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Validation of the Infant Feeding Beliefs Questionnaire (IFBQ) among Pregnant African-American Women and Their Study Partners

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Abstract

Maternal feeding beliefs and practices have been associated with weight gain in infants and young children. Less work examines feeding beliefs prenatally or the feeding beliefs of other non-maternal caregivers (NMCs) who play important roles in infant feeding. This study validates a scale, the Infant Feeding Beliefs Questionnaire (IFBQ), to assess feeding beliefs during pregnancy among African-American women and other caregivers and tests whether the resulting belief constructs (laissez-faire, restrictive, responsive, pressuring and indulgent) are associated with maternal and NMC characteristics.

Data come from 429 pregnant women and 374 NMCs including fathers, grandmothers and other family and friends enrolled in the baseline 28-week gestation visit of the *Mothers and Others Study*, a family-based, randomized control trial to support healthy infant feeding and prevent obesity. Confirmatory factor analysis (CFA) was used to test the fit of four *a priori* feeding constructs. Models were modified iteratively in mothers and then separately tested in the NMCs sample. Construct scores were created by averaging the remaining items and scale reliability was assessed. External validity was tested using bivariate and multivariable regression models.

We validated five feeding belief constructs, measured through 8 sub-constructs. Reliability coefficients ranged from 0.58 for laissez faire and 0.76 for pressuring. Goodness of fit indices for CFA models indicated good fit with CFIs from 0.97–0.99 and RMSEA from 0.00–0.06. Construct scores differed significantly by depressive symptoms, obesity, education, income, and previous children in mothers and NMCs.

The IFBQ may be used among mothers and NMCs to assess feeding beliefs beginning in the prenatal period, providing a tool to assess the longitudinal development of feeding beliefs and to highlight avenues for intervention on feeding practices during a critical period for behavior change.

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Keywords

feeding beliefs; pregnancy; confirmatory factor analysis; fathers; grandmothers

A large body of research documents that women's feeding intentions and beliefs during pregnancy and even prior to pregnancy are closely linked to their infant feeding practices (e.g. Donath, Amir, & Team, 2003; Roll & Cheater, 2016; Stuebe & Bonuck, 2011; Young, Farazandeh, Westra, & Krebs, 2016). Women's intention to breastfeed is one of the strongest predictors of breastfeeding duration and intensity (Donath, et al., 2003; Stuebe & Bonuck, 2011) and having a plan for the duration of breastfeeding early in pregnancy is associated with a greater likelihood of accomplishing breastfeeding goals (Donath, et al., 2003; Gurka, et al., 2014; Risica & McCausland, 2017). Support for these feeding goals from others, particularly the infant's father and maternal grandmother, also plays a key role in shaping prenatal feeding intentions and breastfeeding initiation and duration (Avery & Magnus, 2011; Bentley, Dee, & Jensen, 2003; Moore & Coty, 2006; Negin, Coffman, Vizintin, & Raynes-Greenow, 2016).

Despite the importance of the prenatal period for shaping breastfeeding practices, little is known about how other aspects of infant and young child feeding may be shaped prenatally and how others may influence these practices. Feeding styles, the food-related parenting practices that parents and caretakers employ and their beliefs about feeding (Thompson, Adair, & Bentley, 2013; Thompson, et al., 2009; Vaughn, et al., 2016), are an important facet of the postnatal feeding environment. Greater parental control of feeding, linked to beliefs that parents need to control the types and amounts of foods children eat, that children should finish the food on their plate, or that food should be used as a reward, has been linked to poorer infant and child diet quality (Kroller & Warschburger, 2008; Thompson, et al., 2013) and the development of less healthy eating behaviors (Birch & Fisher, 2000; Birch, Fisher, & Davison, 2003). More pressuring feeding styles scores have been associated with a lower likelihood of breastfeeding and a greater risk of age-inappropriate solid feeding in low-income African American infants (Thompson et al., 2013). Among older children, more controlling feeding practices have been linked to lower fruit and vegetable intake, although these results are conflicting (Gerards and Kremers, 2015). Since controlling (pressuring or restrictive) feeding practices can disrupt the development of children's self-regulation of energy intake (Faith et al., 2004) and encourage overeating or eating in the absence of hunger when the restriction is removed (Fisher et al., 1999; Stifter& Moding, 2015), they have been consistently associated with greater weight gain and risk of obesity in infants and children (Birch & Fisher, 2000; Johnson & Birch, 1994; Hughes, Power, O'Connor, Fisher, and Chen, 2016; Spruijt-Metz, Lindquist, Birch, Fisher, & Goran, 2002; Thompson, et al., 2013; Wherly, Bonilla, Perez & Liew, 2014).

Conversely, more responsive feeding styles, linked to the beliefs that children know when they are hungry or full, have been associated with better diet quality, such as greater fruit and vegetable intake in childhood (Patrick, Nicklas, Hughes, & Morales, 2005), lower energy intake (van der Horst, Oenema, Ferreira, Wendel-Vos, Giskes, van Lenthe, & Brug, 2007), and longer duration of breastfeeding (DiSantis, Hodges, and Fisher, 2013). Since

responsive feeding styles are thought to enhance the development of self-regulation of energy intake (Fisher, Birch, Smiciklas-Wright, & Picciano, 2000; Johnson & Birch, 1994), responsive feeding beliefs and food parenting practices have been proposed to promote healthier infant and child weights (DiSantis, Hodges, Johnson & Fisher, 2011). Although the empirical evidence linking responsive feeding practices to infant growth trajectories is limited (DiSantis et al., 2011; Hurley, Cross, & Hughes, 2011), greater maternal responsiveness to infant cues was associated with lower infant weight-for-length z-scores (Thompson et al., 2009). Conversely, low maternal sensitivity to infant cues has been associated with an increased weight gain from 6 to 12 months (Worobey, Lopez & Hoffman, 2009), suggesting that maternal control has the potential to alter infants' ability to regulate their weight gain (Farrow and Blissett, 2006).

While the establishment of these feeding beliefs before or during pregnancy and their stability postnatally remains unknown, research in infancy suggests that maternal feeding styles develop early, likely in response to infant cues and growth, and may track across childhood (Fisher, et al., 2000; Garcia, et al., 2018; Haycraft & Blissett, 2012; Thompson, et al., 2013; Young, et al., 2016). Yet, most studies examining feeding styles and child weight are cross-sectional, limiting the study of causality (Shloim, Edelson, Martin, & Hetherington, 2015). Given the potential longterm impacts of feeding styles on diet and growth trajectories (Ventura & Birch, 2008; Vollmer & Mobley, 2013), the ability to examine mothers' feeding beliefs during pregnancy would provide an important first step for investigating how the reciprocal relationship between feeding beliefs and practices and child growth is established in early life. It would also provide an opportunity to intervene early to improve feeding practices and infant growth postnatally.

At the same time, increasing research documents the limitations of solely focusing on mothers for infant feeding and obesity interventions (Davison, et al., 2018; Khandpur, Blaine, Fisher, & Davison, 2014). Non-maternal caregivers (NMCs), particularly fathers, are playing an expanding role in feeding infants and young children (Barrett, Wasser, Thompson, & Bentley, 2018; Wasser, et al., 2013) due to increases in maternal employment since the 1980s (Khandpur, et al., 2014). Although they are rarely included in prenatal or infant feeding research and interventions (Davison, et al., 2018), the majority of American fathers report sharing the responsibility for feeding their young children (Khandpur, et al., 2014; Vollmer, Adamsons, Foster, & Mobley, 2015). In a nationally-representative study, over 70% of American fathers with co-residential children under the age of 5 report feeding or eating with their children daily (Jones, 2013). While little information exists on the feeding beliefs and food-related practices of fathers during infancy (Khandpur, et al., 2014), work among older children suggests that fathers may be more pressuring than mothers and more permissive with snacking or types of foods consumed (Hendy, Williams, Camise, Eckman, & Hedemann, 2009). These differences are important, since other research suggests that, at least for preschool-aged and older children, fathers' feeding practices may have a stronger impact on child diet and weight gain than mothers (Khandpur, et al., 2014; Mallan, et al., 2014; Watterworth, et al., 2017; Wong, et al., 2017).

Even less often studied are other NMCs (Davison, et al., 2018; Khandpur, et al., 2014; Thullen, Majee, & Davis, 2016), such as grandmothers, who play a central role in various

aspects of child feeding decisions and practices in many societies, including among African-Americans (Bentley, Gavin, Black, & Teti, 1999; Bentley, et al., 2003). Our previous work among first-time, low-income African-American mothers documented that in over half of participating households someone other than the mother was responsible for feeding infants most of their meals from 3 to 18 months of age (Wasser, et al., 2013) and that the feeding styles of these NMCs differ from those of mothers (Barrett, et al., 2018). In this relatively small sample of NMCs, grandmothers were the most common type of NMC and had less laissez-faire and indulgent feeding styles than mothers, suggesting that grandmaternal involvement in feeding may improve the postnatal feeding environment (Barrett, et al., 2018). Yet very little is known about how the prenatal feeding beliefs of these key others, such as fathers and grandmothers, may shape prenatal beliefs or postnatal feeding practices.

Given these considerable gaps in the literature, recent papers have highlighted the need to include larger, more diverse samples of families into infant and child feeding research and to validate tools for measuring food parenting practices across multiple caregivers (Khandpur, Charles, Blaine, Blake, & Davison, 2016). Thus, we developed a scale, the Infant Feeding Beliefs Questionnaire (IFBQ) to assess feeding beliefs during pregnancy that can be administered to a wide range of caregivers. Based on our Infant Feeding Style Questionnaire (IFSQ; Thompson, et al., 2009), the IFBQ assesses feeding beliefs around five constructs, laissez-faire, restrictive, responsive, pressuring and indulgent (Table 1), that have been previously linked to infant feeding and growth outcomes (Gross, Mendelsohn, Fierman, Hauser, & Messito, 2014; Hittner, Johnson, Tripicchio, & Faith, 2016; Thompson, et al., 2013). In this paper, we: 1) validate this scale for use in pregnant women using confirmatory factor analysis (CFA), 2) test the resulting CFA models in a sample of NMCs (i.e. fathers, grandmothers, and other family and friends), and 3) as a measure of external validity, assess whether the feeding belief constructs are associated with sociodemographic and caregiver characteristics previously associated with feeding styles and food parenting practices.

Sample and Methods

Data for this study come from 429 pregnant, African-American women and 374 study partners (NMCs) participating in the baseline visit of the longitudinal randomized control trial, Mothers and Others: Family-based Obesity Prevention for Infants (Mothers and Others) (Wasser, et al., 2017). Briefly, the Mothers and Others trial compared the effects of a home-based, multicomponent intervention to a safety attention-control group on infant size and growth at 15 months postnatally. Pregnant African-American women were randomized to one of the study arms and identified a study partner, an “other,” hereafter referred to as NMC, to actively participate alongside mom (intervention group) or to only complete study assessments (control group). To identify their NMC, mothers were asked “Who is the person, other than a doctor or healthcare professional, that is most important to your decision-making about infant care or that will be involved in caring for the infant during the first few months after his/her birth?” Baseline measures were collected prior to randomization and, thus before participants received any study-related nutritional information, by trained study personnel when women were at 28 weeks of gestation. Eligible women were between the ages of 18–39 with a singleton pregnancy, identified as non-Hispanic Black, were English-speaking and could name a NMC. Of the 1462 women

screened for potential participation, under 4% (n=56) of women were excluded for not being able to identify a NMC.

For this validation analysis, the sample was limited to women (n=429) and NMCs (n=374) who completed the feeding beliefs component of the baseline survey. The Institutional Review Board of the University of North Carolina at Chapel Hill approved the study protocol and analysis. The study is registered with the National Clinical Trial Registry (NCT01938118 at clinicaltrials.gov).

Infant Feeding Belief Questionnaire

The IFBQ assesses feeding beliefs grouped into five theoretically and empirically-derived constructs: laissez-faire, restrictive, responsive, pressuring and indulgent (Table 1). Within each of these larger constructs, items probed beliefs around domains such as infant feeding practices, dietary needs (i.e. quality and amount), and feeding goals (i.e. infant health, happiness, sleep, etc.). Items for each construct come from the belief questions of the corresponding IFSQ constructs (Thompson et al., 2009). Like the IFSQ, the IFBQ is meant to probe infant and toddler feeding beliefs and is appropriate for use to assess feeding beliefs across the first 2 years of life. Since our intention was to validate a scale that could be used in pregnant women, postpartum women, and NMCs, who may or may not have children, and that could be used across infancy to permit longitudinal follow up, we did not tailor the scale to the prenatal period. Further, while no qualitative testing was done for the IFBQ specifically, the items were developed after qualitative research and had undergone cognitive testing during their initial development as part of the IFSQ in a similar study sample.

To adapt the IFBQ from the IFSQ, we chose only the belief questions, since they assess attitudes around infant and young child feeding in general and do not ask about feeding behaviors specific to the index infant. This selection process led to the responsive belief construct of the IFBQ having only one item, *It's important to help or encourage a toddler to eat*. The original IFSQ had three belief questions for the responsive sub-constructs, but two of these belief items asked about the index infant specifically, *[Child] knows when s/he is full* and *[Child] knows when s/he is hungry and needs to eat*. Consequently, these items were omitted from the IFBQ.

This adaptation process led to a scale with a total of 36 Likert-type questions, coded on a 5-point scale of 1=strongly disagree to 5=strongly agree, across five constructs. Items related to each domain were distributed randomly across this section of the questionnaire and a few items were reverse-coded so that different responses would reflect more "desirable" beliefs. The resulting IFBQ was administered by trained interviewers in person and/or over the phone as part of a larger survey. The estimated response time for the IFBQ portion of the survey was around 5 minutes.

Maternal and NMC Characteristics

In addition to these feeding beliefs, participants were asked to report a number of sociodemographic characteristics including: age, education, employment, income and marital status. Mothers reported their parity (excluding the current pregnancy) and NMCs reported whether they had experience caring for their own children under 2. Both mothers

and NMCs were also asked about their previous experience in caring for young children. Mothers self-reported their pre-pregnancy height and weight and NMCs self-reported their current height and weight. Body mass index was calculated as weight (kg)/height $(m)^2$ and participants were considered obese if their reported BMI was >30kg/m^2. Mothers and NMCs both completed the Center for Epidemiological Studies Depression Scale (CESD). Participants were considered to show depressive symptoms if their CESD score was ≥16.

Statistical analysis

Confirmatory Factor Analysis: Using the data from our sample of pregnant women, we examined the means, ranges and distribution of our belief items and calculated item reliabilities for the five feeding belief constructs. We calculated Cronbach's alpha coefficients for the larger constructs and sub-constructs. This descriptive analysis guided our choice of confirmatory factor analysis (CFA) models and item selection. CFA was first used to test the fit of four *a priori* feeding constructs (laissez-faire, pressuring, restrictive, and indulgent). The responsive belief construct only had one associated item and was not included in the model validation. Following the procedure we used to validate the IFSQ, we first tested overall CFA models including all items for each of the four constructs. For each construct, we examined factor loadings and model fit and used this information to iteratively modify the models, eliminating items with low standardized factor loadings and adding covariances between similarly worded items to improve model fit. Where indicated empirically and based on our previous work (Thompson, et al., 2009, Thompson et al., 2013, Wood, et al., 2016) showing that different components of feeding beliefs may be differentially associated with infant feeding and growth, we tested smaller subsets of items with common themes (i.e. sub-constructs). For example, in our previous work, restriction was measured through two sub-constructs, restrictive amount and restrictive diet quality, which were differentially associated with infant weight-for-age z-score. We then retested the fit of these models developed in the mother sample in our sample of NMCs.

CFA models were fit in Stata (version 15; College Park, Texas), using the maximum likelihood with missing values (mlmv) estimator. Standardized factor loadings were generated to assess factor loading. Model fit was assessed using chi-square, root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI) and the standardized root mean squared residual (SRMR). The chi-square test evaluates absolute model fit in comparison to a saturated model while the other measures provide an assessment of relative fit in comparison to models with "reasonable" fit in the data. Good fit is indicated by a smaller, non-significant chi-square value, RMSEA <0.06, CFI and TLI >0.95, and SRMR <= 0.08 (Schreiber, Nora, Stage, Barlow, & King, 2006). Assessment of model fit between iterative models was additionally assessed using Bayesian Information Criteria (BIC) values.

Feeding belief construct scores: Scores for each construct or sub-construct were created by averaging the items retained in the CFA models. If participants were missing more than one item in constructs or sub-constructs with 3 or fewer items or more than 2 items in constructs or sub-constructs with 4 or more items, scores for those constructs and sub-constructs were considered missing. Otherwise, missing items were assigned the

average of the non-missing items for creating the score. The single item score was used as the score for the responsive feeding belief construct. Feeding belief construct scores were compared between mothers and NMCs as a group using t-tests and between mothers and the types of NMCs using one-way ANOVAs with a Bonferroni specification to contrast scores between groups.

Associations between feeding belief scores and maternal and other characteristics: Finally, external validity was assessed first using t-tests to test whether feeding belief construct scores differed by characteristics previously associated with feeding beliefs and practices (Barrett, et al., 2018; Haycraft & Blissett, 2012; Hurley, Black, Papas, & Caufield, 2008) and prior experience in caring for young children. Multivariable adjusted regression models were then fit for each feeding belief construct for mothers and NMCs as a group and also divided into three categories: fathers, grandmothers, and others, to assess which characteristics were independently associated with feeding beliefs.

Results

The mother and NMCs samples differed significantly in a number of characteristics (Table 2). On average, mothers were younger than the NMCs and were less likely to be married or in a domestic partnership, have previous children, be obese, or have depressive symptoms than the others. Mothers were more likely to have had previous childcare experience than NMCs. The majority of mothers had participated (88.0%) or were currently participating (81.3%) in the federal-funded Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Over half of the participating others were male. Biological father was the most common relationship between the other and the expectant infant (49.9%). Other common relationships were maternal grandmother (26.7%) and maternal aunt (7.3%) with a lower proportion of friends (3.0%). Nearly all NMCs identified as African-American (92.5%).

Confirmatory factor analysis results, including the initial models, modifications, and final selected model are presented for four of the constructs, laissez faire, pressuring, restrictive, and indulgence, in the mothers sample (Table 3). The initial four-item laissez faire model fit well and no further modifications were made for this construct. For the other constructs, models were modified iteratively, first dropping items with low factor loadings and next adding covariances between items with similar wordings or intent. Good fit was obtained for the pressuring construct by dropping two items with low loadings ("*It is important that a toddler finish all of the food that is on his/ her plate*" and "*When an infant cries, it means he/she needs to be fed*"), and co-varying the errors of the items with similar wording (for example, "*Cereal in the bottle helps infants sleep through the night*" and *"Putting cereal in the bottle helps infants feel full"*). With these modifications, the 7-item construct showed good model fit across all measures except the chi-square test. The chi-square test is highly dependent on sample size and the distribution of data and, in larger samples like ours, small discrepancies between the observed and predicted matrices may result in a large and significant chi-square value (Brown, 2006).

Similarly, dropping two items ("It's important for a parent to have rules about how much a toddler eats" and "It's important for a parent to decide how much an infant should eat") improved the fit of the restrictive construct across all goodness of fit indices. Since the retained and dropped questions reflected two different sub-themes from the IFSQ (i.e. restriction of amounts and restriction of diet quality), that have been previously associated with differential feeding and growth outcomes in infants (Thompson, et al., 2013), we renamed the 5-item construct "restrictive diet quality" and created a two-item sub-construct, "restrictive amount," from the dropped questions. While we could not test the model fit of this two-item construct, these two items were significantly correlated, $r=0.24$, $p<0.001$, with each other and with few of the other restrictive diet quality items, supporting their inclusion as a separate belief sub-construct.

Finally, we could not obtain good model fit for our initial 16-item indulgence construct. We broke this construct into four sub-constructs, each with four items, based on the themes of permissiveness, coaxing, soothing and pampering, corresponding to our previous work in infants (Thompson, et al., 2009). All initial items were able to be included in the sub-constructs and no items were dropped. Two of these four sub-constructs, indulgence coaxing and indulgence pampering, had good fit across all indices without modification. The fit of the remaining two sub-constructs, indulgence permissive and indulgence soothing, was improved with the inclusion of a covariance between two similarly worded questions.

Final models developed in the mother sample were then tested in the NMC sample (Table 4). Except for the laissez-faire construct and the indulgence coaxing and indulgence pampering sub-constructs, all models had good fit across most indices. No modifications improved the fit of the laissez faire construct, which had a significant chi-square value and TLI value that indicated only moderate fit. Conversely, the fit of both indulgence coaxing and indulgence pampering were improved by adding a covariance term between similarly worded items (e.g. "*A toddler should be allowed to eat fast foods to keep him/her happy*" and "*A toddler should be allowed to eat desserts to keep him/her happy*"). With these modifications, both sub-constructs had good fit across all indices: chi-square=0.21 ($p=0.64$), RMSEA=0.00, CFI=1.00, TLI 1.01, and SRMR=0.01 for indulgence coaxing and chi-square=2.80 ($p=0.09$), RMSEA=0.07, CFI=1.00, TLI 0.97, and SRMR=0.01 for indulgence pampering.

We next calculated the mean construct scores and internal reliability of our selected constructs for both mothers and NMCs (Table 5). Internal reliability was generally acceptable ranging from 0.54 –0.74. Apart from laissez faire, constructs and sub-constructs had Cronbach alpha values above 0.60. There were few differences in reliability values between mothers and NMCs. Both mothers and NMCs tended to score highest in restrictive and responsive beliefs and lower in laissez-faire and indulgence beliefs. Because feeding styles may differ between types of caregivers, we compared the feeding belief scores between mothers and three groups of NMCs: fathers, grandmothers, and other NMCs. Compared to mothers, fathers had significantly lower scores for the responsive feeding item and higher indulgent coaxing, soothing and pampering scores while grandmothers had lower laissez faire scores and others had lower responsive feeding scores. Compared to fathers, grandmothers had significantly lower laissez faire, pressuring and indulgent pampering

belief scores while others had lower indulgent coaxing and soothing belief scores. No significant differences were seen between grandmothers and others.

To test the external reliability of the belief constructs, we conducted bivariate and multivariable adjusted analyses of the association between several sociodemographic and health characteristics --income, obesity, depressive symptoms, marital status and education-- previously linked to infant feeding beliefs and practices and two child care variables, parity and experience caring for children under the age of two, with feeding belief construct scores for mothers and NMCs as a group and then divided into the NMC types. Patterns of association were little changed when examined unadjusted or adjusted for the other factors. The final adjusted models for mothers and all NMCs are presented in Table 6 and for NMCs grouped into fathers, grandmothers, and other NMCs in Supplemental Table 1.

Mothers', but not NMCs', depressive symptoms were associated with several feeding belief constructs. Mothers with depressive symptoms had higher laissez-faire, responsive and indulgent feeding belief scores. Obesity was associated only with feeding beliefs in mothers, with lower laissez-faire scores seen in mothers with obesity. Among the sociodemographic variables, income and education were associated with a number of feeding belief differences in mothers and NMCs. Low-income mothers had higher responsive scores than mothers with higher income, whereas NMCs with low-income had higher pressuring, restrictive amount, indulgence coaxing and indulgence soothing scores. Mothers with at least a high school diploma had lower indulgence scores for the coaxing, soothing and pampering constructs. Similar results were seen in NMCs, where those with at least a high school diploma had lower pressuring and indulgence permissive, soothing and pampering construct scores. Being married or in a domestic partnership was associated with lower pressuring scores for mothers.

Parity had little association with maternal feeding beliefs. No significant differences were seen between women for whom this was a first pregnancy compared to those who already had children. Conversely, most feeding beliefs differed between NMCs who had and didn't have children. Those with children had lower laissez-faire, pressuring and indulgence scores and higher restrictive diet quality scores than NMCs without children. Any previous child care experience had few independent associations for both mothers or NMCs. Mothers with previous child care experience had higher indulgence pampering scores while NMCs with previous care experience had higher responsive feeding belief scores.

When compared by type of NMCs, the results were generally consistent with the results for NMCs as a whole (Supplemental Table 1). Having at least a high school education was associated with feeding belief scores in all three groups. Fathers with a high school education had lower laissez faire and indulgence scores, grandmothers with a high school education had lower restrictive amount scores, and other NMCs with a high school education had lower pressuring scores. Low income was significantly associated with feeding beliefs only in grandmothers, with those with low income having higher pressuring and restrictive amount belief scores. Since all grandmothers had previous children and child care experience, we looked at these variables only in fathers and other NMCs. Among fathers, having previous children was associated with lower indulgent pampering scores and

child care experience was associated with higher laissez faire, responsive and indulgent coaxing scores. Among other NMCs, having a child was associated with significantly lower scores across nearly all constructs, including laissez faire, pressuring, and indulgent permissive, pampering, coaxing and soothing. Among this group, having experience caring for children under age 2 was associated with lower laissez faire and indulgence pampering scores.

Discussion

Our paper is among the first to examine feeding beliefs beyond breastfeeding prenatally, an important period for setting feeding intentions and potential behavioral change (Donath, et al., 2003; Pollak, et al., 2010). We identified five feeding belief constructs, analogous to feeding styles previously validated (Thompson, et al., 2009; Wood, et al., 2016) and associated with infant feeding and growth outcomes (Thompson, et al., 2013), that had good model fit and acceptable to good reliability. The scale's focus on feeding beliefs, in contrast to feeding practices, allows it to be administered prenatally or to participants without children, which will permit earlier identification of and intervention on beliefs associated with less optimal feeding practices. Importantly, the scale also had acceptable validity in a sample composed of a range of NMCs, fathers, grandmothers and other relatives and friends. This breadth is important given the paradoxical overwhelming focus on mothers during prenatal feeding interventions and documented importance of supportive others (Davison, et al., 2018; Khandpur, et al., 2014; Thullen, et al., 2016; Vollmer & Mobley, 2013). While recent calls have been made to include fathers and, to a lesser extent, grandmothers, in feeding research and interventions, limited information exists on other NMCs or family structures (Davison, et al., 2018; Khandpur, et al., 2016). Thus, the validation of this scale will permit research in a wider range of household contexts.

Among both mothers and NMCs, the majority of constructs and sub-constructs had good model fit with relatively few modifications. The resulting scale has 33 items across five belief constructs that correspond to previously validated feeding styles, laissez-faire, restrictive, pressuring, responsive, and indulgent. Our validation showed that two of these feeding belief constructs, restrictive and indulgent, were better measured through sub-constructs around specific themes, diet quality vs. amount for restrictive beliefs, for example. The use of these sub-constructs improved model fit and increased reliability scores, suggesting that they may be capturing different dimensions of restriction or indulgence. These results are similar to those seen in our prior work in infants where the restrictive diet quality and restrictive amount feeding style sub-constructs had opposite associations with infant weight-for-age (Thompson, et al., 2013) and support previous claims that restriction of diet quality in this age group may represent a beneficial, "covert" form of control over the food environment rather than a more overt overriding of child hunger/satiety cues (Ogden, Reynolds, & Smith, 2006). Also similar to our previous work (Thompson, et al., 2009; Wood, et al., 2016), laissez-faire had the poorest reliability across samples, despite adequate model fit in mothers. No further modifications improved the model in either mothers or NMCs. Nonetheless, the high prevalence of laissez faire feeding beliefs and practices in African-American samples (Hughes, Power, Orlet Fisher, Mueller, & Nicklas, 2005; Thompson, et al., 2009) and the association between laissez-faire beliefs and

maternal and other caregiver characteristics in this sample indicate that this construct is an important one and may require further refinement in other samples.

Comparing the mean feeding belief construct scores of mothers and NMCs shows that both groups had the highest scores on the responsive feeding question and the restrictive amount sub-construct and the lowest scores on the indulgence sub-constructs. These scores suggest that mothers and NMCs more readily agree with more positive feeding beliefs and less often agree with more permissive feeding beliefs, findings similar to studies of food parenting practices (Khandpur, et al., 2014) and feeding styles (Barrett, et al., 2018; Thompson, et al., 2009). Within these overall trends, several construct scores differed significantly between mothers and NMCs. We found that mothers had higher responsive scores than NMCs. Conversely, NMCs had significantly higher indulgence scores for three of the four constructs (coaxing, soothing, and pampering) than mothers. These results are consistent with limited previous research showing that some NMCs tend to be more permissive or indulgent than mothers (Khandpur, et al., 2016, Haycraft & Blissett, 2008).

When comparing the feeding beliefs of different types of NMCs, we found that fathers had lower scores on the responsive construct and higher scores on the indulgent sub-constructs than mothers. These results are consistent with past literature showing that fathers tend to be more permissive in their child feeding (Khandpur, et al., 2016), show less concern about the types of food children eat (Khandpur, et al., 2014), allow greater snacking (Hendy et al, 2009), and use food instrumentally as a reward (Haycraft & Blissett, 2008); all behaviors are consistent with more indulgent and/or less responsive feeding beliefs. In contrast to several previous studies among older children (Hendy, et al., 2009; Khandpur, et al., 2016) and our own work in infants (Barrett, et al., 2018), we did not see differences in the mean scores for pressuring or restriction between mothers and fathers. Previous studies comparing mothers' and fathers' feeding styles and practices have shown that, compared to mothers, fathers tend to be more pressuring (Hendy, et al., 2009; Khandpur, et al., 2016; Loth, MacLehose, Fulkerson, Crow, & Neumark-Sztainer, 2013; Pulley, Galloway, Webb, & Payne, 2014) and more restrictive with the amount, though not the types, of food children eat (Hendy, et al., 2009).

Compared to mothers, the grandmothers in our study had lower laissez faire scores, a result consistent with our past work in infants showing lower laissez-faire feeding beliefs and practices among grandmothers (Barrett et al., 2018). The feeding beliefs of grandmothers in the current study also differed from those of fathers, with grandmothers having significantly lower laissez faire, pressuring and indulgence pampering scores than fathers. While we are not aware of other studies comparing fathers' and grandmothers' feeding beliefs, a few studies have suggested that grandparents may also be more indulgent than parents, though this differs by residential status with grandparents living in multigenerational households being less indulgent than those who see their grandchildren less frequently (Farrow, 2014; Higgins & Murray, 2010). Understanding differences in the feeding beliefs and motivations of mothers versus NMCs and between the different types of NMCs will be important for developing interventions aimed at improving postnatal feeding styles and practices since differences between co-parents or between generations may lead to conflicting infant and child feeding strategies with adverse consequences for diet quality and child growth.

Our analysis also shows that prenatal feeding beliefs are associated with several sociodemographic characteristics, mental health measures and previous child care experience in both mothers and NMCs. On the other hand, few significant associations were seen between caregiver obesity and feeding beliefs in either mothers or NMCs in the adjusted models. Although previous research has shown that the feeding practices of obese mothers (Hodges, et al., 2013; Wardle, Sanderson, Guthrie, Rapoport, & Plomin, 2002) and other caregivers (Haycraft & Blisset, 2012) differ from non-obese parents, not all research has found an association between caregiver BMI and feeding practices (Lewis & Worobey, 2011; Mallan et al. 2014). It may be that, within this African-American, predominantly low-income sample, weight status is less important in shaping feeding beliefs than other individual and household factors. Income and education were associated with feeding beliefs in both mothers and NMCs. Mothers of lower income had higher responsive scores than those with higher income. Conversely, among NMCs, lower income was associated with greater pressuring, restrictive and indulgent belief scores, though these associations appear to be limited to grandmothers in the models assessing the types of NMCs separately. The greater responsive belief scores of low-income mothers differ from previous research in infants and children where low-income parents tend to have more coercive, pressuring feeding styles and practices (Francis, Hofer, & Birch, 2001; Loth, et al., 2013; Wehrly, Bonilla, Perez, & Liew, 2014), results also seen among the grandmothers in our study. Mothers and NMCs with at least a high school education had lower indulgent feeding beliefs and NMCs with a high school education or more had lower pressuring beliefs. These findings are similar to some previous research finding differences in permissiveness by father's education (Khandpur, et al., 2016) and lower pressuring with higher education (Ystrom, Barker, & Vollrath, 2012). However, the association between education and feeding styles is not consistently seen in the literature and several studies have found no association between education and feeding styles in either mothers (Francis, et al., 2001) or NMCs (Barrett, et al., 2018; Mallan, et al., 2014). These contrasting results suggest that further research is needed to disentangle the associations between income, education, and infant and young child feeding in samples of varying SES and education levels. It may be particularly important to examine participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), a federal nutrition assistance program that provides a nutritious food package and nutrition education to low-income women and young children. While we saw no significant differences in feeding beliefs by maternal WIC participation (data not shown), differences in infant food and nutrient intakes by WIC participation have been demonstrated (Guthrie et al. 2018; Jun et al. 2018) and further research on the contribution of WIC to caregiver feeding beliefs and practices is needed.

Interestingly, depressive symptoms were associated with feeding beliefs in mothers but not in other caregivers, findings similar to other studies examining the association between psychological characteristics and feeding practices in mothers and fathers (Cerniglia, Cimino, & Ballarotto, 2014; Haycraft & Blissett, 2012). Previous work has suggested that mothers with depressive symptoms tend to have more pressuring, less involved and more indulgent feeding practices (Goulding, et al., 2014; Haycraft & Blissett, 2012; Hurley, et al., 2008). In our study, women with depressive symptoms reported higher laissez-faire and indulgent beliefs but also a higher responsive belief score. These somewhat contradictory

results, that mothers have beliefs associated with less involved and more permissive practices as well as a more responsive practice, is not without precedent in the literature. Haycraft and colleagues (2012) found that mothers with depression had more coercive feeding practices but also had more food-related vocalization during mealtimes than non-depressed mothers. Given the high prevalence of depressive symptoms in our sample for both mothers (32.3%) and NMCs (44.3%) and the importance of caregiver mental health for child growth and development (Wachs, Black, & Engle, 2009), our findings suggest that a more fine-grained understanding of the impact of depressive symptoms on feeding beliefs and practices of caregivers is needed.

Another important difference between the correlates of feeding beliefs in mothers and NMCs was the importance of having a previous child. Surprisingly, we did not see any differences in feeding belief scores for mothers who had and didn't have previous children in either bivariate or multivariable analysis. We would expect that mothers who already have children would base their feeding beliefs on their experiences with feeding their other children, as has been shown in the literature for breastfeeding attitudes (e.g. Bartle & Harvey, 2017). Our lack of results may be associated with other differences between the primiparous and multiparous mothers, such as differences in self-efficacy or social support, that may also shape feeding beliefs, suggesting that further exploration of the factors shaping maternal feeding beliefs pre- and postnatally is needed.

Conversely, for NMCs as a group and for fathers and other NMCs separately, having a previous child and previous child care experience was significantly independently associated with numerous feeding belief constructs scores. For both fathers and other NMCs, having previous children was associated with generally healthier feeding beliefs: lower scores for laissez faire, pressuring, and indulgent sub-constructs. Child care experience had more mixed results; for fathers, child care experience was associated with higher responsive feeding scores but also higher laissez faire and indulgent permissive scores. For other NMCs, child care experience was associated with lower laissez faire and pampering feeding beliefs. Previous research has documented higher scores on more responsive feeding styles and lower scores on pressuring, laissez-faire and indulgent constructs among child care providers (Barrett, et al., 2018), a finding attributed to their training in child development. We did not ask participants what type of previous child care experience they had in the current study, but, nonetheless, these results suggest that prior experiences are important in shaping feeding beliefs among NMCs and may need to be addressed in feeding interventions.

Along with the consistent model fit in mothers and NMCs, these associations indicate that the use of the IFBQ has the potential to fill several important gaps in the literature: the scale can be used to directly assess the feeding beliefs of fathers and other NMCs without relying on maternal reports and the similarity of the scale for mothers and NMCs allows the responses of multiple caregivers to be compared. Perhaps more importantly, the validation of this tool in a wide range of NMCs will allow additional research in more diverse household contexts, an important strength given the changing demographics of households in the United States (Khandpur, et al., 2014). Despite these strengths, our study is not without limitations. While the validation in a predominantly African-American and low-income

sample expands the ethnic and economic diversity of the existing literature which predominantly relies on middle-income, White families, the generalizability to other populations remains to be established. Our ability to examine responsive feeding beliefs was limited due to a single belief question being included in our questionnaire. Future work expanding this construct is warranted given its association with healthy child feeding practices and growth outcomes. While our overall sample size of NMCs is large (n=378), the sub-groups are smaller, n=151 fathers, 90 grandmothers, and 68 other NMCs, in the multivariable models. Consequently, the associations between sociodemographic and child care experience and feeding beliefs that we find between these groups of NMCs should be considered exploratory. Finally, this analysis was limited to a single, baseline visit during pregnancy. How important prenatal beliefs are for future feeding practices requires more research.

Conclusion

Our analysis validates a feeding belief scale, the Infant Feeding Belief Questionnaire, that can be used to assess feeding beliefs during pregnancy around five constructs, laissez-faire, pressuring, restrictive, responsive and indulgent, previously linked to infant feeding practices and child growth. Our analysis further documents that two of these constructs, restriction and indulgence, were better assessed through sub-constructs around the themes of amount and diet quality and permissiveness, coaxing, soothing, and pampering, respectively. The establishment of the suitability of this tool for both expectant mothers and the NMCs that play an important role in infant feeding and care is a key advance in the literature, which has called for an extension of infant feeding interventions to fathers and other caregivers and the inclusion of more diverse household types. Thus, the IFBQ provides a preliminary tool for tracking the development of and potentially intervening upon feeding beliefs at a critical period for behavioral change and in a population at high risk for pediatric obesity.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1:

Infant Feeding Belief Questionnaire

Feeding Belief Construct	*Description*	**Initial items**[a]
Laissez faire	Parent doesn't believe that infants or toddlers should have limits on food quality or quantity and has little or no interaction with the child during feeding	LF4:I think it is okay to prop an infant's bottle
		LF5: It's okay for a toddler to walk around while eating as long as s/he eats
		LF10: A toddler should be able to eat whatever s/he wants for snacks
		LF11: A toddler should be able to eat whatever s/he wants when eating out at a restaurant
Pressuring	Parent believes that child should finish food, should be fed to soothe them, or should be fed to help them sleep	PR7: Important for toddler finish all food on his/her plate
		PR8: Important for infant finish all milk in his/her bottle
		PR12: Cereal in bottle helps an infant sleep through the night
		PR13: Putting cereal in bottle is good because it helps infant feel full
		PR14: An infant <6 mo needs more than formula or breastmilk to be full
		PR15: An infant <6 mo needs more than formula or breastmilk to sleep through the night
		PR17: Best way to make infant stop crying is to feed
		PR18: Best way to make toddler stop crying is to feed
		PR19: When infant cries, usually means s/he needs to be fed
Restrictive	Parent believes he/she should limit the quantity of food the child consumes and control the quality of food	*Amount*
		RS3: Important parent has rules about how much a toddler eats
		RS4: Important parent decides how much infant should eat
		Diet Quality
		RS7: A toddler should never eat fast food
		RS8: An infant should never eat fast food
		RS9: A toddler should never eat sugary food like cookies
		RS10: A toddler should never eat junk food like chips

Appetite. Author manuscript; available in PMC 2020 October 01.

Feeding Belief Construct	*Description*	**Initial items**[a]
		RS11: A toddler should only eat healthy food
Responsive	Parent believes that they he/she should encourage exploration and pay attention to child cues	RP12: Important to help or encourage a toddler to eat
Indulgence	Parent does not believe they should set limits on food quantity or quality to keep child happy, to keep him/her from crying, to ensure the child eats enough or to cater to child desires	*Permissive*
		ID5: Toddlers should be allowed to watch TV while eating if they want
		ID6: Toddlers should be allowed to eat fast food if they want
		ID7: Toddlers should be allowed to drink sugared drinks/ soda if they want
		ID8: Toddlers should be allowed to eat desserts/sweets if they want
		Coaxing
		ID13: Toddlers should be allowed to watch TV while eating to make sure they get enough
		ID14: Toddlers should be allowed to eat fast food to make sure they get enough
		ID15: Toddlers should be allowed to drink sugared drinks/ soda to make sure they get enough
		ID16: Toddlers should be allowed to eat desserts/sweets to make sure they get enough
		Soothing
		ID21: Toddlers should be allowed to watch tv while eating to keep them from crying/fussing
		ID22: Toddlers should be allowed to eat fast food to keep them from crying/fussing
		ID23: Toddlers should be allowed to drink sugared drinks/ soda to keep them from crying/fussing
		ID24: Toddlers should be allowed to eat desserts/sweets to keep them from crying/fussing
		Pampering
		ID29: Toddlers should be allowed to watch tv while eating to keep them happy
		ID30: Toddlers should be allowed to eat fast food to keep them happy
		ID31: Toddlers should be allowed to drink sugared drinks/ soda to keep them happy
		ID32: Toddlers should be allowed to eat desserts/sweets to keep them happy

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[a] Item numbers correspond to those on the IFSQ (Thompson et al., 2009)

Table 2:

Sample Characteristics of Participating Mothers and NMCs

	Mothers	NMCs
Characteristics	***Mean (SD)/% (N)***	
Sample Size	429	374
Age, yrs	25.8 (5.3)	36.2 (12.6)***
Sex, %male	--	54 (201)
Education, %hs grad or higher	83.4 (357)	86.9 (325)
Work, % yes	77.6 (333)	NA
Married/domestic partnership, %yes	27.8 (119)	48.6 (151)***
Parity, #births	1.02 (1.24)	NA
Previous children, %yes	55.8 (240)	64.2 (240)*
Child care experience, %yes	96.0 (412)	89.4 (321)***
HH income, %<185% poverty line[a]	72.8 (286)	70.8 (213)
BMI, kg/m^{2},[b]	28.6 (8.4)	30.7 (8.3)***
Obese, %BMI >30	34.9 (144)	44.5 (158)**
CES-D score[c]	13.5 (9.8)	16.7 (6.9)***
Depressive symptoms, %CESD >16	32.3 (139)	44.3 (158)**
WIC[d] participation, ever	87.9 (377)	NA
WIC[d] participation, current	81.3 (349)	NA

*p<0.05,

**P<0.01,

***p<0.001 from t-tests for continuous or chi-square for categorical variables

[a]Variable was only available from 393 mothers and 329 others

[b]calculated from self-reported pre-pregnancy height and weight for mothers and self-reported height and weight for other

[c]Score from the Center for Epidemiological Studies-Depression scale

[d]Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

Table 3:

Model fit and revisions from models fit in mothers

	MODEL	CHI2	RMSEA	AIC	BIC	CFI	TLI	SRMR
CONSTRUCTS[A]								
LAISSEZ-FAIRE	Inital 4-item	2.88*	0.03*	5148	5196	0.99*	0.98*	0.02*
PRESSURING	Initial- 9 item	305.13	0.16	12568	12677	0.67	0.56	0.096
	7 item model- drop 7 and 8; covary 14–15, 17–18	101.75	0.13	9482	9575	0.86	0.76	0.96
	7 item model- drop 7 and 8; covary 12–13, 14–15, 17–18	42.178	0.08	9425	9522	0.95*	0.91	0.049*
	6 item model- drop 7,8, and 19; covary 14–15, 17–18	39.204	0.11	8071	8152	0.94	0.88	0.07*
	7 item model- drop 7 and 19; covary 14–15, 17–18	90.46	0.13	9429	9522	0.88	0.79	0.08*
	7 item model- drop 7 and 19; covary 12–13, 14–15, 17–18	28.8	0.06*	9369	9466	0.97*	0.95*	0.04*
RESTRICTIVE	Initial 7-item model	50.21	0.078	9457	9542	0.87	0.8	0.06*
	5 item- drop 3 and 4[b]	0.41*	0.00*	6785	6854	1.00*	1.04*	0.006*
INDULGENCE (ID)	Initial 16 item model	870.6	0.13	14488	14682	0.75	0.71	0.09
	16-item covary all TV variables	382.35	0.08	14012	14230	0.91	0.89	0.05*
	I6-item covary all TV, 5–6, 6–8, 7–8 30–32	282.82	0.07	13920	14155	0.94	0.92	0.04*
ID SUB-CONSTRUCTS								
ID PERMISSIVE	Initial 4-item model (5–8)	11.85	0.11	4892	4941	0.96*	0.88	0.04*
	4-item covary 7–8	0.53*	0.00*	4883	4935	1.00*	1.01*	0.007*
ID COAXING	Initial 4-item model (13–16)	3.512*	0.04*	3455	3503	0.99*	0.98*	0.02*
ID SOOTHING	Iniital 4-item model (21–24)	9.05	0.09	3767	3815	0.98*	0.94	0.03*
	4-item covary 22–24	0.05*	0.00*	3760	3812	1.00*	1.02*	0.002*
ID PAMPERING	Initial 4-item model (29–32)	1.95*	0.00*	3416	3466	1.00*	1.00*	0.02*

*Indicates good model fit

[a]The responsive feeding constructs had only one item and could not be validated through CFA

[b]The 5 item model forms the sub-construct restrictive diet quality and the dropped items (RS3 and RS4) form the sub-construct restrictive amount.

Table 4:

Fit of CFA Models in the NMCs Sample

CONSTRUCTS[A]	CHI2	RMSEA	AIC	BIC	CFI	TLI	SRMR
LAISSEZ-FAIRE	6.52	0.08	4217	4264	0.97*	0.91	0.03*
PRESSURING	20.39	0.05*	7932	80.25	0.99*	0.97*	0.04*
SUB-CONSTRUCTS							
RESTRICTIVE DIET QUALITY[B]	5.11*	0.01*	5595	5653	1.00*	1.00*	0.02*
INDULGENT PERMISSIVE	2.18*	0.06*	4137	4188	1.00*	0.98*	0.01*
INDULGENT COAXING	7.71	0.09	3359	3406	0.98*	0.94	0.03*
INDULGENT SOOTHING	1.79*	0.05*	3354	3405	1.00*	0.98*	0.02*
INDULGENT PAMPERING	8.60	0.10	3371	3417	0.98*	0.94	0.03*

* indicates good model fit

[a] The responsive feeding constructs had only one item and could not be validated through CFA

[b] Restrictive amount sub-construct only had two items and could not be tested

Table 5:

Mean Construct Scores and Reliability for Mothers and NMCs

	Mothers		NMCs (all)		Fathers	Grandmothers	Other NMCs[c]
Feeding Belief Construct	**Mean (SD)**	**Cronbach's alpha**	**Mean (SD)**	**Cronbach's alpha**	**Mean(SD)**	**Mean (SD)**	**Mean (SD)**
Laissez Faire	1.84 (0.75)	0.54	1.79 (0.74)	0.58	1.96 (0.71)	1.53 (0.69)[ab]	1.77 (0.76)
Pressuring	2.59 (0.82)	0.73	2.60 (0.85)	0.76	2.71 (0.82)	2.42 (0.89)[b]	2.59 (0.87)
Restrictive amount	4.07 (0.94)	--	3.96 (0.94)	--	4.01 (0.83)	3.96 (1.05)	3.85 (1.03)
Restrictive diet quality	3.32 (0.80)	0.63	3.36 (0.87)	0.69	3.37 (0.80)	3.38 (0.94)	3.30 (0.95)
Responsive	4.83 (0.48)	--	4.56 (0.95) ***	--	4.48 (0.96)[a]	4.72 (0.81)	4.51 (1.10)[a]
Indulgent permissive	2.02 (0.78)	0.64	1.97 (0.85)	0.73	2.05 (0.78)	1.89 (0.93)	1.92 (0.88)
Indulgent coaxing	1.34 (0.52)	0.66	1.47 (0.63) **	0.70	1.59 (0.67)[a]	1.36 (0.56)[b]	1.33 (0.55)[b]
Indulgent soothing	1.38 (0.60)	0.71	1.2 (0.61)	0.69	1.53 (0.66)[a]	1.38 (0.58)	1.25 (0.49)[b]
Indulgent pampering	1.34 (0.56)	0.72	1.49 (0.68) ***	0.74	1.59 (0.72)[a]	1.36 (0.60)[b]	1.44 (0.67)

* p<0.05,

** P<0.01,

*** p<0.001 from t-tests of feeding belief scores by caregiver type

[a] significantly different (p<0.05) from mothers and

[b] significantly different (p<0.05) from fathers in oneway ANOVA

[c] other NMCs includes family (e.g aunts, grandfathers, and cousins) and friends

Table 6:

Adjusted models of the association between feeding belief scores and mothers' and NMCs' characteristics

	Mothers									NMCs								
			RS			ID	ID	ID	ID			RS			ID	ID	ID	ID
	LF[a]	PR	amt	RS dq	RP	Pamp	Coax	Soothe	Pamp	LF	PR	amt	RS dq	RP	Pamp	Coax	Soothe	Pamp
	B(SE)	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*	*B(SE)*
Depressive symptoms[b]	0.24** (0.08)	0.08 (0.09)	0.15 (0.11)	−0.07 (0.09)	0.10* (0.05)	0.22* (0.09)	0.06 (0.06)	0.17* (0.06)	0.10 (0.06)	−0.02 (0.08)	0.14 (0.09)	−0.08 (0.11)	−0.10 (0.10)	0.09 (0.10)	0.06 (0.10)	−0.03 (0.070)	−0.04 (0.07)	−0.04 (0.07)
Obesity[c]	−0.19* (0.08)	−0.15 (0.09)	−0.05 (0.10)	0.07 (0.08)	−0.02 (0.05)	−0.12 (0.08)	−0.09 (0.06)	−0.06 (0.06)	−0.08 (0.06)	−0.06 (0.08)	−0.03 (0.09)	0.16 (0.11)	0.06 (0.10)	- 0.004 (0.10)	−0.01 (0.09)	−0.08 (0.07)	−0.06 (0.07)	−0.03 (0.07)
Low income[d]	−0.05 (0.09)	0.19 (0.10)	0.04 (0.12)	−0.04 (0.10)	0.12* (0.06)	0.07 (0.10)	0.09 (0.06)	0.11 (0.07)	0.08 (0.07)	−0.02 (0.09)	0.26* (0.10)	0.32** (0.12)	−0.03 (0.11)	0.09 (0.11)	0.02 (0.10)	0.16* (0.08)	0.16* (0.07)	0.14 (0.08)
Marital status[f]	−0.06 ().08)	- 0.23* (0.1)	0.11 (0.11)	−0.02 (0.10)	0.02 (0.05)	−0.05 (0.09)	−0.04 (0.06)	0.01 (0.07)	−0.05 (0.06)	−0.03 (0.08)	−0.004 (0.10)	−0.05 (0.11)	0.10 (0.10)	−0.12 (0.10)	−0.02 (0.10)	−0.03 (0.07)	0.01 (0.07)	−0.01 (0.07)
Education[g]	−0.00 (0.11)	−0.15 (0.12)	−0.03 (0.15)	0.03 (0.13)	0.07 (0.07)	−0.15 (0.12)	- 0.17* (0.08)	. 0.23** (0.09)	. 0.26** (0.08)	−0.24 (0.12)	−0.29* (0.14)	−0.08 (0.16)	0.28 (0.16)	0.18 (0.15)	−0.37* (0.14)	−0.17 (0.10)	−0.23* (0.10)	- 0.30** (0.11)
Previous child	0.00 (0.08)	−0.01 (0.10)	−0.20 (0.11)	0.05 (0.10)	−0.03 (0.05)	0.00 (0.09)	−0.02 (0.06)	−0.07 (0.07)	−0.04 (0.07)	−0.45*** (0.10)	−0.40** (0.12)	−0.13 (0.14)	0.32* (0.13)	0.14 (0.12)	- 0.34** (0.12)	- 0.26** (0.09)	- 0.22** (0.08)	- 0.32** (0.09)
Child care experience[e]	−0.06 (0.21)	0.10 (0.24)	0.20 (0.28)	−0.45 (0.24)	0.12 (0.13)	0.46* (0.23)	0.04 (0.15)	−0.00 (0.17)	0.09 (0.16)	0.17 (0.16)	0.068 (0.18)	0.18 (0.21)	−0.21 (0.19)	0.41* (0.19)	0.18 (0.18)	0.22 (0.13)	0.06 (0.13)	0.08 (0.14)

*p<0.05,

**P<0.01,

***p<0.001 from multivariable regression models run separately for each feeding belief construct

[a]Feeding belief constructs: LF-laissez faire; PR-pressuring; RS amt- restrictive amount; RS dq- restrictive diet quality; RP- responsive; IN Pamp- indulgence pampering; IN Coax- indulgence coaxing; IN Soothe- indulgence soothing; ID Pampering- indulgence pampering

[b]CESD ([C]Score from the Center for Epidemiological Studies-Depression scale) score >16

[c]BMI >30 kg/m^2

[d]Income <185% of the federal poverty line

[e]Previous experience caring for a child under the age of 2

[f]married or in a domestic partnership

[g]high school graduate or greater level of education compared to less than a high school diploma