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The Influence of Maternal Psychosocial Characteristics on Infant Feeding Styles

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Abstract

Maternal feeding styles in infancy and early childhood are associated with children's later risk for overweight and obesity. Maternal psychosocial factors that influence feeding styles during the complementary feeding period, the time during which infants transition from a milk-based diet to one that includes solid foods and other non-milk products, have received less attention. The present study explores how maternal psychosocial factors—specifically self-esteem, parenting self-efficacy, parenting satisfaction, and depression symptoms—influence mothers' infant feeding styles at nine months of age, a time during which solid foods eating habits are being established. Participants included 160 low-income, African-American mother-infant pairs in central North Carolina who were enrolled in the Infant Care and Risk of Obesity Study. Regression models tested for associations between maternal psychosocial characteristics and pressuring and restrictive feeding styles. Models were first adjusted for maternal age, education, marital status and obesity status. To account for infant characteristics, models were then adjusted for infant weight-for-length, distress to limitations and activity level scores. Maternal self-esteem was negatively associated with pressuring to soothe. Maternal parenting self-efficacy was positively associated with restriction-diet quality. Maternal parenting satisfaction and depression symptoms were not associated with feeding styles in the final models. Focusing on strengthening maternal self-esteem and parenting self-efficacy may help to prevent the development of less desirable infant feeding styles.

Keywords

Infant feeding; self-esteem; parenting self-efficacy; feeding styles; African-American mothers

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INTRODUCTION

Obesity in the United States has an increasing impact on health and social policy as well as implications for socioeconomic inequalities (Puhl & Heuer, 2009). Obesity rates in early childhood are higher among African-Americans than among non-Hispanic whites, and the disparities widen over time (Ogden, Carroll, Kit, & Flegal, 2014). Evidence suggests that the early childhood nutritional environment, especially parents' feeding styles, can influence the risk of obesity and chronic disease over the life course (Thompson, 2012). Rapid or excessive infant weight gain is associated with increased risk of obesity later in life (Baird et al., 2005; Ong & Loos, 2006). The feeding styles parents employ may help explain how differential growth trajectories develop.

Feeding styles, which encompass both parental attitudes toward feeding interactions and the feeding practices parents exhibit (Blissett, 2011), develop as early as infancy (Thompson et al., 2009), can remain stable throughout early childhood (Blissett & Farrow, 2007; Duke, Bryson, Hammer, & Agras, 2004), and are associated with child weight status (Birch & Fisher, 1998, 2000; Hughes, Power, Fisher, Mueller, & Nicklas, 2005; Johnson & Birch, 1994). Controlling feeding styles, specifically pressuring and restriction, are associated with infant growth and dietary outcomes (Thompson, Adair, & Bentley, 2013). Pressuring feeding styles are characterized by a concern for increasing the amount of food consumed by the infant and include pressuring to finish meals and the instrumental use of food (Thompson et al., 2009). They are also associated with higher energy intake and smaller infants and children (Francis, Hofer, & Birch, 2001; Gross, Mendelsohn, Fierman, & Messito, 2011; Thompson et al., 2013). Restrictive feeding styles are characterized by regulating the quality and quantity of foods consumed (Thompson et al., 2009) and are associated with lower energy intake and larger infants and children (Blissett & Farrow, 2007; Thompson et al., 2013). These controlling styles may lead to increased reliance on external cues to initiate and terminate eating and decreased responsiveness to energy density, which may indicate less sensitivity to internal cues of hunger and satiety and lead to poorer self-regulation (Birch & Fisher, 1998).

Several studies of infant and child feeding have found that maternal psychosocial characteristics may impact feeding style outcomes. For example, maternal stress, anxiety, and depression symptoms have been associated with both pressuring and restrictive feeding styles (Farrow & Blissett, 2005; Francis et al., 2001; Haycraft, Farrow, & Blissett, 2013; Hurley, Black, Papas, & Caufield, 2008; Mitchell, Brennan, Hayes, & Miles, 2009). Higher parenting self-efficacy and parenting satisfaction were found to be negatively associated with controlling feeding styles in children (Mitchell et al., 2009). Little work has evaluated how self-esteem may influence feeding styles, which may be explained in part by the differences between self-esteem and self-efficacy. Leerkes and Crockenberg (2002) distinguish self-esteem from self-efficacy, stating that self-esteem refers to one's global sense of worth, whereas self-efficacy is action-oriented and domain-specific (see also: Bandura, 1977). However, lower pre-pregnancy self-esteem has been associated with feeding problems among 6-month-old infants, namely with an increased percentage of food refused (Farrow & Blissett, 2006). There is still a need to investigate these relationships between maternal psychosocial factors and feeding styles among low-income and minority

populations, particularly how these feeding styles develop during the complementary feeding period, defined as the time during which infants begin to receive non-milk and non-formula foods and beverages (Agostoni et al., 2008).

In addition to maternal psychosocial factors, maternal demographic and anthropometric characteristics have been associated with perceptions of hunger and satiety cues as well as infant and child feeding styles. Maternal education has been positively associated with the belief that infant crying indicates hunger, and maternal BMI has been positively associated with perceiving an infant is hungry if she is sucking her hand and negatively associated with perceiving that an infant knows he is full (Gross et al., 2010). Among mothers of young children, lower maternal BMI and being a single parent have been associated with restrictive feeding styles (Fisher & Birch, 1999; Hurley et al., 2008).

Similarly, infant characteristics may shape how mothers interact with them during feeding. Higher infant activity and distress to limitations have been associated with higher weight-for-length at 12 months of age (Slining, Adair, Goldman, Borja, & Bentley, 2009), and higher distress to limitations scores have been associated with rapid weight gain and higher percentage body fat (Darlington & Wright, 2006; Wells et al., 1997). It is possible that infant temperament characteristics influence how mothers feed their babies, which may help explain the link between infant temperament and size. Mothers of infants who were perceived to have difficult temperaments were more likely to give their infants food in order to calm them (McMeekin et al., 2013). Negative infant reactivity and maternal use of the pressuring with cereal feeding style was found to be associated with earlier introduction of solid foods (Doub, Moding, & Stifter, 2015). These infant characteristics may also operate in conjunction with maternal psychosocial characteristics to influence feeding styles. For example, self-efficacy has been found to moderate the inverse relationship between negative infant reactivity and weight gain (Anzman-Frasca, Stifter, Paul, & Birch, 2013), and feeding style may be one mechanism that influences these outcomes.

To explore the mechanisms through which the relationships between maternal psychosocial factors and infant feeding styles might operate, the present study analyzes how maternal self-esteem, parenting self-efficacy, parenting satisfaction, and depression symptoms influence infant feeding styles among an African-American population in North Carolina. Data from a cross-section of mothers with 9-month-old infants were examined to understand which relationships existed at this point in time. Maternal education, marital status, and obesity status were included. Infant weight-for-length *z*-scores, activity, and distress to limitations scores were also included in order to investigate if and how infant characteristics shape the feeding styles mothers employ.

METHODS

Sample

The Infant Care, Feeding and Risk of Obesity Project was conducted between 2003 and 2007 in Orange, Wake, and Durham counties in central North Carolina. The project was an observational study of African-American mother-infant dyads designed to assess household factors that influence infant feeding patterns, such as infant feeding styles and diet, and the

risk of obesity. Healthy, first-time mothers aged 18 to 35 years old with healthy infants ($N=217$) were recruited from local Supplemental Food Program for Women, Infants, and Children (WIC) clinics. Healthy mothers were identified as those who had no serious health problems requiring regular treatment and no history of substance abuse. Healthy infants were identified as those who completed at least 35 weeks of gestation, did not have a chronic or congenital illness, were not diagnosed with failure to thrive, and were not receiving medical treatment that might interfere with dietary intake or growth. The study consisted of in-home interviews conducted when infants were 3, 6, 9, 12, and 18 months old. The analytic sample focuses on 160 mothers and infants participating in the 9-month home visit specifically to gain a better understanding of infant feeding styles during the complementary feeding period. All measures except maternal BMI were collected during the 9-month visit, a time at which complementary feeding was established and infants had been exposed to a relatively wide variety of foods. The study and current analyses were approved by the School of Public Health Institutional Review Board at the University of North Carolina at Chapel Hill.

Feeding Styles

Infant feeding styles were measured using the Infant Feeding Style Questionnaire (IFSQ) (Thompson et al., 2009), which includes questions that evaluate both feeding beliefs and behaviors. Although 6 constructs and 13 sub-constructs were measured with the IFSQ, the current analysis examines pressuring and restrictive feeding constructs because of their relation to infant growth outcomes. The pressuring feeding style includes the sub-constructs pressuring with cereal (e.g., “cereal in the bottle helps an infant sleep through the night”), pressuring to finish (e.g., “it is important for an infant to finish all the milk in his/her bottle”), and pressuring to soothe (e.g., “the best way to make an infant stop crying is to feed him/her”). The restrictive feeding style includes the sub-constructs restriction-diet quality (e.g., “an infant should never eat fast food”) and restriction-amount (e.g., “I am very careful not to feed my infant too much”). All sub-constructs were measured on a scale from 1 to 5 with higher scores indicating higher levels of control.

Maternal Psychosocial Characteristics

To assess maternal psychosocial characteristics that may influence infant feeding styles, self-esteem, parenting self-efficacy, parenting satisfaction, and depression symptoms were included as explanatory variables in statistical models. General self-esteem was measured using the Rosenberg Self-Esteem Scale (Gray-Little, Williams, & Hancock, 1997); questions were scored using a 4-point Likert-type scale with high scores indicating higher levels of self-esteem. The Parenting Sense of Competence (PSOC) Scale, scored using a 6-point Likert-type scale, was used and included two separate measures: self-efficacy and satisfaction (Johnston & Mash, 1989). Three individual cases had invalid parenting satisfaction response items scores, which were imputed using the mean of the remaining response scores. Because each measure assesses a unique aspect of parental sense of competence, each component was modeled separately. Higher scores indicated higher levels of each measure. Maternal depression symptoms were assessed using the Center for Epidemiological Studies Depression Scale (CES-D). Scores were dichotomized using the clinical cut point of 16 or higher to identify mothers who were experiencing depression

symptoms and were at risk for clinical depression (Radloff, 1977). One individual case had a single invalid response item score, which was imputed based on the remaining response scores and did not affect the dichotomized score.

Infant Characteristics

Three measures of infant characteristics were included in statistical models to explore if they influenced the associations between maternal psychosocial factors and infant feeding styles: weight-for-length, activity level, and distress to limitations (DTL). Infant anthropometrics were measured by trained study personnel using standard methods. Infant weight was measured digitally (Tanita BD-585 Digital Baby Scale) to the nearest 10 g. Recumbent length was measured by a two-person team using a portable length board (O'Leary Length Board) to the nearest 0.1 cm. Measurements were obtained in triplicate, and the mean value was used in analysis. Infant weight-for-length z-scores (WLZ) were calculated using the Centers for Disease Control and Prevention (CDC) and National Center for Health Statistics (NCHS) growth reference (Ogden et al., 2002) because the sample consisted of predominantly non-breastfed infants and for consistency with previously published papers. Results did not differ when WLZ was calculated from the World Health Organization (WHO) Multicenter Growth Reference Study (MGRS) (de Onis, Onyango, Van den Broeck, Chumlea, & Martorell, 2004).

Activity level and distress-to-limitations (DTL) are subscales of the Infant Behavior Questionnaire-Revisited (IBQ-R) (Gartstein & Rothbart, 2003), which was completed by mothers during the 9-month interview. Activity level measures infants' levels of movement and locomotion (e.g., "when put into the bath water, how often did the baby splash or kick?"). Distress to limitations measures how quickly infants recover from distress (e.g., "when your baby was upset about something, how often did s/he stay upset for up to 10 minutes or longer?"). Responses were measured on a 7-point Likert-type scale, and higher composite scores indicate higher levels of activity and distress to limitations respectively.

Covariates

Covariates included maternal age, maternal education (categorized as less than high school, high school or degree equivalent, some college or program certificate, 4-year degree or higher), marital/partnered status (dichotomized as married/living with the infant's father or single), and obesity status (classified as obese or not). Maternal height and weight were collected using standard methods during the home visits when the infants were 3, 6, and 12 months old. Height was measured to the nearest 0.1 cm using a stadiometer (Harpender), and weight was measured to the nearest 0.1 kg using a digital scale (Seca 761). All anthropometric measurements were done in triplicate, and the mean of these measures was used in calculating BMI ($\text{weight}(\text{kg})/\text{height}(\text{m})^2$). Few mothers changed BMI category over the course of the study and, consequently, mothers were classified as obese at 9 months if their BMI was greater than 30 at two or more of the three home visits during which height and weight were measured.

Statistical Methods

All statistical analyses were conducted in STATA software (version 13.1; STATA Corporation, College Station, TX). Descriptive statistics were run first, followed by Pearson and polychoric correlations to test the relationship between maternal psychosocial factors and infant feeding styles. Regression analyses were modeled for all correlations at $p < 0.10$. The models first adjusted for maternal age, education, marital status, and obesity status. Infant characteristics were added to the models to determine how the infant might shape observed outcomes. Finally, a combined linear regression model that included all maternal psychosocial factors, infant characteristics, and covariates was run in order to test the relative importance of each maternal psychosocial factor. Significance was set at $p < 0.05$, but because of the relatively small sample size, the results of these data analyses should be considered exploratory.

RESULTS

Select sociodemographics, maternal characteristics, and feeding styles are presented in Table 1. General self-esteem scores were high, averaging 34.8 on a scale of 40. Self-efficacy scores averaged 38.7 on a scale of 48, and maternal parenting satisfaction scores averaged 38.5 on a scale of 54. CES-D scores averaged 11.8 out of a possible 60, and nearly one-quarter of mothers reported depression symptoms based on the clinical cut point. Overall, mothers had higher scores for restrictive versus pressuring feeding styles.

Correlations between infant feeding styles and maternal psychosocial factors are presented in Table 2. Self-esteem was negatively correlated with pressuring with cereal and with pressuring to soothe, but the correlations were not statistically significant at $p < .05$. Parenting self-efficacy was positively correlated with restriction-diet quality. Parenting satisfaction was negatively correlated with pressure with cereal. Maternal depression symptom scores were positively correlated with pressure to soothe.

Associations for the final regression models with all maternal psychosocial characteristics, maternal covariates, and infant characteristics are presented in Table 3. Data for the intermediate models are available in Supplemental Tables 1–5. After adjusting for all covariates, three maternal factors were significantly associated with pressuring feeding styles. Lower levels of maternal self-esteem were associated with higher pressure to soothe scores. Mothers who were married or living with the infant's father reported lower pressure with cereal scores. Mothers who were obese reported higher pressure with cereal and pressure to soothe scores. Two infant characteristics were also important in the final pressuring models. Higher infant activity levels were associated with lower pressure to soothe scores. Lower WLZ scores were associated with higher pressure with cereal and pressure to soothe as reported by mothers. In the final adjusted model, only parenting self-efficacy was positively associated with restriction-diet quality.

DISCUSSION

This exploratory analysis suggests that several maternal factors and infant characteristics were significantly associated with the pressuring and restriction feeding styles. Pressure to

soothe was negatively associated with maternal self-esteem, infant activity, and infant WLZ. Pressure with cereal was significantly associated with maternal obesity status and negatively associated with maternal marital status and infant WLZ. Restriction-diet quality was positively associated with parenting self-efficacy. Maternal depression symptoms and maternal parenting satisfaction were not significantly associated with any infant feeding styles in the final models. While the effects of maternal psychosocial factors were smaller than other maternal and infant characteristics, our findings nonetheless suggest that it may be important to help mothers feel confident in themselves, particularly in their roles and abilities as parents, in order to reduce the risk of developing controlling infant feeding styles.

Pressure to soothe was associated with lower maternal self-esteem, infant activity, and infant WLZ. Pressuring feeding styles have previously been reported by mothers with smaller infants and mothers who express concern that their infants may be underweight in the future (Gross et al., 2011). It's possible that mothers with higher levels of self-esteem are more likely to perceive larger infant size and higher activity levels as healthy, developmentally appropriate outcomes and therefore may be less likely to use food to soothe their infants. Higher maternal parenting self-efficacy has been negatively associated with the use of food to soothe (Stifter, Anzman-Frasca, Birch, & Voegtline, 2011), and although maternal self-esteem and parenting self-efficacy were highly correlated in this study, our results suggest that global self-esteem is independently associated with the pressuring to soothe feeding style. These maternal psychosocial characteristics may operate through different pathways to influence feeding styles, and the specific mechanisms remain to be discovered.

The pressure with cereal feeding style was not significantly associated with maternal psychosocial characteristics in the final model. Most infant feeding research focuses on the early introduction of cereal in the bottle, but this sub-construct is still of interest among 9-month-old infants because cereal in the bottle generally augments rather than replaces caloric intake from other foods (Thompson & Bentley, 2013). Being a single mother and being a mother with obesity were significantly associated with this sub-construct. Single mothers may be more likely to live with their own mothers and rely on them for advice (McLorg & Bryant, 1989), which has been associated with the early introduction of cereal in infants' bottles (Bentley et al., 1999; Wasser et al., 2013) and is a practice that may continue throughout infancy. Maternal obesity has previously been associated with less controlling feeding styles (Wardle, Sanderson, Guthrie, Rapoport, & Plomin, 2002), suggesting that heavier mothers may be more likely to comply with their children's food choices. It is possible that obese mothers are more likely to associate what they perceive as positive outcomes (e.g., sleeping through the night) with consuming more food. Lower infant WLZ scores were also significantly associated with pressuring with cereal, which is a finding supported by other research (Thompson et al., 2013). Mothers of smaller 9-month-old infants may be more likely to continue adding cereal to their bottles in order to facilitate growth.

Restriction-diet quality was positively associated with parenting self-efficacy. Some researchers have found negative associations between restrictive feeding styles and parenting self-efficacy among mothers of school-aged children (Mitchell et al., 2009), but this may be due to differences in the ages of children in each sample and in measurement tools. For

example, the frequently used Child Feeding Questionnaire (CFQ) includes the instrumental use of food within the restriction construct (Birch et al., 2001), which leads to a more negative interpretation of restrictive feeding styles. Among African-American mothers and infants, restriction-diet quality has been associated with a reduced risk of age-inappropriate feeding of solids and liquids (Thompson et al., 2013) based on the American Academy of Pediatrics' age-dependent guidelines for optimal feeding of infants (Kleinman, 2004). At these very young ages, the restriction-diet quality sub-construct may be more comparable to "covert" restriction, which tends to go undetected by children and has been negatively associated with unhealthy snacking behaviors among older children (Ogden, Reynolds, & Smith, 2006). Therefore restriction-diet quality may lead to better infant feeding styles in this African-American population.

Neither parenting satisfaction nor the presence of depression symptoms was associated with the pressuring or restriction feeding styles when multiple maternal psychosocial factors were tested concurrently. Although other studies have identified negative associations between parenting satisfaction and pressuring feeding styles (Mitchell et al., 2009) and positive associations between depression symptoms and pressuring feeding styles (Francis et al., 2001; Haycraft et al., 2013), it's possible that parenting satisfaction and depression symptoms are not particularly salient factors in relation to feeding interactions among this population of African-American mothers. Rather, maternal self-esteem and parenting self-efficacy may be more important. Messages of affirmation are considered by many to be critical for positive self-evaluations of African-American women and are important aspects of parenting in this population (see for example: Collins, 2000; Greene, 1990).

The associations identified between maternal psychosocial factors and feeding styles were significant, but the effect sizes of self-esteem and self-efficacy were lower than the effect sizes for maternal marital status, obesity status, infant activity and WLZ. These other maternal and infant characteristics may be more immediately important to address in efforts to reduce potentially obesogenic feeding styles. Nonetheless, a better understanding of how self-esteem and parenting self-efficacy influence other maternal characteristics and mothers' perceptions of their infants may lead to the creation of novel strategies for helping mothers develop more positive feeding styles for their infants.

Strengths and Limitations

Because this study examined a cross-sectional sample of mothers with infants approximately 9 months old, the results reflect only a snapshot of what occurs throughout the course of infant development. They do not address changes over time that may occur as a consequence of changes in mothers' psychosocial characteristics, infants' characteristics, or situations such as household composition. Additionally, there was considerable loss to follow-up from the beginning of the study. Mothers who left the study did not differ significantly in age, obesity status or marital status compared with mothers who were retained. They were more likely to have a high school education, less likely to employ pressure to finish, and more likely to employ restriction-diet quality, which may have influenced the associations identified in this study. Despite these limitations, this study does have its strengths. This study analyzes several maternal psychosocial measures concurrently and identifies

independent associations between maternal psychosocial characteristics and infant feeding styles. Self-esteem, parenting self-efficacy, parenting satisfaction, and depression symptom questionnaires were administered during the 9-month interview, so the scores reflect each mother's state at this particular time during infant development. This study examines how maternal psychosocial characteristics influence feeding styles early in the transition to solid foods, which is an important step toward understanding the mechanisms through which caretaker psychology influences infants' feeding environments and later risk of obesity. Inclusion of infant characteristics in the regression modeling helps to account for a few important aspects of infant development that could influence these relationships.

CONCLUSION

Among African-American mothers of 9-month-old infants in Central North Carolina, pressure to soothe was associated with lower maternal self-esteem, infant activity and infant WLZ scores. Higher pressure with cereal scores were associated with being a single mother, obesity, and smaller infant weight-for-length z-scores. Restriction-diet quality was positively associated with parenting self-efficacy. These exploratory findings demonstrate a need for further investigation of how the complex associations among maternal self-esteem, parenting self-efficacy, maternal and infant characteristics, and feeding styles influence obesity risk. A better understanding of how maternal self-esteem and parenting self-efficacy may influence the developmental feeding pathways early in infants' lives could help health professionals design supportive messaging and affirmations to promote self-esteem and parenting self-efficacy in prevention and intervention programs.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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TABLE 1

Descriptive characteristics of participating mothers during the 9-month visit

| Total Sample (9m) (n = 160) | Mean ± SD | Range |
|---------------------------------------|------------------|--------------|
| Age (years) | 23.31 ± 3.99 | 18 – 36 |
| Education | | |
| < High School | 27.39% (43) | |
| High School / GED | 26.11% (41) | |
| Some College | 35.67% (56) | |
| College Degree | 10.83% (17) | |
| Not Married or Living with Partner | 87.50% (140) | |
| Obese | 44.38 % (79) | |
| Self-Esteem | 34.83 ± 4.19 | 23 – 40 |
| Parenting Self-Efficacy | 38.66 ± 4.55 | 23 – 48 |
| Parenting Satisfaction | 38.47 ± 6.91 | 22 – 54 |
| CES-D Score | 11.81 ± 8.86 | 0 – 42 |
| % with Depression Symptoms (CES-D 16) | 24.53% (39) | |
| Feeding Style Scores | | |
| Pressure w/ Cereal | 2.72 ± 0.93 | 1.00 – 4.60 |
| Pressure to Finish | 2.56 ± 0.68 | 1.00 – 4.75 |
| Pressure to Soothe | 2.10 ± 0.85 | 1.00 – 4.75 |
| Restrict Amount | 3.59 ± 0.93 | 1.25 – 5.00 |
| Restrict Diet Quality | 2.64 ± 0.57 | 1.29 – 4.00 |
| Infant Characteristics | | |
| Age (months) | 9.38 ± 0.47 | 8.7 – 10.8 |
| WFL z-score | 0.55 ± 1.10 | -1.94 – 4.45 |
| Activity Score | 4.84 ± 0.73 | 3.00 – 6.33 |
| DTL Score | 4.01 ± 0.77 | 1.80 – 5.62 |

TABLE 2

Correlation Coefficients for Bivariate Associations

| | Feeding Styles | | | Maternal Psychosocial Characteristics | | | | Other Maternal Characteristics | | | | Infant Characteristics | | | |
|---------------------------------|----------------|-------|--------|---------------------------------------|-------|-------------------|-------------------|--------------------------------|---------------------|---------------------|----------------------|------------------------|---------------------|--------------------|-------------------|
| | RDQ | PC | PF | PS | S-Est | S-Eff | Sat | Dep | Age | Edu | MS | Ob | DTL | AL | WLZ |
| Restrict Amount (RA) | 0.16* | 0.16* | 0.20* | -0.01 | 0.01 | 0.11 | -0.04 | -0.05 ^a | -0.13 | -0.14 ^a | -0.34 ^{a**} | 0.07 ^a | 0.09 | 0.22** | 0.08 |
| Restrict DQ (RDQ) | | 0.12 | -0.06 | -0.05 | 0.06 | 0.20* | 0.06 | -0.13 ^a | 0.07 | -0.05 ^a | 0.06 ^a | 0.06 ^a | -0.11 | 0.03 | -0.03 |
| Pressure w/ Cereal (PC) | | | 0.21** | 0.38 [†] | -0.14 | 0.06 | -0.16* | 0.13 ^a | -0.14 | -0.18 ^{a*} | -0.51 ^{a†} | 0.23 ^{a*} | 0.08 | 0.05 | -0.23** |
| Pressure to Finish (PF) | | | < | -0.01 | 0.02 | 0.01 | -0.13 | -0.02 ^a | -0.11 | -0.06 ^a | -0.11 ^a | 0.03 ^a | 0.18* | 0.12 | -0.11 |
| Pressure to Soothe (PS) | | | | | -0.15 | 0.06 | -0.07 | 0.23 ^a | 0.03 | 0.01 ^a | -0.12 ^a | 0.22 ^{a*} | -0.03 | -0.19* | -0.24** |
| Maternal Self-Esteem (S-Est) | | | | | | 0.41 [†] | 0.51 [†] | -0.36 ^{a†} | 0.03 | 0.20 ^{a*} | 0.25 ^{a*} | -0.03 ^a | -0.16* | 0.03 | -0.02 |
| Parenting Self-Efficacy (S-Eff) | | | | | | | 0.46 [†] | -0.08 ^a | -0.19* | 0.01 ^a | -0.03 ^a | -0.06 ^a | -0.17* | 0.07 | 0.06 |
| Parenting Satisfaction (Sat) | | | | | | | | -0.32 ^{a†} | -0.04 | -0.01 ^a | 0.23 ^{a*} | -0.13 ^a | -0.26 [†] | -0.05 | 0.06 |
| Depression Symptoms (Dep) | | | | | | | | | -0.28 ^{a*} | < | -0.33 ^a | 0.24 ^a | 0.13 ^a | 0.05 ^a | < |
| Maternal Age (Age) | | | | | | | | | | 0.56 ^{a†} | 0.51 ^{a†} | 0.13 ^a | -0.20* | -0.09 | -0.05 |
| Maternal Education (Edu) | | | | | | | | | | | 0.65 ^{a†} | -0.03 ^a | -0.30 ^{a†} | -0.10 ^a | < |
| Maternal Marital Status (MS) | | | | | | | | | | | | 0.01 ^a | -0.13 ^a | -0.01 ^a | 0.08 ^a |
| Maternal Obesity (Ob) | | | | | | | | | | | | | -0.02 ^a | 0.02 ^a | < |
| Infant DTL (DTL) | | | | | | | | | | | | | | 0.30 [†] | -0.04 |
| Infant Activity Level (AL) | | | | | | | | | | | | | | | |
| Infant WLZ (WLZ) | | | | | | | | | | | | | | | |

All correlations are Pearson correlations unless otherwise noted.

^a Polychoric correlation

* $p < .05$,

** $p < .01$,

[†] $p < .001$

TABLE 3

Associations between Maternal Psychosocial Factors and Infant Feeding Styles

| Variable | Pressure to Soothe | | Pressure with Cereal | | Restrict Diet Quality | |
|-----------------------------------|--------------------|----------|----------------------|----------|-----------------------|----------|
| | β | <i>p</i> | β | <i>p</i> | β | <i>p</i> |
| Maternal Self-Esteem | -0.04 | 0.02 | -0.01 | 0.49 | -0.01 | 0.44 |
| Parenting Self-Efficacy | 0.03 | 0.06 | 0.03 | 0.14 | 0.03 | 0.02 |
| Parenting Satisfaction | < 0.01 | 0.77 | -0.01 | 0.26 | < 0.01 | 0.94 |
| Maternal Depression Symptoms | 0.25 | 0.12 | 0.07 | 0.69 | -0.16 | 0.17 |
| Maternal Age | 0.03 | 0.23 | 0.01 | 0.66 | < -0.01 | 0.79 |
| Maternal Education | -0.02 | 0.81 | -0.08 | 0.41 | 0.07 | 0.28 |
| Maternal Marital/Partnered Status | -0.14 | 0.51 | -0.74 | < 0.01 | 0.04 | 0.80 |
| Maternal Obesity Status | 0.26 | 0.05 | 0.34 | 0.02 | 0.03 | 0.76 |
| Infant Distress to Limitations | 0.01 | 0.93 | 0.04 | 0.68 | -0.05 | 0.47 |
| Infant Activity | -0.21 | 0.03 | 0.06 | 0.53 | 0.10 | 0.16 |
| Infant WLZ | -0.15 | 0.01 | -0.17 | < 0.01 | -0.06 | 0.19 |