

Feeding Practices in NC-based Early Head Start Programs among Teachers Serving 12-36mo  
Children

by

Caitlin E. Bullard

July, 2019

Thesis Advisor: Virginia C. Stage, PhD, RDN, LDN

Major Department: Department of Nutrition Science

**Background:** Food behaviors are developed during the first few years of life making caregiver interactions especially important in the formation of healthy food preferences. Limited data exists on caregiver feeding styles and practices who work directly with toddlers 12-36 months. Of particular interest are differences in feeding practices among different ethnicities.

**Objective:** To determine feeding styles of Early Head Start (EHS) teachers in North Carolina (NC) and examine differences in feeding practices by ethnicity.

**Design:** Cross sectional data surveying the feeding practices of EHS teachers

**Participants/Setting:** NC-based EHS teachers recruited throughout the state of NC aged  $42.81 \pm 12.74$  working with toddlers 12-36 months.

**Main outcome measures:** Validated instruments, Caregiver Feeding Style Questionnaire (CFSQ) and Mealtime Verbal Comments Checklist

**Statistical Analyses:** Fisher's Exact Test, Mann-Whitney U Test, Pearson's  $\chi^2$ , and Independent *t*-tests test were used to determine variations between ethnicities of childcare providers who completed the survey.

**Results:** Teachers were categorized as authoritative (17.19%), authoritarian (34.38%), indulgent (29.69), and uninvolved (18.75%). Feeding styles were not significantly different among African Americans (AA) and White ( $p=0.33$ ) teachers. However, significant differences between AA and white teachers' were observed on individual CFSQ items such as "I physically struggle with the child to get him or her to eat" (White  $\mu=35.93$  and AA  $\mu = 28.09$ ;  $p=0.02$ ). Significant differences were also observed on 4 items within the section on Verbal Comments Checklist such as "when you're playing with your cup, you're showing me you're done" ( $p=0.045$ ). White teachers were more likely to use both supportive ( $42.5\pm 6.35$ ) and unsupportive ( $57.48\pm 6.34$ ) comments during mealtime compared to AA with a mean of  $37.24\pm 12.69$  for supportive comments and  $62.76\pm 12.69$  unsupportive comments.

**Conclusions:** Additional research is needed to explore direct observations of teacher-toddler interactions during mealtime to understand ethnic differences between teacher feeding styles.



Feeding Practices in NC-based Early Head Start Programs among Teachers

Serving 12-36mo Children

A Thesis

Presented To the Faculty of the Department of Nutrition Science

East Carolina University

In Partial Fulfillment of the Requirements for the Degree

Master of Science in Nutrition Science

by

Caitlin Elizabeth Bullard

July, 2019

© 2019 CAITLIN ELIZABETH BULLARD

FEEDING PRACTICES IN NC-BASED EARLY HEAD START PROGRAMS AMONG  
TEACHERS SERVING 12-36mo CHILDREN

by

Caitlin E. Bullard

APPROVED BY:

DIRECTOR OF THESIS:

\_\_\_\_\_  
VIRGINIA STAGE, PhD, RDN, LDN

COMMITTEE MEMBER:

\_\_\_\_\_  
ARCHANA HEGDE, PhD

COMMITTEE MEMBER:

\_\_\_\_\_  
DIANA SAUM, MS, RDN, LDN

COMMITTEE MEMBER:

\_\_\_\_\_  
IAN HINES, PhD

CHAIR OF NUTRITION SCIENCE DEPARTMENT:

\_\_\_\_\_  
MICHAEL WHEELER, PhD

DEAN OF THE GRADUATE SCHOOL:

\_\_\_\_\_  
PAUL J GEMERLINE, PhD

## **DEDICATION**

For Mike, although you are no longer with us, you have been my motivation to pursue my dreams. Thank you for always believing in me.

## ACKNOWLEDGEMENTS

This work would not have been possible without the financial support of East Carolina University College of Allied Health Sciences Graduate Research Award. I am especially thankful for Dr. Virginia Stage for her guidance and support throughout the duration of graduate school and the completion of this manuscript. Thank you for providing the emotional and academic support and patience during my time at ECU. I would also like to extend gratitude for my thesis committee, Dr. Archana Hegde, Mrs. Diana Saum, and Dr. Hines, along with Dr. Dipti Dev, and Dr. Hui Bian for their support throughout my journey.

I cannot begin to express my thanks and appreciation for my family for always supporting me both emotionally and financially in my research endeavors. Thank you for always believing in me when I was unable to believe in myself.



## TABLE OF CONTENTS

LIST OF TABLES.....	vii
LIST OF FIGURES.....	viii
CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: METHODS .....	4
STUDY DESIGN AND SETTINGS .....	4
STUDY SAMPLE AND ELIGIBILITY .....	4
SURVEY ADMINISTRATION AND DATA COLLECTION .....	4
MEASURES.....	5
Caregiver Feeding Style Questionnaire (CFSQ).....	5
Mealtime Verbal Comments Checklist .....	6
DATA ANALYSIS .....	6
CHAPTER 3: RESULTS .....	8
PROVIDER CHARACTERISTICS.....	8
FEEDING STYLE.....	8
VERBAL COMMENTS DURING MEALTIME .....	9
CHAPTER 4: DISCUSSION .....	10
CHAPTER 5: CONCLUSION .....	15
CHAPTER 6: REFERENCES.....	16
APPENDIX A: IRB PERMISSION LETTER.....	29

## LIST OF TABLES

TABLE 1.....	23
TABLE 2.....	24
TABLE 3.....	27

## LIST OF FIGURES

FIGURE A.....	22
---------------	----

## CHAPTER 1: INTRODUCTION

Traditionally, children younger than 2 years have been excluded from the Dietary Guidelines for Americans (DGA)<sup>1</sup> with primary research focusing on pre-school age children and older.

Interestingly, 12.3% of infants ages 3 to 23 months had a high weight-for-length in 2014 which increased obesity risks.<sup>2-4</sup> Nutrition interventions targeting obesity and feeding difficulties during the first 1000 days are critical in shaping food preferences and behaviors.<sup>5</sup> Feeding behaviors change rapidly in infants and toddlers during the transition to table food making the caregiver-child feeding relationship important in the promotion of healthy food preferences and the prevention of childhood obesity.<sup>6</sup>

Caregiver-child interactions are especially important in the formation of toddlers' food preferences and behaviors. Toddlers' food intake may be influenced by the feeding environment created at mealtimes as well as the selection of foods offered.<sup>7</sup> The emotional climate created during feeding between the interaction of the caregiver and toddler refer to feeding styles and are based on two dimensions-demandingness and responsiveness.<sup>7-9</sup> Demandingness refers to the extent caregivers exert control and supervision during feeding while responsiveness refers to the extent caregivers display nurturance, acceptance, and involvement.<sup>9-10</sup> Based on the dimensions, four feeding style classifications emerged: authoritative (high demanding, high responsiveness) characterized by caregiver involvement, nurturance, and structure; authoritarian (high demandingness, low responsiveness) characterized by restrictive, power-assertive behaviors, and responsive to toddlers needs<sup>8-9</sup>; indulgent (low demandingness, high responsiveness) characterized by nurturance and lack of monitoring; and uninvolved (low demandingness, low responsiveness) characterized by little to no control and involvement during feeding.<sup>9</sup> Authoritarian, indulgent, and uninvolved styles in pre-school aged children foster picky-eating

and excessive energy intake, while authoritative feeding styles have been associated with healthier dietary behaviors.<sup>9,11</sup>

Feeding practices, subcategories of feeding styles, refer to strategies caregivers use to control children's dietary intake such as verbal and non-verbal communication, monitoring, coercion, and restriction.<sup>7,9,12</sup> Responsive feeding practices, as highlighted by Black and Aboud, is characterized as the exchange between caregiver and child involving a 4-step process: 1) caregiver creates a structured routine in an environment that fosters emotional stability and interaction; 2) the child's gestures involve both verbal and non-verbal communications such as vocalizations, facial expression, and motor gesticulations; 3) the caregiver responds promptly with age-appropriate emotional support depending on the signal exhibited; and 4) the child receives a predictable response.<sup>13</sup> Traditional feeding practices were non-responsive techniques that evolved from environmental threats of food scarcity that have impacted our current obesogenic environment.<sup>14</sup> These practices included soothing responses by offering food, overfeeding, enabling "picky" eaters, and pressuring children to eat all of the food on their plate.<sup>6</sup> Traditional feeding consequently fostered excessive weight gain in infants leading to early onset obesity. Self-regulation is therefore altered and satiation cues are terminated.<sup>6</sup>

Feeding practices have been influenced by culture.<sup>9</sup> Based on results from a study conducted by Blaine and colleagues, white providers were more likely to allow children to leave food unfinished compared to African Americans and Latinas.<sup>15</sup> Freedman and colleagues found similar evidence in that Hispanics were more likely than other races to force children to finish the food on their plate compared to 69% of Asians and 44% of whites.<sup>16</sup> Forcing children to eat their food does not align with Institute of Medicine guidelines and further increases the prevalence of childhood obesity and feeding difficulties. White Americans were more likely to

sit with children at the table compared to 24% of Hispanic providers.<sup>16</sup> Hispanics were more likely than white providers to encourage children to finish eating.<sup>17</sup> Because Hispanics do not sit with children during mealtime, positive role modeling is likely diminished.

To date, there is limited guidance available for responsive feeding practices and the role ethnicity plays in determining feeding practices in children younger than 36 months. The purpose of this study is to explore the self-reported feeding styles of NC-based Early Head Start teachers serving low-resource toddlers 12-36 months.

## **CHAPTER 2: METHODS**

### **Study Design and Settings**

This study used a cross-sectional design to examine toddler (12-36 months) feeding practices of NC-based EHS teachers. Data collection was carried out from June to December 2018. The East Carolina University Institutional Review Board approved the study protocol involving human subjects. All subjects provided informed consent prior to participation.

### **Study Sample and Eligibility**

Participants were recruited from funded EHS programs across the state of NC that met the following inclusion criteria: 18 years of age or older, employed in NC-based EHS Programs, teacher or assistant teacher, and serving toddlers 12-36 months. EHS programs serve infants and toddlers under the age of 3 and provide support to low-income families with children and pregnant women.<sup>18</sup> One hundred seventy-one eligible centers within 27 EHS-funded organizations in NC were identified as part of the sampling frame.

### **Survey Administration and Data Collection**

EHS Program Directors were contacted via telephone or email to gain permission for their teachers to participate in the study. Once permission was granted, Center Directors within each of the program's centers were contacted via telephone or email and asked to provide email addresses for each of the teachers in the organization. Eligible participants received a survey link using Research Electronic Data Capture (REDCap).<sup>19</sup> Participants were asked to provide electronic consent before proceeding with the survey tool. If consent was not granted, access to the survey was suspended. Participants were reassured of their anonymous participation. Upon completion, survey participants were compensated with a \$10.00 electronic gift card.

## Measures

The previously validated tools Caregiver's Feeding Style Questionnaire (CFSQ)<sup>9</sup> and Verbal Comments Checklist<sup>20</sup> were used to examine feeding practices and differences by ethnicity.

Wording in both tools were slightly revised to reflect practices of early childhood teachers serving toddlers younger than 36 months versus preschool children aged 3-5 years. For example, the CFSQ item 'if a child says "I'm not hungry", I try to get him/her to eat anyway' was revised to say "if a child indicates they are not hungry (physical or verbal), I try to get him/her to eat anyway". "Physical or verbal" was added since toddlers' verbal communication skills are likely to be limited.<sup>21</sup> The revised tools were reviewed for content appropriateness and clarity (face validity) by one early childhood education expert, three Registered Dietitians, and two early childhood teachers in a local private center with children aged 12-36 months in their classrooms. Reliability measures for both the CFSQ (31 items) and Verbal Comments Checklist (19 items) were acceptable for this study with Cronbach's  $\alpha$  of 0.79 and 0.91 respectively.

**Caregiver Feeding Style Questionnaire (CFSQ).** The CFSQ was created to measure African American (AA) and Hispanic parents' overall feeding strategies to get their preschool children to eat. Hughes reported internal consistencies of 0.85 for demandingness and 0.86 and 0.71 for responsiveness. Childcare providers completed questions regarding the characteristics of their feeding styles that include provider involvement, nurture, restriction, reasoning, and monitoring behavior. Feeding style for the questionnaire was calculated based on two dimensions: demandingness and responsiveness. Demandingness refers to the extent teachers encourage eating, while responsiveness refers to how teachers encourage eating.<sup>9</sup> The typological approach was used when scoring the CFSQ. A median split was used to determine high and low ranges for demandingness and responsiveness. Demandingness and responsiveness were recoded into high



and low categories. If scores were higher than the median, they were categorized as high. If lower than or equal to the median, they were categorized as low. High and low scores for each provider resulted in four feeding styles: authoritative (high demandingness/high responsiveness), authoritarian (high demandingness/high responsiveness), indulgent (low demandingness/high responsiveness), and uninvolved (low demandingness/low responsiveness).

**Mealtime Verbal Comments Checklist.** EHS teachers completed a checklist of 19 provider comments adapted for the EHS population that assessed whether teachers' mealtime comments were supportive of children's self-regulation cues.<sup>20</sup> The checklist comprised both supportive, and non-supportive verbal comments. From the checklist, teachers reported using specific comments by using a Likert scale with 1=never and 5=always. A dichotomous scale was created to condense "rarely", "sometimes", "mostly" and "always" responses into "yes" and "never" responses to "no". The sum of supportive and non-supportive comments for each provider was calculated. Dev and colleagues used a similar approach and reported a Cronbach's  $\alpha$  of 0.65 to 0.88.<sup>22</sup> A percentage of providers' supportive comments were calculated by sum of supportive comments divided by the sum of the total comments x 100. A percentage of providers' non-supportive comments were calculated by finding the sum of non-supportive comments divided by the sum of the total comments x 100.<sup>22</sup>

### **Data Analysis**

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) Version 25. Data were imported directly from REDCap into SPSS. Descriptive statistics were used to describe continuous variables (e.g. age of participants, average number of children per classroom, amount of nutrition training received). Frequencies were used to describe categorical variables (e.g. gender, race/ethnicity, level of education, counties of EHS centers represented).

Fisher's Exact Test assessed the association between categorical variables, ethnicity and feeding style. Mann Whitney U test was performed to rank the differences between AA and White teacher responses on the CFSQ. We used Pearson's  $\chi^2$  test to test the null hypothesis that there we no differences between African Americans and White teachers on the Mealtime Verbal Comments Checklist. Independent *t*-tests were used to compare the average scores of supportive and non-supportive verbal comments between AA and White EHS teachers. The  $\alpha$  level for all analyses were at  $p \leq 0.05$ .

## CHAPTER 3: RESULTS

### Provider Characteristics

Sixty-eight teachers from 13 organizations (56% participation rate) across 22 NC counties completed the survey (Figure A). The final sample size was 65; data from 3 surveys were excluded from analyses because participants reported not working directly with toddlers. The mean age of participants was  $42.81 \pm 12.74$  years. The majority of participants were female (96.9%) and identified as non-Hispanic White (55%) or AA (43%). Nearly 42% of participants reported receiving a 4-year degree or higher while 50.8% report having at least a 2-year Associates Degree. The mean number of children per classroom was  $8 \pm 0.28$ . Nearly 88% of EHS teachers surveyed reported receiving nutrition education at their respective center, with 41.5% reporting receiving supplemental training at least 1 time per year and 44.6% receiving additional education at least 2 or more times per year.

### Feeding Style

Feeding style was determined from the CFSQ by calculating median splits of demandingness and responsiveness. Mean demandingness score was calculated as  $2.55 \pm 0.44$  and responsiveness as  $1.47 \pm 0.14$ . The demandingness and responsiveness scores for each feeding style were as follows: authoritative (2.75, 1.57), authoritarian (3.01, 1.35), indulgent (2.15, 1.59), and uninvolved (2.55, 1.47). Teachers were then categorized into four feeding styles based on demandingness and responsiveness: authoritative (n=11), authoritarian (n=22), indulgent (n=19), and uninvolved (n=12). Feeding styles were further determined by ethnicity (Table 1). Feeding style was not significantly different among AA and White teachers ( $p=0.33$ ). However, there were item specific differences in the CFSQ as follows: “physically struggle with the child to get

him or her to eat” (white  $\mu=35.93$  and AA  $\mu = 28.09$ ;  $p=0.02$ ), “give the child multiple servings of a certain food regardless of what has been eaten” (White  $\mu=37.38$  and AA  $\mu =26.23$ ;  $p=0.02$ ), “offer the children a second helping during the meal” (white  $\mu =35.25$  and AA  $\mu =26.95$ ;  $p=0.05$ ), “say to the child ‘hurry up and eat your food’” (White  $\mu =35.67$  and AA  $\mu =28.43$ ;  $p=0.05$ ), “get too busy to notice when the child talks about the food” (White  $\mu =35.93$  and AA  $\mu =28.09$ ;  $p=0.01$ ) (Table 2).

### **Verbal Comments during Mealtime**

Table 3 presents frequency of reported “yes” comments to items in the Verbal Comments Checklist. Statistical significant differences were observed between 4 items in the Verbal Comments Checklist: “when you’re playing with your cup, you’re showing me you’re done” ( $p=0.045$ ), “were you hungry?” ( $p=0.008$ ), and “you want some more?” ( $p=0.025$ ). White teachers had a mean of  $57.48\pm6.34$  unsupportive comments with AA averaging  $62.76\pm12.69$ . Supportive comments differed by ethnicity with White teacher scores of  $42.5\pm6.35$  versus  $37.24\pm12.69$  for AA.

## CHAPTER 4: DISCUSSION

Development of food preferences begin as early as infancy and continue to develop throughout the lifespan.<sup>23</sup> Caregiver feeding practices, in particular, are important in the facilitation of healthy eating behaviors in toddlers. Responsive caregivers are engaged in supporting children's autonomy and self-regulation while non-responsive caregivers exert permissive practices such as restriction and pressure to eat. Non-responsive practices have been associated with obesity and feeding difficulties.<sup>24</sup> Research focusing on feeding styles and practices of EHS teachers are limited in toddlers and fewer have focused on ethnic variations of feeding practices. This study sought to explore the self-reported feeding styles and ethnic differences in feeding practices of NC-based Early Head Start providers serving toddlers 12-36 months. Results from this study show teachers used Authoritarian (34%) or Indulgent (31%) feeding styles. We found no overall ethnic differences in feeding style but there were individual items differences in the CFSQ and Verbal Comments Checklist.

Feeding styles of EHS teachers in the current study were primarily identified as Authoritarian or Indulgent. Both the authoritarian and indulgent styles are in opposition of each other. Authoritarian styles have high demandingness and low responsiveness while indulgent styles have low demandingness and high responsiveness. Responsive feeding practices support toddlers' ability to communicate and recognize and interpret verbal and nonverbal communication signals from their caregiver.<sup>13</sup> The absence of caregiver-toddler interactions, may interfere with toddlers' ability to recognize hunger and satiety cues.<sup>25</sup> Childcare providers are displaying authoritarian or indulgent feeding styles in the classrooms which may suggest childcare providers are concerned with socioeconomic status (SES) of children in their classroom.<sup>26</sup> Teachers may modify their feeding styles in the classroom based on children's food

availability at home or children's hunger cues in the classroom.<sup>27</sup> Feeding styles of EHS teachers in our current study are consistent with results found by Hughes and colleagues which assessed feeding styles of preschool teachers.<sup>9</sup> Hughes and colleagues (2005) found that the authoritarian style was associated with high levels of restrictive eating and pressure to eat with low levels of nurturing and responsiveness.<sup>9</sup> Prior research has also shown that children who interacted with a caregiver displaying high demandingness and low responsiveness (authoritarian feeding style) showed reduced food enjoyment and higher levels of fussiness.<sup>8</sup> Authoritarian feeding styles are likely to foster feeding difficulties such as neophobia while the indulgent style has been associated with childhood obesity.<sup>9</sup>

Although there were no observed significant differences between feeding style, there were significant differences between individual items in the CFSQ among African Americans and Whites. Whites, on average, were more likely to offer children more servings regardless of the food eaten. Traditional restrictive feeding practices interfere with self-regulation in children and foster eating behaviors that contribute to obesity.<sup>6</sup> Studies reporting ethnic differences in parental feeding behaviors have suggested that minorities such as African American and Hispanic parents display more controlling behaviors compared to their white peers and are less likely to encourage balance and variety.<sup>28-29</sup> Data from the 2017 US Census reported that African Americans were nearly twice as likely to be at or below the poverty level.<sup>30</sup> This evidence suggest that because ethnic disparities exist in minority populations, food insecurity may potentially be a source of non-responsive feeding practices. There, feeding practices may not be generalizable between cultures or children of families with varying socioeconomic backgrounds.<sup>13,26</sup>

There were also significant differences between AA and whites in supportive comments from the Verbal Comments Checklist. AA reported higher scores of unsupportive comments and lower scores for supportive comments. Supportive interactions between the toddler and caregiver provide opportunities for younger children to develop healthy eating behaviors as they are introduced to new tastes and textures.<sup>31</sup> Mealtime environments in the absence of positive verbal communication foster adverse mealtime experiences and unsupportive of healthy eating habits.<sup>32</sup> Children who experience positive interactions during mealtime develop healthy food preferences.<sup>33</sup> Different verbal comment scores among AA and white teachers likely illustrate variation in cultural attitude towards food<sup>25</sup> as well as differing value systems<sup>34</sup>. African Americans and whites have different communication styles. African Americans rely on high context communication compared to whites who have a low context culture. High context cultures rely on implied meanings in relation to context while low context cultures, in contrast, rely heavily on verbal communication.<sup>35</sup> This implies that AA EHS teachers may have had less verbal interaction with toddlers during mealtime due to cultural communication styles. Feeding practices such as verbal comments made without context of the provider's attitudes and values likely disregard the providers' intention. For example, teachers who use coercive comments towards toddlers during mealtime practices may be considering external factors such as food insecurity.<sup>36</sup>

The current study is not without limitation. Data collection was limited to purposive sampling of childcare providers. The self-reported data was not observational in nature which could be the result of response bias among the providers. The web-based survey administered was lengthy and part of a larger study that included multiple tools assessing feeding styles, feeding practices, and factors affecting caregiver feeding practices. Because of the length of the

survey, there may have been a lowered response rate due to fatigue. To combat survey fatigue, participants were able to log back into the survey to finish at their convenience. A total of 65 participants completed the survey with a 56% response rate. Participants from this study were from EHS programs that coordinate with Child and Adult Care Food Program (CACFP)<sup>37</sup> for reimbursement for meals and snacks to eligible children and adults enrolled in child and adult care facilities. EHS and Head Start (HS) programs provide learning environments for low-resource children therefore the mealtime environment in the current study was controlled which may mean findings from this study are not representative of children from non-EHS programs. Traditional childcare programs may represent children from an array of socioeconomic backgrounds.

Future research should further explore qualitative ethnic differences in providers' attitudes and values surrounding mealtime to provide context for possible barriers to feeding practices that promote responsive feeding. EHS programs currently provide tools for promoting positive mealtime environments yet providers aren't creating environments conducive to children's ability to self-regulate.<sup>38</sup> Such tools should be reviewed by Registered Dietitian Nutritionists (RDNs) or adapted for provider ease-of-use as knowledge of ethnic variations in values and beliefs surrounding mealtime are explored. RDNs and the community of nutrition researchers can provide support and supplemental training to assist childcare providers in creating positive mealtime environments. Current HS standards do not require partnership with nutrition experts. In collaboration with HS, RDNs can have significant impacts on the health of low-resource toddlers. The Academy of Nutrition and Dietetics (AND) currently provide nutrition benchmarks in early care and education targeting children ages 2 to 5 years.<sup>39</sup>



Additional benchmarks should be created to bridge the gap for childcare providers serving children specifically 1-2 years.

## **CHAPTER 5: CONCLUSION**

Findings from this article suggest feeding styles of EHS teachers are not consistent with current evidence that supports positive mealtime behaviors in toddlers. Although there were not significant differences between feeding styles and ethnicity, further research should explore communication styles between ethnicities to understand barriers affecting providers' compliance with best practices in the field. Future interventions should focus on culture-specific approaches that aid teachers in supportive mealtime practices in childcare centers.

## CHAPTER 6: REFERENCES

- <sup>1</sup>U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2015 – 2020 Dietary Guidelines for Americans. 8th Edition. December 2015. Available at <https://health.gov/dietaryguidelines/2015/guidelines/>.
- <sup>2</sup>Freeman DS, Sharma AJ, Hamner HC, et al. Trends in Weight-for-Length Among Infants in WIC from 2000 to 2014. *Journal of American Academy of Pediatrics*. 2017; 139(1).
- <sup>3</sup>Woo Baidal JA, Locks LM, Cheng ER, Blake-Lamb TL, Perkins ME, Taveras EM. Risk Factors for Childhood Obesity in the First 1,000 Days: A Systematic Review. *American journal of preventive medicine*. 2016;50:761.
- <sup>4</sup>Reidy KC, Deming DM, Briefel RR, Fox MK, Saavedra JM, Eldridge AL. Early development of dietary patterns: transitions in the contribution of food groups to total energy— Feeding Infants and Toddlers Study, 2008. *BMC Nutrition*. 2017;3.
- <sup>5</sup>Raiten DJ, Raghavan Ramkripa, Porter A, Obbagy JE, Spahn J. Executive summary: evaluating the evidence base to support the inclusion of infants and children from birth to 24 mo of age in the Dietary Guidelines for Americans—“the B-24 Project”. *American Journal of Clinical Nutrition*. 2014; 99 (3): 663S-691S.
- <sup>6</sup>Birch LL, Doub AE. Learning to eat: birth to age 2 y. *The American Journal of Clinical Nutrition*. 2014; 99 (3): 723S–728S.
- <sup>7</sup>van der Horst K, Sleddens EFC. Parenting styles, feeding styles and food-related parenting practices in relation to toddlers' eating styles: A cluster-analytic approach. *PLoS One*. 2017;12(5):e0178149. Published 2017 May 24. doi:10.1371/journal.pone.0178149
- <sup>8</sup>Power TG, Silva Garcia K, Beck AD, Goodell LS, Johnson SL, Hughes SO. Observed and self-reported assessments of caregivers' feeding styles: Variable- and person-centered

approaches for examining relationships with children's eating behaviors. *Appetite*. 2018;130:174-183.

- <sup>9</sup>Hughes SO, Power TG, Orlet Fisher J, Mueller S, Nicklas TA. Revisiting a neglected construct: parenting styles in a child-feeding context. *Appetite*. 2005;44:83-92.
- <sup>10</sup>Collins C, Duncanson K, Burrows T. A systematic review investigating associations between parenting style and child feeding behaviours. *Journal of Human Nutrition and Dietetics*. 2014;27:557-568.
- <sup>11</sup>Wang L, van de Gaar, Vivian M, Jansen W, Mieloo CL, van Grieken A, Raat H. Feeding styles, parenting styles and snacking behaviour in children attending primary schools in multiethnic neighborhoods: a cross-sectional study. *BMJ Open*. 2017;7:e015495.
- <sup>12</sup>Liszewska N, Scholz U, Radtke T, Horodyska K, Luszczynska A. Bi-directional associations between parental feeding practices and children's body mass in parent-child dyads. *Appetite*. 2018;129:192-197.
- <sup>13</sup>Black MM, Aboud FE. Responsive feeding is embedded in a theoretical framework of responsive parenting. *The Journal of nutrition*. 2011;141:490-494.
- <sup>14</sup>Birch LL. Child Feeding Practices and the Etiology of Obesity. *Obesity*. 2006;14:343-344.
- <sup>15</sup>Kamdar N, Hughes SO, Chan W, Power TG, Meiningner J. Indirect Effects of Food Insecurity on Body Mass Index Through Feeding Style and Dietary Quality Among Low-Income Hispanic Preschoolers. *Journal of nutrition education and behavior*. 2019.
- <sup>16</sup>Speirs KE, Fiese BH, STRONG Kids Research Team. The Relationship Between Food Insecurity and BMI for Preschool Children. *Maternal and Child Health Journal*. 2016;20:925-933.

- <sup>17</sup>Edwards OW, Shipman W. Food insecurity and BMI for children and adolescents across six grade levels. *International Journal of Child and Adolescent Health*. 2018;11:15-22.
- <sup>18</sup>Birch LL, Ventura AK. Preventing childhood obesity: what works? *International Journal of Obesity*. 2009;33:S74-S81.
- <sup>19</sup>Blaine RE, Davison KK, Hesketh K, Taveras EM, Gillman MW, Benjamin Neelon SE. Child Care Provider Adherence to Infant and Toddler Feeding Recommendations: Findings from the Baby Nutrition and Physical Activity Self-Assessment for Child Care (Baby NAP SACC) Study. *Childhood Obesity*. 2015;11:34-313.
- <sup>20</sup>Freedman MR, PhD, Alvarez, Karina P., MS, RD. Early Childhood Feeding: Assessing Knowledge, Attitude, and Practices of Multi-Ethnic Child-Care Providers. *Journal of the American Dietetic Association*. 2010;110:447-451.
- <sup>21</sup>Perrin EM, Rothman RL, Sanders LM, et al. Racial and ethnic differences associated with feeding- and activity-related behaviors in infants. *Pediatrics*. 2014;133(4):e857–e867.
- <sup>22</sup>Early Head Start Programs. Head Start Early Childhood Learning & Knowledge Center. <https://eclkc.ohs.acf.hhs.gov/programs/article/early-head-start-programs>. 2018. Accessed June 3, 2019.
- <sup>23</sup>Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap) – A metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009; 42(2):377-81.
- <sup>24</sup>Ramsay SA, Branen LJ, Fletcher J et al. “Are you done?” Child care providers’ verbal communication at mealtimes that reinforce or hinder children’s internal cues of hunger and satiation. *J Nutr Educ Behav*. 2010; 42:265-270.

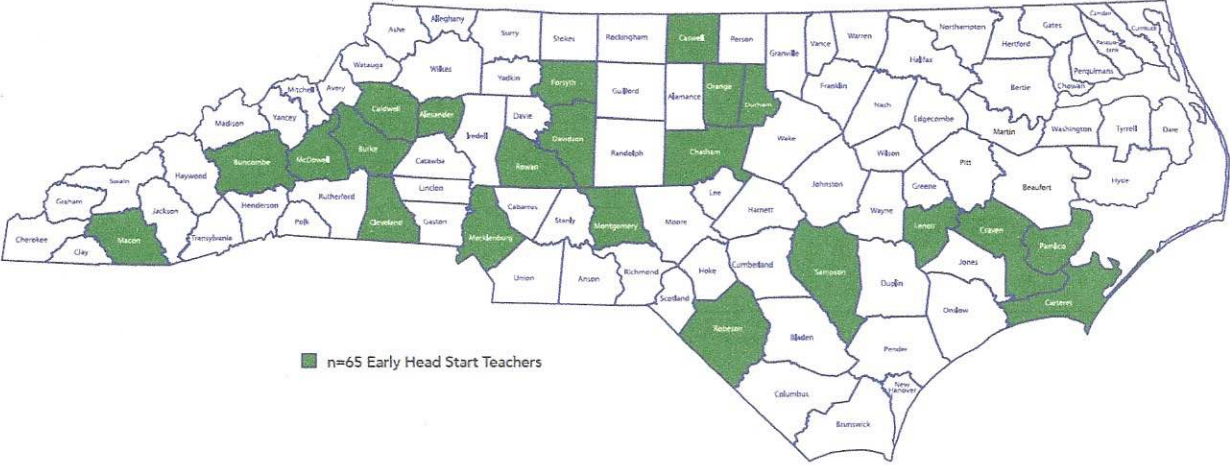
- <sup>25</sup>National Institute on Deafness and Other Communication Disorders (U.S.). Speech and Language Developmental Milestones. Vol no. 10-4781.;no. 10-4781;. Bethesda, Maryland: U.S. Department of Health & Human Services, National Institutes of Health, National Institute on Deafness and Other Communication Disorders; 2010.
- <sup>26</sup>Dev DA, MS, McBride BA, PhD, STRONG Kids Research Team. Academy of Nutrition and Dietetics benchmarks for nutrition in child care 2011: Are child-care providers across contexts meeting recommendations? *Journal of the Academy of Nutrition and Dietetics*. 2013;113:1346-1353.
- <sup>27</sup>Ventura A, Worobey J. Early Influences on the Development of Food Preferences. *Current Biology*. 2013;23:R401-R408.
- <sup>28</sup>Machado RHV, Tosatti AM, Malzyner G, et al. Maternal Feeding Practices among Children with Feeding Difficulties-Cross-sectional Study in a Brazilian Reference Center. *Frontiers in Pediatrics*. 2017;5:286.
- <sup>29</sup>Dovey TM, Staples PA, Gibson EL, Halford JCG. Food neophobia and ‘picky/fussy’ eating in children: A review. *Appetite*. 2008;50:181-193.
- <sup>30</sup>Proserpio C, Laureati M, Bertoli S, Battezzati A, Pagliarini E. Determinants of Obesity in Italian Adults: The Role of Taste Sensitivity, Food Liking, and Food Neophobia. *Chemical senses*. 2016;2015;41:169.
- <sup>31</sup>Lindsay AC, Sitthisongkram S, Greaney ML, Wallington SF, Ruengdej P. Non-Responsive Feeding Practices, Unhealthy Eating Behaviors, and Risk of Child Overweight and Obesity in Southeast Asia: A Systematic Review. *International journal of environmental research and public health*. 2017;14:436.

- <sup>32</sup>Hughes SO, Shewchuk RM, Baskin ML, Nicklas TA, Qu H. Indulgent feeding style and children's weight status in preschool. *Journal of developmental and behavioral pediatrics* : JDBP. 2008;29:403.
- <sup>33</sup>Lumeng JC, MD, Kaplan-Sanoff M, EdD, Shuman S, BS, Kannan S, PhD. Head Start Teachers' Perceptions of Children's Eating Behavior and Weight Status in the Context of Food Scarcity. *Journal of Nutrition Education and Behavior*. 2008;40:237-243.
- <sup>34</sup>Gu, C., Warkentin, S., Mais, L. A., & Carnell, S. (2017). Ethnic differences in parental feeding behaviors in UK parents of preschoolers. *Appetite*, 113, 398-404.
- <sup>35</sup>Kiefner-Burmeister A, Hoffmann D, Zbur S, Musher-Eizenman D. Implementation of parental feeding practices: does parenting style matter? *Public health nutrition*. 2016;19:2410-2414.
- <sup>36</sup>Power TG, Sleddens EF, Berge J, et al. Contemporary research on parenting: conceptual, methodological, and translational issues. *Child Obes*. 2013;9 Suppl(Suppl 1):S87–S94.
- <sup>37</sup>Harding C, Wade C, Harrison K. Communication between children and carers during mealtimes. *Journal of Research in Special Educational Needs*. 2013;13:242-250.
- <sup>38</sup>Swindle T, Rutledge JM, Dix B, Whiteside-Mansell L. Table Talk: development of an observational tool to assess verbal feeding communications in early care and education settings. *Public health nutrition*. 2017;20:2869-2877.
- <sup>39</sup>Mita SC, Gray SA, Goodell LS. An explanatory framework of teachers' perceptions of a positive mealtime environment in a preschool setting. *Appetite*. 2015;90:37-44.
- <sup>40</sup>Leal S, Vrij A, Vernham Z, et al. Cross-cultural verbal deception. *Legal and Criminological Psychology*. 2018;23:192-213.

- <sup>41</sup>Swindle TM, Patterson Z, Boden CJ. A Qualitative Application of the Belsky Model to Explore Early Care and Education Teachers' Mealtime History, Beliefs, and Interactions. *Journal of Nutrition Education and Behavior*. 2017;49:568-578.e1.
- <sup>42</sup>Observational Research, Advantages and Disadvantages. *Encyclopedia of Communication Research Methods*. 2017.
- <sup>43</sup>United States. Office of Child Development. Positive Eating Environment Tool. 2019. U.S. Dept. of Health and Human Services, Administration for Children and Families, Head Start Bureau. <https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/positive-eating-assessment.pdf> (accessed June 6, 2019).
- <sup>44</sup>Early Head Start Programs. Head Start Early Childhood Learning & Knowledge Center. Head Start Program Performance Standards. <https://eclkc.ohs.acf.hhs.gov/policy/45-cfr-chap-xiii>. 2018. Accessed June 20, 2019.
- <sup>45</sup>Benjamin-Neelon SE. Position of the Academy of Nutrition and Dietetics: Benchmarks for Nutrition in Child Care. *Journal of the Academy of Nutrition and Dietetics*. 2018;118:1291-1300.



**Figure A.** NC Counties represented by Early Head Start teachers (n=65)



**Table 1.** Feeding Style Classification of North Carolina Early Head Start Teachers by Ethnicity (n=64)

Feeding Style	Ethnicity n (%)		Total
	White	African American	
Authoritative	9 (81.80)	2 (18.20)	11
Authoritarian	11 (50.00)	11 (50.00)	22
Indulgent	9(45.00)	10 (50.00)	19
Uninvolved	7 (58.30)	5 (41.70)	12

**Table 2.** Descriptive Statistics of Child Feeding Style Questionnaire of North Carolina Early Head Start teachers (N=64)

Items	Mean		Total	U	P
	White	African American			
Physically struggle with the child to get him or her to eat	1	1	1	391.50	0.02*
Allow the children to eat as much as they want	5	3	4	361.00	0.06
Promise the children something other than food if he or she eats	1	1	1	414.00	0.09
Permit the children to decide whether they get a second or third helping	4	3	4	400.00	0.14
Encourage the children to eat by arranging the food to make it more interesting	2	2	2	540.50	0.61
Wait to give the children more food until they have finished another food on the plate	2	3	2	528.50	0.73
Ask the children questions about the food during lunch	5	5	5	589.50	0.06
Let the children decide when they are done eating	5	5	5	567.50	0.26
Tell the children to eat at least a little bit of food on their plate	4	4.5	4	576.00	0.30
Reason with the children to get them to eat	4	4	4	557.50	0.45
Say something to show your disapproval of the children for not eating lunch	1	1	1	411.00	0.10
Allow the children to choose the foods they want to eat for lunch	3	2	2	428.80	0.28
Give the children multiple servings of a certain food regardless of what has been eaten	3	2	3	328.50	0.02*
Compliment the children for eating food	4.5	5	5	568.50	0.32

Let the children decide how much they should eat off the plate	5	5	5	533.00	0.65
Suggest to the children that they eat meals	3	3	3	460.00	0.71
Allow the children to eat what they want to eat	5	4	5	392.00	0.09
Offer the children a second helping during the meal	5	4	5	348.50	0.05*
Say to the child "hurry up and eat your food"	1	1	1	390.00	0.05*
Warn the child that you will take away something other than food if he or she doesn't eat	1	1	1	479.50	0.43
Take a second helping yourself in front of the children during lunch	3	2.5	3	418.00	0.22
Encourage the children to eat something by using food as a reward	1	1	1	517.00	0.82
Let the children eat when they want to eat	2	2.5	2	549.00	0.53
Warn the child that you will take a food away if the child doesn't eat	1	1	1	462.00	0.12
Feel like not responding when a child asks about the food	1	1	1	474.00	0.44
Say something positive about the food while the children are eating during lunch	5	5	5	553.00	0.41
Spoon-feed the children to get them to eat lunch	2	2	2	420.50	0.24
Help the children to eat meals	4	4	4	443.00	0.39
Tell the children to eat something on the plate	3	3	3	576.00	0.31
Beg the children to eat the meals	1	1	1	578.00	0.11
Get too busy to notice when the child talks about the food	1	1	1	380.50	0.01*

<sup>a</sup> Comparison of groups, African American and White, made with Mann-Whitney U  
Median scores range from 1 (never) to 5 (always)  
\* $p < 0.05$  considered significant

**Table 3.** Mealtime Verbal Comments Checklist of North Carolina Early Head Start Teachers (N=65)

	White	African American	Pearson Chi-Square	
<b>Non-supportive Comments</b>	%	%	$\chi^2$	<i>p</i> -value
Mmm. Mmm. Its good, eat some.	60.00	40.00	5.49	0.02*
The lights will go off soon for naptime so finish your lunch.	62.50	37.50	1.02	0.31
Are you done?	57.10	42.90	1.31	0.25
You are the vegetable queen, the vegetable lady.	60.70	39.30	0.40	0.53
When you're playing with your cup, you're showing me you're done.	60.70	39.30	3.67	0.06
Drink some milk at least, even if its just a little bit.	62.00	38.00	3.07	0.08
You want some more?	57.40	42.60	0.67	0.41
Let's go, hurry up. It's time to go.	66.70	33.30	0.65	0.42
Let's see you make a happy plate.	61.30	38.70	0.62	0.43
Lunch time is over.	55.20	44.80	0.03	0.87
We are good eaters, [child's name] and I. I like the way she eats; she eats all her food.	58.70	41.30	0.40	0.53
I also do not like green beans	70.60	29.40	1.93	0.16
<b>Supportive Comments</b>				
Milk will make you big and strong like mommy.	61.00	39.00	6.97	0.01*
Does it make your tummy happy?	62.70	37.30	4.30	0.04*
Can you put a little tiny bit on your plate? Just try it.	58.30	41.70	0.40	0.56

When we run out of those, if you're still hungry, you'll have to try some green beans or some fruit.	65.00	35.00	3.32	0.07
Were you hungry?	61.80	38.20	4.93	0.03*
Are you full?	60.40	39.60	2.14	0.14
Does your body have what it needs?	62.90	37.10	1.37	0.24

<sup>a</sup>White

<sup>b</sup>African American

Teachers were asked to respond to the items in the Verbal Comments Checklist using a Likert Scale from 1 (never) to 5 (always). A dichotomous scale was created to code "rarely", "sometimes", "mostly" and "always" responses into "yes" and "never" responses to "no".

\*p<0.05 considered significant

Ramsay SA, Branen LJ, Fletcher J et al. "Are you done?" Child care providers' verbal communication at mealtimes that reinforce or hinder children's internal cues of hunger and satiation. *J Nutr Educ Behav.* 2010; 42:265-270.

## APPENDIX A: IRB PERMISSION LETTER



EAST CAROLINA UNIVERSITY  
University & Medical Center Institutional Review Board  
4N-64 Brody Medical Sciences Building· Mail Stop 682  
600 Moye Boulevard · Greenville, NC 27834  
Office 252-744-2914 · Fax 252-744-2284  
[www.ecu.edu/ORIC/irb](http://www.ecu.edu/ORIC/irb)

### Notification of Amendment Approval

From: Social/Behavioral IRB  
To: [Caitlin Bullard](#)  
CC: [Virginia Stage](#)  
[Virginia Stage](#)  
Date: 4/3/2018  
Re: [Ame1\\_UMCIRB 17-002831](#)  
[UMCIRB 17-002831](#)  
Feeding Practices Early Head Start

Your Amendment has been reviewed and approved using expedited review for the period of 4/3/2018 to 3/11/2019. It was the determination of the UMCIRB Chairperson (or designee) that this revision does not impact the overall risk/benefit ratio of the study and is appropriate for the population and procedures proposed.

Please note that any further changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. A continuing or final review must be submitted to the UMCIRB prior to the date of study expiration. The investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Document	Description
Bullard Teacher Recruitment Flyer.pptx(0.01)	Recruitment Documents/Scripts
Childcare Mealtime Initiative_Final.pdf(0.01)	Surveys and Questionnaires
Teacher Consent Form(0.02)	Consent Forms

The Chairperson (or designee) does not have a potential for conflict of interest on this study.