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Parent-child mealtime interactions in racially/ethnically diverse families with preschool-age children

Angela Kong^{a,*}, Blake L. Jones^b, Barbara H. Fiese^b, Linda A. Schiffer^c, Angela Odoms-Young^d, Yoonsang Kim^e, Lauren Bailey^{e,f}, and Marian L. Fitzgibbon^{c,e,f,g}

^aCancer Education and Career Development Program, Institute of Health Research and Policy, University of Illinois at Chicago, 1747 West Roosevelt Road, MC275, Room 558, Chicago, IL 60608, USA; akong@uic.edu

^bFamily Resiliency Center, Department of Human and Community Development, University of Illinois, 2028 Doris Kelley Christopher Hall, 904 West Nevada Street, MC-081, Urbana, IL 61801, USA; blakej13@illinois.edu; bhfiese@illinois.edu

^cDepartment of Medicine, University of Illinois at Chicago, 1747 West Roosevelt Road, MC275, Room 558, Chicago, Illinois, 60612, USA; mlf@uic.edu; lschiff@uic.edu

^dDepartment of Kinesiology and Nutrition, University of Illinois at Chicago, 1919 W. Taylor Street Chicago, IL, 60612, USA; odmyoung@uic.edu

^eInstitute for Health Research and Policy, 1747 West Roosevelt Road, MC275, Room 558, University of Illinois at Chicago, Chicago, Illinois, USA; ykim96@uic.edu; lbaile8@uic.edu

^fSchool of Public Health, University of Illinois at Chicago, Chicago, Illinois, 60612, USA

^gCenter for the Management of Complex Chronic Care, Jesse Brown VA Medical Center, Hines VA Hospital 151-H, 5000 South 5th Avenue, Bldg. 1, B-260, Hines, Illinois, 60612 USA

Abstract

Family meals may improve diet and weight outcomes in children; however, results from nationally representative samples suggest these relationships vary by race/ethnicity. Observing parent-child mealtime interactions may lend insight to why racial/ethnic differences exist. In this pilot study, a multi-ethnic sample of low-income families ($n=30$) with a preschool-age child were videotaped during a dinner in their home. A global coding scheme was used to assess the following: *'Action'* (behaviors that divert attention from eating), *'Behavior Control'* (behaviors intended to modify another person's behavior), and *'Communication'* (i.e., meal-oriented, interpersonal, and critical). All families spent a significant amount of time in *'action'* oriented behaviors that diverted their attention from eating. We also observed racial/ethnic differences in communication (i.e. critical)

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*Corresponding author: Angela Kong, PhD, MPH, RD Postdoctoral Research Associate Cancer Education and Career Development Program Institute of Health Research and Policy University of Illinois at Chicago 1747 West Roosevelt Road Chicago, IL60608 Phone: 312-355-0557 akong@uic.edu.

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and behavior patterns (i.e. behavior control). This study demonstrated that this approach for observing parent-child mealtime interactions in a naturalistic setting among a diverse study sample was feasible; however, future studies should address how these patterns relate to dietary intake and weight status.

Keywords

preschool; family; obesity; African-American; Hispanic; eating behavior

1.0 Introduction

Although many factors influence children's dietary intake and weight, research suggests family meals may help predict better dietary intake (Andaya, Arredondo, Alcaraz, Lindsay, & Elder, 2011; Berge et al., 2012; Burgess-Champoux, Larson, Neumark-Sztainer, Hannan, & Story, 2009; Feldman, Eisenberg, Neumark-Sztainer, & Story, 2007; FitzPatrick, Edmunds, & Dennison, 2007; Fulkerson, Kubik, Story, Lytle, & Arcan, 2009; Gillman et al., 2000; Larson, Neumark-Sztainer, Hannan, & Story, 2007; Neumark-Sztainer, Hannan, Story, Croll, & Perry, 2003; Welsh, French, & Wall, 2011; Woodruff & Hanning, 2009) and weight outcomes (Chan & Sobal, 2011; Fulkerson, et al., 2009; Fulkerson, Neumark-Sztainer, Hannan, & Story, 2008; Gable, Chang, & Krull, 2007; Goldfield et al., 2011; Lehto, Ray, & Roos, 2012; Sen, 2006; Taveras et al., 2005). Previous findings have linked greater family meal frequency with higher intakes of fruits and vegetables (Andaya, et al., 2011; Berge, et al., 2012; FitzPatrick, et al., 2007; Fulkerson, et al., 2009; Gillman, et al., 2000; Hammons & Fiese, 2011; Larson, et al., 2007; Neumark-Sztainer, et al., 2003; Welsh, et al., 2011), calcium rich foods (Feldman, et al., 2007; Gillman, et al., 2000; Neumark-Sztainer, et al., 2003), fiber (Burgess-Champoux, et al., 2009; Gillman, et al., 2000; Neumark-Sztainer, et al., 2003) and lower body mass index (BMI) (Chan & Sobal, 2011; Fulkerson, et al., 2009; Fulkerson, et al., 2008; Goldfield, et al., 2011; Lehto, et al., 2012; Rollins, Belue, & Francis, 2010; Sen, 2006; Taveras, et al., 2005). However, stratified analyses, based on larger cohorts, suggest the relationships between family meal frequency and weight and diet outcomes vary by race/ethnicity (Neumark-Sztainer, et al., 2003; Rollins, et al., 2010; Sen, 2006). For instance, data from the National Longitudinal Survey of Youth (1997) suggests more frequent family meals reduced the odds for being overweight among non-Hispanic white adolescents, yet the same relationship was not found for African-American or Hispanic adolescents (Sen, 2006). The mechanisms for racial/ethnic differences have not been elucidated; therefore, a closer examination of what occurs during family mealtimes could lend insight.

A few studies have assessed mealtime behaviors via direct observation (e.g. videotaping) where parent-child interactions are observed and then coded with a global coding scheme. (Fiese, Hammons, & Grigsby-Toussaint, 2012; Fiese, Winter, & Botti, 2011; Jacobs & Fiese, 2007; Patton et al., 2004; Patton, Dolan, & Powers, 2006; Patton, Piazza-Waggoner, Modi, Dolan, & Powers, 2009; Powers et al., 2005). This method has been used to study families with children diagnosed with chronic illnesses (Fiese, et al., 2011; Jacobs & Fiese, 2007; Patton, et al., 2004; Patton, et al., 2006; Patton, et al., 2009; Powers, et al., 2005), but has only recently been used to study childhood obesity and early findings suggest that observed mealtime interactions may be related to child weight status among non-Hispanic White families (Fiese, et al., 2012). To extend on these findings, we examine the feasibility of observing family meals via video-recording in a multi-racial/ethnic sample of low-income families with healthy preschool-age children. The objectives of this pilot study were to examine parent-child mealtime interactions *observed* during family dinners and to determine if there were any racial/ethnic differences.

2.0 Methods

2.1 Participants and Eligibility

Thirty families were recruited from clinics administering the Special Supplemental Nutrition Program for Women, Infants, Children (WIC) program in Illinois (Chicago and Urbana-Champaign). In order to examine racial/ethnic differences, we targeted African-American and Hispanic families during recruitment to comprise two-thirds of our study sample. Children between 48 to 60 months enrolled in WIC and their mothers were eligible. This age range was chosen because we wanted children who were old enough to feed themselves and could communicate verbally. All study procedures were reviewed and approved by the Institutional Review Boards at the University of Illinois at Chicago and Urbana-Champaign, respectively.

2.2 Sociodemographics

Self-reported information on age, race/ethnicity, marital status, education and income level were collected from mothers by trained staff. Bilingual/bicultural (Spanish and English) staff recruited and collected data from all Hispanic participants.

2.3 Anthropometrics

Anthropometric measurements were performed with a portable stadiometer (SECA, Hanover, MD) and digital scale (Tanita Corporation of America, Inc., Arlington Heights, IL) with the participant in light clothes and no shoes. Both heights and weights were measured twice, to the nearest 0.1 cm and 0.1 kg, respectively, and averaged. Body mass index (BMI) was computed from observed height and weight (kg/m^2).

2.4 Parent-Child Mealtime Interactions

Family mealtimes were videotaped in participants' homes and then coded with The ABC Mealtime Coding system developed by Fiese et al (Fiese, Foley, & Smyth, 2007). Study staff set up the video recorder but was not present during the meal to minimize reactivity. The ABC Mealtime Coding system (Fiese, et al., 2007) was created to assess the following domains: 1) 'Action': behaviors that divert attention away from the meal (e.g. talking on the phone); 2) 'Behavior Control': intended to modify another person's behavior (e.g. "Get your elbows off the table!"); 3) Communication (*three categories*): a) 'mealtime communication' includes all exchanges pertaining to the meal (e.g., "Please pass the bread"), b) 'Critical Communication' involves making negative statements (e.g. "you're annoying"), c) 'Interpersonal Communication' involves giving or receiving neutral or positive information (e.g., friendly joking, discussion of daily events).

Blinded coders used VCode software (Hagedorn, Hailpern, & Karahalios, University of Illinois, Urbana, IL) to independently view and code each videotaped meal. The duration of time spent in each domain (e.g., 'action' 'behavior control') was coded for all meal participants. One family meal was excluded from this analysis due to poor tape quality. Inter-rater reliability ranged from 90.2% to 100% across domains. The percent time spent in each domain was derived by dividing the total time spent in each domain (for all meal participants) by the total time spent across all domains (for all meal participants).

2.5 Statistical Analysis

Due to skewed distributions, we presented medians along with the interquartile range (ie. 25th, 75th percentile) for all main variables of interest and used the Kruskal-Wallis test to examine differences by race/ethnicity. All other descriptive data were presented as means and standard error (SE) or proportions, as appropriate. All statistical tests were two sided at

5% significance level and analyses was performed using STATA version 11.1 (College Station, TX, Stata Corp).

3.0 Results

Table 1 presents sociodemographic and anthropometric characteristics by race/ethnicity. Mothers were similar in age, income, and employment status. Fewer Hispanic mothers completed high school compared to African-American and non-Hispanic White mothers; however, a higher percentage of Hispanic mothers were married compared to counterparts. On average, children were 4.5 years old and most families had 2 children (>18 yrs) in the household. Forty four percent of children in this sample were at risk for overweight (85th percentile for BMI) and most mothers were either overweight (37% with BMI 25–29.9) or obese (48% with BMI ≥30).

3.1 Mealtime Characteristics and Parent-Child Mealtime Interactions

Table 2 examines differences in mealtime characteristics and parent-child mealtime interactions by race/ethnicity. The median number of adults at meals was one for all groups. African-American households had fewer children at meals compared to Hispanic and non-Hispanic White households. Families reported a median of 1–2 dinners outside of the home/month for all groups, thus, at-home meals represented the norm for this sample. Mealtimes lasted a median length of 18.9 minutes (data not shown) and were similar across groups.

Percent time spent in the five domains was summarized by race/ethnicity in Table 2. For all groups, the majority of time was spent in 'Action' oriented behaviors. African-American families exhibited more 'action' behaviors than their counterparts; however, the difference was not significantly different. Percent time in 'Behavior Control' was less prevalent; however, Hispanic families exhibited more time in this behavior than non-Hispanic White and African-American households. The most prevalent forms of communication were 'mealtime' and 'interpersonal', but these did not vary by race/ethnicity. In contrast, very little critical communication (e.g., harsh statements) was observed; however, non-Hispanic White households exhibited significantly more of these behaviors than Hispanic households.

4.0 Discussion

Family meals may positively influence diet and weight-related outcomes (Larson, et al., 2007; Woodruff & Hanning, 2009), yet previous research suggests that race/ethnicity may moderate these relationships (Neumark-Sztainer, et al., 2003; Rollins, et al., 2010; Sen, 2006). The mechanism for why racial/ethnic differences exist is unclear; therefore, observing parent-child meal interactions may lend insight.

Families in this study spent the majority of their time in 'action' oriented behaviors (e.g., talking on the phone). In particular, African-American families spent two-thirds of the mealtime in these types of behaviors compared to non-Hispanic White and Hispanic families and similar findings were observed by Fiese et al among families with 5–12 year olds (Fiese, et al., 2012). Among children with asthma, more time spent in 'action' oriented behaviors during meals was linked to poorer outcomes (e.g., more asthma symptoms, lower quality of life scores) (Fiese, et al., 2011). The speculation is that this behavior during meals may reflect a less functional climate (Fiese, et al., 2011; Jacobs & Fiese, 2007). In the context of childhood obesity, it would be important to determine if exhibiting more 'action' oriented behaviors during meals is also indicative of poorer diet quality at meals or otherwise. This is currently not known and will require further examination. Second to 'action', families also spent time in conversation about the meal ('mealtime communication') or other topics ('interpersonal communication'). Families that engaged more in 'mealtime' or 'interpersonal'

communication spent less time in 'action' oriented behaviors. In previous research, these forms of communication positively predicted healthy weight status in children (Fiese, et al., 2012). Unfortunately, our small sample size limited our ability to draw any conclusions about this form of communication and BMI status; therefore, future research is needed to explore this further.

The third form of communication observed was 'critical communication' (i.e. harsh/negative comments). Although infrequent, non-Hispanic White families did exhibit more of this behavior than Hispanic families. Fiese et al (Fiese, et al., 2012) also found racial/ethnic differences with 'critical communication'; however, it was non-Whites (race/ethnicity not specified) that exhibited more 'critical communication' than non-Hispanic Whites. Yet, similarly in both studies, the percent time spent in this form communication was minimal (1–2%). We suspect that being observed might deter families from displaying overtly negative behavior.

While less common than 'action' or 'mealtime'/'interpersonal' communication, there were clear racial/ethnic differences observed in 'behavior control' (directing someone else's actions). Time spent in 'behavior control' was highest in Hispanic and lowest in African-American families. Fiese et al suggests this pattern of behavior might reflect a more "rigid" and "controlling" mealtime parenting style (Fiese, et al., 2012). Previous findings have linked greater 'behavior control' with poorer dietary adherence in children with Type 1 diabetes (Patton, et al., 2009) and with poorer quality of life scores and medical adherence in children with asthma (Fiese, et al., 2011). However, these associations were only found in non-Hispanic White families and not minorities (Fiese, et al., 2011). Future research is needed to determine if and how race/ethnicity moderates these associations. Differences have also been detected between single and two parent households (Fiese, et al., 2011) in that single parent households were more likely to exhibit 'behavior control' compared to two parent households. In our sample, a greater number of Hispanic families (9 out of 10) represented two parent households compared African-American (3 out of 10) and non-Hispanic White (6 out of 10) families. However, it was more common for all groups to only have one parent present at meals, regardless of marital status. Therefore, racial/ethnic differences are potentially less likely due to the number of adults present at dinner and more likely due to other cultural/contextual factors.

4.1 Limitations

We need to interpret these findings with an understanding of the limitations. This was a pilot/feasibility study and was limited by a small sample size. Another limitation was the inability to measure foods served. Future modification of this approach and coding scheme might enable us to capture foods served and the quality of food-related mealtime interactions better. Lastly, we were only able to videotape one meal rather than videotaping multiple meals.

5.0 Conclusion

Family mealtimes are a ritual shared by families across race/ethnicity, cultures, and socioeconomic status (Fiese, et al., 2011). A main goal of this study was to assess the feasibility of videotaping mealtimes in the homes of low-income, racially/ethnically diverse families. With that accomplished, a primary finding was that families spent a significant portion of the meal more focused on factors outside of the meal. This behavior pattern leaves less time for other types of behaviors that may be more productive (e.g., 'mealtime communication' or 'interpersonal communication'). We also observed racial/ethnic differences in communication and behavior patterns, which are intriguing. However, our findings need to be augmented by the foods offered at family meals. How these behaviors

relate to foods served and consumed can lead to more informed decisions regarding key strategies for intervention development.

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Highlights

- We observed parent-child behaviors during mealtimes among multi-ethnic families.
- A global coding scheme was used to assess parent-child mealtime interactions.
- This pilot study found racial/ethnic differences in parent-child interactions during family dinner time.

Table 1

Sociodemographic characteristics and BMI status by race/ethnicity

	Total		Hispanic		African American		Non-Hispanic White		
	n=30		n=10		n=10		n=10		
Sociodemographics	mean	se	mean	se	mean	se	mean	se	<i>p</i> [*]
Parent age (yrs)	33.9	1.3	33.7	2.1	35.6	2.6	32.5	1.9	0.79
Child age (yrs)	4.5	0.05	4.5	0.1	4.6	0.1	4.5	0.1	0.19

	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>p</i> ^{**}
At least high school degree/GED, <i>n</i> % yes	23	76.7%	4	40.0%	9	90.0%	10	100%	0.003
Full time employed, <i>n</i> % yes	4	13.3%	0	0.0%	2	20.0%	2	20.0%	0.32
Married/living with partner, <i>n</i> % yes	18	60.0%	9	90.0%	3	30.0%	6	60.0%	0.02
Income <\$20,000/yr	16	53.3%	7	70.0%	6	60.0%	3	30.0%	0.18
>2 children in household	15	50.0%	5	50.0%	3	30.0%	7	70.0%	0.20

Body Mass Index (BMI) Status

Child BMI status ^a	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>p</i> ^{**}
>= 85th percentile	13	44.8%	3	30.0%	5	55.6%	5	50.0%	0.50

Parent BMI status ^b	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>p</i> ^{**}
18.5–24.9	4	14.8%	1	11.1%	1	11.1%	2	22.2%	0.93
25–29.9	10	37.0%	4	44.4%	3	33.3%	3	33.3%	
>30	13	48.1%	4	44.4%	5	55.6%	4	44.4%	

^aChild BMI: *n*=10 Hispanic; *n*=9 African American; *n*=10 non-Hispanic White^bParent BMI: *n*=9 Hispanic; *n*=9 African American; *n*=9 non-Hispanic White^{*} *p* value based on F test using analysis of variance;^{**} *p* value based on chi square test

Table 2

Mealtime characteristics and parent-child mealtime interactions by race/ethnicity

	Hispanic n=10		African American n=10		Non-Hispanic White n=10		
Mealtime Characteristics	media n	IQR	media n	IQR	media n	IQR	p [*]
Length of mealtime	23.3	17.2–28.7	18.9	16.7–30.9	17.8	17.2–20.8	0.65
Total number of children at meal ^a	3.0	1.5–3.0	1.5	1.0–2.0	3.0	2.0–3.0	0.02
Total number of adults at meal	1.0	1.0–2.0	1.0	1.0–2.0	1.0	1.0–2.0	0.66

Meal Patterns (times/month)	media n	IQR	media n	IQR	media n	IQR	
Eat out for dinner	1.0	0–2.0	1.0	0–3.0	2.0	2.0–4.0	0.20
Eating out	2.5	1.0–4.0	3.5	2.0–8.0	4.5	3.0–8.0	0.10

Parent –child mealtime interactions (%)	media n	IQR	media n	IQR	media n	IQR	p ^{**}
Action	40.9%	25.3–47.7	65.4%	53.6–76.8	52.0%	37.9–53.2	0.07
Behavioral Control ^b	6.5%	4.9–8.3	2.4%	1.1–3.2	4.9%	4.7–9.0	0.002
Mealtime Communication	20.1%	8.4–28.3	10.8%	8.1–16.8	15.3%	11.1–18.8	0.20
Interpersonal Communication	22.5%	14.8–41.0	15.9%	11.4–34.3	25.2%	13.9–30.2	0.67
Critical Communication ^c	0.08%	0–0.19	0.29%	0–1.04	0.64%	0.25–1.54	0.03

IQR: Interquartile range (25th to 75th percentile);

a–c pairwise comparisons examined between racial/ethnic groups

* Kruskal Wallis test used to compare differences between groups;

** chi square test used to compare groups

^a number of children at meal: Hispanic vs. African American p=0.027; African American vs. non-Hispanic White p=0.01^b % Behavioral Control p=0.0019 for Hispanic vs African American; p=0.004 for African American vs. non-Hispanic White^c % Critical Communication p=0.007 for Hispanic vs. Non-Hispanic White