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In the U.S., African-American children suffer from higher rates of obesity than their white peers. African American families are often multi-generational, with extended family members, especially women, caring for child relatives. Yet little is currently known about the influence of these female extended family members (EFMs) on African American children's dietary and physical activity behaviors. The purpose of this study was to examine relationships between the amount of time an African American child spent with an EFM, the frequency of child physical activity and eating around the EFM, and family members' weight status. Data were collected and analyzed as part of a larger study examining relationships in African-American families (*n*=47). Participating families consisted of the mother, her child aged 8-12 years, and an EFM. Participants were recruited from community organizations in Guilford County, North Carolina. Family Systems Theory guided the research in accordance with current literature which suggests that family-based lifestyle interventions achieve better outcomes than education or information only interventions. Eighty-eight percent of non-pregnant mothers (*n*=44) and 87% of non-pregnant EFMs (*n*=45) were classified as overweight or obese as defined by Body Mass Index (BMI) compared to 47% of the children in the study as defined by Body Mass Index For Age (BMI-For-Age). EFMs comprised 10 grandmothers, two great grandmothers, one great aunt, 19 aunts, and 15 cousins. No significant association was found between time spent with EFMs and frequency of child eating and physical activity behaviors. Children were less active around grandmothers and great grandmothers

compared to aunts and cousins ($p<0.05$). Children were less active and ate less frequently around relatives 45 years and older ($p<0.01$). No significant relationship was found between child weight status and frequency of physical activity around EFMs. Children with higher weight status were more likely to be related to grandmothers, great grandmothers and great aunts than to aunts and cousins ($r=-0.289$, $p<0.05$); to spend 4 days or more with EFMs ($r=0.311$, $p<0.05$); and to have an EFM who was overweight or obese herself ($r=0.314$, $p<0.05$). EFM relationship type and time spent with the EFM were significantly predictive of child BMI status. EFM BMI was also predictive. EFM age and frequency of physical activity around the EFM were not ($p<0.05$). These findings call for future research to help understand how EFMs influence the dietary and physical activity behaviors of children in their care.

AN EXAMINATION OF THE INFLUENCE OF AFRICAN-AMERICAN EXTENDED FAMILY RELATIONSHIPS ON CHILD WEIGHT STATUS

by

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CHAPTER I

INTRODUCTION

The World Health Organization views childhood obesity as one of the most serious public health crises of the twenty-first century.[1] This crisis is prevalent at the global and local levels. In North Carolina, for example, 27% of white children between the ages of 10 and 17 are either overweight or obese, and these numbers rise to 37% for Hispanic children and 44% for African American children.[2] A similar pattern of health disparities exists in Guilford County.[3] The link between childhood obesity and adult chronic disease such as heart disease, hypertension and diabetes has long been recognized.[4] Few would dispute the large body of evidence demonstrating the impact of overweight and obesity in childhood on morbidity and mortality in adulthood. Obese children are more likely to become obese adults with all the health implications that entails.[5]

Although rates of obesity in North Carolina are highest for African American children, weight loss interventions have been shown to be less effective for African American populations than for white populations.[6] Evidence acquired for interventions therefore needs to examine cultural and social aspects of African American communities to promote healthy eating and lifestyle behaviors. Cultural influences should be seen as assets, rather than barriers.[7]

There is a need for behavioral science theories when designing obesity interventions. These theories should form a framework for interventions, incorporating social and historical contexts of the participants involved. If behavioral science models are not used, the many influences that determine attitudes, beliefs and understanding of different cultural groups will be omitted and interventions may be less effective.[7]

Gender differences are important to assess, as the difference in effectiveness of weight loss interventions for African American populations is more pronounced for females.[8] It is important however, not to overlook boys, as obesity rates although not as high as for girls, are still higher than those for white boys.[7]

Mothers are critical role models, regulating their children's health habits.[9] Yet most research to date has focused on parents, rather than mothers per se. Research regarding mothers' roles has tended to focus on the 3- to 5-year old age group, as this is when dietary habits form and, to a large extent, become entrenched. However, given today's prevalence of childhood obesity, it is relevant to focus on school-aged children's weight status also. Moreover, children's autonomy increases as they age, so it is important to understand the family's influence over time, not just when children are younger.

African American families are often multi-generational, with relatives, especially female relatives, caring for and influencing healthful behaviors of children. Female extended family members (EFMs), therefore, may have a profound effect on child dietary and exercise habits.[10] Although there have been some studies that examine family

interventions for African American childhood obesity, there are very few that consider the influence of EFMs. Those that do, have tended to be with grandparents only.[11, 12] Results of these studies have shown positive changes in nutrition knowledge following extended family-based interventions, as well as insights into barriers families face when trying to make lifestyle changes.[12] There are even fewer studies that consider the effect of other EFMs such as aunts or cousins. Given the promising results of interventions with grandparents, it would be valuable to also consider the effect of other female relatives.

There is scant research that examines relationships between EFMs, mothers, and the child relatives they care for. The influence of EFMs, of course, extends far beyond nutritional knowledge. In order to design an obesity intervention, it is important to consider factors such as the amount of time a child spends with his or her EFM, the frequency of child physical activity around the EFM when the mother is not present, and family members' weight status. For example, an EFM who spends more time with the child may be more likely to influence child dietary and physical activity behaviors. Child gender and the type of family relationship (grandmother, aunt, cousin etc.) have also not been closely examined in the past. Most research has been conducted with African American girls, not boys.[8] Grandparents have been considered in a handful of studies, but rarely have other extended family members.[11, 12]

There are very few studies of obesity interventions that consider perspectives unique to African American families, yet to omit such consideration is to bypass cultural relevance. To increase success rates and reduce attrition rates of obesity interventions for

African American children, it is necessary to examine extended family relationships in a culturally tailored and targeted setting. This will better the understanding of the context in which a successful intervention might be established.

Study Objectives

Aim 1: To examine the relationship between the amount of time the child spends with the EFM, and frequency of child eating and physical activity around the EFM when the mother is not present.

Hypothesis 1: A child who spends more time with an EFM is more likely to eat around the EFM when the mother is not present.

Hypothesis 2: A child who spends more time with an EFM is more likely to be physically active around the EFM when the mother is not present.

Aim 2: To examine the relationship between the frequency of child physical activity around the EFM when the mother is not present and child weight status.

Hypothesis 3: A child who is physically active more frequently around an EFM when the mother is not present, is less likely to have a high BMI.

Aim 3: To examine the relationship between the amount of time the child spends with the EFM, and the EFM's and child's weight status.

Hypothesis 4: A child who spends more time with an EFM with a high BMI is more likely to have a high BMI.

CHAPTER II

REVIEW OF THE LITERATURE

Childhood Obesity in the African American Community

Obesity is disproportionately high in racial and ethnic minorities such as African Americans, yet existing interventions seem to be less impactful for these groups.[7] The problem is two-fold. There are few targeted interventions for African Americans, and attrition rates are higher for minority populations when compared to non-minority populations.[13] Clearly, something needs to change. This literature review will examine obesity prevention and treatment interventions to date especially those that have targeted African American adults and children, discuss factors that need to be taken into account when designing interventions for African American adults and children, and identify gaps in the literature.

Health Disparities

The prevalence of obesity in African American children and adults is high compared to US whites. Studies have shown that obesity interventions have less impact and higher attrition rates than for whites, but evidence is limited as to how improve the effectiveness of such interventions.[7]

Several randomized clinical trials have shown that when exposed to the same interventions, African American men and women attain smaller weight losses than white

participants. For example, one study by West et al. compared weight loss outcomes for African American, white and Hispanic men and women in the lifestyle treatment of the Diabetes Prevention Program (DPP).[14] The DPP was a randomized, controlled, multi-center trial designed to compare the effects of lifestyle and metformin in delaying or preventing type 2 diabetes. Lifestyle interventions such as weight reduction were shown to be much more effective than medication in delaying the onset of type 2 diabetes. Outcomes were compared by gender and race in order to facilitate understanding of intervention outcomes among minority populations. It was found that African-American women lost significantly less weight than all other race and gender groups ($p<0.01$). This remained true after a period of 12 months. In a study by Kumanyika et al., race-specific weight-loss results from 2 randomized, multicenter trials were compared: the Hypertension Prevention Trial (HPT), and the Trials of Hypertension Prevention (TOHP).[15] Mean weight loss averaged 2.2 kg less in black women than white women during an 18 month follow up period for HPT. Mean weight loss averaged 2.7 kg less in black women than white women during a 36 month follow up period in the TOHP trial. Over the same periods of time, mean weight loss for men averaged 2.0 kg less in black participants in the HPT trial, and 1.4 kg less in black participants in the TOHP trial. These racial differences in weight loss were statistically significant for both trials ($p<0.05$).

These results suggest that lifestyle interventions may have lower adherence rates within African American adult populations.[7] Similarly, although there have been some

reports of stabilized upwards trends amongst obesity prevalence in children, studies suggest that these stabilized trends do not exist for African American children. A study by Madsen et al. examined prevalence of high BMI amongst Californian 5th, 7th and 9th graders between 2001 ns 2008.[16] Logistic regression was used to identify trends in prevalence of high BMI. The study found that from 2001 to 2008, prevalence increased for African American girls, but declined for non-Hispanic white girls. In 2008, disparities in prevalence were greatest for BMI ≥99th percentile, with 4.6% for African American girls compared to 1.3% for non-Hispanic white girls. Black boys showed no increase in prevalence from 2001 to 2008 except for BMI ≥99th percentile, which peaked in 2007.

Various reasons have been put forward for the difference in weight loss outcomes between blacks and whites. For example, attitudes and preferences towards physical activity and eating may affect the impact of weight loss interventions. These attitudes and preferences may be influenced by social and historical contexts.[17] Environmental influences have been categorized as physical, economic and sociocultural. Examples of physical environment obstacles would be limited access to full service grocery stores, or lack of pedestrian pathways. These factors might make compliance with interventions difficult. Economic factors impeding success would include unstable employment status or the prohibitively high cost of private gyms. Sociocultural factors might include high sugar and high fat foods in traditional cooking and cuisine or high exposure to television commercials for food.[7]

Evidence has shown that African American children and adults are exposed to disproportionately higher advertisements for sedentary forms of entertainment and high-calorie foods and beverages. One study by Powell et al. analyzed television ratings to examine trends in food advertising seen by U.S. children and adolescents. A trend analysis was performed in 2003, 2005, and 2007, including separate analyses by race. The participants were children aged 2 to 5 years, 6 to 11 years, and adolescents aged 12 to 17 years.[18] The authors found that in general, African American children watched more food ads per day than white children. This is consistent with other research that has shown that African American after-school and prime-time programming contains more food advertisements.[19, 20] Other research has shown that African American children spend longer amounts of time watching television than white children.[21] Of concern in the Powell et al. study was the fact that the racial gap in exposure grew between 2003 and 2007. In particular, African American children and adolescents had more than double the rate of increase in exposure to fast food commercials than white children. It is not hard to see that such exposure could obscure more positive health advice as has been suggested by other authors.[22]

Systems Level Approach

The Academy of Nutrition and Dietetics advocates a systems level approach for the reduction of childhood obesity, with interventions taking place at the individual, family, school and community level.[23] At the family level, parents exert direct influence over the daily food choices and activity levels of their children. As such, it would seem

they are best placed to promote healthy weight and lifestyle behaviors. There is evidence from a review of the literature that family-based lifestyle interventions achieve better results when compared to information only/education interventions.[24] This is especially true in African American families, where extended family members are very influential in child socialization and other behaviors.[25] These factors will be considered next.

Most studies looking at family-based obesity interventions have been conducted with white families. Although promising, results may not be representative of a more diverse population. It has been suggested by the American Heart Association (AHA) in a review of parents and adult caregivers as "agents of change," that there is a need for more diverse studies that include racial and ethnic minorities, a need for studies that specifically tailor interventions to different cultural groups, and a need for more studies that examine the nature of family relationships.[26] In addition, the Institute of Medicine has recommended assessments of how parents engage with children and adolescents in obesity-related interventions as a step to reducing health disparities.[27]

For the few behavioral interventions that do exist for racial/ethnic minority youth, there is evidence that family interventions are among the most successful.[28] African American families, historically, have strong home environments.[8] There are two aspects to this when considering childhood obesity interventions. First, it is important to examine interpersonal parent-child relationships, and secondly, it is important to examine extended family relationships.

As regards parent-child relationships, studies have tended to focus on parents and African American adolescent girls, as this group has the highest prevalence of obesity and reduced effectiveness of weight loss interventions compared to other ethnic groups.[29] Due to the importance of the matriarch in African American culture, the role of the mother in obesity interventions should be taken into account.[30] One pilot intervention by Barr-Anderson et al. for mothers and daughters (mean age 12.4 years) recruited participants to follow a 9-month culturally tailored healthy eating, physical activity, and social support intervention.[30] The study was guided by the socioecological model and social cognitive theory. Examples of surface level cultural adaptations included same race instructors, and same race models in study materials. Examples of structural level cultural adaptations included the inclusion of commonly eaten African American foods in the dietary component, family-based participation in cooking and taste-testing nutritious meals, and demonstrations of different kinds of dance, including "Gospel aerobics." The program emphasized health, recognized the framework of culturally influenced body image, and focused on food-related cultural and social practices. Focus groups were conducted to gather feedback from participants. The intervention found positive improvements in family relations, eating habits and levels of physical activity, following the intervention. Mothers stated that the intervention helped forge stronger communication with their daughters, and daughters stated that they had more conversations with their mothers about healthy eating and physical activity following the

intervention. However, the sample size was small and the study focused on Midwestern African American females so it might not be generalizable to the population as a whole.[30]

In another study by White et al., a family based weight loss intervention was conducted via the internet over a period of 6 months. Participants consisted of 57 overweight African American female adolescents between the ages of 11 and 15, and one obese parent. Participants were randomized between an education-based control group and an internet-based weight loss program. The internet program was culturally tailored and included self-monitoring, goal-setting and problem solving components. At 6 months, there were significantly greater reductions in both weight and body fat for adolescents taking part in the intervention, compared to those in the control group. An interesting finding of this study was that family functioning and parental satisfaction with life was found to significantly mediate weight loss in this group of adolescent girls.[31]

The conclusions of these and other similar studies indicate the need for more research to understand the role of parental support and how this can help reduce obesity related health disparities.[32] Many interventions do not allow inferences to be made as to how best to involve family members. However, the literature does indicate that future research should study different levels and types of family involvement.[8]

A qualitative study by Brown et al., using semi-structured interviews with 24 participants across 8 African American families, found that adults were inconsistent in the way they taught children to adopt healthful dietary behaviors. Other findings in the

study suggested children learn from adults to value activities that combine the enjoyment of food eaten with family members and quality family time.[10]

While it is certainly important to try to reduce obesity among adolescent African American girls, the tendency of research to focus on this group means that interventions for children of other ages, or even interventions for boys, are hard to find in the literature.

There has also been relatively little research on the subject of how much influence EFMs exert on African American children's eating and exercise habits.[7] Yet as stated above, these family members form an integral part of their child-relatives' lives. African American families are often multi-generational, with family members across and within generations actively involved in caring for and raising children.[10] Children who spend time with EFMs are therefore likely to be influenced by the eating and exercise habits of these family members, a fact which has been borne out by research. In one study of inter-generational African American families in Oklahoma, significant correlations were found between grandparent and child BMI. Also, more sedentary grandparents were associated with less physical activity in the children they cared for.[11] Another study involving urban African American grandparents in the Atlanta, Georgia area, found that following participation in a physical activity and nutrition program, knowledge of both physical activity and nutrition increased, and grandparents were better able to assess portion sizes than before the intervention.[12] Given the success with grandparents, future research needs to focus on other EFMs who play a role in the lives of the children in their extended family.

Parents and family members as agents of change cannot be viewed in isolation. Relationships between family members are crucially important in terms of communication about food preferences, portions and other aspects of eating together. Families who communicate ineffectively will have a lot more conflict surrounding food-related decisions than those who communicate effectively.[33]

Behavioral Science Theories

Perhaps the biggest need when designing interventions for specific cultural groups is for the consistent use of behavioral science theories that incorporate the social and historical contexts of the participants involved. Moreover, theoretical frameworks can help design interventions that target multiple behaviors, rather than single ones.[34] To omit such consideration is to omit the many influences that determine the attitudes, beliefs and understanding of such groups.

Studies that use behavioral perspectives unique to African American families have provided valuable insight into effective weight loss strategies.[32, 35] If used consistently, theoretically based approaches can be used to mediate behavior change by assessing factors such as self-efficacy, which can then be built upon in future research.[18] However, most studies tend not to use them.[8] In addition, when theoretical frameworks are used, they tend to vary between studies, which makes comparison difficult.[36]

The most common theoretical models that have been used include the social cognitive theory, the transtheoretical model of behavior change, and the social ecological model, focusing on the family level and family systems theory.

Through social cognitive theory, participants are able to change behavior through a personal sense of control: if people believe they can take action to solve a problem or overcome a barrier, they are more likely to do so.[37] The mother and daughter intervention by Barr-Anderson et al. mentioned above used social cognitive theory and a family level approach as a framework for the study.[30] For example, the intervention was culturally tailored at both the surface and structural level (same race instructors, and the inclusion of commonly eaten African American dishes, respectively). The framework for the study addressed food related cultural and social practices, and included a family based intervention component.

In general, studies for both adults and children suggest that the involvement of family members in obesity interventions may be more effective when looking at long term behavior change.[38] Families provide rules, positive reinforcement, and encouragement, and hence family dynamics play an important role in children's healthy lifestyle choices.[39] This may be an especially effective, culturally appropriate strategy for behavioral change in African American families.[8] Additionally, the involvement of female primary caregivers is important to pay attention to, due to the influence of the matriarch in African American culture.[40] Within African American families, women often head households, and shoulder the responsibility of family resources and care of family members. As such, women make many key family decisions, such as which foods to prepare, which may directly impact healthy eating.[30]

No intervention in the world is going to work if participants are not ready to make a behavior change. Therefore, the transtheoretical model is often used in association with social cognitive theory to gauge participants' readiness for change.[41] For example, in the Barr-Anderson et al. mother and daughter study, participants were volunteers who elected to participate in the intervention. Oh et al. examined relationships between adherence to a walking intervention in a group of urban African American women and perceptions of neighborhood crime and safety.[41] Telephone screening was used to determine eligibility, during which the Stage of Readiness to Change Exercise Behavior Scale was used to assess each woman's stage of behavior change.[42]

The social ecological model provides a comprehensive framework that recognizes the many spheres of influences affecting an individual's behavior.[43] This theory proposes that intrapersonal, interpersonal, environment and policy components all influence the way people behave. The family and social context are at one level of the ecological model that can influence the dietary and physical activity behaviors of children and adolescents, although as stated, theoretical constructs in interventions targeting youth vary from study to study which makes comparisons difficult.[44]

Family Systems Theory explains human behavior in terms of multiple interrelated systems, including family structure. According to this theory, all systems are interrelated parts of an ordered whole, with each subsystem influencing other parts of the whole.[9] In the context of the family, positive family communication and parenting skills are key elements and supporting factors. The use of family-based interventions has long been

supported by obesity research studies.[45] Family dynamics can influence weight-related behaviors among family members in many ways.[46] For example, parental dietary patterns, or the frequency with which families sit down and eat together, have been shown to affect children's eating behaviors.[10] Due to the involvement of EFMs in the raising and care of children in African American families, EFMs may also have an important role to play in influencing children's dietary behaviors.[10] This intergenerational cultural framework is well placed to be incorporated into a family-systems based obesity intervention. However, there is scant literature concerning children's relationships with their EFMs and how this might impact children's healthful dietary behaviors. More research is needed to help understand this important interaction between family members.[10]

Effectiveness of Studies Designed for African Americans

It is only relatively recently that obesity interventions have been designed for specific cultural groups such as African Americans, so the evidence base is small.[7]

Factors that make effectiveness difficult to evaluate include the fact that many studies are pilot studies and/or of short duration.[36] Many obesity interventions for African American adults tend to have small sample sizes with limited follow up, which makes comparability between studies difficult.[47] As mentioned earlier, attrition rates tend to be high for African American participants, which again makes study evaluation difficult. For example, a study by Bopp et al. designed to increase physical activity levels and nutrition knowledge had an attrition rate of 36% from the treatment group, and 58% from the control group, despite being modeled on social cognitive theory and the transtheoretical

model of behavior change, and despite a 3- and 6-month post-intervention follow up.[48] Additional research is needed to help understand how best to retain African American participants.[36]

When it comes to the effectiveness of obesity interventions for African American children, there are even fewer studies to compare. As with studies for adults, studies for children vary in terms of intervention length, cultural adaptation, theoretical frameworks, and methodological quality. Studies tend to be with adolescent or pre-adolescent girls, and involvement of parents is not the norm.[49] For the scant number of studies that have been carried out, effects of interventions on weight-related behaviors have been promising, but results tend to be non-significant. In addition, data is usually not sufficient to be able to infer how best to involve family members in interventions.[8]

Despite the above limitations, when interventions are culturally tailored and targeted, results have shown promise. Robinson et al. noted that based on the literature, African American women were less dissatisfied with a higher body weight than white women, and were therefore less likely in general to engage in weight-reducing behaviors.[50] The authors wanted to design a culturally tailored intervention aimed at increasing physical activity and reducing sedentary behaviors among African American girls. They therefore focused on dance as the physical activity component, and reduced television watching as the decreased sedentary activity component. Thus, the emphasis was not on weight loss per se, but on other relevant, culturally relevant and weight-related behaviors that would achieve the same aim. 52 African American girls aged 8-10,

with a BMI-for-age greater than or equal to the 50th percentile, and at least one overweight or obese parent completed a 12-week, randomized control trial. Daughters and their parents/guardians were randomized to either a treatment group (dance classes, in home lessons on reduction of television viewing time, and culturally appropriate newsletters for parents/guardians), or a control group (community health lectures and mailed newsletters only). Although there was not sufficient statistical power to test the effectiveness of the intervention compared to the control group, the authors found that the treatment group reported 23% reduced household television viewing hours compared to the control group, and 7% increased minutes of moderate physical activity compared to the control group after the dance intervention had ended. Girls in the treatment group tended to have lower BMI-for-age and waist circumference than girls in the control group following the intervention, and there was evidence of greater treatment effects for those participants who had greater baseline values. A strength of this study was that by tailoring and integrating the intervention to meet participants' needs, there was a very successful retention rate among this sample. Only one family was lost to follow-up, and participation and completion rates were very high. Limitations include the fact that only girls were included, and there was not enough statistical power to draw larger inferences.[50]

Overall, there is a need for more culturally based, family integrated obesity prevention and treatment with African American children, in order for efficacy of these studies to be adequately assessed.

So far, it has been established that parents and EFMs are influential in the food related choices of the children they care for, and studies should be underpinned by behavioral science theories. Yet, more research needs to be done to ascertain the specific knowledge, attitudes and beliefs of different family and cultural groups, so that interventions can be tailored accordingly. This is especially urgent in view of the health disparities previously mentioned and in particular the differences in weight loss outcomes following interventions for blacks compared to whites.[7] Further, there is evidence that misperceptions of child weight and health status have worsened over time, with decline in perception most strongly marked among parents of African American children.[51] Duncan et al. have suggested social comparison theory as a possible cause for the decline in perception; absolute increases in obesity rates mean parents are comparing their children against other overweight children.[51] Since obesity rates are among the highest for African American children, this would explain the larger decrease in perception for this demographic group. The authors also speculated that the inability of parents to understand child growth charts could be another reason for the decline in perception: mothers' emphasis is often on child growth, and parameters such as healthy and unhealthy weight gain are not being adequately explained to them by health professionals. There is other evidence that African American mothers, in particular, find growth charts to be ethnically biased, and so are wary of using them.[52]

Studies that have used a culturally sensitive design for obesity interventions have shown some success, such as the Barr-Anderson study previously described.[30] Cultural

perspectives may be helpful for future as well as current interventions. For example, a study focusing on African American adolescents' perspectives of domains that encourage physical activity showed that future interventions should concentrate on gender as a facilitator of physical activity. Moreover, clear patterns of cultural facilitators of physical activity were perceived by adolescents in this study. This included factors such as family and friend support, and parental reinforcement.[53]

Summary

In conclusion, there are many gaps in research that remain to be filled. Childhood obesity remains an urgent priority and must be addressed at multiple levels of intervention.[26] In African American families, inter-generational family relationships form an integral part of family structure, with mothers and EFMs of school aged children modeling eating and exercise behaviors. In general, the influence of African American EFMs has been overlooked when designing obesity interventions.[10] Given the role of the matriarch in African American culture, as well as the predominately higher rates of obesity for African American women compared to other ethnic and racial groups, EFMs are an important influence to consider.[8] African American grade school children have among the highest obesity rates in the country compared to other racial and ethnic groups, yet are among the least studied.[13] In order to address these health disparities, interventions need to be tailored and culturally relevant.[7]

The purpose of this study was to examine relationships between African American EFMs and the children in their care. Relationships examined included the

amount of time the child spent with the EFM; the frequency of eating and physical activity by the child around the EFM when the mother was not present; and the weight status of the EFM and child, compared to time spent with the EFM.

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CHAPTER III

RESEARCH ARTICLE

Introduction

Few would dispute the World Health Organization's consensus that childhood obesity represents one of the most serious public health crises of the twenty-first century.[1] The startling facts are that this crisis is prevalent at global and local levels, with North Carolina statistics showing that 27% of white children between the ages of 10 and 17 are either overweight or obese. These numbers are even higher for Hispanic and African American children: 37% and 44% respectively.[2] Health disparities do not discriminate by age or gender. A similar pattern emerges at the county level.[3] Childhood obesity has been shown to lead to adult chronic diseases such as heart disease, hypertension and diabetes.[4] There is a large body of evidence demonstrating the impact of overweight and obesity in childhood on morbidity and mortality in adulthood. Obese children are more likely grow into obese adults with all accompanying adverse health implications.[5]

Obesity interventions would seem to be a logical first step to tackle this crisis, especially for African American children, but what should be addressed when designing such interventions?

The first factor to consider is cultural appropriateness. Although rates of obesity in North Carolina are highest for African American children, weight loss interventions

have been shown to be less effective for African American populations than for white populations. Moreover, weight loss interventions for African Americans suffer higher rates of attrition than for whites.[6] Any hope of addressing such disparity in outcomes should turn to those cultural and social aspects of African American communities that promote healthy eating and lifestyle behaviors. Moreover, it is common to view cultural aspects as barriers to healthy lifestyles, when in actuality there are many positive cultural influences that should rather be seen as assets.[7]

Secondly, although gender differences are important to assess, as the difference in effectiveness of weight loss interventions for African American populations is more pronounced for females, this has meant that studies for males are few and far between.[7, 8] It is therefore important to consider both boys and girls when designing obesity interventions.

Mothers are critical role models, regulating their children's health habits.[9] Yet most research to date has focused on parents, rather than mothers per se. Research regarding mothers' roles has tended to focus on the 3- to 5-year old age group, as this is when dietary habits form and, to a large extent, become entrenched. However, given the levels of childhood obesity prevalent today, it is relevant to focus on school-aged children's weight status also. Moreover, children's autonomy increases as they age, so it is important to understand the family's influence over time; not just when children are younger.[10]

Family Systems Theory explains human behavior in terms of multiple interrelated systems, including family structure. According to this theory, all systems are interrelated parts of an ordered whole, with each subsystem influencing other parts of the whole.[11] In the context of family, positive family communication, parenting skills, and the role of EFMs, are key elements and supporting factors of Family Systems Theory.[10] Interestingly, there are very few studies of obesity interventions that consider theoretical perspectives unique to African American families, yet to include such consideration is very relevant. Theoretical models form a framework upon which historical and social contexts can be incorporated.[7]

African American families are often multi-generational, with relatives caring for and influencing healthful behaviors of children.[9] Although there have been some studies that examine family interventions for African American childhood obesity, there are very few that consider the influence of extended family members (EFMs).[8] Those that do, have tended to be with grandparents only.[12, 13] Result of these studies have shown positive changes in nutrition knowledge following extended family-based interventions, as well as insights into barriers families face when trying to make lifestyle changes.[13] There are even fewer studies that consider the effect of other EFMs such as aunts or cousins.

The influence of EFMs extends far beyond nutritional knowledge. The more time the EFM spends with the child, the more likely the child may be to eat and play around the EFM without the mother being present. Similarly, an EFM who perceives her family

to be close may be more likely to spend quality time with the child, and thus may be more influential on that child's lifestyle-related behaviors.[10] These are all additional factors to consider when designing an intervention, yet, as stated above, there are very few studies that consider the effect of EFMs.

The purpose of this study was to utilize a Family Systems Theory theoretical framework to examine key factors that could be considered when devising an obesity prevention or intervention program for African American families. This purpose was achieved by analyzing survey questions answered as part of a larger study begun by Dr. Natasha Brown at the University of North Carolina at Greensboro (UNCG). Dr. Brown sought to examine how extended family environments and relationship quality affected dietary and physical activity behavior of urban African American children in Guilford County, North Carolina. This thesis examined various relationships between the child and EFM among the families participating in this larger study. The EFM was one who spent time with the child on a regular basis. The type of family relationship (grandmother, aunt or cousin for example) and age of the EFM were also examined.

The overall aims of the study were to examine relationships between the amount of time the child spends with his or her EFM; child physical activity and eating behaviors around the EFM when the mother was not present; and whether there was a relationship between the amount of time the child spent with the EFM, and the child's and EFM's weight status.

Aim 1: To examine the relationship between the amount of time the child spends with the EFM, and frequency of child eating and physical activity around the EFM when the mother is not present.

Hypothesis 1: A child who spends more time with an EFM is more likely to eat around the EFM when the mother is not present.

Hypothesis 2: A child who spends more time with an EFM is more likely to be physically active around the EFM when the mother is not present.

Aim 2: To examine the relationship between the frequency of child physical activity around the EFM when the mother is not present and child weight status.

Hypothesis 3: A child who is physically active more frequently around an EFM when the mother is not present, is less likely to have a high BMI.

Aim 3: To examine the relationship between the amount of time the child spends with the EFM, and the EFM's and child's weight status.

Hypothesis 4: A child who spends more time with an EFM with a high BMI is more likely to have a high BMI.

Methods

Design, Setting, and Participants

This quantitative study was conducted by examining data collected as part of a larger research project. The larger study sought to examine how extended family environments and relationship quality affected dietary and physical activity behavior of urban African American children in Guilford County, North Carolina. The larger study

utilized a convenience sample by recruiting eligible African American families via collaborations between the UNCG Teamwork in Research and Intervention to Alleviate Health Disparities (TRIAD-2) Center of Excellence in Health Disparities Research and the community. These sites included community organizations serving urban African American families in North Carolina. Participants were recruited directly from local WIC offices, public housing locations, the YWCA, neighborhood markets, and community nutrition education classes. Eligible participants were also recruited indirectly by responding to advertisements posted in local libraries, social networking websites, and fliers placed in locations from which participants were directly recruited. A research study phone number, text number, email address, and Quick Response (QR) code were also set up to facilitate ease of signing up. A QR code is a type of barcode that can be read by an app enabled phone. A QR code can contain all different kinds of information; in this case, a link to the follow-up survey.

IRB approval was received for all pertinent recruitment sites.

With direct recruitment, the mother or EFM (female adult family member over the age of 18) was the initial point of contact. Potential participants were approached and asked if they would like to participate in the study. They were asked to identify one child between the age of 8 and 12, and an adult female member who spent a regular amount of time with the child. If a potential participant did not have a child between the age of 8 and 12 herself, but had a female relative who did, then she was invited to participate as the EFM with her relative and her relative's child. The mother had to be a resident of

Guilford or Rockingham Counties. The EFM had to be a resident of Guilford County, Rockingham County or one of the surrounding counties. The mother and EFM had to self-identify as African American. The mother had to also identify her child as African American. Participants were permitted to be of Hispanic origin. All participants had to be able to speak, read and write English. All adult participants had to be over the age of 18. Adult participants were restricted to women because of their role in child rearing.

Potential participants were asked if they would prefer to be contacted by phone or text in the next couple of days to give them a chance to talk to their EFM, or to the mother if they themselves were the EFM. If text was requested, follow up was made by text with a link to a short survey asking potential participants to re-confirm their interest. Research team members then followed up by phone or text to schedule a study visit. A QR code was attached to recruitment fliers with a direct link to the follow-up survey, to enable potential participants to sign up without having to wait for contact from a research team member.

Potential participants who signed up indirectly by responding to a flier (either by phone, text, email, or QR code) were contacted by a research team member by phone or text and screened for eligibility. The study protocol was reviewed and approved by the Institutional Review Board at the University of North Carolina at Greensboro.

Study Procedures and Measures

Eligible families (the mother, her child, and the EFM) were invited to sign up for a study visit at the family's convenience. Study visits took place either at the Department

of Nutrition's personal interview room at the University of North Carolina at Greensboro, or at the home of the mother, or at the home of the EFM. Two members of the research team were present at each study interview. Individual informed consent forms were first completed by the mother, EFM and child. The mother completed an additional consent form, assenting to the child's collaboration in the survey process. Adults were also asked if they would like to be contacted for future studies, and if so, they provided contact information on the last page of the consent form. Mothers were asked if they would like both themselves and their child to be considered for future studies.

Surveys were offered in paper or electronic form. Participants were asked not to collaborate with each other, but to answer their questions privately. The mother and EFM completed their own surveys, asking for help if needed. One member of the research team sat with the child, and read questions aloud if the child was unsure or uncertain how to answer.

Incentives in the form of a $20 gift card were offered to each adult upon completion of the study visit. A $5 gift card and a culturally appropriate, age and gender appropriate book were offered to the child upon completion of the study visit.

Family Members' Weight Status

The mother and EFM had their height, weight, waist, and hips measured. Following body measurements, the mother and EFM completed their surveys. The child's anthropometric measurements were not taken until the mother and EFM completed their

surveys. This prevented the child's measurements from influencing the adults' survey answers. The child had his or her height, weight and waist measured.

Participants' weight and height were measured using a Charder HM200P Portstad portable stadiometer and Tanita BWB-800 digital scale. Measurements were taken in light clothing with shoes removed. All measurements were taken twice and an average calculated which was used to assess weight status by means of standard body mass index (BMI) for adults and BMI-for-age calculations for children. Waist and hips were measured with a Gulick tape measure. Waists were measured at the narrowest part of the torso above the umbilicus and below the xiphoid process. If there was no visible narrowest part of the torso, the waist was measured at the umbilicus. Hips were measured at the maximal circumference of the hips or buttocks, whichever was larger. Waist-hip ratio was calculated for adults and waist-height ratio was calculated for children.

Time Spent with Extended Family Member

The EFM was asked how often she saw the child during a typical week. The EFM could respond by writing down a single day (for example "2 days a week"), or a multiple number of days (for example "2-3 days a week"). The EFM was also asked how long she was typically around the child when the two were together. The EFM could respond: "Just a few minutes," "A few hours," or "Most or all of the day." These questions were derived from an instrument developed for a previous study. Since that study was never funded, nor carried out, this thesis was the first time these questions were asked in a research study setting. The mother was independently asked the same questions on her

survey. The questions were combined by comparing EFM and mother responses. For the first question described above, EFM and mother responses were averaged, after eliminating answers 4 days or more apart (four families). For the second question described above, the categories "A few hours" and "Most or all of the day" were combined, then EFM and mother answers were compared. Families that answered differently (for example, if EFM answered "Just a few minutes," but mother answered "A few hours or most or all of the day") were eliminated from the data analysis of time spent (two families). The two questions were then condensed into the following categories: "Just a few minutes/up to 4 days a week," "Just a few minutes/4 days or more a week," "A few hours or most or all of the day/up to 4 days a week," and "A few hours or most or all of the day/4 days or more a week." Only 1 family answered "Just a few minutes/up to 4 days a week," and only 1 family answered "Just a few minutes/4 days or more a week." Therefore, these 2 answers were combined with the "A few hours or most or all of the day/up to 4 days a week" families. The net result was that time spent was divided into 2 categories: less than 4 days a week (22 families), and 4 days or more a week (19 families). The average number of days in the "less than 4 days" category was 2.5 and the average number of days in the "4 days or more" category was 6.4. Since this was exploratory analysis and these questions had not been used before, it was decided that this division would best allocate EFMs to those who spent more time or less time with their child relative.

Frequency of Physical Activity and Eating

The EFM was asked the frequency with which the child was physically active around her without the mother being present. The EFM could answer: "Never," "Rarely," "Sometimes," "Very often," or "Always." The mother was not asked to answer this question on her survey, and therefore the EFM's answer was used for the purpose of this data analysis. For certain research questions, answers were collapsed into "Never, Rarely, Sometimes" and "Very Often, Always." Since this was exploratory analysis, it was decided that this division would best describe children who were physically active less frequently and children who were physically active more frequently.

The EFM was asked the frequency with which the child ate around her without the mother being present. The EFM could answer: "Never," "Rarely," "Sometimes," "Very often," or "Always." The mother was not asked to answer this question on her survey, and therefore the EFM's answer was used for the purpose of this data analysis. For certain research questions, answers were collapsed into "Never, Rarely, Sometimes" and "Very Often, Always." Since this was exploratory analysis, it was decided that this division would best describe children who ate around the EFM less frequently and children who ate around the EFM more frequently.

This question was not included as a potential factor in impacting child BMI-for-age, as there was no way to measure what the child was eating and at what time of day.

Other Questions

The mother and EFM answered survey questions to ascertain demographic variables including age, education level, and gross income. It should be noted that the question regarding income asked the mother or EFM to specify her annual gross income rather than annual household gross income. For example, a college educated woman who was not working outside the home would have indicated that she had no annual gross income, and this might not have been representative of the income status of her family as a whole. However, for the purpose of this exploratory analysis, gross income was included with the above caveat. The mother and EFM were asked to specify the highest level of education they had each achieved. They could answer, "Less than a high school degree," "High school degree or GED," "Some college, but have not graduated," "Two-year college degree," "Four-year college degree," "Graduate or post-graduate degree."

The EFM was asked about her relationship to the child in the study with her. The EFM could respond: "Grandmother," "Aunt," "Cousin," or "Other," specifying the relationship in the latter instance. The EFM was also asked about her relationship to the mother. The EFM could respond that the mother was her "Daughter," "Sister," "Aunt," "Cousin," or "Other," specifying the relationship in the latter instance. The mother was also asked about the EFM's relationship to the child, and about her own relationship to the EFM. The answers were set up as for the EFM's questions above. The EFM's and mother's answers were compared to ensure they were consistent prior to analysis. All answers were consistent. These answers were also compared during data collection. For

the purpose of this analysis, relationship categories were combined into "Grandmother, great grandmother, great aunt," "Aunt," and "Cousin." This was necessary due to the small sample size (n=47) and enabled meaningful chi square analysis to be carried out.

The EFM was asked about the usual reason for the time the child spent with her. The choices were: "Childcare/babysitting," "Shared residence," "Casual family time," or "Other," with a description of this other reason. This question was derived from an instrument developed by Dr. Brown and her post-doctoral advisors for a previous study as mentioned above. The mother was also asked this question. The mother's and EFM's answers were compared for consistency.

Other questions not pertinent to the thesis hypotheses were also asked on the EFM's and mother's survey.

Finally, the child completed dietary and physical activity questionnaires not directly related to this data analysis. All surveys and questions are attached in the Appendices.

The mother and EFM each received an information sheet containing all measurements taken, along with an explanation of the measurements and healthy eating tips for children. Time was allocated during study visits to answer any questions the mother or family member may have had about the body measurements and calculations.

Data Analysis

The Statistical Package for Social Sciences (SPSS Inc., Mac version 22 Chicago, IL) was used for analyses of the quantitative data. Descriptive statistics were generated to

describe and compare socio-demographic characteristics of the sample population of mothers and EFMs. Such characteristics included age, education level, income, participation in government programs, and pregnancy status. Descriptive statistics were also generated to describe characteristics of the children in the sample. Such characteristics included age, gender, weight status, and waist height ratio. Adult weight status was classified based on adult BMI status into one of the following four categories: "underweight" (<18.5), "normal weight" (18.5-24.9), "overweight" (25.0-29.9), and "obese" (>30.0).[14] Child weight status was classified based on BMI-for-age percentile into one of the following four categories: "underweight" (≤5th percentile), "normal weight" (>5->85th percentile), "overweight" (≤85th-<95th percentile), and "obese" (≥95th percentile).[15] In addition, child BMI z scores were calculated to enable direct comparison to adult BMI scores. Z scores were calculated using the Children's Hospital of Philadelphia Research Institute Pediatric Z score calculator.[16]

Chi square analysis was used to compare the amount of time the child spent with the EFM and frequency of child eating and physical activity behaviors. Chi square analysis was also conducted to compare the amount of time the child spent with the EFM and EFM age and type of relationship. Categorical variables with 3 or more options were collapsed into logical categories. Likert scale categories used to describe frequency of child eating and physical activity behaviors were collapsed into 2 categories: "Never, Rarely, Sometimes" and "Very Often, Always." Age was collapsed into "20-39 years" and "40 and older." Age was alternatively collapsed into "20-44 years" and "45 and

older," depending on the test. Relationship type was collapsed into 3 variables: "Grandmother, great grandmother, great aunt," "aunt," and "cousin." Collapsing the categories was necessary to enable meaningful chi square analysis to be carried out.

Spearman's correlation was used to compare child BMI z scores with the frequency of physical activity around the EFM when the mother was not present. Two correlations were run. The first compared BMI z scores to the 5 Likert scale categories used on the survey to answer frequency of physical activity: "Never," "Rarely," "Sometimes," "Very Often," and "Always." The second correlation collapsed the frequency of physical activity categories into "Never, Rarely, Sometimes" and "Very Often, Always."

Finally, regression analysis was used to compare child BMI z scores to EFM BMI, time spent with EFM, EFM age and type of relationship, and child physical activity around the EFM.

Data Sets

Fifty-three families originally took part in the study. Two families were eliminated for not meeting eligibility criteria (in one case the EFM was too young, and in the other case the EFM was not biologically related to the mother). Four families were eliminated for not including the child's date of birth on the mothers' survey forms. Data set 1 (n=47) was created by eliminating these 6 families.

As discussed above, 6 families were eliminated due to inconsistencies in the EFM's and mother's responses to the questions concerning time spent with the child.

Data set 2 (*n*=41) was created by removing these 6 families from data set 1. Data set 2 was used to analyze aim 1.

Data set 1 was used for descriptive analyses where pregnancy status did not need to be accounted for and to analyze aim 2.

Data set 1 included 3 pregnant mothers. Data set 3 (*n*=44) was created to exclude these pregnant mothers. Data set 1 included 2 pregnant EFMs. Data set 4 (*n*=45) was created to exclude these pregnant EFMs. Data sets 3 and 4 were used for descriptive analyses where pregnancy status needed to be accounted for, for example when analyzing adult BMI.

Finally, data set 5 (*n*=40) was created for analyses that included both time spent and EFMs' weight status. Data set 5 excluded families with inconsistent time spent answers and pregnant EFMs. Data set 5 was used to analyze aim 3. A summary of all data sets created is shown in Figure 1, below.

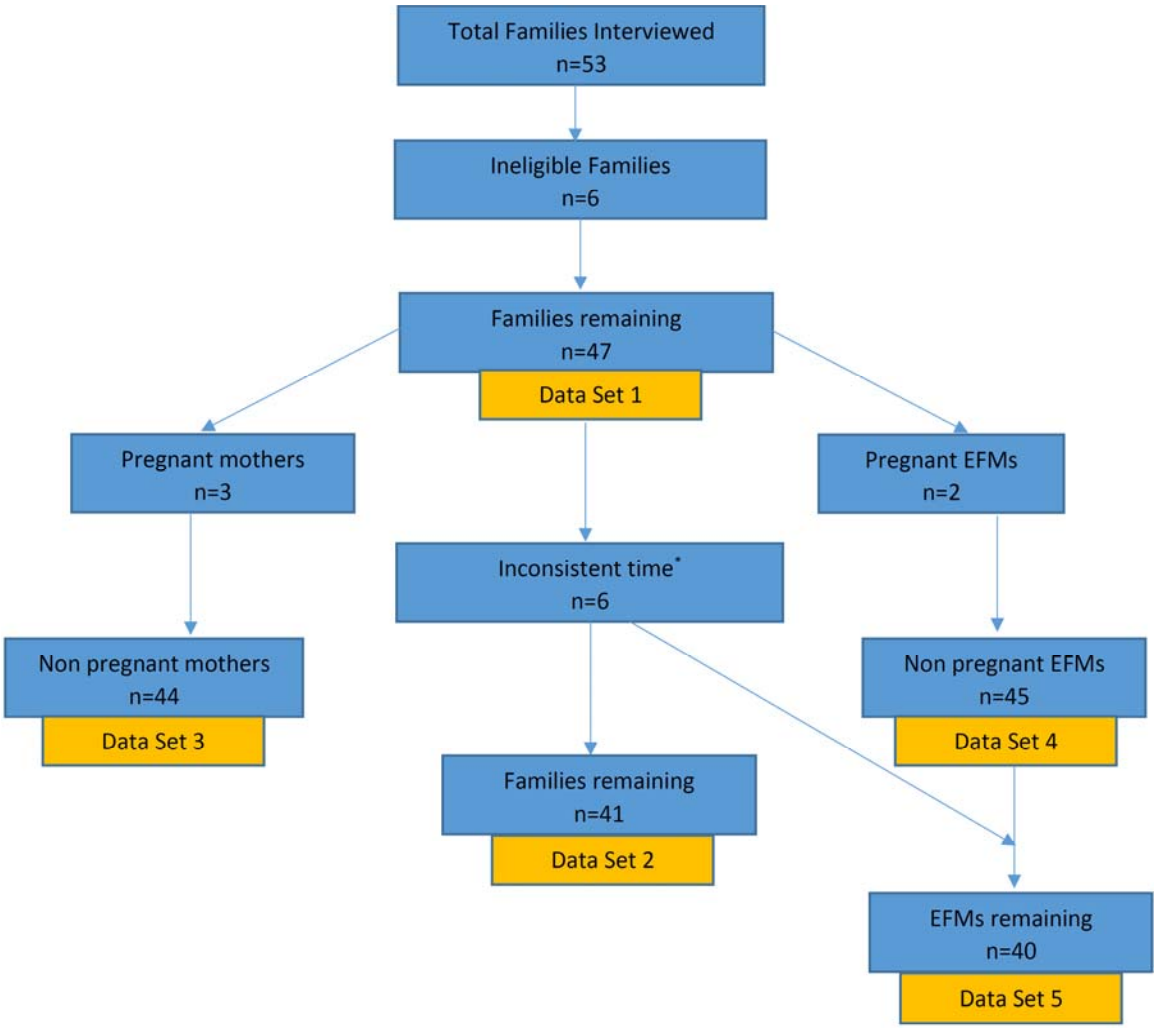

Figure 1. Data Sets. The Six Families in "Inconsistent Time" Included One Pregnant EFM. Therefore, this EFM Was Already Eliminated from Data Set 4. To Avoid Double Counting, This EFM Was Not Eliminated Again When Creating Data Set 5 from Data Set 4.

Results

Descriptive Analyses

Among the 47 families in data set 1, the mean age of the mothers was 34 years and the mean age of the EFMs was 41 years. EFMs consisted of 10 grandmothers, two

great grandmothers, one great aunt, 19 aunts, and 15 cousins. Average BMI of the mothers was 36.48 (± 10.2 S.D.) and of the EFMs 35.59 (± 9.6 S.D.). Eighty-eight percent of mothers and 87% of EFMs were either overweight or obese. Sixty-four percent of mothers reported some type of college education or above, compared to 49% of EFMs. Eighty-two percent of mothers and 83% of EFMs indicated gross income of $30,000 or below. The vast majority of women participated in some form of food assistance program (91% of mothers compared to 85% of EFMs), although the type of assistance received varied considerably. There was a statistically significant association between EFM BMI and relationship type, with the mean BMI of grandmothers, great grandmothers and cousins being 40.13 ± 6.8 S.D., and that of aunts and cousins being 33.74 ±10.0 S.D. Mother and EFM sociodemographic variables and other characteristics are listed in Tables 1 and 2.

Of the 47 children in the study, 29 were boys and 18 were girls. All children were aged between 8 and 12, with a mean age of 9.7 years (± 1.2 S.D.) for boys, and 9.4 years (± 1.5 S.D.) for girls. Forty-eight percent of boys fell into a normal weight category, as defined as a BMI between the 5th and 85th percentile. Fifty-two percent of boys fell into an overweight or obese weight category, as defined as a BMI ≥85th percentile. For girls, 65% fell into a normal weight category, and 35% fell into an overweight or obese weight category. Average waist height ratio (WHTR) was 0.48 for boys and 0.47 for girls. Characteristics of children in the study are listed in Table 3.

Aim 1: Time Spent and Frequency of Child Eating and Physical Activity

No significant association was found between time spent with EFM when the mother was not present and frequency of child eating and physical activity behavior. When EFM relationship type was examined, a statistically significant association was found between relationship type and frequency of child physical activity around the EFM when the mother was not present ($\chi^2 = 8.733$, $p = 0.01$). The association was moderate (Cohen, 1988), Cramer's V = 0.431. Children were less likely to be physically active around grandmothers, great grandmothers and great aunts than around aunts and cousins. A statistically significant relationship was also found between EFM age and frequency of child physical activity around the EFM when the mother was not present ($\chi^2 = 6.801$, $p = 0.009$). The association was moderate (Cohen, 1988), Cramer's V = 0.380. Children were less likely to be physically active around EFMs aged 45 and older. As far as frequency of eating behaviors was concerned, there was no statistically significant association between EFM relationship type and frequency of child eating behavior around the EFM without the mother present. There was however a statistically significant association between the age of the EFM and frequency of eating behavior ($\chi^2 = 7.521$, $p = 0.006$). The association was moderate (Cohen, 1988), Cramer's V = 0.400. Children were more likely to eat around aunts and cousins than around grandmothers, great grandmothers, and great aunts. As expected, there was a statistically significant association between age of EFM and relationship type ($\chi^2 = 19.254$, $p = 0.0001$). The association was large (Cohen, 1988), Cramer's V = 0.640.

Aim 2: Child Weight Status and Frequency of Physical Activity

No correlation was found between child BMI Z scores and frequency of child physical activity behavior around the EFM when the mother was not present. Further analysis using Spearman's correlation test found a weak positive correlation between child BMI Z score and amount of time spent with the EFM ($r(39) = 0.311$, $p<0.05$). Overweight and obese children were more likely to spend more time per week with their EFM. No correlation was found between child BMI Z score and age of the EFM. Child BMI Z score and EFM relationship type were weakly negatively correlated, $r(45) = -0.289$, $p<0.05$. In other words, there was a correlation between children with higher weight status and grandmothers, great grandmothers and great aunt. EFM weight status was weakly positively correlated with child weight status ($r(43) = 0.314$, $p<0.05$), but there was no significant correlation found between mother and child weight status. Finally, EFM weight status was weakly positively correlated with mother's weight status ($r(40) = 0.313$, $p<0.05$).

Aim 3: Child and Extended Family Member Weight Status and Time Spent

Three multiple regression analyses were carried out. Multiple Regression 1 was run to predict child BMI z score from EFM relationship type, EFM age, EFM weight status, time spent with EFM, and frequency of child physical activity around the EFM. The multiple regression model significantly predicted child BMI z score ($F(5,34) = 3.563$, $p<0.05$). EFM relationship type and time spent with EFM added significantly to the prediction, $p<0.05$. EFM weight status was close to being significant, $p<0.07$. EFM

age and physical activity did not add significantly to the prediction. Regression coefficients and standard errors can be found in Table 4.

Since EFM relationship type and EFM age were found to be correlated with a large association, two additional multiple regressions were carried out to separate the two variables. Multiple regression 2 was run to predict child BMI z score from EFM relationship type, EFM weight status, time spent with EFM, and frequency of child physical activity around the EFM. The multiple regression model significantly predicted child BMI z score ($F(5,34) = 4.343$, $p<0.01$). EFM relationship type and time spent with EFM added significantly to the prediction, $p<0.05$. EFM weight status was close to being significant, $p<0.09$. Physical activity did not add significantly to the prediction. Regression coefficients and standard errors can be found in Table 5.

Multiple regression 3 was run to predict child BMI z score from EFM relationship type, EFM age, time spent with EFM, and frequency of child physical activity around the EFM. The multiple regression model significantly predicted child BMI z score ($F(5,34) = 2.667$, $p<0.05$). Time spent with EFM added significantly to the prediction, $p<0.05$. EFM weight status was close to being significant, $p<0.09$. EFM age and physical activity did not add significantly to the prediction. Regression coefficients and standard errors can be found in Table 6.

Discussion

The purposes of this study were to explore relationships between the amount of time child spends with his or her EFM, the frequency of child physical activity and eating

around the EFM when the mother is not present, and family members' weight status. These are all components that may be of value when designing a family obesity or prevention program for African American families.

This study found that time spent and EFM relationship type were significantly predictive of child weight status. EFM BMI, while not significant per se, was also predictive of child weight status. EFM age and frequency of physical activity around the EFM were not. The study found no significant association between time spent with the EFM and the frequency of child eating and physical activity behaviors around the EFM when the mother was not present. Neither was a significant relationship found between child weight status and frequency of child physical activity around the EFM when the mother was not present. Each of these findings will now be examined.

A very interesting finding of this study was the relationship between child weight status, EFM weight status, EFM BMI and time spent with the EFM. As stated, EFM relationship type and time spent with the EFM were significantly predictive of child weight status. EFM BMI, while not significant per se, was also an important predictive factor.

This study found that children with higher weight status were more likely to be related to a grandmother, great grandmother or great aunt than to an aunt or a cousin ($p<0.05$). This was an interesting finding and merits further review. There have been very few studies that have examined the effect of EFM relationship type on African American child weight status.[10] Research that has been performed to date has tended to focus on

grandparents only.[12, 13] Given the importance of extended family in the lives of African American children, this is an important oversight.[10] It is speculated that the reason for the findings in this study is that different types of EFM (grandmother, aunt, cousin, etc.) may have different types of relationship with their child relative. For example, grandmothers may be more indulgent and 'spoil' their grandchildren, using food or TV as rewards. Future research should examine the effect of EFM relationship type on child weight status, including relatives other than grandmothers, in order to replicate the results found in this study.

Another interesting finding of this study was the correlation between child weight status and amount of time spent with EFMs. This research found that overweight and obese children were more likely to spend 4 days or more with their EFM. Again, there are very few studies that have examined this question and studies that have been performed have tended to be with grandparents only. Moreover, although research has found that more sedentary grandparents are associated with less physical activity in the children they care for, studies have rarely considered time spent together as a variable.[13] Future studies should address not only how much time the child spends with relatives, but also how the child spends time with relatives, in terms of dietary and physical activity behavior.

EFM BMI, while not significant per se, was also predictive of child BMI. This was another interesting finding with implications for the design of future obesity interventions. Consistent with research findings stated above, studies have been conducted with grandparents, but not with other EFMs.[12, 13] Although children with

higher BMI z scores were more likely to be related to grandmothers, great grandmothers and great aunts, and children with higher BMI z scores were more likely to spend more time with EFMs, no significant association was found between relationship type and time spent with EFMs. In other words, it cannot be deduced from these findings that children with higher BMIs are spending more time with grandmothers, great grandmothers and great aunts. Ultimately, it could be that the sample size was too small to show an association between time spent and relationship type, so this would be an interesting area for future research. No correlation was found between mother and child weight status.

The number of days per week a child spent with the EFM did not impact the frequency of physical activity or eating of the children. This is perhaps not surprising, as children may follow the same routine with EFMs regardless of how many days they see them during a typical week. The most common reason given for the time spent with EFMs was casual family time. It would be interesting to examine the type of physical activity the child is engaged in when with the EFM. This question was not asked in the current study, but is an important focus for future research. Moreover, studies that have focused on African American adolescents' perspectives of domains that encourage physical activity, have shown clear patterns of cultural facilitators of physical activity, such as family and friend support, and parental reinforcement.[17] Studies have also shown that gender is an important facilitator of physical activity.[18] As stated previously, interventions need to be culturally tailored to accommodate the specific knowledge,

attitudes and beliefs surrounding physical activity in African American extended families.[7]

Similarly, it would be interesting to address the types of foods the child is eating when spending time with the EFM in future studies. The availability of certain food groups in the home such as fruits and vegetables has been linked with children's intake of these items. Family behavior patterns have also been associated with child dietary intake.[12] Examples of these behavior patterns might include having the television on during meals or consuming fast food as a family.[19] Interestingly, these studies, which were carried out in the general population as a whole, and not tailored to African American families, did not establish definitively whether such factors were significant determinants in weight-related behaviors of children. For instance, it is not clear how family behavior patterns reflect whether children are meeting recommended national guidelines for dietary and physical activity.[19] It would be interesting to address such factors in the future, focusing on dietary patterns of African American extended families.

As regards child weight status, no significant relationship was found between child weight status and frequency of child physical activity around the EFM when the mother was not present. This might seem surprising, but it must be remembered that the sample size was small, so results may have been different with a larger cohort. Also, the frequency of child physical activity was not objectively measured, but rather was self-reported by the EFM herself, which may have led to differing results than if a more objective measure was employed, such as the use of a pedometer or accelerometer.

Objective tools such as pedometers or accelerometers are not always used in interventions to measure physical activity.[20] Subjective measures such as self-reporting are of course inherently prone to limitations. A way to mitigate these limitations is to use previously validated, reliable survey forms to capture physical activity data such as the 7-day Physical Activity Recall (PAR). The PAR has been validated for use with children and adolescents.[21] Even previously validated instruments may not always capture all the data.[22] Ultimately, studies that rely on self-reporting methods need to be replicated in additional studies that use more objective tools.[23]

When EFM relationship type and age were examined in relation to frequency of child eating and physical activity around the EFM, it was found that children were more likely to be frequently engaged in physical activity around their aunts and cousins than around their grandmothers, great grandmothers and great aunts ($p<0.05$). No such relationship was found between EFM relationship type and frequency of dietary behaviors. Because cousins varied in age from 22-56 years ($n=15$), an analysis was carried out to see if overall EFM age was a factor. The analysis showed that children were more likely to be physically active around relatives less than 45 years old ($p<0.01$). The children were also more likely to eat more frequently around EFMs less than 45 years old ($p<0.01$). This finding has important implications. Studies have shown that in African American families, environment is an important factor in influencing children's dietary behaviors.[9] The dietary quality of the EFM may therefore play a huge role in influencing dietary habits of the children in her care. This was not examined in the

current study, but is an important area for future research, given that the heavier children in the study were spending time with their grandmothers, great grandmothers and aunts, and given that the heavier children were those spending more time with their EFM.

There were not enough children in the current study to make meaningful analyses based on gender, but since research has shown clear differences in outcomes for girls and boys, it is important to distinguish between gender in the design of any obesity intervention.[8] Moreover, since research has tended to focus on African American girls and women, due to their predominately larger rates of overweight and obesity compared to boys and men, it has been suggested that much more evidence is required to help develop interventions for African American boys and men.[7] In other words, it is important not to lose sight of the fact that obesity rates are high for African American males also, with an accompanying need for more research studies that incorporate African American men.[24] There is evidence that there are gender differences in adherence to the same intervention.[8] Although studies with African American children do tend to include both boys and girls, results are not always stratified by gender.[7]

Overall, EFM relationship type seemed to be influential in each of the relationships studied. This has huge implications for future research. Interventions using family systems theory need to address not only child dietary and physical activity behaviors, but also the dietary and physical activity behaviors of the adults who look after them. Interventions should be further tailored according to the type of family

relationship.[7] An intervention including grandmothers, for instance, may look different from one including aunts.

In line with national data examining weight status of adults, this study found that older EFMs tended to have higher BMIs than younger aunts and cousins, or indeed the mother herself.[25] The EFMs' mean age and BMI were 31.69 years ± 6.9 S.D. and 33.58 ± 10.03 S.D., respectively, for EFMs aged 20-44 years, and 55.74 years ± 7.8 S.D. and 38.33 ± 8.4 S.D., respectively, for EFMs aged 45 years and older. Again, this has important implications when the influence of the EFM on child dietary behaviors is taken into account.[9] Eighty-seven percent of the non-pregnant EFMs in this study were either overweight or obese, with grandmothers, great grandmothers and great aunts having higher BMIs than aunts or cousins. It can easily be seen how important it is to consider EFM dietary and physical activity behaviors as part of a family obesity intervention. Eighty-eight percent of the non-pregnant mothers in the study were also overweight or obese. These figures are higher than the national average for African American women as analyzed in the recent National Health and Nutrition Examination Survey (NHANES) data for 2009-2010. Nationwide statistics are 61.3% for women ≥ 20 years old, and 71.6% for women ≥ 60 years old.[25] It is speculated that this might be due to the population recruited for this study being for the most part food insecure, as implied by 83% of mothers and 87% of EFMs reporting gross income of up to $30,000. Also supporting this supposition is the fact that 91% of mothers and 85% of EFMs received

some sort of government or food assistance in the preceding 12 months. The link between food insecurity and obesity has been well supported by previous studies.[26]

Forty-seven percent of children in the study were classified as overweight or obese according to the BMI-For-Age categories established by the Centers for Disease Control and Prevention. This compares to 44% of African American children in North Carolina, between the ages of 10-17 years.[2] Nationwide, 34% of all children aged 6-11 years are classified as overweight or obese, with 38% of African American children aged 6-11 falling into this category. As can be seen, percentages of overweight and obese children in this study are above national and regional averages. WHTR has been shown to be an accurate indicator to identify overweight and obesity in boys and girls. A threshold of 0.445 has been identified for overweight in both genders, with an obesity threshold of 0.485 in boys and 0.475 in girls.[27] The inclusion of waist height ratio data in this study validates that BMI-for-age was an accurate indicator of weight status in this sample of children, as opposed to BMI-for-age being reflective of children growing at different rates for their age.

In addition, there is a paucity of research concerning obesity interventions for African American children and effectiveness is difficult to evaluate include the fact that many studies are pilot studies and/or of short duration.[20] Many obesity interventions for African American participants tend to have small sample sizes with limited follow up, which makes comparability between studies difficult.[28] Attrition rates tend to be high for African American participants, which again makes study evaluation difficult.[7]

This study had a number of strengths. First, there are very few studies that consider the influence and impact of EFMs on child dietary and physical activity behaviors. There are even fewer studies that attempt to disseminate the different relationship types and ages of EFMS as a precursor to designing family obesity interventions. The current study, though small, opens up the door to many exciting future research possibilities for a sector of the community that is fighting an obesity epidemic all of its own.

Limitations of this study related to community-based data collection in general and to the sampling method used to collect data for the larger study. This analysis relied on questions that had already been answered as part of a larger survey, so there was no opportunity to add additional questions. The sample was a convenience sample, recruited mainly from the Guilford County Public Health Department, which meant there was not a lot of diversity in terms of sociodemographic characteristics. Future research should focus on recruiting from a broader socioeconomic base, so as to engender additional meaningful comparisons. Other limitations include the fact that the sample size was small, and questions were answered subjectively. This latter fact is slightly mitigated by the fact that many of the questions were asked of both the EFM and the mother. Answers were compared and consolidated, while inconsistent answers were not used for analysis.

Conclusion and Implications

This study revealed interesting findings. It is important for nutrition researchers to consider these findings in future research, in order to adequately address the obesity

epidemic affecting African American families. It is critical to consider the role of grandmothers, aunts and cousins when designing obesity interventions. This exploratory study highlighted the fact that among the families who participated, EFM relationship type, EFM BMI, and time spent with children, appeared to be influential on child weight status. Although these findings are very preliminary, it is hoped this research can be used to further examine family- and cultural-related factors that can be incorporated into the design of obesity interventions for African American families.

Table 1. Demographic and Socioeconomic Characteristics of Mothers and Extended Family Members (n=47)

Variable	Mothers*†		Extended Family Member		*p*
	N	*(%)*	*N*	*(%)*	
Age					0.00
20-39	41	(87)	24	(51)	
40-59	5	(11)	19	(40)	
≥ 60	1	(2)	4	(9)	
Pregnant					0.33
Yes	3	(6)	2	(4)	
No	44	(94)	45	(96)	
Highest Level of Education[1]					0.46
Less than high school	7	(15)	8	(17)	
High school or equivalent	10	(21)	16	(34)	
Some college/associates	15	(32)	10	(21)	
College diploma	15	(32)	13	(28)	
Gross Income					0.57
Up to $30,000	39	(83)	39	(87)	
$30,001-$45,000	7	(15)	4	(9)	
$45,001 and over	1	(2)	2	(4)	
Participation in SNAP					0.06
Yes	36	(77)	27	(57)	
No	11	(23)	20	(43)	
Participation in WIC					0.01
Yes	29	(62)	15	(32)	
No	18	(38)	32	(68)	
Participation in school breakfast programs					0.00
Yes	29	(62)	10	(21)	
No	18	(38)	37	(79)	
Participation in school lunch programs					0.00
Yes	29	(62)	8	(17)	
No	18	(18)	39	(83)	
Participation in school dinner programs					0.00
Yes	12	(26)	0	(0)	
No	35	(74)	47	(100)	
Participation in summer meal programs					0.01
Yes	14	(30)	4	(9)	
No	33	(70)	43	(91)	
Participation in Head Start program					0.01
Yes	8	(17)	1	(2)	
No	39	(83)	46	(98)	
Participation in food pantry programs					0.65
Yes	14	(30)	12	(26)	
No	33	(70)	35	(74)	
Participation in any assistance programs					0.34
Yes	43	(91)	40	(85)	
No	4	(9)	7	(15)	

*Mothers category includes one great grandmother and 46 mothers. †46 mothers born in the USA and 1 mother born in Jamaica; all extended family members born in the USA. p=0.05. [1]For extended family members, n=45 (two questions left unanswered).

Table 2. Characteristics of Mothers and Extended Family Members

Variable	Mother		Extended Family Member	
	M±*SD*	*N*	*M*±*SD*	*N*
Age (years)	34.19 ± 7.5	47	41.00 ± 14.3	47
Grandmother			55.90 ± 7.2	10
Great grandmother			70.00 ± 7.1	2
Great aunt			52.00 ± 0	1
Aunt			33.37 ± 7.9	19
Cousin			36.13 ± 12.8	15
Body Mass Index (BMI)	36.48 ± 10.2	44*	35.59 ± 9.6	4†
Grandmother			40.77 ± 7.0	10
Great grandmother			36.90 ± 10.0	2
Great aunt			40.20 ± 0	1
Aunt			32.80 ± 10.4	19
Cousin			35.12 ± 9.6	13
Waist Circumference (inches)	41.79 ± 8.2	44*	41.28 ± 7.0	45†
Grandmother			46.81 ± 4.3	10
Great grandmother			42.56 ± 0.8	2
Great aunt			46.25 ± 0	1
Aunt			38.77 ± 6.7	19
Cousin			40.13 ± 7.7	13
Weight Status[1]	*N* (%)	44*	*N* (%)	45†
Underweight	0 (0)		0 (0)	
Normal Weight	5 (11)		6 (13)	
Overweight	9 (20)		7 (16)	
Obese	30 (68)		32 (71)	

* Non-pregnant mothers only (*n*=44). † Non-pregnant extended family members only (*n*=45).
[1] Categories based on BMI cut off values (CDC, 2000): Below 18.5 = underweight, 18.5-24.9 = normal weight; 25.0-29.9 = overweight; 30.0 or above = obese.

Table 3. Characteristics of Children

	Boys		Girls		*P*
Variable	*N*	*(%)*	*N*	*(%)*	
Number of children	29	(62)	18	(38)	
Ages					
8	9	(19)	6	(13)	
9	7	(17)	6	(11)	
10	4	(9)	3	(6)	
11	2	(4)	0	(0)	
12	7	(15)	3	(6)	
Mean age	9.7±1.2		9.4±1.5		0.44
BMI Status[1]					
Normal	14	(30)	11	(23)	0.54
Overweight	9	(19)	3	(6)	
Obese	6	(51)	4	(9)	
Waist Height Ratio by Age					
8	0.47		0.50		
9	0.47		0.45		
10	0.51		0.48		
11	0.48		0.43		
12	0.49		0.47		
Overall Waist Height Ratio	0.48		0.47		0.48

Note. N=47. [1] Categories based on the BMI-for-age percentile cut off values (CDC, 2000): ≤5th percentile = underweight, 5th-<85th percentile = normal weight; ≥85th-<95th percentile = overweight; ≥95th= obese.

Table 4. Multiple Regression Analysis 1

Variable	*B*	SE_B	*β*	*p* value	95.0% Confidence Interval for B	
					Lower Bound	Upper Bound
Intercept	.171	1.289		.895	-.449	2.790
Time Spent*	.812	.310	.383	.013*	.182	1.442
EFM BMI†	.031	.016	.280	.066	.002	.065
EFM Relationship*	-.592	.248	-.414	.023*	-1.096	-.088
Physical Activity	-.060	.337	-.027	.859	-.744	.624
EFM Age	-.011	.014	-.149	.435	-.040	.017

Note. N=40. Sample includes non-pregnant extended family members (n=45) and excludes extended family members who had inconsistent time spent survey answers when compared to mothers (5 families). *p<0.05, † p<0.09. R^2 = .344 Adjusted R^2 = .247

Table 5. Multiple Regression Analysis 2

Variable	*B*	SE_B	*β*	*p* value	95.0% Confidence Interval for B	
					Lower Bound	Upper Bound
Intercept	-.549	.909		0.550	-2.393	1.296
Time Spent*	.859	.303	.405	0.008	.244	1.473
EFM BMI^	.028	.016	.248	0.087	-.004	.060
EFM Relationship*	-.490	.210	-.342	0.026	-.916	-.063
Physical Activity	.009	.323	.004	0.977	-.647	.666

Note. N=40. Sample includes non-pregnant extended family members (*n*=45) and excludes extended family members who had inconsistent time spent survey answers when compared to mothers (5 families). *p<0.05, ^ p<0.09. R^2 = .332 Adjusted R^2 = .255

Table 6. Multiple Regression Analysis 3

Variable	B	SE_B	β	p value	95.0% Confidence Interval for B	
					Lower Bound	Upper Bound
Intercept	-1.586	1.128		.169	-3.875	.704
Time Spent*	.766	.330	.361	.026	.097	1.436
EFM BMI^	.031	.017	.278	.085	-.005	.067
EFM Age	.006	.013	.086	.506	-.019	.032
Physical Activity	-.093	.358	-.041	.796	-.820	.634

Note. N=40. Sample includes non-pregnant extended family members (*n*=45) and excludes extended family members who had inconsistent time spent survey answers when compared to mothers (5 families). *p<0.05, ^p<0.09. R^2 = .234 Adjusted R^2 =.146.

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CHAPTER IV

EPILOGUE

I began working with Dr. Brown during the second semester of my master's degree. At the time, Dr. Brown was developing a project to examine how extended family environments and relationship quality affect dietary and physical activity behavior of urban African American children in Guilford County, North Carolina. I was fortunate enough to join Dr. Brown in the early developmental stages of the project, and as such was able to assist with developing IRB forms, consent and recruitment documents, study questionnaires and educational materials. I greatly appreciated being involved in this process, as it gave me a huge insight into how the research process gets up and running from the very beginning. I learned the importance of setting up research in such a way as to satisfy regulatory compliance, as well as the importance of ensuring all materials are backed by evidence based research. Dr. Brown's meticulousness and attention to detail had a great impact on me, and I have continued to try to emulate her methods throughout my time as a research assistant and graduate student.

As a member of three different cultures myself, I am very aware of the importance of connecting with other cultures through culturally tailored and appropriate means. I was therefore very interested in the process of tailoring our study materials to an African American audience. We included same race images on recruitment fliers and

educational materials, and selected books for the children in the study that reflected relatable stories featuring African American children and achievements. We focused on health topics of interest to African Americans. For example, one of my first community assignments on Dr. Brown's project was to compile a series of short videos on health topics for use by a local church with a largely African American congregation.

The recruitment process was probably the most challenging aspect of the study for me. Recruitment was a very time consuming process, and many of the women we spoke to were interested, but not eligible. These women either did not have a female extended family member living close by, or they did not have children within the relevant age limits. Despite this, I very much enjoyed talking to women and telling them about the study.

Recruitment took place at various sites. The predominant locations were the Guilford County Health Department WIC offices in Greensboro and High Point. The WIC office staff could not have done more to assist with recruitment and were extremely accommodating. We were allowed to come and go as we wished, to post fliers in the waiting room, and to recruit women whilst they waited for their WIC appointments.

I grew to have a lot of respect for these WIC mothers during recruitment and study visits. I recognized that these were women who were trying to do the best for their children, and as a mother myself, I very much related to that. These women were of relatively low socioeconomic status, and lived lives very different to mine, yet were

striving to do the best for themselves and their children. This connected with me on a very deep level: maybe not so different after all.

Another study recruitment site that I enjoyed involved setting up a table at various High Point public housing locations, next to a farm stand, and sharing healthy food samples with farm stand customers. At the same time, we provided information about the study, and signed up potential participants. Our very first study family was recruited at a farm stand, but despite setting up a recruitment table 10-12 more times, we were unable to recruit further participants. This is a great example of the challenges of community-based nutritional research. It takes a lot of time and patience. Despite the lack of participants for the study, I greatly enjoyed being able to share healthy food samples with members of the community. In fact, this aspect of recruitment, that of giving back to the community in return for the opportunity to recruit, became a recurring theme.

I helped devised a curriculum for a children's summer camp, and taught at the camp for three sessions. Recruitment fliers were sent home with children in the hope that parents would sign up for the study. Despite the work we put into the camp, we did not receive any participants for the study. Similarly, we were invited to teach three nutrition classes at Guilford Child Development Center in return for the opportunity to recruit. We did manage to enroll two families following this venture.

Other recruitment sites included a neighborhood market and a YWCA after school program. We received a few participants from these locations. We also recruited

indirectly, by placing fliers in neighborhood libraries, community centers, and other local organizations.

Again and again, it became clear to me that community-based research is an extremely challenging process. Despite this, I gained valuable experience in all aspects of the research process, and was very grateful for the opportunity to engage so meaningfully with members of the community.

Despite our best efforts, recruitment was slow. We brainstormed each week as to how we could improve our numbers, and were constantly attempting new methods to attract participants. I realized that the research process was a very dynamic one. One very exciting innovation to our study, was to obtain IRB approval for communication by text with our participants. Our goal was to make it as easy as possible for participants to communicate with us. To this end, in addition to texts, we set up a QR code and online form, so that potential participants could express initial interest without us having to contact them first. At the same time, we could pre-screen interested women, thus saving valuable recruitment time.

Although this did not necessarily pick up our numbers, it made communication far easier, not only in terms of screening participants, but also when it came to scheduling study visits.

We transferred our surveys to an electronic format, and offered each family the choice of completing surveys by tablet or paper. I found the tablets to be very effective for the children in the study, but I preferred the paper format for the adults. For this

reason, I switched back to using paper towards the end of data collection. The reason I preferred paper surveys, was that it was much easier to review survey data at the time of the study visits using the paper format. This is because there were various questions that had to be checked for consistency, for example relationship between the mother and extended family member, which was easier to do with the paper versions side by side. Some questions with drop down menus could not be reviewed on the tablets (for example, child's date of birth) as once the data was entered, the drop-down menu did not reveal the answer when scrolling back through pages as part of the review process.

I was given the opportunity to train and work with other graduate students during the course of this project, which I greatly enjoyed. I trained other students how to carry out recruitment, study visit procedures, and data entry. Having this additional help was invaluable. All students involved in the project gave their best, and were professional to work with, which speaks to the caliber of nutrition graduate students at this university.

I became interested in perceptions of child weight status by mothers and extended family members during our study visits. The children in our study reflected national statistics in terms of rates of overweight and obesity, and the adults caring for them exceeded these rates. The first step in treating obesity is to recognize it. However, the theory of social comparison makes it more difficult to recognize overweight and obesity in the first place. If everyone around us is getting bigger, then that becomes the new norm. I started to collect data for my thesis topic by adding questions related to perception to the mother's and extended family member's surveys. It soon became

apparent that since recruitment was so slow, it would be difficult to recruit enough families to engender adequate power to answer my research questions. So I changed gears. I started to think about a new thesis topic, based on the questions already included in the survey documents.

There were many exciting new research questions included in the larger study which had not been considered before. I chose to focus on time spent with extended family members as it seemed that this might impact child healthy eating and physical activity behaviors. To my surprise, the more important factor impacting child behaviors appeared to be the type of extended family relationship, rather than the amount of time spent with family members. Although this study did not answer my questions as expected, I was very excited by these findings. Research begets research, and I would love the opportunity at some time in the future to come back to these findings. The interaction with the participants in the larger research study was beyond a question of a doubt my favorite part of the entire process. It would be a privilege to work with these families or others in the future to design an intervention based on the results of this exploratory analysis.

I learned a great deal during this research project. I learned about my capabilities and adaptability to work on all the different aspects of the study. I felt good about the work I was doing. To be able to contribute to scientific knowledge in a way that might help people in the future is a very rewarding thing. New questions continuously arise during the research process and these questions are fun to ponder. I have always had an

intellectual curiosity for the world around me, and this project provided the perfect opportunity to set that side free. I have a feeling I may be returning to research in the future.

I have discovered that I am passionate about research, and love sharing my nutritional knowledge with others. The participants in our study expressed over and over this same desire to improve the healthy behaviors of those family members in their care. Community nutritional research is a two-way street. Yes, we impart knowledge to participants in our study, but the knowledge we gain in return from our participants about their lives far exceeds anything we could hope to teach them. Community-based research is both humbling and a privilege.

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

THE UNIVERSITY of NORTH CAROLINA
GREENSBORO

OFFICE OF RESEARCH INTEGRITY
2718 Beverly Cooper Moore and Irene Mitchell Moore
Humanities and Research Administration Bldg.
PO Box 26170
Greensboro, NC 27402-6170
336.256.0253
Web site: www.uncg.edu/orc
Federalwide Assurance (FWA) #216

To: Sarah Burch
Nutrition
3507-2G Bally Brook Drive, Greensboro NC 27410

From: UNCG IRB

Date: 8/04/2016

RE: Notice of IRB Exemption (exempt)
Exemption Category: 4.Existing data, public or deidentified
Study #: 16-0250

Study Title: The Influence of Extended Family Members on Child Weight Status among African American Families Residing in Guilford County, North Carolina

This submission has been reviewed by the IRB and was determined to be exempt from further review according to the regulatory category cited above under 45 CFR 46.101(b).

Study Description:

I am a Master's student in the Department of Nutrition at UNCG. This study will be a secondary data analysis; no new data will be collected. I propose to analyze data collected by Dr. Natasha Brown for her research study (IRB 14-0041) in order to answer the research questions for my Master's thesis.

I will be specifically examining the influence of extended family members on child weight status. I will therefore be analyzing data from three of the four surveys created by Dr. Brown for her study.

Modification Information:

- Removed Dr. Natasha Brown from the study as she is no longer at UNCG. Added Dr. Jigna Dharod as new faculty advisor.

Investigator's Responsibilities

Please be aware that any changes to your protocol must be reviewed by the IRB prior to being implemented. Please utilize the most recent and approved version of your consent form/information sheet when enrolling participants. The IRB will maintain records for this study for three years from the date of the original determination of exempt status.

Signed letters, along with stamped copies of consent forms and other recruitment materials will be scanned to you in a separate email. **Stamped consent forms must be used unless the IRB has given you approval to waive this requirement.** Please notify the ORI office immediately if you have an issue with the stamped consents forms.

APPENDIX B

MOTHER'S SURVEY

Family Background Survey Mother

You are about to complete a survey for our study. The purpose of this survey is to help us learn more about you, your extended family, and your relationship with the relative who joined you today. This will also help us learn more about your child's physical activity, eating habits, and overall health. There are no right or wrong answers. Please remember that your answers will remain confidential and you may refuse to answer any question. It will take 30-45 minutes for you to complete the survey. If you have any questions, please ask the research staff member who is helping you today.

About You

1. Do you consider yourself to be:
   - ☐1 Very underweight
   - ☐2 A little underweight
   - ☐3 About right
   - ☐4 A little overweight
   - ☐5 Very overweight

About Your Household

Please complete the following table for all adults and children who live in your household. This may include non-relatives who live with you. For each household member, please indicate their relationship to you, their gender and their age.

Relationship to you	**Gender**	**Age**
ex. HUSBAND	*M*	*35*

Please stop here and have your measurements taken before continuing

2. What is your zip code? _____

3. Which county do you live in?
   - ☐1 Guilford
   - ☐2 Rockingham

General Health

4. In general, would you say your health is:
   - ☐1 Excellent
   - ☐2 Very good
   - ☐3 Good
   - ☐4 Fair
   - ☐5 Poor

5. What is your age? _____

6. What would you estimate your current weight to be?
   _____ pounds

7. What would you estimate your height to be?
   _____ feet _____ inches

8. Are you currently pregnant?

   _____ Yes _____ No _____ I'm not sure

About Your Child

Please complete the following information about the child who is participating in this study with you.
What is the date of birth of your child?
Day_____ Month_____ Year_____

9. What is the gender of your child?
   - ☐1 Girl
   - ☐2 Boy

10. Do you consider your child to be
    - ☐1 Very underweight
    - ☐2 A little underweight
    - ☐3 About right
    - ☐4 A little overweight
    - ☐5 Very overweight

11. In general, would you say your child's health is
    - ☐1 Excellent
    - ☐2 Very Good
    - ☐3 Good
    - ☐4 Fair
    - ☐5 Poor

Your Child's Diet

Thinking about the child who is participating in the study with you, please answer the following questions about the types of foods and beverages he/she typically eats and drinks.

12. On a **typical day**, how many times does your child drink soda (*Do not include diet sodas*)?
    - ☐1 None
    - ☐2 1 time per day
    - ☐3 2 times per day
    - ☐4 3 or more times per day

13. How much soda (not including diet soda) does your child typically drink **each time**?
    - ☐1 Small glass (4-6 ounces)
    - ☐2 Medium glass (8-12 ounces)
    - ☐3 Large glass (16-20 ounces)
    - ☐4 One can (12 ounces)
    - ☐5 One bottle (16-20 ounces)
    - ☐6 One bottle (32 ounces)
    - ☐7 Typically doesn't drink soda

14. On a **typical day**, how many times does your child drink sweetened beverages such as sweet tea, punch, Kool-Aid, sports drinks or fruit drinks *(Do not count 100% fruit juices or diet drinks*)?
    - ☐1 None
    - ☐2 1 time per day
    - ☐3 2 times per day
    - ☐4 3 or more times per day

15. How much of these sweetened beverages does your child typically drink **each time**?
    - ☐1 Small glass (4-6 ounces)
    - ☐2 Medium glass (8-12 ounces)
    - ☐3 Large glass (16-20 ounces)
    - ☐4 One can (12 ounces)
    - ☐5 One bottle (16-20 ounces)
    - ☐6 One bottle (32 ounces)
    - ☐7 Typically doesn't drink sweetened beverages

16. How many **times a week** does your child eat from a fast food restaurant like Burger King, Chik-Fil-A, Bojangles or Pizza Hut?
    - ☐1 None
    - ☐2 Less than once a week
    - ☐3 1 time a week
    - ☐4 2 times a week
    - ☐5 3-5 times a week
    - ☐6 5 or more times a week

17. On a **typical day**, how many times does your child eat French Fries or chips? Chips are potato chips, tortilla chips, Cheetos, corn chips or other snack chips.
    - ☐1 None
    - ☐2 1 time per day
    - ☐3 2 times per day
    - ☐4 3 or more times per day

18. On a **typical day**, how many glasses of milk does your child drink? One glass is the amount in an eight ounce (one cup) drinking glass.
    - ☐1 None
    - ☐2 Less than 1 glass per day
    - ☐3 1 glass per day
    - ☐4 2 glasses per day
    - ☐5 3 glasses per day
    - ☐6 4 or more glasses per day

19. What type of milk does your child usually drink?
    - ☐1 Typically does not drink milk
    - ☐2 Skim or non-fat
    - ☐3 Low Fat (1/2 – 1%)
    - ☐4 Reduced Fat (2%)
    - ☐5 Whole
    - ☐6 Flavored
    - ☐7 Soy milk
    - ☐8 Other or non-dairy milk (*specify*) _____

20. On a **typical day**, how many servings of yogurt does your child eat (**1 serving = 6 oz. container**)?
    - ☐1 None
    - ☐2 Less than 1 container per day
    - ☐3 1 container per day
    - ☐4 2 containers per day
    - ☐5 3 or more containers per day

21. On a **typical day**, how many servings of desserts or sweets does your child eat?
    - ☐1 None
    - ☐2 Less than 1 serving per day
    - ☐3 1 serving per day
    - ☐4 2 servings per day
    - ☐5 3 or more servings per day

22. On a **typical day**, how many servings or vegetables does your child eat? (*Do not include French Fries*) (1 serving = ¼ cup cooked or raw or ½ cup leafy salad greens)
    - ☐1 None
    - ☐2 Less than 1 serving per day
    - ☐3 1 serving per day
    - ☐4 2 servings per day
    - ☐5 3 or more servings per day

23. On a **typical day**, how many servings of fruit does your child eat? (1 serving = ¼ cup, 1 medium or 3 oz. 100% juice)
    - ☐1 None
    - ☐2 Less than 1 serving per day
    - ☐3 1 serving per day
    - ☐4 2 servings per day
    - ☐5 3 or more servings per day

Your Child's Physical Activity

Thinking about the child who is participating in this study with you, please answer the following questions about his/her physical activity.

24. Does your child have a television in his/her bedroom?
    - ☐1 Yes
    - ☐2 No

25. Over the past 30 days, on average how many hours per day did your child sit and watch TV or videos? Would you say:
    - ☐1 Less than 1 hour a week
    - ☐2 At least 1 hour a week, but less than 1 hour a day
    - ☐3 At least 1 hour a day, but less than 2 hours a day
    - ☐4 At least 2 hours a day, but less than 4 hours a day
    - ☐5 At least 4 hours a day

26. In the past week, how many days did your child eat dinner with the television turned on?

    _____ days

27. How often does your child eat or snack while watching television?
    - ☐1 Always
    - ☐2 Usually
    - ☐3 Sometimes
    - ☐4 Rarely
    - ☐5 Never

28. Think for a moment about a typical weekday for your child in the last month. How much time would you say your child spends playing outdoors on a typical weekday?

    _____ hours, _____ minutes

29. Now think about a typical weekend day for your child in the last month. How much time would you say your child spends playing outdoors on a typical weekend day?

    _____ hours, _____ minutes

About Your Extended Family

Please rate how true each of these statements is about your extended family (not your immediate family) according to the way it is now.

	Very untrue for my family	Fairly untrue for my family	Fairly true for my family	Very true for my family
30. Family members really help and support one another	☐1	☐2	☐3	☐4
31. There is a feeling of togetherness in our family	☐1	☐2	☐3	☐4
32. Our family doesn't do things together	☐1	☐2	☐3	☐4
33. We really get along well with each other	☐1	☐2	☐3	☐4
34. Family members seem to avoid contact with each other	☐1	☐2	☐3	☐4

Your Child's Relationship with Your Relative

Thinking of the family member who joined you today, answer the following questions about YOUR CHILD'S relationship with her.

35. What is YOUR CHILD'S relationship to the family member who joined you today? Is she your child's
    - ☐1 Grandmother
    - ☐2 Aunt
    - ☐3 Cousin
    - ☐4 Other: _____

36. During a typical week, how many days does your child see her? _____

37. When your child sees this family member, how long are they typically around each other?
    - ☐1 Just a few minutes
    - ☐2 A few hours
    - ☐3 Most or all of the day

38. What is usually the reason for the time your child spends with her?
    - ☐1 Childcare/babysitting
    - ☐2 Shared residence
    - ☐3 Casual family time
    - ☐4 Other: _____

Still thinking about your child's relationship with the family member who joined you today, please rate how true each of these statements is about their relationship according to the way it is now.

	Definitely does not apply	Not really	Neutral, not sure	Applies somewhat	Definitely applies
39. This family member shares an affectionate, warm relationship with my child.	☐1	☐2	☐3	☐4	☐5
40. When this family member praises my child, my child beams with pride.	☐1	☐2	☐3	☐4	☐5
41. My child spontaneously shares information about himself/herself with this family member.	☐1	☐2	☐3	☐4	☐5
42. If upset, my child will seek comfort from this family member.	☐1	☐2	☐3	☐4	☐5

	Definitely does not apply	Not really	Neutral, not sure	Applies somewhat	Definitely applies
43. My child openly shares his/her feelings and experiences with this family member.	☐1	☐2	☐3	☐4	☐5
44. My child values his/her relationship with this family member.	☐1	☐2	☐3	☐4	☐5
45. This family member and my child always seem to be struggling with each other.	☐1	☐2	☐3	☐4	☐5
46. My child is uncomfortable with physical affection or touch from this family member.	☐1	☐2	☐3	☐4	☐5
47. My child easily becomes angry with this family member.	☐1	☐2	☐3	☐4	☐5
48. My child remains angry or is resistant after being disciplined by this family member.	☐1	☐2	☐3	☐4	☐5
49. My child's feelings toward this family member can be unpredictable or can change suddenly.	☐1	☐2	☐3	☐4	☐5
50. My child is sneaky or manipulative with this family member.	☐1	☐2	☐3	☐4	☐5

Your Relationship with Your Relative

Now, still thinking of the family member who joined you today, answer the following questions about YOUR relationship with her.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
51. My family member makes me happy.	☐1	☐2	☐3	☐4	☐5
52. My family member's feelings are very important to me.	☐1	☐2	☐3	☐4	☐5
53. I enjoy my relationship with my family member.	☐1	☐2	☐3	☐4	☐5
54. I am proud of my family member.	☐1	☐2	☐3	☐4	☐5
55. My family member and I have a lot of fun together.	☐1	☐2	☐3	☐4	☐5
56. My family member frequently makes me very angry.	☐1	☐2	☐3	☐4	☐5
57. I admire my family member.	☐1	☐2	☐3	☐4	☐5
58. I like to spend time with my family member.	☐1	☐2	☐3	☐4	☐5
59. I presently spend a lot of time with my family member.	☐1	☐2	☐3	☐4	☐5
60. I call my family member on the telephone frequently.	☐1	☐2	☐3	☐4	☐5
61. My family member and I share secrets.	☐1	☐2	☐3	☐4	☐5
62. My family member and I do a lot of things together.	☐1	☐2	☐3	☐4	☐5
63. I never talk about my problems with my family member.	☐1	☐2	☐3	☐4	☐5
64. My family member and I borrow things from each other.	☐1	☐2	☐3	☐4	☐5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
65. My family member and I 'hang out' together.	☐1	☐2	☐3	☐4	☐5
66. My family member talks to me about personal problems.	☐1	☐2	☐3	☐4	☐5
67. My family member is a good friend.	☐1	☐2	☐3	☐4	☐5
68. My family member is very important in my life.	☐1	☐2	☐3	☐4	☐5
69. My family member and I are not very close.	☐1	☐2	☐3	☐4	☐5
70. My family member is one of my best friends.	☐1	☐2	☐3	☐4	☐5
71. My family member and I have a lot in common.	☐1	☐2	☐3	☐4	☐5
72. I believe I am very important to my family member.	☐1	☐2	☐3	☐4	☐5
73. I know I am one of my family member's best friends.	☐1	☐2	☐3	☐4	☐5
74. My family member is proud of me.	☐1	☐2	☐3	☐4	☐5
75. What is YOUR relationship to the family member who joined you today? Is she your ☐1 Mother (Go to question 102) ☐**2** Sister ☐**3** Aunt ☐**4** Cousin ☐**5** Other: _____					

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
76. Were you and your family member children at the same time and did you grow up together? ☐**1** Yes (Go to question 78) ☐**2** No (Go to question 102)					
77. My family member bothered me a lot when we were children.	☐1	☐2	☐3	☐4	☐5
78. I remember loving my family member very much when I was a child.	☐1	☐2	☐3	☐4	☐5
79. My family member made me miserable when we were children.	☐1	☐2	☐3	☐4	☐5
80. I was frequently angry at my family member when we were children.	☐1	☐2	☐3	☐4	☐5
81. I was proud of my family member when I was a child.	☐1	☐2	☐3	☐4	☐5
82. I enjoyed spending time with my family member as a child.	☐1	☐2	☐3	☐4	☐5
83. I remember feeling very close to my family member when we were children.	☐1	☐2	☐3	☐4	☐5
84. I remember having a lot of fun with my family member when we were children.	☐1	☐2	☐3	☐4	☐5
85. My family member and I often had the same friends as children.	☐1	☐2	☐3	☐4	☐5
86. My family member and I shared secrets as children.	☐1	☐2	☐3	☐4	☐5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
87. My family member and I often helped each other as children.	☐1	☐2	☐3	☐4	☐5
88. My family member looked after me (OR I looked after my family member) when we were children.	☐1	☐2	☐3	☐4	☐5
89. My family member and I often played together as children.	☐1	☐2	☐3	☐4	☐5
90. My family member and I did not spend a lot of time together when we were children.	☐1	☐2	☐3	☐4	☐5
91. My family member and I spent time together after school as children.	☐1	☐2	☐3	☐4	☐5
92. I talked to my family member about my problems when we were children.	☐1	☐2	☐3	☐4	☐5
93. My family member and I were 'buddies' as children.	☐1	☐2	☐3	☐4	☐5
94. My family member did not like to play with me when we were children.	☐1	☐2	☐3	☐4	☐5
95. My family member and I were very close when we were children.	☐1	☐2	☐3	☐4	☐5
96. My family member and I were important to each other when we were children.	☐1	☐2	☐3	☐4	☐5
97. My family member had an important and positive effect on my childhood.	☐1	☐2	☐3	☐4	☐5
98. My family member knew everything about me when we were children.	☐1	☐2	☐3	☐4	☐5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
99. My family member and I liked all the same things when we were children.	☐1	☐2	☐3	☐4	☐5
100. My family member and I had a lot in common as children.	☐1	☐2	☐3	☐4	☐5

A Little More About You

Now, please complete the following information about yourself.

1. What is the **highest** level of education you have achieved?
   - ☐1 Less than a high school degree
   - ☐2 High school degree or GED
   - ☐3 Some college, but have not graduated
   - ☐4 Two-year college degree
   - ☐5 Four-year college degree
   - ☐6 Graduate or post-graduate degree

2. What is your annual gross income?
   - ☐1 Up to $15,000
   - ☐2 $15,001 - $30,000
   - ☐3 $30,001 - $45,000
   - ☐4 $45,001 - $60,000
   - ☐5 $60,001 and up

3. Have you participated in any of the following programs in the last year? (Mark all that apply)
   - ☐1 WIC
   - ☐2 SNAP (formerly Food Stamps)
   - ☐3 Free or reduced-price school breakfast
   - ☐4 Free or reduced-price school lunch
   - ☐5 Free or reduced-price school dinner
   - ☐6 Free summer meals
   - ☐4 Head Start
   - ☐5 Food Pantry
   - ☐6 **Do not** participate in any of these programs

4. Were you born in the United States?
   - ☐1 Yes (please skip questions 105 and 106)
   - ☐2 No (please answer questions 105 and 106)

5. If you were not born in the United States, where were you born?

_____

6. How long have you lived in the United States?

_____

Thank you for completing this survey and your participation in our study!

APPENDIX C

EXTENDED FAMILY MEMBER'S SURVEY

Family Background Survey Family Member
You are about to complete a survey for our study. The purpose of this survey is to help us learn more about you and your relationship with the relative who joined you today. There are no right or wrong answers. Please remember that your answers will remain confidential and you may refuse to answer any question. It will take 30-45 minutes for you to complete the survey. If you have any questions, please ask the research staff who is helping you today.

About You

1. Do you consider yourself to be
   - ☐1 Very underweight
   - ☐2 A little underweight
   - ☐3 About right
   - ☐4 A little overweight
   - ☐5 Very overweight

   Please stop here and have your measurements taken before continuing

Where You Live

2. What is your zip code? _____

3. Which county do you live in?
   - ☐1 Guilford
   - ☐2 Rockingham
   - ☐3 Other _____

General Health

4. In general, would you say your health is:
   - ☐1 Excellent
   - ☐2 Very good
   - ☐3 Good
   - ☐4 Fair
   - ☐5 Poor

5. What is your age? _____

6. What would you estimate your current weight to be?
   _____ pounds

7. What would you estimate your height to be?
   _____ feet _____ inches

8. Are you currently pregnant?

_____ Yes _____ No _____ I'm not sure

About Your Extended Family

Please rate how true each of these statements is about your extended family (not your immediate family) according to the way it is now.

	Very untrue for my family	Fairly untrue for my family	Fairly true for my family	Very true for my family
9. Family members really help and support one another	☐1	☐2	☐3	☐4
10. There is a feeling of togetherness in our family	☐1	☐2	☐3	☐4
11. Our family doesn't do things together	☐1	☐2	☐3	☐4
12. We really get along well with each other	☐1	☐2	☐3	☐4
13. Family members seem to avoid contact with each other	☐1	☐2	☐3	☐4

About the child in the study with you

Thinking about the child who is participating in this study with you, answer the following questions about your relationship with him/her.

14. What is your relationship to the child who joined you today? Are you the child's
    - ☐1 Grandmother
    - ☐2 Aunt
    - ☐3 Cousin
    - ☐4 Other: _____

15. During a typical week, how many days do you see him/her? _____

16. When you see this child, how long are you typically around each other?
    - ☐1 Just a few minutes
    - ☐2 A few hours
    - ☐3 Most or all of the day

17. What is usually the reason for the time this child spends with you?
    - ☐1 Childcare/babysitting
    - ☐2 Shared residence
    - ☐3 Casual family time
    - ☐4 Other: _____

18. Do you consider this child to be:
    - ☐1 Very underweight
    - ☐2 A little underweight
    - ☐3 About right
    - ☐4 A little overweight
    - ☐5 Very overweight

19. In general, would you say this child's health is
    - ☐1 Excellent
    - ☐2 Very good
    - ☐3 Good
    - ☐4 Fair
    - ☐5 Poor

	Never	Rarely	Sometimes	Very Often	Always
20. How often does the child eat around you without his/her mother being present?	☐1	☐2	☐3	☐4	☐5
21. How often is the child physically active around you without his/her mother being present?	☐1	☐2	☐3	☐4	☐5

Still thinking about your relationship with the child who is participating in this study with you, please rate how true each statement is about your relationship according to the way it is now.

	Definitely does not apply	Not really	Neutral, not sure	Applies somewhat	Definitely applies
22. I share an affectionate, warm relationship with him/her.	☐1	☐2	☐3	☐4	☐5
23. When I praise this child, he/she beams with pride.	☐1	☐2	☐3	☐4	☐5
24. This child spontaneously shares information about himself/herself with me.	☐1	☐2	☐3	☐4	☐5
25. If upset, this child will seek comfort from me.	☐1	☐2	☐3	☐4	☐5
26. This child openly shares his/her feelings and experiences with this me.	☐1	☐2	☐3	☐4	☐5
27. This child values his/her relationship with me.	☐1	☐2	☐3	☐4	☐5
28. This child and I always seem to be struggling with each other.	☐1	☐2	☐3	☐4	☐5
29. This child is uncomfortable with physical affection or touch from me.	☐1	☐2	☐3	☐4	☐5

	Definitely does not apply	Not really	Neutral, not sure	Applies somewhat	Definitely applies
30. This child easily becomes angry with me.	☐1	☐2	☐3	☐4	☐5
31. This child remains angry or is resistant after being disciplined by me.	☐1	☐2	☐3	☐4	☐5
32. This child's feelings towards me can be unpredictable or can change suddenly.	☐1	☐2	☐3	☐4	☐5
33. This child is sneaky or manipulative with me.	☐1	☐2	☐3	☐4	☐5

About the family member in the study with you

Thinking of the family member you joined today, answer the following questions about YOUR relationship with her.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
34. My family member makes me happy.	☐1	☐2	☐3	☐4	☐5
35. My family member's feelings are very important to me.	☐1	☐2	☐3	☐4	☐5
36. I enjoy my relationship with my family member.	☐1	☐2	☐3	☐4	☐5
37. I am proud of my family member.	☐1	☐2	☐3	☐4	☐5
38. My family member and I have a lot of fun together.	☐1	☐2	☐3	☐4	☐5
39. My family member frequently makes me very angry.	☐1	☐2	☐3	☐4	☐5
40. I admire my family member.	☐1	☐2	☐3	☐4	☐5
41. I like to spend time with my family member.	☐1	☐2	☐3	☐4	☐5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
42. I presently spend a lot of time with my family member.	☐1	☐2	☐3	☐4	☐5
43. I call my family member on the telephone frequently.	☐1	☐2	☐3	☐4	☐5
44. My family member and I share secrets.	☐1	☐2	☐3	☐4	☐5
45. My family member and I do a lot of things together.	☐1	☐2	☐3	☐4	☐5
46. I **NEVER** talk about my problems with my family member.	☐1	☐2	☐3	☐4	☐5
47. My family member and I borrow things from each other.	☐1	☐2	☐3	☐4	☐5
48. My family member and I 'hang out' together.	☐1	☐2	☐3	☐4	☐5
49. My family member talks to me about personal problems.	☐1	☐2	☐3	☐4	☐5
50. My family member is a good friend.	☐1	☐2	☐3	☐4	☐5
51. My family member is very important in my life.	☐1	☐2	☐3	☐4	☐5
52. My family member and I are **NOT** very close.	☐1	☐2	☐3	☐4	☐5
53. My family member is one of my best friends.	☐1	☐2	☐3	☐4	☐5
54. My family member and I have a lot in common.	☐1	☐2	☐3	☐4	☐5
55. I believe I am very important to my family member.	☐1	☐2	☐3	☐4	☐5
56. I know I am one of my family member's best friends.	☐1	☐2	☐3	☐4	☐5
57. My family member is proud of me.	☐1	☐2	☐3	☐4	☐5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
58. What is YOUR relationship to the family member who joined you today? Is she your ☐1 Daughter (Go to question 84) ☐2 Sister ☐3 Aunt ☐4 Cousin ☐5 Other: _____					
59. Were you and your family member children at the same time and did you grow up together? ☐1 Yes (Go to question 60) ☐2 No (Go to question 84)					
60. My family member bothered me a lot when we were children.	☐1	☐2	☐3	☐4	☐5
61. I remember loving my family member very much when I was a child.	☐1	☐2	☐3	☐4	☐5
62. My family member made me miserable when we were children.	☐1	☐2	☐3	☐4	☐5
63. I was frequently angry at my family member when we were children.	☐1	☐2	☐3	☐4	☐5
64. I was proud of my family member when I was a child.	☐1	☐2	☐3	☐4	☐5
65. I enjoyed spending time with my family member as a child.	☐1	☐2	☐3	☐4	☐5
66. I remember feeling very close to my family member when we were children.	☐1	☐2	☐3	☐4	☐5
67. I remember having a lot of fun with my family member when we were children.	☐1	☐2	☐3	☐4	☐5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
68. My family member and I often had the same friends as children.	☐1	☐2	☐3	☐4	☐5
69. My family member and I shared secrets as children.	☐1	☐2	☐3	☐4	☐5
70. My family member and I often helped each other as children.	☐1	☐2	☐3	☐4	☐5
71. My family member looked after me (**OR** I looked after my family member) when we were children.	☐1	☐2	☐3	☐4	☐5
72. My family member and I often played together as children.	☐1	☐2	☐3	☐4	☐5
73. My family member and I did **NOT** spend a lot of time together when we were children.	☐1	☐2	☐3	☐4	☐5
74. My family member and I spent time together after school as children.	☐1	☐2	☐3	☐4	☐5
75. I talked to my family member about my problems when we were children.	☐1	☐2	☐3	☐4	☐5
76. My family member and I were 'buddies' as children.	☐1	☐2	☐3	☐4	☐5
77. My family member did **NOT** like to play with me when we were children.	☐1	☐2	☐3	☐4	☐5
78. My family member and I were very close when we were children.	☐1	☐2	☐3	☐4	☐5
79. My family member and I were important to each other when we were children.	☐1	☐2	☐3	☐4	☐5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
80. My family member had an important and positive effect on my childhood.	☐1	☐2	☐3	☐4	☐5
81. My family member knew everything about me when we were children.	☐1	☐2	☐3	☐4	☐5
82. My family member and I liked all the same things when we were children.	☐1	☐2	☐3	☐4	☐5
83. My family member and I had a lot in common as children.	☐1	☐2	☐3	☐4	☐5

A Little More About You

84. What is the **highest** level of education you have achieved?
    - ☐1 Less than a high school degree
    - ☐2 High school degree or GED
    - ☐3 Some college, but have not graduated
    - ☐4 Two-year college degree
    - ☐5 Four-year college degree
    - ☐6 Graduate or post-graduate degree

85. What is your annual gross income?
    - ☐1 Up to $15,000
    - ☐2 $15,001 - $30,000
    - ☐3 $30,001 - $45,000
    - ☐4 $45,001 - $60,000
    - ☐5 $60,001 and up

86. Have you participated in any of the following programs in the last year? (Mark all that apply)
    - ☐1 WIC
    - ☐2 SNAP (formerly Food Stamps)
    - ☐3 Free or reduced-price school breakfast
    - ☐4 Free or reduced-price school lunch
    - ☐5 Free or reduced-price school supper
    - ☐6 Free summer meals
    - ☐7 Head Start
    - ☐8 Food Pantry
    - ☐9 **Do not** participate in any of these programs

87. Were you born in the United States?
    - ☐1 Yes (please skip questions 88 and 89)
    - ☐2 No (please answer questions 88 and 89)

88. If you were not born in the United States, where were you born?

_____

89. How long have you lived in the United States?

_____

Thank you for completing this survey and your participation in this study!