



Research report

Effects of children's self-regulation of eating on parental feeding practices and child weight[☆]

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ABSTRACT

The purpose of this study was to determine whether self-regulation of eating in minority preschool-aged children mediates the relationship between parent feeding practices and child weight. Participants were 299 low-income African American and Hispanic parents and their preschool-aged children who participated in Head Start. Parents completed questionnaires about controlling feeding practices (pressure to eat, restriction) and children's appetitive characteristics (enjoyment of food, food responsiveness, satiety responsiveness). Path analyses were used to determine whether children's self-regulation of eating mediated the relationship between feeding practices and child weight. Greater satiety responsiveness in African American preschool-age children partially mediated the inverse association between pressure to eat and children's weight, B (SE) = -0.073 (0.036), $P < .05$. Enjoyment of food and food responsiveness did not mediate the relationship between pressure to eat and weight in the African American sample, $ps > .05$, nor did appetitive characteristics mediate the relationship between restriction and child weight, $ps > .05$. Appetitive characteristics did not mediate the relationship between controlling feeding practices and child weight in the Hispanic sample, $ps > .05$. Implications include the need for culturally sensitive self-report measures and for researchers to account for the possible effects of racial/ethnic differences when designing interventions.

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Introduction

Overweight and obesity is associated with increased risk of chronic diseases and premature death among minority children (Genovesi et al., 2012; Marcus et al., 2012; Popkin, 2010). The prevalence of overweight and obesity are markedly higher in Mexican American and non-Hispanic black preschool-aged (2–5 years) children relative to their non-Hispanic white counterparts (Ogden, Carroll, Kit, & Flegal, 2012). Health disparities by race/ethnicity are exacerbated by behaviors acquired in early life (Taveras, Gillman,

Kleinman, Rich-Edwards, & Rifas-Shiman, 2010, 2013). Although the role of parents in determining their children's health is well-known (Lindsay, Sussner, Kim, & Gortmaker, 2006), evidence suggests that the mediating effect of child appetitive characteristics may predispose children to becoming obese and may differ by race/ethnicity (Birch & Fisher, 2000; Joyce & Zimmer-Gembeck, 2009; Morrison, Power, Nicklas, & Hughes, 2013).

Parenting behavior in the child-feeding context has been implicated in the maintenance of normal weight and prevention of childhood overweight and obesity. Parents typically determine the content, frequency, and quantity of food their children consume (Ventura & Birch, 2008). Thus, parent–child interactions around food have been associated with increasing rates of overweight and obesity in minority children (e.g., Hoerr et al., 2009; Hughes, Power, Fisher, Mueller, & Nicklas, 2005; Hughes et al., 2011). Two commonly assessed controlling feeding practices are restriction and pressure to eat. Restriction refers to parents making unhealthy foods (e.g., sweets, junk foods) less available, whereas pressure to eat describes the practice of encouraging a child to eat more food (e.g., spoon-feeding, verbally prompting the child to eat, and telling the child to eat a small amount of a particular food) despite the child indicating fullness (Birch et al., 2001). While some studies have found no

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association between restrictive feeding practices and child weight (e.g., Baughcum et al., 2001; Carnell & Wardle, 2007a; Montgomery, Jackson, Kelly, & Reilly, 2006), other studies have found a positive relationship (e.g., Birch & Fisher, 2000; Faith, Dennison, Edmunds, & Stratton, 2006). Multiple studies have established a negative association between parents' pressuring children to eat and childhood overweight and obesity (Carnell & Wardle, 2007a; Galloway, Fiorito, Francis, & Birch, 2006), and differences for controlling feeding practices have been identified among racial/ethnic groups (Hughes et al., 2011; Powers, Chamberlain, van Schaick, Sherman, & Whitaker, 2006). Furthermore, parenting behavior has been shown to differ between white and African American samples (Baumrind, 1972). Systematic reviews of controlling feeding practices and their relations with child weight have shown much of the research in this area has been conducted with predominantly or exclusively white samples (Faith, Scanlon, Birch, Francis, & Sherry, 2004; Hurley, Cross, & Hughes, 2011). More research is needed examining the role of controlling feeding practices on child weight status in African Americans and Hispanics.

It is generally accepted that dietary habits track from childhood to adolescence (Feinstein et al., 2008; Ponza, Devaney, Ziegler, Reidy, & Squatrito, 2004; Singh, Mulder, Twisk, van Mechelen, & Chinapaw, 2008), so reducing maladaptive eating behaviors in preschool-age children and maladaptive feeding behaviors in their parents is paramount to preventing and managing overweight and obesity. Children's self-regulation of energy intake has been identified as a mechanism governing weight loss or maintenance (Kristeller & Wolever, 2011). Child self-regulation of eating refers to the ability of the child to eat in response to their internal cues of hunger and fullness (Herman & Polivy, 2011). Children with greater fat mass and children whose parents controlled their children's food intake exhibited impaired self-regulation of eating (Johnson & Birch, 1994). Parent-reported pressuring to eat predicted a greater tendency for girls to eat less and engage in disinhibited eating (Carper, Fisher, & Birch, 2000). In addition, mothers' perceptions of their children's overweight status were related to restrictive feeding practices that, consequently, were associated with children's reduced ability to regulate their energy intake and with increased eating in the absence of hunger (Birch & Fisher, 2000). Using the Children's Eating Behaviour Questionnaire (CEBQ; Wardle, Guthrie, Sanderson, & Rapoport, 2001), Carnell and Wardle (2007b, 2008) have found inverse associations between satiety responsiveness and eating in the absence of hunger and weight and positive associations between food responsiveness and energy intake and between enjoyment of food and eating in the absence of hunger and weight among predominantly white samples. To our knowledge, minority preschool-age children's ability to regulate their energy intake has not been extensively examined.

The mediating variable model posits that interventions should target known mediators acting as barriers to and facilitators of behavior change to induce adiposity change (Baranowski & Jago, 2005). The literature on controlling feeding practices and children's weight has been inconsistent (see Faith et al., 2006; Hurley et al., 2011, for reviews). Two reasons may explain these inconsistencies. First, studies differ in whether they account for intervening variables. If children's ability to regulate their energy intake is a mediator of the relationship between controlling feeding practices and child weight, then the relationship between controlling feeding practices and child weight will differ depending on whether self-regulation of energy intake is controlled. Second, it could be that the relationships between controlling feeding practices and child weight differ according to sample characteristics such that, for some racial/ethnic groups, controlling feeding practices may have negative effects on weight status whereas in others, they may not. The purpose of this study was to determine whether children's ability to regulate their energy intake partially explains the relations between controlling

feeding practices and child BMIz and whether racial/ethnic differences existed on these variables. Understanding the mechanisms of the association between parent controlling feeding practices and child weight status and the characteristics of those for whom these associations exist will provide more accurate intervention targets in child obesity programs. In this study, we examined how controlling feeding practices predict children's ability to regulate their food intake and consequently impact children's weight status. Using a cross-sectional design, this study aimed to determine whether children's ability to regulate their energy intake partially explains the relations between controlling feeding practices and child BMIz. We hypothesized that children's ability to self-regulate energy intake would mediate the relations between controlling feeding practices and children's weight status and differ by race/ethnicity.

Method

Participants

Participants were part of a larger study aimed at gaining a better understanding of how low-income families interact during the dinner meal. The study consisted of three home visits in which parent-child interactions during the dinner meal were observed. Participants completed questionnaires and staff members obtained digital photographs of the foods placed on the dinner plates (parents and children). A subset of the participants was also observed during the dinner meals (to assess the emotional climate of the meal) (Hughes et al., 2011). A total of 299 low-income primary caregivers (referred to as mothers hereafter because the majority were mothers) and their preschool-age children were recruited for participation in the study. After a staff member explained the study to them, mothers provided informed consent for themselves and their children. Table 1 shows demographic characteristics of the sample stratified by race/ethnicity.

Procedures

Mothers received questionnaire packets at the end of the first home visit, and staff members picked up the packets at the subsequent home visit. Mothers completed questionnaires about demographics (i.e., age, sex, and race/ethnicity of the parent and child, mother's education level), mothers' child-feeding practices, and children's appetitive characteristics. Because we were interested in mothers' perceptions of their own and their child's behavior and the constructs examined here differ from those in the observational data, this study examines only the questionnaire data relating to children's self-regulation of energy intake and mothers' child-feeding practices. The Institutional Review Board at Baylor College of Medicine reviewed and approved the procedures of the original study, and the Committee for the Protection of Human Subjects at University of Houston approved the secondary analysis of the data.

Measures

Child Feeding Questionnaire (CFQ)

The Child Feeding Questionnaire (Birch et al., 2001) is a parent-report measure used to assess perceptions about their own weight and their children's weight and controlling feeding practices used with their children. The CFQ consists of 28 items comprising seven subscales: perceived responsibility (3 items), perceived parent weight (4 items), perceived child weight (3 items), concern about child weight (3 items), restriction (8 items), pressure to eat (4 items), and monitoring (3 items). Internal consistencies for the subscales are $\alpha = .70$ for pressure to eat and $\alpha = .73$ for restriction (Birch et al., 2001). In this study, the internal consistencies for the entire sample were $\alpha = .53$ for pressure to eat and $\alpha = .73$ for restriction. Internal

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