



## Research report

## Parent behavior and child weight status among a diverse group of underserved rural families

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## ABSTRACT

The purpose of this study was threefold: to investigate the association between three parenting behaviors (parenting style, feeding style, and feeding practices), to evaluate whether these behaviors were associated with child weight, and to determine whether style (parenting and feeding) moderated the relationship between feeding practice and child weight. Ninety-nine parent–child dyads were recruited for a cross-sectional study where parents self-reported their parenting style, feeding style, and feeding practices along with demographic characteristics. Height and weight were measured for each dyad. The relationship between parenting style and feeding style showed modest agreement. Feeding style, but not parenting style, was associated with child BMI z-score while controlling for known covariates. An indulgent feeding style was associated with a higher child weight status. Multiple regression analysis demonstrated that feeding style moderated the association between restrictive feeding practices and child BMI z-score. No moderating relationship was found between feeding style and the practices of pressure to eat or monitoring and child weight. This research suggests that an indulgent feeding style may be predictive of higher child weight and that future studies should examine the possible moderating role of feeding style in the parent feeding practice–child weight relationship.

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## Introduction

Understanding the risk factors associated with undesirable weight gain in children is important if we are to reverse current obesity trends. This has prompted great interest in how family context influences child weight (Ventura & Birch, 2008). Within the family setting, parents play a particularly critical role in determining their child's behaviors, habits, and attitudes, and also dictate their physical and social environment (Davison & Birch, 2001; Ritchie, Welk, Styne, Gerstein, & Crawford, 2005). Recent evidence suggests that the influence of parenting on child overweight and obesity is likely to be complex (Joyce & Zimmer-Gembeck, 2009). Theoretically, a parent's influence may be either direct (e.g. parenting practices directly shape child development and behavior) or indirect (e.g. parenting style indirectly influences child development and behavior by altering – or moderating – the effectiveness of particular parenting

practices) (Darling & Steinberg, 1993). However, a recent review (Ventura & Birch, 2008) noted that the child eating and obesity literature often fails to make the distinction between the terms *parenting style* and *parenting practice*.

## Parenting style

Parenting style is based on the idea that parents' attitudes and the beliefs they hold about how they should rear their children result in a two-way interaction that describes the emotional climate of the general parenting interaction (Darling & Steinberg, 1993). It describes *how* parents interact with their children. This dynamic process alters how a child views their parents and thus changes how receptive that child is to their parents' socialization demands. Baumrind describes parenting style based on two dimensions of parental behavior: responsiveness/nurturance to and demandingness/control of the child (Baumrind, 1971). *Responsiveness/nurturance* is “the extent to which parents foster individuality and self-assertion by being attuned, supportive, and acquiescent to children's requests.” *Demandingness/control* refers to the “claims that parents make on children to become integrated

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into society through behavior regulation, direct confrontation, and maturity demands and supervision of children's activities." Combining the two dimensions together – responsiveness/nurturance versus demandingness/control – results in four parenting style typologies: authoritarian, authoritative, indulgent, and uninvolved. An authoritarian style (high demandingness, low responsiveness) is characterized by attempts to control the child's behavior with little regard for the child's needs and strict obedience to the parent (Patrick, Nicklas, Hughes, & Morales, 2005). While an authoritative style (high demandingness, high responsiveness) suggests that parents provide encouragement for the child to express independence, clear set of boundaries, and open communication. Evidence supports the association between authoritative parenting and positive child health outcomes across multiple domains (Cullen et al., 2000; Gable & Lutz, 2000; Steinberg, Dornbusch, & Brown, 1996). General parenting research has focused mostly on general child outcomes including school achievement, social adjustment among peers, and alcohol and drug-related problems in adolescence (Steinberg, Lamborn, Dornbusch, & Darling, 1992).

There is now evidence in the childhood obesity literature to empirically support Darling and Steinberg's (Darling & Steinberg, 1993) theoretical framework that links parenting style to child outcomes, and in this context, child obesity-related behaviors. Rhee, Lumeng, Appugliese, Kaciroti, and Bradley (2006) demonstrated that an authoritarian parenting style was associated with the highest risk of child overweight, while Arredondo et al. (2006) found that a controlling parenting style was associated with poor child dietary intake. However, Blissett and Haycraft (2008) showed no relationship between parenting style and child BMI. The inconsistent findings may be due, in part, to the measurement of a general or more global parenting style.

#### *Feeding style*

Application of the parenting style conceptualization to the feeding context implies that parents' possess overarching styles that can describe how they interact with their children during all feeding situations (Ventura & Birch, 2008). Measuring a style of feeding (referred to as 'feeding style') as opposed to a style of general parenting (referred to as 'parenting style') may be more predictive of weight status in childhood because of the context specific impact of feeding on the eating behavior of children (Hughes et al., 2006; Hughes, Shewchuk, Baskin, Nicklas, & Qu, 2008; Wardle, Sanderson, Guthrie, Rapoport, & Plomin, 2002). As our understanding of the parent–child feeding relationship in the context of the childhood obesity epidemic has developed, research has shifted from concentrating on one construct of parenting – control – toward capturing other important aspects, such as responsiveness, to describe the behavior of parents (Hughes et al., 2006). Validated instruments such as the Caregiver Feeding Styles Questionnaire (Hughes, Power, Fisher, Mueller, & Nicklas, 2005) focus on both demandingness and responsiveness to describe a feeding typology similar to general parenting (Maccoby & Martin, 1983). For example, authoritarian type parents encourage eating using highly directive behaviors that are also not supportive of the child (e.g. physically struggling with the child, using rewards, and punishments) (Hughes et al., 2008).

#### *Parenting practices*

Parenting practices are related to, but distinct from parenting styles, and describe the behavioral strategies that parents use to socialize their children (Darling & Steinberg, 1993; Ventura & Birch, 2008). Thus, parenting practices are embedded within the broader context of the emotional climate of parenting style, are

less trait-like, and more responsive to contexts. Within the feeding domain, the majority of research has focused almost entirely on feeding practices and inferred feeding styles from these practices. Current evidence suggests that parents may inadvertently promote excess weight gain in childhood by using inappropriate feeding practices (Clark, Goyder, Bissell, Blank, & Peters, 2007). For instance, restricting access to highly desirable foods may hinder a child's ability to self-regulate their intake (Faith, Scanlon, Birch, Francis, & Sherry, 2004; Ventura & Birch, 2008). This reduced responsiveness to internal hunger and satiety cues has been associated with greater childhood weight (Birch & Fisher, 2000; Fisher & Birch, 2000). In general, because style and practice are related concepts, certain practices may be more authoritative (e.g. praising the child, negotiating with the child), authoritarian (e.g. punishments, coercion) or permissive (e.g. letting the child eat whatever he/she wants). However, research that is solely focused on measuring individual feeding practices does not explicitly focus on or systematically allow for the measurement of feeding styles. This is because feeding practices sometimes infer, but do not necessarily measure demandingness and responsiveness, the two underlying dimensions of parenting style and feeding style. Measuring feeding styles in addition to feeding practices may give a more complete picture of children's feeding environments (Hughes et al., 2008; Rhee, 2008).

Moreover, recent studies have suggested that certain aspects of food-related parenting may vary across culturally diverse populations (Arredondo et al., 2006; Matheson, Robinson, Varady, & Killen, 2006; Powers, Chamberlin, van Schaick, Sherman, & Whitaker, 2006). For instance, in contrast to previous studies, Matheson et al. (2006) found no relationship between restrictive feeding practices and child BMI percentile among Mexican-American families. Overall, knowledge in this area is limited because the majority of research has focused on a specific population: white, middle class, girls. More work is needed to determine whether the measurement of parental feeding functions differently in ethnically and socio-economically diverse populations.

Given the limited evidence regarding the conceptualization of feeding styles, and the discrepancies in the literature regarding the measurement of general parenting style in relation to child eating and weight status, we sought to investigate the inter-relationship between three parenting behaviors (parenting style, feeding style, and feeding practices) and to determine whether these behaviors relate to child weight status in a diverse group of parent–child dyads living in under-resourced rural areas. It is particularly important to focus on this population given that rural children now have a 25% greater risk of being overweight or obese compared to their metropolitan counterparts (Lutfiyya, Lipsky, Wisdom-Behounek, & Inpanbutr-Martinkus, 2007). Many studies either do not focus on rural areas or do not provide detailed information on rural populations, especially rural minorities (Tai-Seale & Chandler, 2003).

The first aim of this study was to describe the parenting styles, feeding styles, and feeding practices of rural parents. The second aim was to examine the agreement between parenting style and feeding style based on the limited evidence suggesting that the general parenting constructs of authoritative, authoritarian, indulgent, and neglectful may also translate into feeding styles within ethnically diverse populations (Fig. 1) (Hughes et al., 2006). The third aim was to investigate the association between parenting style, feeding style, and specific feeding practices. It has been argued that if feeding practices are independent of a parent's style, then certain practices could be targeted singly while those that are linked require interventions that treat underlying family dynamics as a whole (Hubbs-Tait, Kennedy, Page, Topham, & Harrist, 2008). Finally, following the theoretical framework described by Darling

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