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On: 02 July 2012, At: 18:04

Publisher: Routledge

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Journal of Reproductive and Infant Psychology

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/cjri20>

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Charlotte N. Markey^a, Patrick M. Markey^b & Jessica L. Schulz^c

^a Rutgers University, Department of Psychology, Camden, NJ, USA

^b Villanova University, Villanova, PA, USA

^c University of Delaware, Delaware, USA

Version of record first published: 02 Jul 2012

To cite this article: Charlotte N. Markey, Patrick M. Markey & Jessica L. Schulz (2012): Mothers' own weight concerns predict early child feeding concerns, *Journal of Reproductive and Infant Psychology*, DOI:10.1080/02646838.2012.693152

To link to this article: <http://dx.doi.org/10.1080/02646838.2012.693152>



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Mothers' own weight concerns predict early child feeding concerns

Charlotte N. Markey^{*a}, Patrick M. Markey^b and Jessica L. Schulz^c

^aRutgers University, Department of Psychology, Camden, NJ, USA; ^bVillanova University, Villanova, PA, USA; ^cUniversity of Delaware, Delaware, USA

(Received 26 September 2011; final version received 9 May 2012)

Primary objective: This research examined children's birth weight and maternal weight concerns as predictors of mothers' concerns about their infants' eating behaviours. **Research design:** This study employed a survey design. **Methods and procedures:** Seventy-one mothers (M age = 29.98 years, SD = 6.10) of infants 2 years and younger (M age = 1.05 years, SD = 0.53) provided information about their children's birth weight, their early feeding experiences, their current weight status, and their own weight concerns. **Main outcomes and results:** Results indicated that maternal weight concerns predicted mothers' early concerns about their children's eating behaviours. Further, infant birth weight and mother's own weight status could not account for this relation. **Conclusion:** These findings may contribute to researchers', clinicians' and laypersons' attempts to understand the current childhood obesity epidemic and the role parental influences on eating behaviours play in children's weight status.

Keywords: birth weight; weight concerns; infants' eating behaviours

A recent review of research shows that the rate of 2- to 5-year-old overweight children more than doubled from 5% to 12% between 1976 and 2006 (Centers for Disease Control and Prevention [CDC], 2009). Currently, 17% of children from 2 to 17 years of age are obese, and 15% are overweight (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). Although the childhood obesity rate appears to be stabilizing (see CDC, 2009 for a review of this research), overweight and obese children are still at risk for serious health issues and later obesity as they develop. For example, the CDC (2009) indicates that being overweight at the age of 8 can predict the most severe adult obesity.

Given the prevalence and consequences of childhood obesity, an understanding of factors that may contribute to childhood obesity is needed (Birch & Ventura, 2009; Gray, Janicke, Wistedt, & Dumont-Driscoll, 2010). Research indicates that parents play a significant role in their children's eating habits, weight status and obesity risk (Anzman, Rollins, & Birch, 2010; Birch & Fisher, 2000; Davison, Markey, & Birch, 2000; Fisher & Birch, 1999; Francis & Birch, 2005). However, concerns about obesity can be viewed as at odds with parents' role to feed their infants to ensure they gain weight and develop appropriately. Many conceptualize a 'chubby baby' as healthy. However, infant weight gain is predictive of being overweight in childhood; infants with more rapid weight gain are more likely to be

*Corresponding author. Email: chmarkey@camden.rutgers.edu

overweight in early childhood (Dennison, Edmunds, Stratton, & Pruzek, 2006; Druet et al., 2012; Gunnarsdottir & Thorsdottir, 2003). Once overweight, research indicates that mothers are often unable to identify their young children as maintaining an unhealthy weight status (Hackie & Bowles, 2007; Hughes, Sherman, & Whitaker, 2010; Mamun, McDermott, O'Callaghan, Najman, & Williams, 2008).

Parents who do recognize their children as overweight or have concerns about their children's weight status may engage in monitoring of their children's food consumption or restriction of particular foods (Musher-Eizenman, Holub, Hauser, & Young, 2007). This behavioural manifestation of parents' concerns about their children's weight – although warranted in many cases – may not lead to productive results in terms of children's maintenance of a healthy weight status (Francis & Birch, 2005; Moore, Tapper, & Murphy, 2010; Sud, Tamayo, Faith, & Keller, 2010). In fact, parents' attempts to restrict their children's eating behaviours may backfire and result in weight gain, not loss (Rifas-Shiman, Sherry, Scanlon, Birch, Gillman, & Taveras, 2010; Spruijjet-Metz, Lindquist, Birch, Fisher, & Goran, 2002; see Campbell et al., 2010, for data suggesting potential benefits of parental restrictive feeding practices). Thus, a cycle of parental concern about child weight, parental restriction of child eating, and child weight gain (not loss) may be set in motion in early childhood (Birch et al., 2001). Given the alarming rates of childhood obesity and the oftentimes counterproductive nature of parents' concerns about children's weight, our interest in the present study is the origin of these concerns.

We hypothesize that there are two factors that may contribute to parents' concerns about their infants' eating and weight gain early in life: child birth weight and mother's own weight concerns. These factors may establish family dynamics that propagate patterns of feeding behaviour that extend into childhood and adolescence. It is intuitive that parents of preterm or otherwise 'small' infants will have concerns about their children's weight gain after birth. Research indicates that feeding preterm infants presents challenges (particularly if the infant was tube fed after birth; see Groh-Wargo & Sapsford, 2009) and it is likely that parents may experience concerns feeding an infant that was not preterm but is smaller than average (with the average child being approximately 3.4 kg/7.5 pounds at birth). Thus, we expect that parents of relatively lower birth weight infants will have more concerns about their infants' eating behaviours than those of relatively higher birth weights.

Research indicates that parents' perceptions of their own weight status impacts their feeding practices and therefore their children's eating behaviours (Payas, Budd, & Polanksy, 2010). The present study extends past research by examining this among parents of *infants*. Parents of children who are dissatisfied with their own bodies use more restrictive feeding practices in feeding their children (Gray et al., 2010). However, mothers have been found to be significantly more dissatisfied with their bodies in the months after having their children (Gjerdingen et al., 2009), which may make concerns about food salient and further impact their approach to feeding their children during infancy. This, in combination with women's tendency to have concerns about their weight and a desire to achieve body ideals that are virtually impossible to attain in the current obesogenic environment, may serve as a powerful contributor to mothers' strategies in feeding their children (Savage, Fisher, & Birch, 2007). Findings demonstrating a link between maternal weight concerns and their young children's weight concerns suggests the potential for the intergenerational transmission of weight concerns

and the negative impact that parents' weight concerns may ultimately have on children's maintenance of a healthy weight status (Davison et al., 2000).

Hypotheses

Based on the research reviewed above, the following hypotheses were examined in this study.

- (1) Children's birth weight will be related to maternal concerns about children's eating behaviours. In particular, mothers will be more concerned about children's eating when their children are of relatively low birth weight.
- (2) Maternal weight concerns will be associated with concerns about their infants' eating and weight during the first weeks of life.
- (3) Maternal weight concerns will predict concerns about infants' eating and weight, even after controlling for infants' birth weight and maternal weight.

Method

Participants and procedures

Seventy-one women (M age = 29.98 years, SD = 6.10) participated in this study via a web-based design. In order to be eligible to participate, women were required to be mothers of infants (0–2 years of age; average infant age = 1.05 years, SD = 0.53). The majority of these infants were full-term at birth, but 6.5% were premature (age at birth ranging from 24 to 36 weeks). Mothers were invited to participate in a brief web-based survey for the chance to win a \$100 prize. Advertising for participants was completed via the internet, including parent blogs and websites, Craigslist and Facebook. In order to avoid recruiting a biased sample, we avoided advertising on websites related to parent feeding, child nutrition, or weight loss issues. The protocol was approved by the Institutional Review Board of a northeastern US university and the survey was maintained through a psychology laboratory at that university. However, participants resided across the US (29 different states). Upon completing a consent form on the internet, participants were directed to an anonymous survey, which included the questions described below.

Measures

Child birth weight

Mothers were asked to indicate their child's weight at birth in pounds and ounces. Children's average birth weight was 3.22 kg (7.11 pounds; SD = 1.4). Weight for length was not used as an index of weight status because maternal reports of child birth length were often missing and when provided included indication that mothers were less than certain about the accuracy of these reports. Past research has found that maternal reports provide extremely valid assessments of infant birth weight (over 90% of maternal reports of child birth weight are within 100 g of the weight recorded by hospitals; Tate et al., 2005).

Maternal weight

In this study, maternal weight status was operationalized using Body Mass Index scores [BMI; (weight (kg)/height² (m))]. Because self-reported weight and height

information has been shown to correlate significantly with researcher-measured anthropometric information (correlations of .90+; Brooks-Gunn, Warren, Rosso, & Gargiulo, 1987; Castro Markey & Gesner, 1999), participants were asked to report their weight in pounds and their height in feet/inches. This information was converted to kilograms and metres and used to calculate BMI. Mothers' average BMI was 26.05 (SD = 6.07), with 7% underweight (BMI < 18.5), 50% normal weight (BMI 18.5–24.9), 19% overweight (BMI 25.5–29.9) and 24% obese (BMI of 30 or greater). Over 60% of US adult women are overweight or obese, thus the percent of women in our sample who were overweight or obese was lower than the percent typically reported for women (2007 estimates from the National Center for Health Statistics of the Center for Disease Control and Prevention; US Department of Health and Human Services, 2012). This is likely due in part to the relatively young age of our sample. To simplify analyses and consistent with convention in the literature, BMI was used as a categorical variable and was dummy coded (0 = underweight, 1 = normal weight, 2 = overweight, and 3 = obese).

Maternal concern about child eating and weight

Mothers completed a measure designed for the purpose of this study that queried them about their experiences feeding their children during the first weeks of life. Specifically, they were asked to indicate whether they had concerns about their children's eating behaviours, weight gain, enjoyment of eating, and the extent to which their child gained weight satisfactorily. These items were created specifically for the current study and are simply designed to assess how much concern the mother recalls having regarding her child's weight. Principle components analysis of these items revealed a clear single factor solution as indicated by a first to second eigenvalue ratio of 2.43 to 0.78. Together these items reliably assessed mothers' concern about their child's eating and weight during the first weeks of their child's life (Cronbach's alpha = 0.77).

Maternal weight concerns

Maternal weight concerns were assessed using a slightly amended version of the Weight Concerns Scale (Killen et al., 1994). Question three was altered to read 'Have you ever gone on a diet?' (instead of the original, 'When was the last time you went on a diet?') and question four was altered so that it contained five possible response options instead of four, so that four of the five items had an equal number of response options. These revisions are consistent with others' piloting and use of this measure (e.g. Markey & Markey, 2011). Together, the sum of these five items (M = 12.84; SD = 3.80) assess fear of weight gain, worry about weight and body shape, the importance of weight, diet history, and perceived fatness (Cronbach's α = 0.76).

Results

As predicted (Hypothesis 1), children's birth weight was negatively related to maternal concerns about their children's early eating behaviours, $r(69) = -0.26$, $p < .05$. Mothers of relatively low birth weight children tended to be more concerned about their children's eating and weight than mothers of higher birth weight children.

Consistent with Hypothesis 2, maternal weight concerns were associated with their concerns about their children's early eating behaviours, $r(69) = 0.38$, $p < 0.01$, even though children in this study were ≤ 2 years of age. Finally, consistent with Hypothesis 3, this association remained significant, even after statistically controlling for children's birth weight and maternal weight (partial $r(67) = 0.30$, $p < 0.05$).

Discussion

This study examined children's birth weight and maternal weight concerns as predictors of mothers' early concerns about their infants' eating behaviours and weight status. Consistent with our first hypothesis, we found that mothers of smaller infants were more likely to be worried about their eating behaviours and weight status. Given US cultures' emphasis on weight gain during infancy as a sign of infant health, it is intuitive that mothers with relatively small infants would express concerns about their eating and weight. Another possible explanation for this relation concerns the complexities involved in feeding preterm and low birth weight infants (Silberstein et al., 2009). These infants are at risk for reflux and other gastrointestinal disorders that may complicate early feeding practices.

Consistent with our second hypothesis, maternal weight concerns were associated with their early concerns about their children's eating and weight. Perhaps more impressive (and consistent with our third hypothesis), children's birth weight and maternal weight could not account for this relation. Thus, it appears that maternal concerns about their infants eating and weight are partially independent of their own weight status and their children's birth weight. This finding suggests that a focus on weight issues that is driven psychologically (and not based on infants' objective weight) may be leading mothers to have concerns about their infants' eating behaviours and weight status. Longitudinal research is needed to confirm this possibility.

An understanding of mothers' early concerns about their infants' eating and weight is important given that parents' concerns about their children's weight status and propensity toward becoming overweight (beginning in toddlerhood) often results in restrictive feeding practices to control children's eating habits (and, thus, their weight; see Gregory, Paxton, & Brozovic, 2010). The efficacy of parental restriction of children's food intake for child weight management has received considerable attention in the eating literature but has yielded inconsistent findings (Birch, Fisher, & Davison, 2003; Faith, Scanlon, Birch, Francis, & Sherry, 2004; Fisher & Birch, 1999; Gregory, Paxton, & Brozovic, 2011; Haycraft, & Blissett, 2008; Sud et al., 2010). There is evidence that parents who restrict their children's eating behaviours may inadvertently lead their children to desire unhealthy foods more than they might otherwise and they may consequently be at risk of overweight and obesity (Birch & Fisher, 1998; Lumeng et al., 2012; Rifas-Shiman et al., 2010). However, some research suggests that dietary restraint is necessary in the current obesogenic environment where unhealthy food choices barrage children and promise toys at the bottom of a sugar-laden box (Birch & Anzman, 2010). What this study contributes to our understanding of parental influences on eating behaviours is the possibility that maternal weight concerns may contribute to the initiation of patterns of parental feeding that begin as early as infants' first weeks of life.

Limitations and conclusions

The design of the current study presents limitations worth noting. Most significant is the cross-sectional, correlational design of this research, which allows for speculation regarding the direction of effects (maternal weight concerns leading to concerns about their infants' eating and weight and not the reverse), but cannot prove causality. Further, our web-based design provided access to a heterogeneous sample of mothers in terms of geography, but prohibited the inclusion of lengthy, detailed questions (e.g. regarding mothers' demographic qualities) that would contribute to a greater understanding of the dynamics explored in this research. It is also possible that mothers who participated in this study are not representative of the general public in the US as concerns about weight issues may have led to their participation.

Although rates of childhood obesity have been relatively stable in the past couple of years, at least one-quarter of children are still overweight or obese and at risk of deleterious health consequences as a result of their weight status (see CDC, 2011 for a review of this research). Knowing that maternal weight concerns are linked with their concerns about their infants' eating behaviours and weight status has implications for how health care professionals and policy-makers approach the problem of childhood obesity. Although the present study cannot conclusively determine the longitudinal nature of the relations among the variables examined, it seems likely that maternal weight concerns influence their concerns about their infants' eating and weight, which across time may influence their adoption of restrictive feeding practices and their children's development of their own weight concerns and weight-management problems (see Davison et al., 2000). Thus, the implication of this research may be that one way to reduce childhood obesity is to treat maternal concerns about food, their bodies, and their weight status. The prenatal period could prove optimal for educating mothers about life-long approaches to weight management – for themselves and their children.

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