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Predicting dietary intake among children classified as overweight or at risk for overweight: Independent and interactive effects of parenting practices and styles

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ABSTRACT

Using baseline data from a randomized controlled pediatric obesity prevention trial, this study sought to examine general parenting style as a potential moderator of the association between feeding-specific parenting practices and child dietary intake. Four hundred and twenty-one parent-child dyads served as participants (49% girls and 93% mothers). Children were, on average, 6.6 years old and either overweight or at-risk for overweight (mean BMI percentile = 84.9). Data were collected in participants' homes. Study staff measured children's height and weight. Parents completed questionnaires designed to assess general parenting styles (authoritative, authoritarian and permissive) and child feeding practices (restriction and monitoring). Child dietary intake was assessed using a 24-h recall system. Outcomes were daily servings of fruits and vegetables, sugar-sweetened beverages (SSB), and unhealthy snacks. Results were as follows: Permissive parenting was inversely associated with fruit and vegetable consumption, and parental monitoring was inversely associated with SSB consumption. There were no other main effects of parenting style or feeding practice on child dietary consumption. Authoritarian parenting moderated the association between restriction and SSB intake (a marginally significant effect after correcting for multiple comparisons). Restriction was inversely associated with SSB consumption when authoritarianism was high but unassociated with SSB consumption when authoritarianism was low. Findings indicate that the parenting practice of monitoring child dietary intake was associated with more healthful consumption regardless of parenting style; interventions may thus benefit from encouraging parental monitoring. The parenting strategy of restricting child dietary intake, in contrast, was associated with lower SSB intake in the context of higher parental authoritarianism but inconsequential in the context of lower parental authoritarianism. This exploratory finding warrants further investigation.

Pediatric obesity is a significant public health concern in the United States (Ogden, Carroll, Kit, & Flegal, 2012). For young children, parents play a key role in shaping child food consumption patterns. Feeding practices are defined as "specific techniques or behaviors usually used to facilitate or limit ingestion of foods" (Blissett, 2011). Much attention has been given to two such practices, restriction and pressure to eat, both of which have been found to be counterproductive (Blissett, 2011; Rhee et al., 2015; Rodgers et al., 2013; Vereecken, Legiest, De Bourdeaudhuij, & Maes, 2009; Wardle, Carnell, & Cooke, 2005). For example, experimental research has demonstrated that restricting access to palatable foods results in children's increased interest in and intake of such food (Fisher & Birch, 1999). In contrast, pressuring children to eat has been found to result in more negative comments regarding and less consumption of the pressured food (Galloway, Fiorito, Francis, & Birch, 2006). Restriction and pressure to eat have also been associated with increased child weight outcomes (Blissett, 2011; Faith, Scanlon, Birch, Francis, & Sherry, 2004; Monnery-Patris et al., 2011), with some exceptions (Farrow & Blissett, 2008; Wang et al., 2013). Less attention has been paid to a third feeding practice, that

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of parental monitoring. Monitoring refers to keeping track of what one's child consumes, specifically with respect to sweet, snack or high-fat foods. Research on this food-specific parenting practice suggests that it is adaptive (Haszard, Skidmore, Williams, & Taylor, 2015; Wang et al., 2013). A questionnaire-based study of 2021 5-year olds, for instance, found that parental monitoring was positively associated with child fiber intake and inversely associated with child sugar intake (Gubbels et al., 2011). In another questionnaire-based study of 203 overweight 4-8 year-olds, monitoring was inversely associated with parent-reported child dietary intake of non-core foods and sweetened beverages; it was also inversely associated with several parent-reported child problem food behaviors such as throwing a tantrum about food, refusing to eat certain foods, and requesting food between meals (Haszard et al., 2015).

Conversely, parenting styles refer to general aspects of parenting behaviors, typically thought of as more static than parenting practices. Parenting styles have been conceptualized in terms of differing levels of warmth and demand (Baumrind, 1966; Maccoby & Martin, 1983), with (a) authoritative parenting being high in both warmth and demand, using structure and expectations in a supportive context; (b) authoritarian parenting being low in warmth but high in demand, expecting ridged adherence to rules; and (c) permissive parenting being high in warmth and low in demand, with few responsibilities or expectations. Research indicates associations between certain general parenting styles and child weight status (Rhee, Lumeng, Appugliese, Kaciroti, & Bradley, 2006). A more authoritative parenting style is generally associated with lower child BMI (Berge, 2009; Berge, Wall, Loth, & Neumark-Sztainer, 2010; Pinquart, 2014), while the reverse is true for permissive and authoritarian parenting styles (Johnson, Welk, Saint-Maurice, & Ihmels, 2012; Rhee et al., 2006). Findings regarding associations between general parenting style and children's consumption of specific classes of foods are less consistent (Vollmer & Mobley, 2013), and effects are small (Pinquart, 2014). On balance, review papers suggest (1) a positive association between authoritative parenting and the consumption of fruits and/or vegetables, particularly among mothers, and (2) an inverse association between authoritative parenting and the consumption of high fat and/or sugar (Berge, 2009; Blissett, 2011; Vollmer & Mobley, 2013).

Two recent review papers note that parenting styles may operate at a broader, more distal level as compared to practices (Kremers et al., 2013; Patrick, Hennessy, McSpadden, & Oh, 2013). For example, Patrick et al. (2013) note that styles may function as a moderator of the association between specific parenting practices and child health outcomes, drawing on much earlier work by Darling and Steinberg (1993). Commonly, obesity prevention interventions address either specific parenting practices or general parenting styles. However, effectiveness may be improved by considering the interaction of the two (Patrick et al., 2013). Understanding how these practices and styles work together to influence dietary intake patterns may lead to the design of more efficacious intervention strategies. A cross-sectional study of 383 students (mean age = 13.5 years) lends support for this notion (van der Horst et al., 2007). The inverse association between restrictive food-related practices and adolescent sugar-sweetened beverage (SSB) consumption was stronger among students who rated their parents as highly involved and moderately strict, characteristics of an authoritative parenting style (van der Horst et al., 2007). A second study also speaks to the moderating effects of parenting style. In this longitudinal investigation of 465 Taiwanese children (Tung & Yeh, 2013), parenting styles and practices were measured in 2008, and child weight and height were measured in 2008 and 2009. Twenty-nine percent of the children were considered overweight per gender- and age-adjusted BMI classifications in 2009. The association between maternal monitoring in 2008 and child overweight status in 2009 was moderated by parenting style. Monitoring was associated with a decreased chance of overweight among children of mothers higher in authoritativeness and an increased chance of overweight among children of mothers higher in authoritarianism (Tung & Yeh, 2013). Thus monitoring was adaptive in the context of parenting characterized by high warmth and high demand, and maladaptive in the context of parenting characterized by low warmth and high demand.

In the present study, associations among general parenting styles, specific feeding practices, and child dietary intake were examined in a large sample of parents of overweight or at-risk for overweight children (BMI percentile 70th-95th). Specifically, the independent and interactive contributions of three parenting styles (authoritative, authoritarian and permissive) and two feeding practices (restriction and monitoring) in predicting child dietary intake were examined. Based on the literature, it was hypothesized that feeding practices would be independently associated with child dietary intake, with monitoring associated with the consumption of fewer unhealthy snack and SSB servings, and restriction associated with the consumption of more unhealthy snack and SSB servings. It was also hypothesized, again based on the extant literature, that authoritative parenting style would be positively associated with fruit and vegetable consumption and inversely associated with SSB consumption. Higher-level analyses examined whether associations between parenting practices and child dietary intake *differed* as a function of parenting style. These analyses were exploratory. It is reasonable to surmise that two competing outcomes might occur. The first is that the effects of parenting practices and styles might be additive, for example, that a child might consume more fruits and vegetables and fewer unhealthy snacks if s/he was monitored by a highly authoritative parent, or that a child might consume fewer fruits and vegetables and more unhealthy snacks if s/he was restricted by an authoritarian parent. On the other hand, styles and practices might serve to offset one another. For example, a child whose parent restricts access to unhealthy foods but who does so with warmth and clear guidelines as to why such foods are restricted might choose to consume more healthful and fewer unhealthful foods.

1. Method

1.1. Participants

This manuscript utilized baseline, pre-randomization data from the Healthy Homes/ Healthy Kids study, a randomized controlled trial of a pediatric, primary care-based behavioral intervention designed to prevent unhealthy weight gain among overweight and at-risk for becoming overweight children (Sherwood et al., 2013). Participants (parent-child dyads) were recruited from the population of children scheduled for a well-child visit with a pediatric primary care provider at one of 20 clinics in the greater Minneapolic-St. Paul area. To be eligible, children had to be aged 5–10 years with a BMI placing them in the 70th to 95th percentile for age and gender. Parents needed to be English speaking and willing and able to complete questionnaires. Exclusionary criteria for children were: consistent use of a steroid medication for more than one month, participation in other pediatric health-related research, a chromosomal abnormality, and a chronic condition such as Type I diabetes or cancer. Families planning to move out-of-state in the next 24 months were also excluded.

Eligible and consenting dyads were randomized to either an obesity prevention arm or an attention control arm focused on general health, safety and injury prevention. Both groups received brief provider counseling regarding healthy eating and activity