding (e.g., restriction) and general parenting styles. PSCFQ subscales were not associated with child BMI, family income or parent education.

Keywords: body weight, eating behavior, feeding practices, parenting, self-determination theory

Self-Determination Theory (SDT; Deci & Ryan, 1985) has been a foundation for research on the presence or development of eating and weight-related motivation and self-regulation (e.g., Girelli, Hagger, Mallia, & Lucidi, 2016; Verstuyf, Vansteenkiste, Soenens, Boone, & Mouratidis, 2013). Further, interventions have relied on SDT as a foundation with some success (see Ng et al., 2012). In general, SDT focuses on how the socioemotional conditions of social contexts or relationships—most commonly operationalized as contexts made up of relationships with close, important or influential others—can fulfill or thwart three basic human psychological needs of autonomy, relatedness, and competence (Ryan & Deci, 2000). In SDT, autonomy is defined as the need for volition and a feeling of having choice in activities and goals. Relatedness is defined as the need to belong to social groups and to be related to, and valued by, others. Competence is defined as feelings of being efficacious and capable of achieving success and

goals, and avoiding failure. When the psychological needs are fulfilled this has been found to facilitate intrinsic motivation, self-regulation, and well-being in many domains, including education and health (Vansteenkiste, Niemiec, & Soenens, 2010; Verstuyf et al., 2013).

Expanding on these views for understanding family contexts, theorists have proposed that there are six socioemotional conditions that are all relevant to the fulfillment or thwarting of the three human psychological needs (Ryan & Deci, 2000; Skinner, Johnson, & Snyder, 2005). These conditions are autonomy support, coercion, warmth, hostility, structure, and chaos. Autonomy support and coercion (sometimes referred to as control; Verstuyf et al., 2013) are proposed as relevant to supporting and thwarting the need for autonomy, respectively. Warmth (also referred to as belonging or relatedness; Baumeister & Leary, 1995) and hostility (also referred to as rejection; Skinner et al., 2005; Zimmer-Gembeck, Webb, Thomas, & Klag, 2015) are proposed as relevant to supporting and thwarting the need for relatedness, respectively. Finally, structure and chaos are proposed as relevant to supporting and thwarting the need for competence, respectively. In the present study, these six contextual conditions were defined specific to young children (age 4 to 8) in the context of parenting related to feeding and eating. More specifically, autonomy support was defined as behaviors and emotions of parents that give a message of valuing children's autonomy and choice and encouraging agency and indi-

This article was published Online First March 14, 2019.

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vidual expression, whereas coercion involves parents' behaviors and emotion that reflect overcontrolling practices and demanding of obedience (Zimmer-Gembeck et al., 2015). Warmth was defined as expressions of affection and caring, whereas hostility included behaviors and emotions that imply rejection, dislike or disapproval. Structure was defined as predictability, consistency, and the provision of clear and reasonable limits, whereas chaos included inconsistent, erratic, or arbitrary parenting behavior or emotion, but also lack of or unclear limits. Our aim in the current study was to develop a new measure to tap the six socioemotional-contextual conditions of autonomy support, coercion, warmth, hostility, structure, and chaos specific to the domain of parenting and children's feeding and eating.

Parenting, Young Children, and Self-Determination Theory

Parents attempting to encourage healthy eating generally aim for their children to eventually internalize positive eating behaviors and enact them without external regulation (e.g., rewards or punishments, parental monitoring; Scaglioni, Salvioni, & Galimberti, 2008); these goals that parents have for their children are key outcomes identified in SDT. Specifically, in SDT, the six socioemotional-contextual conditions that support or undermine basic psychological needs are anticipated to have such effects; they are described as foundations of internalization, self-regulation, intrinsic motivation, and, eventually, well-being and health (Deater-Deckard, Chen, Wang, & Bell, 2012; Ryan & Deci, 2000; Skinner et al., 2005; Skinner, Zimmer-Gembeck, & Connell, 1998). As such, SDT is a useful approach for identifying how the family social context can influence eating regulation and related behaviors, and potentially increase adaptive self-regulation of eating (e.g., more intuitive eating and less emotional eating), more healthy eating choices, and more consistent exercise behavior (e.g., Chiang & Padilla, 2012; Girelli et al., 2016; Wilson, Sweeney, Kitzman-Ulrich, Gause, & St George, 2017). For example, in a meta-analysis of 184 interventions, those interventions using SDT principles showed participant outcomes of better weight loss, increased exercise, and reduced depressive symptoms (Ng et al., 2012). Outside the eating domain, there has also been support for the six dimensions of parenting derived from SDT as correlates of children's motivation and well-being. For example, when parents reported they were more autonomy supportive, warm, and structured (and less coercive, hostile/rejecting, and chaotic), children were found to exhibit greater self-regulation and show greater internalization of appropriate parental behaviors and values (Grolnick, Deci, & Ryan, 1997; Joussemet, Landry, & Koestner, 2008; Skinner et al., 1998). Also, household chaos, measured as a busy and noisy household with lack of routine and disarray, has been found to have deleterious effects on children's behavior and academic performance (Deater-Deckard et al., 2009).

Extending Current Research Applying SDT to Families, Eating, and Weight

Despite previous research, there are three extensions that could be made to SDT research when the focus is on parent and child

eating and weight. First, SDT does place the primary emphasis on the need for autonomy (Deci & Ryan, 1985), but, as described above, three psychological needs have been highlighted, but they have often been overlooked in research on eating and weight. In such research, the focus has been almost exclusively on the need for autonomy, and how the social context meets this need through autonomy support or undermines it through coercion/control. Yet, SDT draws attention to multiple important socioemotional-contextual conditions that could promote or undermine healthy behaviors.

A second extension relates to the focus only on *general* autonomy support and coercion (or control) in most studies of parenting and children's feeding and eating, rather than a focus on autonomy support specific to the domain of feeding and eating. Domain may matter, as parents may find feeding and eating practices particularly challenging for personal reasons, such as body image concerns (Blissett & Haycraft, 2011; Webb & Haycraft, 2019). Moreover, the socioemotional-contextual conditions they wish to provide for their children may be constantly interrupted by other influences they face daily, such as advertisements, and the availability and attractiveness of snacks, making this domain particularly emotional and conflictual (Driessen, Cameron, Thornton, Lai, & Barnett, 2014).

Regarding the third extension that is needed, all studies we could locate have investigated SDT elements as correlates of eating or related health behaviors among adolescents or adults. In addition, most often these studies relied only on self-report from these participants to gather information on others' autonomy supportive or controlling behaviors, as well as personal eating beliefs and behaviors. In contrast, in most studies of young children, reports about parenting cannot be reported by the children themselves. Because there is no available measure for parents of young children that captures the SDT socioemotional-contextual conditions for eating or weight related to all three psychological needs, there has been little research focused on parental support for young children's eating autonomy. Also, there has been even less research on parental support for children's relatedness or competence around eating.

Other Measures of Food-Related Parenting

There are other measures available that have been important for understanding children's eating and weight problems or regulation (e.g., Moens, Braet, & Soetens, 2007; Musher-Eizenman & Holub, 2007). For example, one available measure is the Caregiver's Feeding Styles Questionnaire (CFSQ; Hughes, Power, Orlet Fisher, Mueller, & Nicklas, 2005) designed for children 3–5 years of age. The CFSQ distinguishes patterns of feeding along two parenting dimensions of demandingness (19 items) and responsiveness (seven items) and more recently described as autonomy (or child-centered feeding directives) and control (or parent-centered feeding directives; Hughes et al., 2012). Items on the CFSQ are designed to assess feeding *directives*, all with a focus on encouraging or discouraging children's particular eating behaviors. Somewhat overlapping with the CFSQ, the Child Feeding Questionnaire (CFQ; Birch et al., 2001, children age 2–11 years) is designed to capture reports from parents about monitoring and restriction of their children's eating, as well as their reliance on pressure to eat. Many items relate to parents concerns (e.g., How

concerned are you about your child having to diet to maintain a desirable weight?), and items tend to tap parenting practices reflective of demandingness. Also available is a third food-related parenting measure, the Comprehensive Feeding Practices Questionnaire (CFPQ; Musher-Eizenman & Holub, 2007). The CFPQ was founded on open-ended questions with parents and includes 12 subscales, which asks parents of young children (2–8 years) to report how food is selected and used in the family, as well as to report food-related modeling, teaching, restricting, pressure, and encouragement. This measure captures a diversity of personal and parenting behaviors proposed to influence children's eating preferences and behaviors.

The CFSQ, CFQ, and CFPQ include items that were developed by identifying parents' behaviors that are relevant to direct socialization of children's eating—what they eat and when. They tend not to include items designed to assess general parenting socioemotional style or the socioemotional family/home climate. Given the existence of good measures of particular parenting eating directives or practices, our aim was not to develop a measure to assess the specific behaviors that parents use when attempting to socialize or direct their children's eating behavior. Our aim was to capture the more socioemotional setting (i.e., climate or context) that parents have developed in the home. For example, we wanted to assess whether the context of the family is more or less supportive or coercive of children by considering a range of food- and eating-related situations (e.g., when shopping for food, when selecting when to eat and what to eat, when preparing food, and during mealtimes). We also aimed to measure general positive or negative emotionality exhibited by parents related to feeding and eating, as well as the general expectations they do or do not have in their family related to feeding and eating. Consistent with the view of Darling and Steinberg (1993), who argued that parenting style and parenting practices are better considered simultaneously when studying child development, we did not view our measure of the food-related parent socioemotional context as a replacement for existing measures. Instead, it could be used alone as a measure of food-related parenting context or climate, but might also be used in conjunction with existing measures of specific parenting socialization behaviors or directives with children, such as the CFSQ, CFQ, and CFPQ.

The Current Studies

In summary, our purpose was to draw from SDT and related research that has investigated parenting and child behavior (e.g., Skinner et al., 2005) and eating and weight concerns (Girelli et al., 2016; Wilson et al., 2017) to develop a new measure of the socioemotional context of feeding and eating in the home that could be used in future research. We refer to this measure as the Parent Socioemotional Context of Feeding Questionnaire (PSCFQ). By conducting a series of two studies, the more specific aim was to develop a reliable and valid measure for parents of young children (age 4 to 8 years) that would capture the socioemotional-contextual conditions in the family important for fulfilling children's three basic psychological needs for autonomy, relatedness and competence. These family conditions included the food-related autonomy support, coercion, warmth, hostility, structure, and chaos endorsed by parents.

Study 1: Exploratory Factor Analyses and Initial Validation of the PSCFQ

Method

Participants and procedure. Participants were 230 caregivers ($M_{\text{age}} = 37.2$ years, $SD = 4.2$) of children aged 4 to 8 years ($M_{\text{age}} = 5.7$ years, $SD = 0.9$; 48% female). We use the general term *caregivers* because most participants (94%) were mothers, but 6% of participants were fathers. The majority of participants (94%) described themselves as white/Caucasian/European, whereas 4% were Asian, and 2% were Aboriginal/Pacific Islander. Almost one third (31%) reported completing a university degree. A total of 247 caregivers with children attending preschool or grades 1 or 2 at two Australian primary schools in an urban area, and who also had primary responsibility for the planning and preparation of family meals, agreed to participate in the study, resulting in a response rate of 49%. Thirteen of these participants were excluded from data analyses because of missing more than 50% of the items on the PSCFQ. Complete data were available for all other participants. However, four parents completed a questionnaire for two of their children (four sets of twins); we randomly selected one child from each family to be excluded from the analyses.

Before study commencement, ethical approval was obtained from the university's ethics review board. Two schools were contacted about participation in the study. Following School Principals' approvals, questionnaire packages were directly mailed to caregivers from the schools, including a reply paid envelope for the return of the questionnaire directly to the university. Participation was voluntary and caregivers provided written consent to participate.

Measures.

Parent Socioemotional Context of Feeding Questionnaire (PSCFQ). Items were developed to be consistent with conceptual definitions of the six socioemotional conditions of the family and parenting (i.e., autonomy support six items, coercion six items, warmth six items, hostility six items, structure nine items, and chaos eight items; Skinner et al., 2005; Zimmer-Gembeck et al., 2015). In Study 1, caregivers completed a total of 41 items. All of the items had response options ranging from 1 (*extremely untrue*) to 7 (*extremely true*).

The development of the measurement items began with a literature review to uncover existing items/scales that assessed parental feeding behaviors, parenting dimensions, and general parenting, which were used to assist in the wording of items for the new measure. In addition, we used convenience sampling and snowballing to identify 10 parents to participate in interviews about food-related parenting. These interviews focused on understanding the language parents of young children would use when discussing their interactions with their children in feeding and eating contexts. We developed 45 items based on our definitions of the six socioemotional contextual features of the parent context and from the literature review and interview context, which were then reviewed by three parenting experts. Twenty parents, recruited via university advertising, completed these items and provided written feedback regarding item clarity, sensitivity, and time taken to complete items. We then modified some item wording, removed some items, and developed some new items from this feedback, leaving a pool of 41 items. These modifications were primarily made to improve

the items designed to measure food-related parent structure and chaos. Caregivers ($n = 89$) recruited through one preschool and one primary school, via the school e-mail newsletters, then completed the 41 items to advise on clarity. Again, some items were modified to improve clarity, but all items were maintained for Study 1.

Child feeding. Parent child-feeding practices were assessed with the Child Feeding Questionnaire (CFQ; Birch et al., 2001). The CFQ was also completed by parents to examine convergent validity with our new measure, given that we anticipated that it would have the closest alignment with subscales designed for the PSCFQ. The CFQ is a parent-report survey for parents of children aged 2 to 11 years. Three subscales measure parental behaviors used to control child feeding: (a) *monitoring* ($\alpha = .85$), which assesses parental supervision of child eating (three items; e.g., “How much do you keep track of the high-fat foods that your child eats?”); (b) *restriction* ($\alpha = .82$), which assesses the extent to which parents restrict child access to foods (eight items; e.g., “If I did not guide or regulate my child’s eating, s/he would eat too much of her favorite foods”); and (c) *pressure to eat* ($\alpha = .78$), which assesses parental pressure to eat more food, typically at mealtimes (four items; e.g., “My child should always eat all the food on her plate”). The *perceived responsibility* subscale ($\alpha = .78$) of the CFQ was included to assess parental perceptions of their responsibility for child feeding (three items; e.g., “How often are you responsible for deciding what your child’s portion sizes are?”). Response options ranged from 1 (*extremely untrue*) to 7 (*extremely true*).

Child and parent body mass index (BMI). Children’s height (cm) and weight (kg) were reported by parents after a prompt in the questionnaire to weigh and measure their children. BMI z-scores were calculated using Centers for Disease Control and Prevention criteria (Centers for Disease Control and Prevention, 2000); 8% of children were classified as at risk for overweight (85th to <95th percentiles) and 5% of children were classified as overweight (95th percentile). Based on standard definitions (Cole, Bellizzi, Flegal, & Dietz, 2000), 10% of children were classified as overweight or obese. Parent weight and height were obtained via self-report. In total, 23% of parents were overweight (between 25 and <30 kg/m²) and 8% were obese (≥ 30 kg/m²).

Overview of analyses. Using SPSS v24, we conducted two sets of exploratory factor analysis (EFA; principal axis factoring with direct oblimin rotation): one set for the autonomy support, coercion, warmth, and hostility items (PSCFQ-1); and the other set for the structure and chaos items (PSCFQ-2). We conducted two sets of analyses because some structure and chaos items had low correlations with warmth and hostility items, but other structure and chaos items were moderately correlated with warmth and hostility items. We suspected that this complicated pattern of correlations occurred because some ways of guiding children using structure are more dependent on positive parenting behaviors than are other ways, and the reverse would be true for chaos and hostility. For example, rules and guidance (i.e., structure) and chaos in the family home can occur with or without high hostility in parents. Consistent with this pattern of correlations we observed, when all items were included in a single principal components analysis, a four-factor structure emerged, but multiple items had complex loadings. Given this pattern, we selected to analyze warmth and hostility separate from structure and chaos, as these

dimensions would be expected to play different roles in children’s eating problems and would ideally be considered as different aspects of food-related parenting, as suggested in SDT.

The number of factors extracted was based on an eigenvalue >1 , the scree plot, and the interpretability of the factor solution. Items were removed if they had low correlations with all other items ($r < .3$), very high correlation with one or more items ($r > .8$), did not load highly on any factor ($r < .45$), or loaded highly on more than one factor ($r > .40$). Following the determination of factors, we calculated Cronbach’s alpha. Once good interitem correlations were established, we computed total scores (by averaging appropriate items) to represent each factor, presented descriptive statistics, and tested convergent validity.

Results

PSCFQ item analysis, factor structure, and reliability.

Autonomy support, coercion, warmth, and hostility. Twenty-four autonomy support, coercion, warmth, and hostility items were subjected to EFA. One item had a correlation $< .30$ with all other items so it was removed from the analyses, leaving 23 items. Although four factors had an eigenvalue over 1, the scree plot showed a large distance between the eigenvalues for factors 2 and 3, and between the eigenvalues for factors 3 and 4. Therefore, two additional EFAs were conducted, with one prespecified to a two-factor solution, and the other a three-factor solution. The two-factor solution showed that all coercion and hostility items loaded highly on Factor 1, and the autonomy support and warmth items loaded highly on Factor 2. The three-factor solution had a similar structure, except two items designed to measure warmth loaded on a third factor (“I give my child praise and encouragement for healthy food and meal choices” and “I compliment my child for eating healthy foods”). Hence, the two-factor solution was maintained, as it yielded a clearer and more theoretically sound structure than the three-factor solution (see Table 1).

The two factors accounted for 46% of the item variance. Factor 1 comprised 11 items, with item loadings ranging from .60 to .85. This factor was labeled *coerciveness* and accounted for 30% of the variance in items (eigenvalue = 6.88). The 12 warmth and autonomy support items loaded (range = .44 to .71) on Factor 2, and was labeled *supportiveness* (16% of total variance; eigenvalue = 3.64). The correlation between Factors 1 and 2 was $r = -.22$.

To create composite scores, we first removed the two items that had the lowest loadings from the supportiveness factor, and the item that had the lowest loading was removed from the coerciveness factor. We did this to balance the number of items on the two subscales, creating a final set of 20 items. The 10 coerciveness items and the 10 supportiveness items had Cronbach’s alpha of .92 and .81, respectively.

Structure and chaos. Seventeen items were designed to measure structure and chaos. Twelve items were submitted to EFA (five items were removed following prescreening because they had correlations $< .30$ with all other items), and two factors were extracted with eigenvalues above 1. The two factors accounted for 48% of the total item variance. The first factor, labeled *chaos*, consisted of six items with loadings from .49 to .73 (see Table 2). This factor accounted for 36% of the variance in items (eigenvalue = 4.35). Items reflected parenting that lacks routine, and will appear inconsistent or unpredictable for the child, such as setting

Table 1
Study 1 Factor Loadings for PSCFQ Coerciveness and Supportiveness Items (N = 230)

Item	Factor loading	
	Coerciveness	Supportiveness
Hard time not getting frustrated	.85	
Power struggles about eating	.83	
Difficult to stay calm	.78	
Loses patience	.76	
Raises voice	.73	
Difficult to hold tongue	.70	
Give a lot of orders	.70	
Have to be forceful	.66	
Make my child eat healthy foods	.60	
Am critical of my child's eating	.60	
Demands feel like a burden ^a	.60	
Ask child to help choose		.71
Give praise and encouragement		.59
Experiment to present foods		.58
Make eating healthy food fun		.57
Let my child know I respect likes and dislikes		.55
Compliment child for eating healthy foods		.55
Encourage child to express feelings of hunger and fullness		.53
Encourage child to make recommendations		.50
Consider the food preferences of my child		.47
Encourage child to express his/her food likes and dislikes		.46
Support child to choose food ^a		.46
Involve my child in food-related activities ^a	-.22	.44

Note. All items are shortened versions of the actual items. See Table 4 for the full item wording of the final 24-item PSCFQ. Loadings less than 1.20 are not shown.

^a These items were excluded from subscale scores, so that scores were based on 10 items each.

mealtime rules that are not consistently maintained. The remaining six items, all of which were designed to measure structure, loaded highest on the second factor, labeled *structure*. This factor reflected parenting marked by clear and consistent expectations related to food, and communication about these expectations. Loadings ranged from .31 to .67, and this factor accounted for 12% of the variance in items (eigenvalue = 1.45). The correlation between the factors was $r = -.52$. The items on both subscales

had adequate interitem correlations, with Cronbach's alpha of .80 and .72, respectively.

Descriptive statistics, intercorrelations, and convergence and divergence of the PSCFQ. Means and *SDs* of each PSCFQ subscale, and correlations between subscales, and between the PSCFQ, CFQ and BMI, are shown in Table 3. Correlations between the PSCFQ and the CFQ subscales ranged from $-.41$ to $.48$, with 11 of the possible 16 associations significant. The magnitude

Table 2
Study 1 Factor Loadings for the PSCFQ Chaos and Structure Items (N = 230)

Item	Factor loading	
	Chaos	Structure
Get frustrated with myself for allowing my child what s/he wants	.73	
Difficult to have and/or follow expectations	.69	
Sweets or junk food, give in too often	.66	
Healthy foods, give in too often	.65	
Reaction can be unpredictable	.59	
Difficult to eat healthy foods	.49	
Set guidelines, make sure family members know about them		.67
Tell or show child behavior expected at meal and snack times		.62
Set a family rule about eating, I would expect my child to follow it		.59
Clear about expectations at meal and snack times	-.24	.47
Consistent expectations about healthy eating for child	-.21	.41
Set a rule, follow my own rule too		.31

Note. All items are shortened versions of the actual items. See Table 4 for the full item wording of the final 24-item PSCFQ. Loadings less than 1.20 are not shown.

Table 3
 Study 1 Correlations Between the PSCFQ and the Child Feeding Questionnaire (CFQ) Subscales (N = 230)

Measure	1	2	3	4
PSCFQ Subscales				
1. Supportiveness (10 items)	—			
2. Coerciveness (10 items)	-.22**	—		
3. Structure (six items)	.40**	-.25**	—	
4. Chaos (six items)	-.25**	.65**	-.50**	—
CFQ Subscales				
Restriction	-.09	.43**	-.07	.36**
Pressure to eat	-.17**	.48**	-.06	.33**
Monitoring	.26**	-.19**	.35**	-.41**
Responsibility	.04	-.08	.20**	-.21**
Child body mass index	.03	.05	-.11	.06
Parent body mass index	.05	.10	-.09	.22**

** $p < .01$.

of these correlations suggests both convergence and divergence, with PSCFQ coerciveness and chaos having the strongest pattern of convergence to the CFQ subscales of restriction and pressure to eat. Coerciveness was positively associated with restriction and pressure to eat, and negatively associated with monitoring. Chaos was significantly associated with all four CFQ subscales; it was positively associated with restriction and pressure to eat, and negatively associated with monitoring and responsibility. The positive subscales of the PSCFQ (supportiveness and structure) were each associated with two CFQ subscales, and the correlations were generally small in magnitude. Supportiveness was negatively associated with pressure to eat, and positively associated with monitoring, and structure was positively associated with both monitoring and responsibility. These findings suggest that, despite some overlap between the PSCFQ and CFQ, the PSCFQ assesses aspects of the parenting context that diverge from the CFQ.

No subscale of the PSCFQ was significantly correlated with child BMI. However, the PSCFQ chaos subscale had a small and significant positive association with parent BMI.

Study 2: Confirmatory Factor Analysis of the PSCFQ

Method

Participants and procedure. Participants were 221 primary caregivers (94% female) aged 22 to 65 years ($M_{\text{age}} = 39.5$ years, $SD = 6.2$ years) of at least one child aged 4 to 8 years ($M_{\text{age}} = 6.0$ years, $SD = 1.5$). Of the children, 53% were female, 46% male, and 1% did not report child sex. The majority (76%) of parents had completed a university degree.

Ethical approval for this study was obtained from the university's ethics review board prior to commencement of the study. Participants completed an anonymous online survey. Recruitment methods included online advertising through social media about the project and providing the survey link ($n = 102$ participants), directly contacting eight schools to advertise the project and survey link to parents via their e-mail newsletters ($n = 31$), and an online newsletter dispersed to staff and students at the university with information about the project and the survey link ($n = 88$). Overall, 272 parents started the online questionnaire, but 51 com-

pleted the first page or two only before exiting the survey, resulting in a response rate of 81%.

Measures.

Parent socioemotional context of feeding. All 221 parents completed the PSCFQ-1 and PSCFQ-2 (see Study 1) items to assess the parent social-contextual conditions of feeding. See Results for Cronbach's alpha.

Parent restriction and general parenting. The first 167 parents completed the restriction subscale of the CFQ (Birch et al., 2001; see Study 1) and the Parent as Social Context Questionnaire for parents of young children (PCSQ-YC; Zimmer-Gembeck et al., 2015) to assess general positive (autonomy support, warmth, and structure) and negative (coercion, rejection, and chaos) parenting, with 12 items on each subscale. Response options for the PCSQ-YC ranged from 1 (*not at all true*) to 6 (*very true*). Items were averaged with higher scores indicating more use of restriction and positive and negative parenting. Cronbach's alpha was .73 for restriction, and Cronbach's alpha was .84 for positive parenting and .86 for negative parenting. Example items for parenting are: "I am clear and consistent about what happens when my child does not follow rules" (positive); "When my child does something wrong, my reaction may not be easy to predict" (negative). To reduce the burden on parents and to gather more data for the analysis of the new measure only, only the first 167 participants completed these additional measures.

Income and education. Parents reported family income and education level. Income ranged from 1 (*AUD\$20,000 or less*) to 4 (*AUD\$100,000 or more*). Education ranged from 1 (*did not complete high school*) to 4 (*university study*). Income and education did not significantly differ when parents who did and did not complete the CFQ restriction subscale and the PCSQ-YC were compared, all $p > .05$.

Overview of analyses. Confirmatory factor analysis (CFA) with maximum likelihood estimation was conducted using AMOS software. In the initial model, each item was constrained to load only on one of the four factors, and correlations between the factors were freed. For comparison, given that two items that loaded highly on the structure factor did have crossloadings over 1.20 (-.24 and -.21) on the chaos factor in Study 1, we also fit an exploratory structural equation modeling (ESEM), which is a type of CFA that allows items to have loadings on more than one factor (i.e., allows for crossloading items). Model fit was assessed using multiple indices, including χ^2 , χ^2 relative to sample size, comparative fit index (CFI), and root mean square error of approximation (RMSEA). Following the CFA and ESEM, PSCFQ subscales scores were formed, and these were correlated with validation measures.

Results

CFA of the PSCFQ. We fit a four-factor CFA with the six highest loading items for each of the four PSCFQ subscales. All loadings were .42 or higher (see Table 4), and the model had a good fit to the data on most indicators, $\chi^2(230, N = 221) = 406.43$, $p < .001$, $\chi^2/df = 1.8$, CFI = .93, RMSEA = .059 (90% CI .050 to .068, $p = .06$). Cronbach's α s were .91, .80, .92, and .81 for the coerciveness, supportiveness, structure, and chaos items, respectively.

Table 4
 Study 2 Confirmatory Factor Model Loadings for the 24-Item PSCFQ ($N = 221$)

Item	Factor loading			
	Coercive	Support	Chaos	Structure
I find it difficult to stay calm when my child refuses to eat certain foods	.89	—	—	—
I sometimes lose my patience when my child complains about food	.88	—	—	—
Sometimes to get my child to eat the healthy foods I expect him/her to eat, I have to raise my voice	.85	—	—	—
I find myself getting into power struggles about eating with my child	.76	—	—	—
I have a hard time not getting frustrated when my child will not eat foods I have prepared	.73	—	—	—
I find it difficult to hold my tongue when my child will not eat certain foods	.71	—	—	—
I encourage my child to make their own recommendations for the healthy foods that the family is going to eat	—	.96	—	—
I ask my child to help choose what healthy foods to buy	—	.69	—	—
I encourage my child to express his/her food likes and dislikes	—	.62	—	—
I let my child know that I respect their likes and dislikes	—	.61	—	—
I consider the food preferences of my child	—	.48	—	—
I encourage my child to express his/her feelings of hunger and fullness	—	.40	—	—
I give in too often when my child does not want to eat healthy foods	—	—	.73	—
I find it difficult to eat healthy foods	—	—	.73	—
When my child wants sweets or junk food, I give in too often	—	—	.68	—
I can be unpredictable in how I react when my child doesn't follow expectations about healthy eating	—	—	.59	—
I get frustrated with myself for sometimes allowing my child to eat what s/he wants	—	—	.56	—
In our family, it is difficult to have and/or follow expectations about healthy eating	—	—	.43	—
I am clear about what I expect my child to eat at meal and snack times	—	—	—	.93
I tell or show my child the behavior I expect from him/her at meal and snack times	—	—	—	.87
I have consistent expectations about healthy eating for my child	—	—	—	.61
If I were to set a rule about eating for my child, I would follow my rule too	—	—	—	.55
If I were to set a family rule about eating, I would expect my child to follow it	—	—	—	.55
When I set guidelines about meals and snacks, I make sure family members know about them	—	—	—	.51

Note. Coercive = parent coerciveness; Support = parent supportiveness.

Exploratory structural equation modeling (ESEM). Using guidelines for fitting ESEM in AMOS (see <http://www-01.ibm.com/support/docview.wss?uid=swg21477958>), we fit an ESEM to test the possibility that there would be significant crossloadings of items for structure and chaos. This model fit the data well, $\chi^2(220, N = 221) = 363.93, p < .001, \chi^2/df = 1.7, CFI = .94, RMSEA = .055$ (90% CI .044 to .064, $p = .22$). This fit was a significant improvement over the four-factor model with no crossloadings, χ^2 -difference(10) = 42.5, $p < .01$. In this model, five of the possible 12 crossloadings were significant and all were chaos items loading negatively on structure (significant loadings ranging from $-.21$ to $-.33$). The loadings for the structure and chaos items on their primary factors were unchanged from those reported in Table 4.

Convergence of the PSCFQ with the CFQ restriction subscale and general parenting. Similar to Study 1, PSCFQ coerciveness and chaos were positively associated with CFQ restriction (see Table 5). Correlations of PSCFQ supportiveness and structure with CFQ restriction were not significant. Regarding correlations with general positive and negative parenting, the findings suggest moderate convergence (see Table 5). The associations between general and food-related parenting were small to moderate in size, with the strongest correlations between food-related coerciveness and general negative parenting, $r = .53, p < .01$. CFQ restriction also had small to moderate correlations with general positive and negative parenting, with more restriction associated with less positive and more negative parenting. There were no significant associations of PSCFQ subscales with family income, parent education, or child age.

Discussion

We developed a reliable and valid measure of parenting dimensions, the Parent Socioemotional Context of Feeding Questionnaire (PSCFQ), specific to the family socioemotional context related to child feeding and eating. This measure is designed for use with parents of young children (ages 4 to 8 years), but future research could test its applicability with older children. Items were developed to tap the food-related family socioemotional-

Table 5
 Study 2 Correlations of the PSCFQ With the Child Feeding Questionnaire (CFQ) Restriction Subscale, General Positive and Negative Parenting, and Family Demographics ($N = 221$)

Measure	1	2	3	4	5
PSCFQ Subscales					
1. Supportiveness	—				
2. Coerciveness	-.08	—			
3. Structure	.30**	.10	—		
4. Chaos	-.01	.41**	-.27**	—	
5. CFQ restriction ^a	-.06	.44**	-.13	.40**	—
General positive parenting ^a	.44**	-.24**	.44**	-.32**	-.20**
General negative parenting ^a	-.24**	.53**	-.17*	.47**	.45**
Family income	-.05	.06	.12	-.10	.05
Parent education	.06	-.10	.00	.08	-.12
Child age	.02	.03	.10	-.06	-.02
Mean	4.57	3.13	4.59	3.01	3.25
SD	.67	.97	.84	.90	1.03

^a $N = 167$.

* $p < .05$. ** $p < .01$.

contextual conditions that were founded in a SDT-derived model of parenting (Skinner et al., 2005). Thus, all items were designed to tap the general social and emotional climate of the family when involving feeding and eating by parents with young children. The findings support four PSCFQ factors, labeled supportiveness (autonomy support and warmth), coerciveness (coercion and hostility), structure, and chaos. Finding four rather than the expected six factors suggests that it may be difficult to differentiate behaviors and emotions of parents related to autonomy support from warmth, and coercion from hostility, when parenting young children. This is likely because the nature of parenting of younger children differs from that for older children, especially in the area of autonomy support versus coercion. Opportunities for choice and support in making personal decisions and being agentic are more limited with young children and often depend on the rapidly developing capacities of the young child for attention, emotional understanding and communication (Pomerantz & Eaton, 2000). Furthermore, it may be particularly difficult to differentiate autonomy support and warmth, and coercion and hostility, for parenting in the food and eating domain where disagreement and conflicts may be frequent and protracted.

Support for the Four Subscales of the PSCFQ

The magnitude and patterns of associations of the four PSCFQ subscales with other measures support convergent validity. However, the findings also reveal important divergence from the CFQ, measures of child and parent BMI, general parenting practices, and family demographics of income, education, and child age. Notably, the PSCFQ was not significantly related to children's BMI in Study 1, and also generally diverged from parent BMI, showing only one significant association with chaos. The final PSCFQ subscales were also not significantly correlated with family income, parent education or child age in Study 2.

The CFQ demandingness subscales of restriction (measured in Studies 1 and 2) and pressure to eat (measured in Study 1) were moderately associated with the negative PSCFQ subscales of coerciveness and chaos, as was general negative parenting in Study 2. Parents who reported more PSCFQ coerciveness also reported more restriction and pressure to eat, and there was also a small association of PSCFQ coerciveness with less CFQ monitoring. Furthermore, parents who reported more PSCFQ chaos also reported more restriction and pressure to eat, and lower levels of monitoring and responsibility. In contrast, PSCFQ supportiveness and structure (the positive subscales) had only small correlations with the CFQ subscales, supporting the need for the four separate PSCFQ subscales. Thus, the four subscales of the PSCFQ will allow for extensions on existing research, which has often concentrated on two parenting dimensions only of demandingness and responsiveness or have used items that tap specific parenting behaviors but not the emotional climate of the family within which these behaviors are enacted (e.g., Birch et al., 2001; Hughes et al., 2005, 2011).

A Structured or Chaotic Parent Socioemotional Context of Feeding

Although a small number of crossloadings were found for PSCFQ structure and chaos in both EFA and ESEM, the pattern of

associations of the PSCFQ with the CFQ provide justification for separate PSCFQ structure and chaos subscales, as defined here, and as separate from supportiveness and coerciveness. First, most crossloadings for PSCFQ structure and chaos were small (about .25) relative to the loadings of the items on their designated factors, suggesting minor empirical overlap but larger differentiation of items on the two factors. Second, in Study 1, PSCFQ structure and chaos seemed to be tapping aspects of parents' positive or negative behaviors and emotions related to their responsibility for child feeding that PSCFQ coerciveness and supportiveness are not. Structure and chaos were the subscales related to the CFQ responsibility scale, and showed the strongest (positive and negative, respectively) of the correlations of the four PSCFQ subscales with the CFQ monitoring scale. Third, the structure and chaos subscales also seem to be more closely assessing the emotional climate within which parents implement routines and supervise their children's eating, as they were designed to measure. Structure and chaos, as part of a family socioemotional context of feeding, may have particular importance given the positive associations that have been found between permissive parenting and child weight (e.g., Moens et al., 2007), negative associations between parental control (and related concepts) and child weight (e.g., Lumeng et al., 2012), and evidence suggesting that permissive parenting might reduce the effectiveness of interventions with obese children (Golan, Kaufman, & Shahar, 2006).

Parents report that structure and routines are important for encouraging children's healthy eating (Fulkerson, Larson, Horning, & Neumark-Sztainer, 2014). Our findings suggest that PSCFQ structure will be important to consider in future research, given that parents who report more positive experiences of providing structure in the home also report more positive food-related parenting behaviors of supportiveness, monitoring, and responsibility, but that parents' level of food-related structure was not significantly associated with parents' restriction and pressure to eat; restriction and pressure are usually considered indicative of problems because they have been associated with child obesogenic behaviors (Faith, Scanlon, Birch, Francis, & Sherry, 2004). Thus, PSCFQ structure may be tapping positive routines, in general, within the family, rather than the more commonly measured restrictiveness, and future research could examine whether structure is uniquely beneficial for children's development in many domains.

Although the concept of structure in the family in relation to eating has received some attention (e.g., Berge, Jin, Hannan, & Neumark-Sztainer, 2013; Quarmby & Dagkas, 2013), chaotic parenting practices, specifically, have received less attention. Chaos is more often operationalized as household chaos, linking it with lower SES or poorer child adjustment (e.g., Evans, Gonnella, Marcynyszyn, Gentile, & Salpekar, 2005; Martin, Razza, & Brooks-Gunn, 2012; Wang, Deater-Deckard, & Bell, 2013). When general household chaos has been studied, chaos has been defined to include a noisy, distracting, or disorganized home environment. Research has found that household chaos may be a contextual factor that moderates the impact of parenting beliefs on their practices (Wang et al., 2013), or of parents' functioning on children's functioning (Deater-Deckard et al., 2012). As we had originally proposed, this suggests that the subscale of family socioemotional chaos developed here might be examined as a moderator of the effects of parent directives for eating on children's outcomes.

Here, different from research on household chaos, we focused specifically on parents' endorsement of behaviors designed to tap a chaotic feeding and eating context in the home. We defined this as more than low structure (or routine), with items that suggest or directly assess food-related parenting that is inconsistent, unpredictable, lax, or overly permissive. Chaos was the only subscale of the PSCFQ that was associated with parent-report of a higher BMI. This may be attributable to the inclusion of one item that directly assessed parents' endorsing a greater inability to eat healthy foods, but also that other items suggest a family socioemotional climate that is generally more difficult for implementing consistent healthy eating practices. Nevertheless, we did not initially anticipate that our definition of feeding-related chaos would be associated with parental psychological and social circumstances (e.g., Dumas et al., 2005), and, in support of this, we found that chaos was not significantly correlated with family income, parent education or child age. Thus, a measure of chaos with specific reference to the feeding and eating family context, as developed here, could make an important independent contribution to the examination of child eating behaviors and the development of weight and related health problems in all contexts. It may also be relevant as an adjunct to work on eating and weight related problems within home environments where children have signs of eating and weight problems, or when parents are time poor, distracted, have fewer financial or educational resources (Matheny, Wachs, Ludwig, & Phillips, 1995; Wilson et al., 2017), and/or have low levels of consistency or negative self-beliefs in relation to their own eating, weight management ability, and parenting competence (Corapci & Wachs, 2002; Wang et al., 2013).

Study Limitations, Summary, and Conclusions

The present results must be considered in light of the study limitations. First, child and parent BMI were assessed by parent-report, which have shown discrepancies with measured estimates (e.g., Wright, Glanz, Colburn, Robson, & Saelens, 2018). As such, the lack of associations found between the PSCFQ subscales and child and parent BMI may be the result of this methodological limitation, and requires replication using objective assessments. Moreover, although the education level was diverse in the first study, most participants in Study 2 had a university degree and both studies included majority white Australian mothers. Feeding practices are known to differ by socioeconomic status and race-ethnicity (Musher-Eizenman & Holub, 2007), and work on fathers has revealed that their feeding practices may differ from mothers, with fathers more restrictive of food access and less likely to monitor food intake (Khandpur, Blaine, Fisher, & Davison, 2014). As a result, additional studies of reliability and validity of the PSCFQ are needed to assess the test-retest reliability of the dimensions and to confirm the measure in larger, more diverse samples of parents or other caregivers.

In summary, the PSCFQ is a promising new measurement tool, specifically designed for young children (aged 4 to 8 years), which will be useful in research examining parents' reports of the socioemotional context of feeding as related to young children's development of weight-related health behaviors. Given the burgeoning of this area of research, the PSCFQ should be useful to those who require a theory-based measure

that can assist in understanding how social contexts and relationships are influential in children's current and future eating problems, overweight, obesity, and weight-related health problems. The PSCFQ could be used alone or in combination with existing parent feeding measures (e.g., Birch et al., 2001; Hughes et al., 2005, 2011; Musher-Eizenman & Holub, 2007) to understand the unique and combined impact of the socioemotional context of feeding provided by parents and the more specific parental directives and other behaviors when interacting with children in the feeding and eating contexts. Together, these tools could allow for a more nuanced understanding of how children's health behaviors are outcomes of the general parenting context and specific behaviors of parents when they engage in food-related interactions with their children.

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Received February 27, 2018

Revision received December 19, 2018

Accepted January 27, 2019 ■

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