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Evaluation of Parent-Reported Feeding Practices in a Racially Diverse, Treatment-Seeking Child Overweight/Obesity Sample

Janet A. Lydecker, PhD[1,2], **Courtney Simpson**[1], **Melissa Kwitowski**[1], **Rachel W. Gow, PhD**[1], **Marilyn Stern, PhD**[1,3], **Cynthia M. Bulik, PhD**[4], and **Suzanne E. Mazzeo, PhD**[1]

[1]Department of Psychology, Virginia Commonwealth University, Richmond, VA, USA

[2]Department of Psychiatry, Yale University School of Medicine, New Haven, CT, USA

[3]Department of Rehabilitation and Mental Health Counseling, University of South Florida, Tampa, FL, USA

[4]Departments of Psychiatry and Nutrition, University of North Carolina, Chapel Hill, NC, USA

Abstract

This study examined psychometric properties and baseline/post-treatment racial differences in the Child Feeding Questionnaire (CFQ) in parents of overweight/obese children in a randomized controlled obesity trial. Participants were 302 (*n*=285 mothers, *n*=17 fathers) diverse (*n*=207 Black, *n*=80 White), treatment-seeking parents of children (5–11 years) with overweight/obesity. CFQ data fit an established factor structure (Anderson et al, 2005) in the full sample and subsample of Black parents. Black parents had higher scores than White parents on only *Pressure to Eat*. The CFQ yields reliable and valid scores in a racially diverse treatment-seeking sample, suggesting its utility in culturally-sensitive pediatric obesity treatment.

Keywords

pediatric obesity; parenting; psychometrics; racial differences; eating behavior; psychology

Overweight occurs in 34% of youth in the United States; 17% of these children are obese (Ogden, Carroll, Kit, & Flegal, 2014). Pediatric overweight occurs when youth have a body mass index (BMI) above the 85th percentile on age- and sex-specific growth charts; pediatric obesity is above the 95th percentile (Barlow, 2007). The high prevalence of pediatric overweight/obesity in United States youth (Ogden et al., 2014) is a critical public health concern because of its association with adverse physical and psychosocial comorbidities that decrease quality of life and increase adult obesity risk and medical morbidity (Whitaker, Wright, Pepe, Seidel, & Deitz, 1997). Moreover, there are racial/ethnic differences in rates of overweight/obesity: in a recent description of United States youth 6–11 years old, White youth had a lower rate of overweight/obesity (29.4%) compared with Black (38.1%) and Hispanic (46.2%) youth; the difference between Black and Hispanic youth overweight/obesity was not significant (Ogden et al., 2014). Black youth with overweight/obesity are

Correspondence should be addressed to Janet A. Lydecker, janet.lydecker@yale.edu.

also at greater risk of maintaining obesity in adulthood compared with their White peers (Wang & Beydoun, 2007), suggesting a need for targeted intervention and prevention (Peña, Dixon, & Taveras, 2011).

Pediatric obesity treatment is complicated by the intricate influences of biological, psychosocial, and environmental factors on the development of this condition (Polfuss & Frenn, 2012). Family-based pediatric obesity treatment is thought to be more successful than treatments targeting youth exclusively because parents play a central role in children's health (Epstein, Wing, Koeske, Andrasik, & Ossip, 1981; Pesch, Harrell, Kaciroti, Rosenblum, & Lumeng, 2011; Wrotniak, Epstein, Paluch, & Roemmich, 2005). Children depend on their parents to structure daily routines and the home environment, and within the bounds of affordability and availability, parents provide important information about health habits as they model eating and physical activity behaviors. In this way, parents' influence on pediatric obesity can be conceptualized as a form of social learning (Mazzeo et al., 2012). Clinical research has sought to develop effective pediatric obesity treatments, but despite the need for treatment in racial/ethnic minority families, culturally-appropriate interventions are rare (Peña et al., 2011; Webber & Loescher, 2013).

In general, parenting styles of Black mothers and fathers are characterized as *no-nonsense* or authoritarian, emphasizing firmness and a controlled environment (Barbarin, McCandies, Coleman, & Hill, 2005). In a key study of Black parenting styles and practices, Hill (1995) found that global parenting styles (i.e., permissive, authoritarian, and authoritative) were valid as constructs for Black parents even though those styles were originally conceptualized through observations of White parents. However, she also concluded that despite this validity, the meaning of those styles and the effects of those parenting practices on children differed for Black children compared with their White counterparts. Most notably, authoritarian—rather than authoritative—parenting produced the most adaptive child outcomes. One aspect of parenting that is of particular relevance to pediatric obesity is parental feeding practices (Boles et al., 2010). Parents establish youth eating habits both overtly, serving as "gatekeepers" of food (Vollmer & Mobley, 2013), and subtly, by modeling their own eating behavior (Mazzeo et al., 2012).

Culture appears to influence parental views on child feeding (Vollmer & Mobley, 2013). Parental control over food, setting limits for meals and snacks, and monitoring child eating, are higher in Black families compared with other racial/ethnic groups (Polfuss & Frenn, 2012). This type of restrictive feeding behavior is associated with pediatric obesity (Birch, 2006; Faith, Scanlon, Birch, Francis, & Sherry, 2004). For example, when parents restrict food type and quantity, children have poorer self-regulation skills and are more likely to overeat (Birch, 2006). However, it is not known whether this effect occurs across racial groups; some evidence suggests that control over food through pressuring children to eat and restricting access to desired foods is associated with food insecurity in urban, low-income Black families (Feinberg, Kavanagh, Young, & Prudent, 2008).

Family-level pediatric obesity treatment requires that parents first recognize a problem with their child's weight. Some research suggests that Black parents are less likely to identify child overweight or obesity, particularly when parents have lower education levels or are

overweight themselves (Polfuss & Frenn, 2012). Additionally, Black parents may prefer a larger body size for their children compared with other racial/ethnic groups because of a culturally-based perception that heavier children are healthier (Flynn & Fitzgibbon, 1996). Thus, a possible point of intervention for culturally-appropriate pediatric obesity treatment could be parenting perceptions and behaviors specific to weight.

The Child Feeding Questionnaire (CFQ) (Birch et al., 2001) is the most commonly used measure of parental feeding practices (Faith et al., 2004; Hurley et al., 2011). The CFQ is a self-report measure examining parents' perceptions and concerns about their child's weight, as well as their feeding practices and attitudes. The scale includes four subscales assessing parental attitudes about weight and feeding (Perceived Responsibility; Perceived Parent Weight; Perceived Child Weight; Concerns about Child Weight) and three subscales assessing controlling feeding practices (Monitoring; Restriction; Pressure to Eat). In the initial scale development study, Birch and colleagues (2001) had three samples of parents complete the measure: 394 parents of 5–9 year-old daughters (no race data available), 148 parents of 8–11 year-old children (85% White, 9% Black, 4% Hispanic), and 126 parents of 7–11 year-old children (10% White, 90% Hispanic). In the third, predominantly Hispanic, sample, they found that model fit improved after dropping two Pressure to Eat items and two Restriction items.

Three subsequent studies of parents in the United States evaluated the psychometric properties of the CFQ; the samples in these studies and their findings are summarized in Table 1. Anderson and colleagues (2005), with a sample of 231 parents of 3–5 year-old children (44% Black, 56% Hispanic), found that the original model had problematic fit, and proposed a five-factor model with Perceived Responsibility, Concerns about Child Weight, Restriction (3 items), Pressure to Eat, and Monitoring (dropping Perceived Child Weight and Perceived Parent Weight). Boles and colleagues (2010) administered a brief version of the CFQ to low-income Black mothers of preschool children. This version included Restriction, Pressure to Eat, and Concerns about Child Weight subscales because of their associations with child and parent weight. Their data were a poor fit to their three-subscale model. Finally, Kong and colleagues (2015) evaluated two models, one that included five scales from the original CFQ (Perceived Responsibility, Concerns about Child Weight, Restriction, Pressure to Eat, and Monitoring) and one that also included a proposed Food as Reward subscale. Both models showed acceptable fit. Taken together, this series of psychometric evaluations suggests that the CFQ has a generally valid factor structure when administered in entirety, although some subscales, particularly Restriction, had problematic fit and were often (Anderson et al., 2005; Birch et al., 2001; Kong et al., 2015) manipulated specifically to improve fit. Although much of the work done with the CFQ has been cross-sectional or longitudinal, some randomized controlled trials (RCTs) have used the CFQ to measure outcomes. Findings from these RCTs generally followed the hypothesized associations between child overweight and parental feeding practices (e.g., Birch, 2006), namely that interventions decreased Pressure to Eat (Burrows, Warren, & Collins, 2010; Essery, DiMarco, Rich, & Nichols, 2008), decreased Restriction (Harvey-Berino & Rourke, 2003), and increased Monitoring (Burrows et al., 2010); yet, another study failed to find significant changes (Stark et al., 2011).

Research has investigated racial/ethnic differences in parents' feeding practices. A comparison of the Restriction and Pressure to Eat subscales revealed higher endorsements of these behaviors by Hispanic compared with White mothers of preschool children (Worobey, Borrelli, Espinosa, & Worobey, 2013). A comparison of all CFQ subscales revealed higher scores on Monitoring, Perceived Responsibility, Restriction, Concerns about Child Weight, and Pressure to Eat by Black compared with White mothers of school-aged children (Spruijt-Metz, Lindquist, Birch, Fisher, & Goran, 2002). Although these are important findings regarding parental feeding practices, it is unknown whether there are racial/ethnic differences among treatment-seeking parents of children with overweight/obesity. This is an important clinical consideration for practitioners and researchers, particularly given that subscales measuring controlling feeding practices (Restriction; Pressure to Eat; Monitoring) have shown racial/ethnic differences and are also associated with child overweight/obesity (Birch, 2006; Burrows, Warren, & Collins, 2010).

The first purpose of the current study was to evaluate the construct validity of the CFQ in parents of children with overweight/obesity seeking treatment for pediatric obesity, including a specific evaluation of treatment-seeking Black parents [Aim 1]. We hypothesized that, consistent with Hill's (1995) findings that global parenting styles apply to Black parents as accurately as they do to White parents, the parental feeding practices assessed by the CFQ would have a similar structure as the measure-development sample (Birch et al., 2001) of White and Hispanic parents [Hypothesis 1]. The second purpose of the current study was to evaluate mean differences in parental feeding practices between Black and White parents [Aim 2]. We hypothesized that Black parents would have higher scores on controlling feeding practices consistent with authoritarian parenting style, including Restriction, Monitoring and Pressure to Eat, and lower scores on attitude-related measures, such as Concerns about Child Weight, compared with White parents [Hypothesis 2]. The third purpose of this study was to evaluate whether parental feeding practices changed after a parent-based pediatric obesity intervention focusing on feeding behavior and modeling healthy eating habits [Aim 3]. We hypothesized that the key obesity-related parental feeding practices—restriction, monitoring and pressure to eat—would improve following treatment [Hypothesis 3].

Method

Participants

Participants were parents enrolled in a pilot intervention (sample 1; *N*=76) and a subsequent randomized controlled trial (sample 2; *N*=226) for pediatric obesity using a parent-focused treatment model. Parents were primary caregivers of a child between 5 and 11 years old; the child with overweight/obesity had to reside in the participating parent's home more than half the time. Children met criteria for overweight: BMI ≥ the 85th percentile using age- and sex-specific growth charts (Kuczmarski, Ogden, & Guo, 2002). Participants were recruited from the Richmond, Virginia metropolitan area using flyers placed in pediatric health practices, community recreation centers, and local elementary schools. Community recruitment used materials indicating our program was for parents concerned about their child's weight, thus, parents who responded to advertisements and determined to be eligible were seeking

pediatric obesity treatment. Independent samples *t*-tests (continuous variables) and χ^2 analyses (categorical variables) determined that samples were not significantly different on parent gender (p=.369), child gender (p=.718), parent age (p=.116), child age (p=.147), parent BMI (p=.398), child BMI z-score (p=.424), parent education (p=.744), marital status (p=.543), or household income (p=.109). However, samples differed by race/ethnicity (p=.029) such that sample 1 had a greater proportion of White parents (38.2%) compared with sample 2 (22.6%), which had greater representation across racial/ethnic groups.

Family demographics are presented in Table 2. Racial/ethnic differences were absent from most variables, including parent gender (p=.139), child gender (p=.899), parent age (p=.490), child age (p=.366), parent BMI (p=.059) and child BMI z-score (p=.366). However, there were racial/ethnic differences in parent education (p<.001), marital status (p<.001) and household income (p<.001). Black parents were more likely to have an education of high school or less (27.6%) compared with White parents (6.3%) and White parents were more likely to have some college or more (93.7%) compared with Black parents (72.4%). White parents were more likely to be married (74.4%) than Black parents (32.2%). Black parents were more likely to have a household income less than $25,000/year (42.8%) than White parents (7.3%).

Procedure

Parents completed the CFQ as part of a battery of questionnaires prior to treatment (i.e., baseline; samples 1 and 2) and immediately following treatment completion (i.e., post; sample 2). All assessment and intervention sessions occurred at a university-based clinic. Parents received a small cash incentive for their participation at baseline and post.

Repeated-measures data for the third aim of this study came from sample 2, the large randomized controlled trial for parent-focused pediatric obesity treatment. This program has been described in detail elsewhere (Mazzeo et al., 2012). Briefly, the treatment intervention included six biweekly group sessions for parents. Sessions addressed parenting practices (both generally and specifically related to feeding), body image, media literacy, nutrition and physical activity. The control group had one in-person group session during which they received publicly-available information about nutrition and physical activity, followed by biweekly mailed information for the same duration as the active intervention.

Participants were included in the current analyses if they completed the CFQ at baseline and post assessment points. In the intervention group, 65.3% of parents (n=79) completed both assessments; in the control group, 85.5% of parents (n=94) completed both assessments. Parents who completed post assessments did not differ from parents who did not complete post assessments on parent gender (p=.823), child gender (p=.877), parent age (p=.191), child age (p=.954), parent BMI (p=.361), child BMI z-score (p=.085), parent education (p=.211), marital status (p=.358) and household income (p=.111). However, there were racial/ethnic differences in completion such that Black parents were more likely to complete post-testing (n=129, 79.1%) than not complete it (n=34, 20.9%, p=.033).

This study was approved by the university's institutional review board.

Measures

Child Feeding Questionnaire (CFQ)—The CFQ is a 31-item self-report measure of parental feeding practices and attitudes about weight (Birch et al., 2001). In our study, only one parent completed the CFQ for only one child. Participants completed the full CFQ (subscales: Perceived Responsibility; Perceived Parent Weight; Perceived Child Weight; Concerns about Child Weight; Monitoring; Restriction; Pressure to Eat). Items are rated on 5-point scales anchored according to the content of the subscale. Internal consistency in the developmental sample was good, Cronbach's α=.70–.92.

Anthropometric measures—Height was measured on a stadiometer by trained staff, rounding to the nearest 0.25 inches. Weight was measured by trained staff on a digital scale to the nearest 0.1 pounds. Participants were asked to remove shoes and heavy outer clothing prior to measurements. These data were used to calculate child BMI *z*-scores using the age- and sex-specific growth charts from the Centers for Disease Control and Prevention Growth Charts (Kuczmarski, Ogden, & Guo, 2002).

Statistical Analyses

Aim 1—The first objective was to evaluate the construct validity of the CFQ in pediatric obesity treatment. To meet this objective, we examined (1) the fit of all items into a single factor, (2) the fit of the initial 7-factor, 31-item model (Birch et al., 2001), and (3) the fit of the briefer 5-factor, 16-item model that showed superior fit in an independent evaluation of the CFQ's psychometric properties (Anderson et al., 2005).

Confirmatory factor analysis (CFA) used maximum likelihood estimation in MPlus (Muthén & Muthén, 2007) to estimate the proposed models and assess data fit. Multiple fit indices were evaluated: the χ^2 test, the Tucker Lewis Index (TLI), the Comparative Fit Index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Small nonsignificant χ^2 values indicate good fit; however, the χ^2 test is extremely sensitive to sample sizes, thus additional fit indices evaluated model fit. Hu and Bentler (1999) suggest that RMSEA values of .06 or lower, CFI and TLI values of .95 or higher, and SRMR values of .08 or lower indicate acceptable model fit.

Aim 2—We used the factor structure that showed the best fit in previous research (Anderson et al., 2005), as well as in our sample, to examine whether there were significant mean differences at baseline between Black and White parents. Multivariate analyses of variance (MANOVAs) and analyses of variance (ANOVAs) in SPSS Version 22 (IBM SPSS Inc., 2013) examined mean differences in CFQ subscales and total score between Black and White parents.

Aim 3—Next, we examined changes in parental feeding practices following intervention in sample 2. A repeated-measures ANOVA evaluated race differences in the CFQ total score (using the Anderson model) in the active and control groups from baseline to post. A repeated-measures MANOVA further evaluated race differences in CFQ subscales in the active and control groups from baseline to post.

Results

Construct Validity of the Child Feeding Questionnaire

Fit statistics for the one-factor model, the Birch (2001) model, and the Anderson (2005) model in the current study's combined baseline sample are summarized in Table 3. The fit of the one-factor model was poor, $\chi^2(434)=3048.48$, $p<.001$, RMSEA=.141 (90% CI: .14-.15), CFI=.24, TLI=.18, SRMR=.18. Internal consistency of items using the one-factor solution was $\alpha=.64$. The data fit the Birch (2001) model better, $\Delta\chi^2=-2398.01$, ΔRMSEA=−.079, ΔCFI=.64, ΔTLI=.67, ΔSRMR=−.07. Internal consistency of subscales from this model ranged from $\alpha=.65$-.91. The fit of the Anderson (2005) model was the best of the three, $\Delta\chi^2=-487.84$, ΔRMSEA=− .013, ΔCFI=.09, ΔTLI=.10, ΔSRMR=−.07. Internal consistency of subscales from this model ranged from $\alpha=.65$–.91. The Anderson (2005) model also fit better in Black parents compared with their White peers, $\Delta\chi^2=18.97$, ΔRMSEA=−.012, ΔCFI=.02, ΔTLI=.03, ΔSRMR=−.03. Internal consistency in the Black subsample was $\alpha=.59$–.93; the White subsample was $\alpha=.41$–.94.

Mean Differences by Race at Baseline

Because the Anderson (2005) model had the best fit in both earlier research and in the current study, we calculated the CFQ total and subscale scores using their model. Baseline means by race are summarized in Table 4. An ANOVA comparing means in CFQ total score by race indicated a significant difference, $F(1, 280)=6.40$, $p=.012$, $\eta_p^2=.022$. Specifically, Black parents ($M=3.75$, $SE=0.03$) had higher total scores than White parents ($M=3.62$, $SD=0.05$), $p=.012$. A MANOVA comparing means in CFQ subscales by race indicated a significant multivariate effect of race, Wilk's $\Lambda=.90$, $F(5, 226)=6.40$, $p<.001$, $\eta_p^2=.104$. Black parents had higher scores on the Pressure to Eat subscale, $F(1, 280)=29.19$, $p<.001$, $\eta_p^2=.094$. However, no other subscales were significantly different between Black and White participants (all ps>.05).

Parent-Focused Pediatric Obesity Treatment Effects

Analyses evaluating treatment effects also used CFQ total and subscale scores calculated using the Anderson (2005) model. A repeated-measures ANOVA examined the effects of pediatric obesity treatment in sample 2. Results are summarized in Table 5. The three-way (time x group x race) interaction was not significant, $F(1, 158)=0.358$, $p=.550$, $\eta_p^{2=}.002$. Race had a significant main effect, $F(1,158)=5.99$, $p=.015$, $\eta_p^{2=}.037$, such that Black parents had a significantly higher total CFQ score ($M=3.71$, $SE=0.03$) compared with White parents ($M=3.54$, $SE=0.06$, $p=.015$). No other effects were significant (all ps>.135).

A repeated-measures MANOVA examined treatment effects on CFQ subscales. The multivariate three-way (time x group x race) interaction was not significant, Wilk's $\Lambda=.96$, $F(5, 151)=1.36$, $p=.243$, $\eta_p^2=.043$. Univariate analyses again revealed nonsignificant three-way (time x group x race) interactions for each subscale (all ps>.06). Time x group and time x race univariate interaction effects were all nonsignificant, all ps>.255. Time had a significant main effect on Concerns about Child Weight such that parents' concern decreased from baseline ($M=4.39$, $SE=.08$) to post ($M=4.22$, $SE=.07$), $F(1, 155)=5.48$, $p=.021$, $\eta_p^2=.034$. Time also had a significant main effect on Monitoring such that parents' monitoring of

their children's food increased from baseline (M=3.71, SE=.09) to post (M=4.05, SE=.07), $F(1,155)=20.64$, $p<.001$, $\eta_p^2=.117$. Time did not have a significant effect on other subscales, $ps>.126$. Race had a main effect on Pressure to Eat, $F(1,155)=9.41$, $p<.001$, $\eta_p^2=.077$, such that Black parents (M=2.36, SE=.08) showed greater Pressure to Eat than White parents (M=1.77, SE=.14). No other subscales showed a significant race effect, all $ps>.288$.

Discussion

Parents have an important influence on the health and weight of their children. The CFQ is one of the few assessments of parents' perceptions and feeding practices; however, research is needed to establish its validity in samples of racially diverse families seeking pediatric obesity treatment. Our findings suggest that the CFQ factor structure reported by Anderson and colleagues (2005) provides the best fit for treatment-seeking parents of children with overweight/obesity, and that this structure has a good fit in both Black and White samples. In addition to evaluating the construct validity of the CFQ, we examined racial differences on this measure. We identified relatively few racial differences. Black parents had higher scores on Pressure to Eat than White parents, but all other subscales were nonsignificantly different. These results were consistent with those from the parent-focused pediatric obesity intervention, which showed significant effects of time (Concerns about Child Weight, Monitoring) and race (Pressure to Eat), although no significant interaction or treatment group effects.

The findings that the CFQ is a valid measure for use with Black parents seeking pediatric obesity treatment is an important extension of earlier work, which has been done with primarily cross-sectional and longitudinal samples with relatively few applications in randomized controlled trials. Birch and colleagues (2001) designed the original scale using samples of White and Hispanic parents of preschoolers (Birch et al., 2001). Three psychometric evaluations of the CFQ in diverse United States samples (Anderson et al., 2005; Boles et al., 2010; Kong et al., 2015) generally showed evidence of construct validity in Black and Hispanic samples, with problematic items primarily stemming from the Restriction subscale. The aim of the current study was to extend these findings into a sample of treatment-seeking parents. The good fit of the model with Black and White parents seeking pediatric obesity treatment suggests clinicians and researchers can use this measure with confidence in this population, and re-emphasizes the need to use the modified Anderson (2005) model, rather than the Birch (2001) model.

Our findings pertain to parents from a diverse, Mid-Atlantic, urban environment. Despite the strengths our study offers in its use of a treatment-seeking sample and randomized controlled intervention, there are limitations. We used a multi-choice checklist to assess race; dimensional racial identity assessment may yield richer information. Furthermore, we were unable to control for variables associated with racial/ethnic differences in our sample (education, marital status, and income). These variables may confound the current study's findings, and should be systematically investigated in future research. In addition, findings are based on treatment-seeking parents of children with overweight/obesity who participated in a university-based program. Findings may not generalize to parents of children with overweight/obesity not seeking any treatment, or to parents who seek treatment in different

settings, such as working with a dietician or pediatrician. Moreover, our sample included Black and White parents of school-aged children, and results may not generalize to parents who self-identify as part of other racial/ethnic groups, parents with children in different age groups, of those from other geographic locations.

Implications for Practice

In addition to providing evidence about the construct validity of the CFQ, findings regarding racial differences and similarities in CFQ scores have implications for clinical practice. Black parents' higher scores on Pressure to Eat are consistent with earlier research (Spruijt-Metz et al., 2002), although the nonsignificant subscales were discrepant. Pressure to Eat items are authoritarian in nature. For example, "my child should always eat all of the food on her plate" (Appendix, Birch et al., 2001). Higher scores among Black parents might reflect their tendency to be more authoritarian than White parents (Hill, 1995). This difference could imply a desire for the child to eat more or gain more weight, possibly related to food insecurity (Feinberg et al., 2008) and culturally-based size preferences (Flynn & Fitzgibbon, 1996). The nonsignificant difference on Concerns about Child Weight, however, suggests that this is not the best explanation for the finding. Parents who exert more pressure despite their children's weight status might benefit from different intervention than parents who are restricting or monitoring their children's eating. Notably, it is possible that these parents might be pressuring their children to eat foods they perceive to be healthier, rather than simply a larger quantity of food. Items can be interpreted as specific to mealtime eating, rather than eating overall, which could be perceived as the time when children eat healthy options compared with unhealthy between-meal snacks. These findings warrant further exploration to establish the interpretation of this difference. Nonsignificant findings are also important. Our findings that other subscales differ little by race suggest that existing pediatric obesity treatments might not require extensive modification to treat persons of different racial groups. Although we explored whether race differences would impact pediatric obesity treatment outcomes, research with larger samples and different treatments is needed to establish whether race predicts pediatric obesity treatment outcomes. Our study also yielded novel findings on the appropriateness of the CFQ for pediatric obesity interventions. Although psychometric results support the use of this measure for a treatment-seeking population, the nonsignificant treatment group effects suggest that further study is needed to understand whether the CFQ is an appropriate measure of outcomes. Our findings showed that time, but not intervention, had a significant influence on Concern about Child Weight (decrease) and Monitoring (increase). This could be interpreted as a response to treatment-seeking behavior, in that parents who went to the effort of enrolling in a pediatric obesity program felt less concern about their child's weight while participating, and also paid more attention to their child's eating while participating. Alternatively, it is possible that the intervention was too brief to produce a response on the CFQ, particularly as parental feeding attitudes may be established earlier in childhood than the target age range for pediatric obesity intervention. It is also possible that the attitudes and behaviors targeted by the intervention did not correspond closely enough to the CFQ subscales to be measurable by them. Our findings are consistent with one earlier study (Stark et al., 2011) that also did not show significant intervention findings, but inconsistent with work that showed differences in Pressure to Eat, Restriction, and Monitoring. One of those studies

evaluated three active interventions without a control group (Burrows et al., 2010), another evaluated two information-only conditions with a control condition (Essery et al., 2008), and another evaluated an active intervention with a support condition (Harvey-Berino & Rourke, 2003). Results from our third aim, in the context of these earlier findings, have value in proposing direction for further research on intervention timing, content, and outcomes assessment related to the measurement of parental feeding practices.

Examining racial differences in the psychometric properties of the CFQ, and in the performance or interpretability of the CFQ in treatment-seeking parents of children with overweight/obesity is important to guide refinement of treatment and prevention. Further research is needed to improve understanding of specific treatment-related needs. Future research should also examine whether race interacts with clinical factors to influence treatment-seeking behaviors and treatment outcomes.

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Table 1

Factor analyses of the Child Feeding Questionnaire

	Sample	Parent		Child			Race	Findings
	N	Gender	Weight	Age	Gender	Weight		
Birch et al. 2001 (Sample 1)	394	Both	M_{BMI} =25.8 (mothers), 28.0 (fathers)	5–9 years	Female	Not available	Not available	RMSEA=.04; CFI =.95
Birch et al. 2001 (Sample 2)	148	Both	M_{BMI}=24.0 (mothers), 25.7 (fathers)	8–11 years	Both	Not available	White 85%, Black 9%, Hispanic 4%	RMSEA=.07; CFI =.87
Birch et al. 2001 (Sample 3)	126	Both	M_{BMI}=29.0 (mothers), 28.2 (fathers)	7–11 years	Both	Not available	90% Hispanic, 6% White	RMSEA=.06; CFI =.85
Anderson et al. 2005	231	98% Female	73% OW or OB	3–5 years	Both	35% OW or OB	56% Hispanic, 44% Black	RMSEA=.04; CFI=.96; SRMR=.06
Boles et al. 2010	296	Female	Not available	2–4 years	Both	Not available	100% Black	RMSEA=.09; CFI=1.00 [3-factor model]
Kong et al. 2015	962	Female	Not available	2–5 years	Both	16.3% OB	69% Black, 31% Hispanic	RMSEA=.07; CFI=.94; TLI =.95; [5-factor model]; RMSEA=.06; CFI=.94; TLI =.95, [6-factor model]

Note. M_{BMI} = Mean body mass index. RMSEA=root mean square error of approximation; CFI=Comparative Fit Index; TLI=Tucker-Lewis Index; SRMR=standardization root mean square residual.

Table 2

Baseline characteristics of participants by race for the combined samples

	Black (*n*=207)	White (*n*=80)	Other (*n*=15)
Caregiver gender	96.6% Female	88.8% Female	93.3% Female
Child gender	59.9% Female	57.5% Female	53.3% Female
Age, mean in years (SD)			
Parent	40.0 (8.3)	39.7 (6.3)	35.0 (5.5)
Child	8.5 (1.8)	8.3 (1.9)	7.5 (2.3)
Education of parent *			
High school diploma or less	27.7%	6.3%	21.4%
Some college or more	72.3%	93.7%	78.6%
Marital status (Married) *	33.2%	75.9%	53.3%
Household income, less than $25,000/year *	44.0%	7.8%	28.6%
Parent BMI (kg/m^2)			
Underweight (BMI < 18.5)	0.0%	1.3%	0.0%
Normal (18.5 ≤ BMI < 25)	5.8%	27.4%	13.3%
Overweight (25 ≤ BMI < 30)	19.3%	28.9%	26.7%
Obese (BMI ≥ 30)	80.7%	42.4%	60.0%

Note. N=302. BMI=body mass index.

*Significantly different at p<.001

Table 3

Fit statistics for confirmatory factor analyses

Model	*df*	χ^2	*p*	RMSEA (90% CI)	CFI	TLI	SRMR
One-factor	434	3048.48	<.001	.141 (.137 – .146)	.24	.18	.18
Birch et al.	303	650.47	<.001	.062 (.055 – .068)	.87	.85	.11
Anderson et al.	94	162.63	<.001	**.049** (.036 – .062)	**.96**	**.95**	**.04**
White	94	122.77	.025	.062 (.023 – .090)	.94	.93	**.074**
Black	94	141.74	.001	**.050** (.032 – .066)	**.96**	**.95**	**.049**

Note. N=302. RMSEA=root mean square error of approximation; CFI=Comparative Fit Index; TLI=Tucker-Lewis Index; SRMR=standardization root mean square residual. Small nonsignificant χ^2 values indicate good fit, and Hu and Bentler (1999) suggest that TLI and CFI values of .95 or higher, RMSEA values of .06 or lower, and SRMR values of .08 or less indicate an acceptable fit of the model. Fit statistics in bold meet the guidelines recommended by Hu and Bentler (1999).

Table 4

Mean differences in parental feeding practices by race

	Black *n*=203		White *n*=79					
	M	***SE***	***M***	***SE***	***Total df***	***F***	***p***	η_p^2
CFQ total	3.75	0.03	3.62	0.05	282	6.40	**.012**	.022
Perceived	4.22	0.05	4.06	0.08	282	2.89	.090	.010
Responsibility Concerns about Child Weight	4.48	0.05	4.64	0.08	282	2.80	.096	.010
Restriction	4.47	0.05	4.60	0.08	282	1.82	.179	.006
Pressure to Eat	2.35	0.06	1.70	0.10	282	29.19	**<.001**	.094
Monitoring	3.72	0.07	3.73	0.11	282	0.10	.920	.000

Note. M=mean; *SE* =standard error.

Table 5

Mean baseline and post intervention scores on the CFQ for participants in sample 2

	Baseline								Post							
	Black- Intervention		Black- Control		White- Intervention		White- Control		Black- Intervention		Black- Control		White- Intervention		White- Control	
	M	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*
CFQ total *	3.59	0.06	3.81	0.05	3.54	0.10	3.58	0.10	3.65	0.05	3.81	0.05	3.56	0.10	3.47	0.10
Perceived Responsibility	4.16	0.10	4.26	0.09	4.20	0.18	4.15	0.17	4.36	0.09	4.24	0.08	4.08	0.17	4.22	0.16
Concerns about Child Weight **	4.30	0.11	4.43	0.10	4.35	0.20	4.50	0.19	4.15	0.12	4.32	0.11	4.29	0.22	4.11	0.21
Restriction	4.52	0.11	4.59	0.10	4.56	0.19	4.47	0.19	4.45	0.10	4.59	0.09	4.53	0.18	4.06	0.18
Pressure to Eat ***	2.16	0.12	2.63	0.11	1.87	0.22	1.81	0.21	2.15	0.13	2.50	0.11	1.75	0.23	1.67	0.22
Monitoring ****	3.64	0.13	3.74	0.12	3.63	0.23	3.85	0.23	3.98	0.10	4.11	0.09	4.08	0.18	4.02	0.17

Note. *N*=159. Means and standard errors by time, race, and treatment group

* Black parents significantly higher than White parents, p=.015

** Baseline significantly higher than post, p=.021

*** Black parents significantly higher than White parents, p<.001

**** Post significantly higher than baseline, p<.001