



The influence of maternal psychosocial characteristics on infant feeding styles



Katherine J. Barrett^{a, c, *}, Amanda L. Thompson^{a, c}, Margaret E. Bentley^{b, c}

^a Department of Anthropology, University of North Carolina at Chapel Hill, 301 Alumni Building, CB# 3115, Chapel Hill, NC, 27599-3115, USA

^b Department of Nutrition, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, 170 Rosenau Hall, CB# 7400, Chapel Hill, NC, 27599-7400, USA

^c Carolina Population Center, University of North Carolina at Chapel Hill, 206 West Franklin St. Rm 208, Chapel Hill, NC, 27516-2569, USA

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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.

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1. 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, Carrol, 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,

* Corresponding author. Carolina Population Center, University of North Carolina at Chapel Hill, 206 West Franklin St. Rm 208, Chapel Hill, NC, 27516-2569, USA.

E-mail addresses: barrett@live.unc.edu (K.J. Barrett), althomps@unc.edu (A.L. Thompson), pbentley@unc.edu (M.E. Bentley).

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. Leerkens 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.

2. Methods

2.1. 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 18–35 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.

2.2. 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.

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