To the Graduate Council:

I am submitting herewith a thesis written by Kirsten Erika Anderson entitled “Roles, Perceptions, and Control of Infant Feeding among Low-Income Fathers in East Tennessee.” I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Nutrition.

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ROLES, PERCEPTIONS, AND CONTROL
OF INFANT FEEDING AMONG LOW-INCOME FATHERS
IN EAST TENNESSEE

A Thesis
Presented for the Master of Science Degree
The University of Tennessee, Knoxville

Kirsten Erika Anderson
December 2008
DEDICATION

To the twenty-one fathers and their families:

Thank you for sharing your stories, your time, and some laughs along the trail. I truly hope that in some small way this research may help our community to serve you, and all families in East Tennessee for years to come.
ACKNOWLEDGEMENTS

Dr. Haughton and Dr. Spence have been valuable resources for me throughout the thesis planning and writing process. None of this would have been possible without their great ideas, resources, and advice. Thank you.

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Lauren Grainger and Joy Nolte
These are the ladies who did the transcription work for this project. They are the ones who did the hard work. Thank you.

I would like to especially thank Jennifer Nicklas, my fellow student and dear friend who spent countless hours helping me code and analyze the fathers’ interviews. …And now we can add without using our calculators!

Of course, it would be a complete crime not to mention here the dedication and support that I got from “Dr. Katie,” to whom I will be forever grateful for getting me through this whole process with my sanity intact (for the most part). She is truly a wonderful educator, mentor, and friend. The University of Tennessee is incredibly lucky to have her smiling face on its payroll.
ABSTRACT

INTRODUCTION: Introduction of solid foods before the recommended age of 4-6 months is a common practice in the United States, and appears to be especially prevalent among infants who are enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Currently, little is known about how fathers influence early infant feeding decisions, outside of the decision to breast- or formula-feed. The purpose of this study was to explore how fathers perceive the role they play in feeding and caring for their infants. METHODS: Participants were 21 male-caregivers, who were fathers or partners of the mothers of WIC income-eligible infants residing in two rural East Tennessee counties. In-depth, audio-taped telephone interviews were completed. Interviews were transcribed, coded, and analyzed according to standard grounded theory procedures to identify emergent concepts. These concepts were explored and linked together to become themes. RESULTS: Three themes emerged: 1) fathers’ roles; 2) fathers’ perceptions; 3) and control. Concepts within the theme of “fathers’ roles” included physical and emotional support for both mother and infant, validation of maternal decisions, and financial support. In this study, fathers’ perceptions were primarily shaped by their own experiences, advice from those with experience, and information sought by the fathers. The theme of control appears to be the linkage between the fathers’ attempts to modify infant behavior and infants’ responses. CONCLUSIONS: A final conceptual model was created to explain the inter-related nature of the themes and may be helpful to those who work with fathers and/or families of new infants.
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PART 1: Introduction Literature Review
The Consequences of Rapid Infant Weight Gain

The focus of this research project was to determine the extent to which male caregivers influence early feeding practices of their infants as well as their perceptions of early infant weight gain. Of particular interest was the role fathers play in making decisions affecting the feeding patterns and introduction of solid foods in both formula-fed and breastfed infants. Because of rising numbers of overweight children it is more important than ever to seek the causes of childhood overweight so that interventions and education may be developed to curb these trends. A number of studies have recently shown correlations between rapid weight gain in early infancy and children’s weight in later years\textsuperscript{(1-5)}.

One of these studies was conducted by Stettler et al, who looked at the weights of 19,397 Americans in a prospective, cohort study at 12 different city sites around the US. Initial infant feeding modality was recorded, but not taken into consideration in this study. They found that rapid weight gain in the first 4 months of life predicted higher BMI measurements at 7 years of age. This study also found that infant weight at 1 year (independent of weight gain in the first 4 months) did not predict BMI at 7 years, putting a greater emphasis on the importance of proper weight gain in early infancy. The researchers noted that feeding guidelines for infants were different when the subjects of this study were born (1959-1965) compared to current guidelines. Guidelines at that time encouraged the introduction of solid foods at an earlier age than is now recommended (current recommendations are for 4-6 months\textsuperscript{(6)}), which may account for some of the additional weight gain before 4 months\textsuperscript{(3)}. 
In 2005 Stettler et al.\textsuperscript{(4)} published a cohort study in which rapid weight gains in the first 8 days and 112 days of life were found to be important predictors of adult overweight 20-32 years later. All infants in the study were formula-fed and complementary foods were allowed (but not encouraged) after day 28. The study did not take these foods into consideration when looking at weight gain variables. The researchers found that these formula-fed infants had a 28% greater chance of becoming obese as adults with every 100 gram weight gain in the first week of life. All subjects in this study were European American, which is not representative of the United States population, but still may offer valuable insight into long-term effects of early weight gain\textsuperscript{(4)}.

Supporting Stettler and colleagues’ research\textsuperscript{(4)} association between weight gain in the first 4 months of life and childhood overweight, Ong et al.\textsuperscript{(1)} conducted a cohort study following infants from birth to 5 years of age to determine whether energy intake at 4 months predicted a higher BMI at 5 years. The study included a sample of 299 exclusively breastfed infants, 499 exclusively formula-fed infants, and 83 mixed breastfed and formula-fed infants. They found that at 4 months of age, formula- and mixed formula-fed infants had higher energy intakes than breastfed infants, which lead to higher body weights (p < 0.0001). This kind of weight gain, predisposing infants to higher BMIs at 5 years of age, was not seen in breastfed infants (p < 0.9). In addition, the earlier that non-breastfed infants were given complementary foods, the higher their energy intake was reported to be (p = 0.002). Those who were introduced to complementary foods at 1-2 months consumed around 2805.6 ± 50.4 kJ/day (670.1 ± 12.0 kcal/day), those at 2+ to 3 months consumed 2658.6 ± 25.2 kJ/day (634.0 ± 6.0...
kcal/day), and those at 4+ months around 2587.2 + 46.2 kJ/day (617.9 ± 11.0 kcal/day).
This was not seen in breastfed infants (p = .28-.35). Because of this, the formula- and
mixed formula-fed infants were more likely to experience rapid weight gain, which may
be an explanatory variable leading to their risk for having a higher BMI at five years\textsuperscript{(1)}.

**The Male Caregiver’s Role in Decision Making: Breastfeed vs. Formula-feed**

Due to tremendous health advantages related to breastfeeding\textsuperscript{(7-9)}, one of the most
critical infant feeding decisions is whether an infant will be breastfed or formula-fed. A
number of studies, including a review of literature from 1980-1995 performed by Bar-
Yam and Darby\textsuperscript{(10)}, have identified that fathers have a significant influence over decisions
concerning infant feeding habits, in particular the decision to breastfeed or formula-
feed\textsuperscript{(10-16)}. Also, research shows that often a mother’s desire to breastfeed is more
predictive of whether she will choose to breastfeed than is the preferences of her
partner\textsuperscript{(17, 18)}. These studies suggest that sometimes a mother’s desire to formula-feed is
directly related to her desire to include the father in the care taking responsibilities\textsuperscript{(19)}.

In one study, Shaker et al. surveyed 108 couples in Scotland, who were 8-12 weeks
pregnant, to determine the mother’s and father’s attitudes toward breastfeeding and
formula-feeding\textsuperscript{(16)}. They found that parents of infants whose mothers intended to
breastfeed had a better understanding of the health benefits associated with breastfeeding
than did those mothers and fathers who planned to formula-feed their infants (p < 0.001,
for both mothers and fathers). In addition, they noted that fathers of breastfed infants
were more likely than fathers of formula-fed infants to believe that breastmilk is the ideal
source of nutrition for the baby (p < 0.001) and that breastfed infants are healthier than formula-fed infants (p < 0.001). The researchers noted that 81.5% of mothers had decided whether or not they would breastfeed or formula-feed before they came to the clinic for their first prenatal visit. This is consistent with the findings from other research suggesting that mothers usually have made a decision about how they plan to feed their baby before they become pregnant or during their first trimester\(^{20}\). Shaker found that 80% of those mothers who were undecided whether to formula- or breastfeed at the time they gave birth, left the hospital formula-feeding\(^{16}\). Because mothers have often made up their minds to breastfeed early in their pregnancy, educational programs to support breastfeeding may be more efficacious if they occur before the woman or couple ever comes to the clinic. In addition, breastfeeding education may be of greater value to those couples who are “undecided” about whether they will breastfeed or formula-feed their infant.

Freed et al.\(^{13}\) conducted a survey of 268 mother-father couples in Houston, Texas in part to determine fathers’ breast-feeding knowledge and perceptions. One of the most surprising findings of the mothers’ survey data was that 32% of the women predicted that their partner would have negative feelings about breastfeeding when the partners did not. An important note made by the researchers in their discussion is that it was actually the perception of their partners’ attitude that affected the mothers’ choice to breastfeed. This finding reinforces the theory that male partners need to receive accurate information and learn to communicate openly attitudes regarding breastfeeding to their female counterpart. In addition, men who indicated that their partners intended to breastfeed
rather than formula-feed knew more about breastfeeding than those who indicated that their partners were planning to formula-feed\(^{(13)}\).

Recently, several pilot programs in the United States have been conducted to test the effectiveness of infant feeding education programs that include the father of the infant\(^{(11, 12, 14, 20)}\). Increasing knowledge among fathers about infant feeding practices appears to be feasible with relatively little educational intervention. In 2004, research done by Wolfberg et al.\(^{(11)}\) sought to determine whether a simple intervention based on educating fathers about breastfeeding would impact the decision to breastfeed. The study included 59 male participants who were recruited during their partners’ second trimester of pregnancy from the John Hopkins obstetrics ward. These participants were divided into an intervention group that received a 2-hour class on breastfeeding education and a control group that received a 2-hour class on general infant care. The researchers found that 74% of expectant fathers who received only 2 hours of breastfeeding education, as opposed to 41% of the control group who received 2 hours of general infant care education, had partners who initiated breastfeeding\(^{(11)}\).

Also in 2004, Stremler and Lovera\(^{(14)}\) began a Father-to-Father Breastfeeding Support Pilot Program in two different Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) clinics in Brownsville, Texas, which was modeled after a similar mother-to-mother peer counseling program that already existed in WIC clinics throughout parts of Texas. This program used 4 peer fathers who provided individual counseling, support, classes, and public speaking to educate other fathers about the benefits of breastfeeding and the importance of the father’s support for breastfeeding success. According to the researchers “almost all” of the fathers found the information
that they received from the peer counselors to be “very important” and all but one of the fathers, whose infant was not breastfed, felt that fathers played an important role in supporting their partners’ breastfeeding. The article did not indicate whether the program actually increased the number of those who initiated breastfeeding or the duration of breastfeeding rates at the clinics\(^{(14)}\).

Another intervention study was conducted by Sciacca et al.\(^{(20)}\) with WIC participants in Flagstaff, Arizona. It provided small incentives to encourage attendance at educational classes for the mother and her significant other. In addition, participants received incentives for breastfeeding for certain lengths of time. The control and intervention groups were provided similar support throughout prenatal and post-partum program enrollment with the exception of an additional 2-hour long prenatal class dedicated solely to breastfeeding and a 5-class series, also provided prenatally, on childbirth preparation, both of which were provided only to the intervention group. Twenty-nine couples completed the study in the control group and 26 couples completed the study in the intervention group. The intervention group had significantly higher rates of women exclusively breastfeeding at initial hospital discharge (88.5\% vs. 55.2\%; \(p<0.05\)), 2 weeks postpartum (80.8\% vs. 34.5\%; \(p=<0.05\)), 6 weeks postpartum (50.0\% vs. 24.1\%; \(p<0.05\)), and 3 months postpartum (42.3\% vs. 17.2\%; \(p<0.05\)). This is one of very few programs that included the father in the infant feeding education, but the main focus of the study was to determine whether incentives would increase class participation and attendance, in turn increasing breastfeeding rates\(^{(20)}\).

One program aimed at fathers to increase their partners’ breastfeeding rates has been in place at the Los Angeles Department of Water and Power since 1990. This program
offers breastfeeding education classes to both the father and his partner, lactation consultant support, and breast pumps that his partner can use either at home or at her workplace. In 1996 this program reported that the average length of breastfeeding among participants’ partners was 8 months and the majority (69%) of the women worked while breastfeeding. This is one more instance of a successful program in which infant feeding choices were affected through education of the father and mother(21).

A small study in Great Britain sought to determine who fathers were consulting for information regarding infant feeding. Recruitment of the fathers was done through primary care offices. When a mother came to the clinic she was given a copy of the survey to take home for her partner to complete. The study surveyed 113 fathers (only 81 actually returned the survey) and found that when they asked fathers who they consulted regarding infant feeding methods during pregnancy, 65% consulted only their partner, while 27% of fathers didn’t consult anyone about infant feeding, including their partner, during pregnancy. Only 5% of the fathers who were surveyed talked with a doctor about infant feeding and only 6% indicated that they had talked with another health care provider about infant feeding practices(22). It should be taken into consideration that these data were collected in Britain in 1993, but because of the low numbers of men who talked with any health care provider (doctor or other) about infant feeding, it may be something that may need further research. It is interesting to note the contrast found in this study and the aforementioned study(22) in which only 65% of couples had discussed infant feeding decisions during pregnancy compared with the study conducted by Freed and colleagues in which 90% of couples had discussed these decisions(13).
Determining whether the mother will initially choose to breastfeed the infant is only one of the first infant feeding decisions that may involve the father and may be greatly influenced by his knowledge and perceptions. The studies discussed in this section have helped establish the theory that the initiation, duration, and exclusivity of breastfeeding may be dependent upon the father’s knowledge on the subject and the support provided to his partner throughout her breastfeeding. His knowledge and abilities are enhanced through education.

A Male Caregiver’s Role and Perceptions Regarding Formula-feeding Activities

Fathers play a particularly important role in formula-feeding and often formula-feeding is established over breast-feeding because the parents specifically want to include the father in the feeding process \(^{(19)}\). In a study done by Earl\(^{(19)}\), 19 women were interviewed twice over the course of their pregnancy and once after giving birth to determine the main reasons they chose to formula-feed or breastfeed. The women who chose to formula-feed expressed two main reasons for formula-feeding that concerned the father’s role, which included: 1) to let the father have the chance to bond with the child through feeding; and 2) to help relieve the mother of the responsibility of having to administer 100% of the feeds to the infant, as would be necessary through breast-feeding \(^{(19)}\). This would suggest that often mothers choose to formula-feed with the intention that their partners will share the responsibility when it comes time to feed a hungry infant.

Voss et al.\(^{(22)}\), researched how often fathers helped with formula-feeding and what kinds of tasks he took part in when helping. Eighty-one participants in the study were
fathers of formula-fed infants at the time that the survey was administered. Of those
surveyed, only 17% reported that they “always” helped with the feeding process in some
way. Sixty-four percent of the fathers reported that they helped “sometimes,” and 14%
helped “rarely.” In helping, 65% of fathers helped with feeding the bottle to the infant,
56% of fathers regularly helped with preparing the formula, and proportionally fewer
fathers helped with things like “preparing the baby’s food,” “cleaning the bottles,”
“keeping other children occupied,” and “housework to give their partners more time to
feed.” The study did not address whether the mothers felt that their partners were helping
as much as they may have planned when they originally chose to formula-feed. The
study was conducted in the United Kingdom, so it may have limited relevance to
populations outside of the area. Nonetheless, the research presents some interesting data
about the actual role male caregivers may play in the feeding of their formula-fed infants.

Early Introduction of Solid Foods

The American Academy of Pediatrics (AAP) Committee on Nutrition
recommends the introduction of solid foods to take place when the infant is
developmentally ready. This could be as early as 4 months and as late as 8 months of
age\(^{(7)}\). Also, recommendations state that children should not receive cow’s milk before
the age of 1 year\(^{(7)}\). These recommendations are made in part due to the increased
exposure to allergens when foods other than breast milk are introduced prematurely\(^{(23)}\).
Some research shows that infants gain weight more rapidly when they are fed these foods
before the recommended ages\(^{(1)}\). Despite recommendations regarding the introduction of
complementary foods, there are still many caretakers who introduce solid foods to their infants before the recommended age\(^{(24-26)}\).

Briefel et al.\(^{(24)}\) analyzed findings from the 2002 Feeding Infants and Toddlers Study (FITS) to determine the number of parents who were not following the infant feeding guidelines recommended by the AAP. The FITS included a 24-hour dietary recall with a national sample of 3,022 infants ages 4-24 months. This study included findings on breastfeeding initiation and duration rates, iron supplementation, and timing of the introduction of solid foods to these infants. They found that 29% of mothers were introducing solid foods before the suggested 4-6 months of age\(^{(24)}\).

Ponza et al.\(^{(25)}\) surveyed mothers of 862 infants between the ages of 4-6 months to determine what foods the infants were eating at this time. Of these infants, 265 were enrolled in the WIC program and the remainder of these infants were not enrolled in the WIC program. The researchers compared the WIC enrolled infants to non-WIC enrolled infants to see if there was a significant difference in the types of foods being introduced. The researchers found that significantly more infants in WIC were introduced to cooked vegetables (\(p<0.05\)), raw vegetables (\(p<0.01\)), potatoes (\(p<0.05\)), any fruit (\(p<0.05\)), non-baby food fruit (\(p<0.05\)), canned fruits (\(p<0.01\)), non-baby food meats (\(p<0.01\)), desserts and sweets (\(p<0.01\)), and juices and juice drinks (\(p<0.01\)) than their non-WIC counterparts who were not enrolled in WIC. None of these foods listed are recommended before 4-6 months of age\(^{(25)}\). Moreover, the researchers estimated the energy intakes of all infants in this study and found that infants in WIC were consuming more energy than they actually required, placing them at higher risk for rapid weight gain and possibly overweight later in life\(^{(25)}\). This may indicate that WIC participants, in particular, need
additional education about early infant feeding recommendations or possibly more effective modes of delivering this education.

In another study (26), researchers asked 218 African-American, WIC enrolled mothers about the “non-milk” foods consumed by their infants after 7-10 days, 8 weeks, and 16 weeks of life. A significant finding of this study was that 32% of mothers reported that they had fed their infants solid food by the time they were 7-10 days old. In addition, 77% of the infants had been introduced to solid foods at 8 weeks of age, 2 months before the most developmentally advanced infant should begin receiving these foods. By the time infants had reached 4 months of age, 93% of the infants had already been given solid foods. Foods that mothers most commonly offered included cereal in the bottle with formula and fruits and cereal from a spoon. The authors noted that parents chose not to adhere to the infant feeding recommendations despite the WIC nutrition education provided. They suggested also that more qualitative research needs to be conducted to determine the reasons mothers make the decision to introduce solid foods earlier than the AAP recommends (26).

Although most information to date regarding the introduction of solid foods has been based on data provided by mothers, it is possible that male caregivers may play pivotal roles in the decisions regarding infant feeding, including when to introduce solid foods. Determining perceptions of male caregivers regarding this subject matter may lead to better education targeted towards male caregivers. It would not be unrealistic to think that educating male caregivers on other infant feeding recommendations beyond breastfeeding may increase adherence to these guidelines as well.
**Perceptions of Infant Weight Gain**

Few studies address how parents perceive infant weight gain. Those that do address this topic look only at the perceptions of mothers and imply that perceptions surrounding infant weight gain may affect the way a mother feeds her infant. One of these studies was conducted in Australia by Zehle et al.(27). It consisted of 16 in-depth interviews with first time mothers of infants and toddlers under 2-year-old. Nine different ethnic groups were represented in the sample and most participants were highly educated. Although the interviewers asked questions that were not directly pertinent to infant weight gain, they did briefly address the topic. The researchers found that most of the mothers were not concerned about overfeeding their infants and that weight gain was seen as a positive attribute. A quote from one of the participants suggested that she did not believe it was possible to overfeed her baby, even when her doctor suggested that she was doing so. Overall, the study found that women were not concerned about issues of obesity while their children were still toddlers or younger.(27). This study revealed some disconnect between the perceptions of mothers and healthcare providers when it comes to weight gain and obesity prevention. More information is needed to gain a better understanding of the constructs that guide mothers’ perceptions.

A study conducted in the US by Worobey and Lopez(28) among WIC mothers sought to gain some insight into the effects of maternal perception of infant weight in relation to the desired weight of their infant. Two-hundred-forty exclusively formula-feeding mothers from racially mixed backgrounds (primarily Mexican or other Latino descent, black, and some whites) were asked to use pictorial representations from the
Baby Rating Scale (BRS) to identify their perception of their infants’ weights. Then they were asked to identify the weight that they thought their children should be. Among the ethnic groups, Mexican American mothers thought their babies were the leanest, but desired the largest babies. This was in direct contrast to the white mothers, who perceived their infants to be slightly larger, but indicated that they desired the leanest infants\(^{(28)}\). Perceptions of infant weight are important. They cast light on reasons mothers may be overfeeding their infants or desiring them to gain weight rapidly. If a larger baby is perceived as being superior or desired, it may be more likely that a mother will over-feed her infant to reach that goal, guided by her perceptions on the subject. It is important that the healthcare providers understand differences in these perceptions so culturally competent methods can be developed to effectively address them. To date, no research exists regarding fathers’ perceptions of infant weight or their thoughts on overfeeding.

**Conclusion**

It is important to recognize the powerful influence a male caregiver may have in shaping the feeding habits of his infant. Male caregivers play an important role in supporting the decision to breastfeed, making it plausible that they could greatly influence other infant feeding decisions and practices, such as the introduction of solid foods and other feeding techniques. The early introduction of solid foods has been linked to greater energy intake and a more rapid weight gain in infancy. This may be linked to childhood overweight that may continue to adulthood. It appears that the most important
time to prevent the rapid weight gain in infants, and thus to reduce the risk of overweight later in life, is before 4 months of age. While there is research that indicates that many infants are being introduced to solid foods before the recommended 4 months of age, there is little research that documents the rationale for this behavior. Currently, no published research could be found that investigates male caregivers’ knowledge, perceptions, or roles regarding the introduction of solid foods to their infants or their perceptions of appropriate infant weight gain and healthy infant weight. Gaining a better understanding of male caregivers’ perceived roles in feeding and their infant’s weight gain may help health care providers to design better interventions and education for male caregivers to promote healthier infant feeding choices that may prevent rapid infant weight gain and its associated long-term health consequences.

**Research Questions**

The questions that this study seeks to address are as follows:

1. What are the roles of fathers in relation to infant feeding?
2. What are the perceptions of fathers in relation to infant feeding?
References: PART 1


PART 2: Article for Publication
Abstract

INTRODUCTION: Introduction of solid foods before the recommended age of 4-6 months is a common practice in the United States, and appears to be especially prevalent among infants who are enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Currently, little is known about how fathers influence early infant feeding decisions, outside of the decision to breast- or formula-feed. The purpose of this study was to explore how fathers perceive the role they play in feeding and caring for their infants. METHODS: Participants were 21 male-caregivers, who were fathers or partners of the mothers of WIC income-eligible infants residing in two rural East Tennessee counties. In-depth, audio-taped telephone interviews were completed. Interviews were transcribed, coded, and analyzed according to standard grounded theory procedures to identify emergent concepts. These concepts were explored and linked together to become themes. RESULTS: Three themes emerged: 1) fathers’ roles; 2) fathers’ perceptions; 3) and control. Concepts within the theme of “fathers’ roles” included physical and emotional support for both mother and infant, validation of maternal decisions, and financial support. In this study, fathers’ perceptions were primarily shaped by their own experiences, advice from those with experience, and information sought by the fathers. The theme of control appears to be the linkage between the fathers’ attempts to modify infant behavior and infants’ response. CONCLUSIONS: A final conceptual model was created to explain the inter-related nature of the themes and may be helpful to those who work with fathers and/or families of new infants.
Introduction

Childhood overweight and obesity is a complex, multifaceted health concern that is expected to continue its upward trend in the 21st century\(^{(1-4)}\). Conditions such as diabetes\(^{(5)}\), metabolic disease\(^{(6)}\), cardiovascular disease\(^{(7)}\), asthma\(^{(8)}\), and sleep apnea\(^{(9)}\) are prevalent among overweight children. In addition, there appears to be a glaring health inequity, with weight inversely associated with socioeconomic status\(^{(10)}\). One piece of the obesity puzzle may be explained by rapid infant weight gain. Several researchers have linked rapid weight gain in early infancy to later overweight in childhood\(^{(11-14)}\). It is unclear how the mode of early infant feeding may impact this rapid rate of gain. The American Academy of Pediatrics Committee on Nutrition recommends delaying introduction of solid foods to at least 4 months of age or longer\(^{(15)}\). However, recent research suggests that early introduction of solid foods may be associated with accelerated infant weight gain\(^{(11)}\), and early introduction of solid foods appears to be prevalent in the United States\(^{(16)}\). Participants in the Special Supplemental Nutrition Program for Women Infants and Children (WIC) appear to be more likely than those not participating in WIC to introduce foods before this 4 month recommendation\(^{(17)}\).

How families decide to feed infants is likely to be influenced by many factors, including exposure to WIC nutrition education, pediatrician advice, grandmother advice, and others\(^{(18, 19)}\). In addition, several studies have reported on the influence of infant’s father, or partner of the mother, on the decision to breast- or formula-feed\(^{(19-22)}\). However, little is known about how these male caregivers influence the introduction of foods other than breastmilk or formula. The aim of this project was to investigate the perceptions of
male-caregivers of 4-6 month old infants regarding their roles in decision-making about infant feeding and specifically introduction to solid foods.

**Methods**

**Script Development**

An approximately 30 minute long interview script was developed based on a topical literature review and feedback received from an expert in maternal and infant nutrition. Six content areas were included in the script (Figure 1). The script was used to guide discussions with the male caregivers. However, if new topics arose during a conversation, the researcher could probe more deeply and did not have to follow the script with rigor. This method of interviewing, referred to as the “general interview guide approach,” is outlined by Patton\(^{23}\). As new ideas emerged in the initial interviews, the script was modified to include questions in these new emergent areas and questions from the original script.

<table>
<thead>
<tr>
<th>Content Areas Included in Script</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Father’s role in supporting infant feeding</td>
</tr>
<tr>
<td>(2) Age of introduction of foods other than breastmilk or formula</td>
</tr>
<tr>
<td>(3) Triggers associated with early introduction of these foods</td>
</tr>
<tr>
<td>(4) Primary influences on infant feeding decisions</td>
</tr>
<tr>
<td>(5) Assessment of how one decides to start and stop a feed</td>
</tr>
<tr>
<td>(6) Perceptions and attitudes toward infant fatness</td>
</tr>
</tbody>
</table>

**Figure 1: Content Areas of Interview Script**
Eligibility, Recruitment, Screening, and Interviewing

To identify male participants, mothers were screened first. Eligibility requirements included having an infant who was 0-6 months old; being a WIC participant or, meeting the WIC income eligibility guidelines (WIC income eligibility is based on a particular income level per particular household size set at 180% of the Federal Poverty Level); and having a male caregiver in the infant’s life that was either the father or someone who functioned as a father figure to the infant. In addition, the male caregiver had to speak English. The male caregiver could not be a male family member (i.e. brother, infant’s grandfather, etc.) or companion (without father-figure role in infant’s life) of the mother.

Recruitment was conducted through: 1) a voluntary birth registry housed at the University of Tennessee, Knoxville; 2) fliers distributed at one WIC clinic; 3) an advertisement in the university’s daily student newspaper; 4) and word-of-mouth. Potential participants were encouraged to contact the project’s research lab to be assessed for eligibility. Approval for this study was granted by the Institutional Review Boards from the University of Tennessee and the State of Tennessee.

Mothers of the infants were screened over the telephone to determine if their infant had a male-caregiver who met eligibility requirements for this study. If a potential male-caregiver was identified, contact information was collected and the lead researcher verified interest via phone call. If interested in participating, identified male-caregivers were mailed a consent form and an interview was scheduled. Informed consent was verified through audio-recorded verbal acknowledgement that the male-caregiver had received, read, understood, and chose to consent to the interview.
All interviews were conducted by the lead researcher for continuity of questioning and to allow for more rapid identification of emerging themes. Upon completion of the interview, male-caregivers were mailed modest compensation. Saturation was reached by the 21st and final interview. This is supported by the estimated number required to generally reach saturation, which was identified by Guest et al. who found that 12 in-depth interviews is generally enough to reach saturation(24).

**Data Coding**

Data analysis and development of the conceptual model followed a systematic procedure of coding, constant comparison, categorizing, and memoing as outlined by Miles and Huberman(25). Interviews were transcribed verbatim into a word-processing software program by research assistants trained in transcription. Subject names were replaced with identification numbers. Inductive coding(26) was utilized for the creation of descriptive and inferential coding, as explained by Miles and Huberman(25). Two researchers coded the first interview separately and independently developed a set of codes which included a detailed description of each code. Subsequently, the researchers met and examined the independently-developed codes and agreed upon the codes and definitions to be used in coding the rest of the transcriptions. Within the second and third interviews, additional codes were identified and added to the list of working codes. Segments of coded text varied in length and depth of topic and could contain multiple codes. The researchers met weekly to discuss any new codes and to reach mutual agreement upon the coding of transcripts. At each weekly meeting, three transcripts were
discussed. Inter-reliability scores were calculated for each individual transcript and for
the average of the three transcripts coded at each meeting. Initial inter-reliability coding
of the first three transcripts was 60%. Few new codes surfaced after the third meeting.
With each meeting, average inter-reliability increased until the researchers reached 97%
original agreement at the final (eighth) coding session. Interviewing continued until
saturation was achieved, as determined by the researchers during the coding process.

**Data Analysis**

Data analysis continued, after the descriptive and inferential coding was complete,
through a process in a series of integrated steps. First, text from coded transcripts was
copied from the word-processing file and inserted into a file in an electronic spreadsheet
program. Within the file, each tab housed text for a specific code. As noted prior, each
segment of text could contain multiple codes. For this reason, each segment was copied
into each relevant tab, thus remaining associated with any other codes that were applied
to that segment of coded text. The primary researcher examined each set of data by
descriptive and inferential code to determine whether there were patterns within each
code. Memoing was utilized several different ways within the spreadsheet of organized
codes. First, it was used to summarize or question the content of short passages of coded
text. Second, it was used after reviewing all of the text related to a specific code to
summarize the ideas within the text applicable to the specific code. Finally, memoing
was used to relate the ideas within one code to those present among other codes.
In addition to memoing about how the information between codes related, because all codes were left attached to every section of coded text, the researcher was able to examine the reoccurrence of multiple codes that appeared frequently in association with the code group being examined. Codes that appeared together frequently were recorded at the top of each code category tab in the spreadsheet. This not only identified patterns that emerged between codes, but also helped to cross validate linkages. The process of determining ideas and organization within each code and then between codes is similar to that used by Jacelon and O’Dell in nursing research\(^{(27)}\).

Patterns codes were developed as the researcher began to identify linkages among coded materials through memoing in the spreadsheet. For this study, pattern coding occurred later in data analysis, after relationships between certain codes were better understood. Organizing robust pattern codes and pattern sub-codes led the researcher to several related concepts, which were categorized into themes.

Through discussion of metaphorical modeling\(^{(25)}\) and revisiting the memos and pattern codes with two other researchers, several exploratory conceptual models were created. The final model was based on consensus about the concepts related to infant feeding and the inter-relationships between the themes identified.
Results

Participants

Ninety-three mothers were screened for presence of an eligible male caregiver. Table 1 outlines recruitment sources of participants and number screened. The primary source for recruiting participants was through the voluntary birth registry. Screening for participants from the WIC program occurred late in the screening process, secondary to delay in receiving the differential IRB approval from the State. Fifteen (71%) participants had WIC-enrolled infants, while 6 (29%) had infants who were WIC income-eligible, but did not participate in WIC. The primary reason for ineligibility was reporting income higher than WIC eligibility criterion (47% of those screened). Three infants were > 6 months of age at the time the mothers were contacted, 8 of those screened had no male-caregiver, and 2 male caregivers did not speak English. In addition, 11 identified male-caregivers refused to participate. Reasons for ineligibility and refusal to participate are displayed in Table 2.

<table>
<thead>
<tr>
<th>Recruitment Sources</th>
<th>Those Screened (n=93)</th>
<th>Participants (n=21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETPD*</td>
<td>77 (83%)</td>
<td>17 (81%)</td>
</tr>
<tr>
<td>WIC</td>
<td>7 (8%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Local Gathering of Mothers</td>
<td>6 (6%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Word of Mouth</td>
<td>2 (2%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>University Student Newspaper Advertisement</td>
<td>1 (1%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>93 (100%)</strong></td>
<td><strong>21 (100%)</strong></td>
</tr>
</tbody>
</table>

*East Tennessee Participant Database
Table 2: Reasons for Ineligibility and Refusal to Participate among those Screened.

<table>
<thead>
<tr>
<th>Reason for Ineligibility</th>
<th>Number of those Ineligible (n=61)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income above WIC-income criterion</td>
<td>48 (59%)</td>
</tr>
<tr>
<td>No male partner</td>
<td>8 (10%)</td>
</tr>
<tr>
<td>Infant older than 6 months</td>
<td>3 (4%)</td>
</tr>
<tr>
<td>Male caregiver did not speak English</td>
<td>2 (2%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reason for Refusal to Participate</th>
<th>Number who Refused (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible with a male partner, but he chose not to participate</td>
<td>7 (9%)</td>
</tr>
<tr>
<td>Male caregiver agreed to the interview, but did not complete the interview</td>
<td>4 (5%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>72 (100%)</strong></td>
</tr>
</tbody>
</table>

All participants resided in Knox and Anderson counties and ranged in age from 21-57 years old and represented a variety of racial backgrounds and education levels. These data are presented in Table 3. Infants ranged in age from 3 to 6 months. Ten participants were first time fathers, with the remainder reporting having between 2 and 4 other children. Ten participants were married to their partners, while 11 were not. Based on data from the initial screen, 3 participants were not the biological father. Twenty participants perceived themselves as being “more involved” in the care of their infants than other fathers they knew. However, one participant reported he was at least “as involved” as other fathers. All men participated in the interview as if they were the father-figure in the infant’s life and therefore are referred to as the father for the remainder of this manuscript.
Table 3: Participant Characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number (%) of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>*<em>Age</em></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>3 (21%)</td>
</tr>
<tr>
<td>25-34</td>
<td>8 (57%)</td>
</tr>
<tr>
<td>35-44</td>
<td>2 (14%)</td>
</tr>
<tr>
<td>45-54</td>
<td>- (- - -)</td>
</tr>
<tr>
<td>55-64</td>
<td>1 ( 7%)</td>
</tr>
<tr>
<td>*<em>Race/Ethnicity</em></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>9 (64%)</td>
</tr>
<tr>
<td>Black</td>
<td>2 (14%)</td>
</tr>
<tr>
<td>Asian</td>
<td>1 ( 7%)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (14%)</td>
</tr>
<tr>
<td>*<em>Highest Level of School Completed</em></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>1 ( 7%)</td>
</tr>
<tr>
<td>High School Graduate</td>
<td>5 (36%)</td>
</tr>
<tr>
<td><strong>Some College</strong></td>
<td></td>
</tr>
<tr>
<td>Associate’s Degree</td>
<td>2 (14%)</td>
</tr>
<tr>
<td><strong>Bachelor’s Degree</strong></td>
<td>2 (14%)</td>
</tr>
<tr>
<td>Graduate Degree</td>
<td>3 (21%)</td>
</tr>
<tr>
<td>**First time Fathers</td>
<td></td>
</tr>
<tr>
<td>Fathers with Additional Children</td>
<td>10 (48%)</td>
</tr>
<tr>
<td><strong>Married to Partner</strong></td>
<td></td>
</tr>
<tr>
<td>Not Married to Partner</td>
<td>10 (48%)</td>
</tr>
<tr>
<td><strong>Biological Father of Infant</strong></td>
<td></td>
</tr>
<tr>
<td>Not biological Father of Infant</td>
<td>18 (86%)</td>
</tr>
<tr>
<td></td>
<td>3 (14%)</td>
</tr>
</tbody>
</table>

*Demographic data for only 14 of the fathers were obtained for these variables.
Emergence of Themes

Initially pattern codes were categorized into the following five major themes: 1) perceptions; 2) motivators; 3) roles; 4) behavior modification; and 5) control. However, it became apparent during the process that two of the five themes, behavior modification and motivators, were actually smaller, interrelated concepts within the three major themes of perceptions of fathers, roles of fathers, and control related to the interaction between the father and the infant. Each theme is built on several concepts.

Roles

The theme of roles is built on a number of concepts identified by fathers. These could be proximal, such as feeding or entertaining the infant, or more distal, such as supporting the mother through validation of her decisions or taking care of other children or herself. Therefore, this theme is comprised of the concepts of physical and emotional support, validation of maternal decisions, and financial support. Physically, this role was manifested in the performance of daily tasks, such as preparing bottles, changing diapers, and holding and playing with the infant. This also could include simply taking the infant into another physical space to allow the mother the ability to “do whatever she needs to do,” including showering, working out, or tending to other children. Among fathers with more than one child, the importance of involving both parents was especially common in order to accomplish daily tasks.

Fathers spoke of their role of offering emotional support to the family. The infant received direct emotional support through play and activities meant to entertain the
infant. Fathers talked about wanting to make the infant smile or laugh and identified a healthy infant as one that was “happy” or “content.” Development of the infant also was important to the fathers and resulted in activities with the infant that were inherently educational or conducive for infant development. Less proximal was emotional support offered to mothers, which was manifested in offering to perform caregiver duties, thus allowing mothers to have space and time for themselves. Fathers spent time with their partners and talked about offering emotional support through “being an advocate” or being there if mothers needed to “vent.”

The fathers’ roles appeared to encompass validation of their partners’ decisions through justification, gathering second opinions, or stating justification for decisions regarding infant feeding. The following quote portrays this sentiment:

“Well, she thinks about it more than I do, so she’s always thinking of ways to improve whatever we do. She talks to me about it, and we’ll make a joint decision. Honestly, I don’t initiate much of the, you know, I kind of follow her lead because I think her intuition is better than mine…. as far as like decisions about what type of formula and stuff, we both have input but she is probably more of the decider.”

Financial support of the family presented itself in the fathers’ stories when they addressed the different types of activities in which they were engaged with the infant. This was often in the context of time, which was offered as a reason that they didn’t spend more or as much time as they would like with the infants. In this regard, unless the father clearly identified himself as a stay-at-home caregiver, the fathers noted the importance of their role in financially supporting the family as means of indirectly caring for the infant.
Perception

Perceptions of the fathers with regard to infant feeding were influenced by a number of concepts. In order of influence, these concepts included personal experience, advice from those with experience, advice sought by the father from sources such as books, the internet, magazines, etc., and finally unsolicited advice that may or may not be generated by those who had experience with children. Fathers’ personal experience generally came from those fathers who had other children, although some who did not have other children, had experience with other infants such as younger siblings or other relatives such as nieces or nephews. If mothers had previous experience with children, the fathers regarded this experience similarly to their own experiences. If previous experience was viewed as positive, this increased its value. Fathers with older children, whose development they were satisfied with, remarked on things like, “if you do similar things you would expect a similar result,” or, “We liked the way our first son turned out. And we have been trying to copy what we did with him.” As experience increased, the less the fathers sought advice elsewhere, “I actually raised by sister's baby from 2 days to 3 years. So, I didn't really have to learn anything this time around. I kind of knew what to expect.”

Advice from those who had raised children was important. Fathers sought advice and second opinions from experienced people and generally thought this advice was superior to advice from others with little direct care-giving experience. Advice from healthcare professionals also was held to this standard. Generally, pediatricians and nurses at pediatric clinics did serve as a good source of advice due to their experience as professionals who care for infants and children. Despite this, advice from healthcare
professionals who did not have children was less valued than advice from healthcare professionals who had experienced parenthood.

“They {doctors} seem kind of eloquent sometimes. I guess you take it with a grain of salt sometimes, too. You know, like is this person telling me this and they probably don't even have any children? You know?”

Other sources of advice included infant care books, the internet, magazines, and pamphlets from their doctors’ office or classes they attended on infant care. Though classes could be hosted by healthcare providers or businesses marketing products to infants and children, there was no indication of valuing advice from either of these sources over another. When advice actively was sought from these sources, fathers generally regarded the information as trustworthy and accurate. However, unsolicited advice was perceived to be less valuable and, especially if the source was a mother or mother-in-law, possibly outdated. The decisions of whether or not to accept and act on advice were ultimately filtered through fathers’ own experiences and whether or not the advice seemed sensible.

Control

The theme of control emerged from concepts related to behavior modification activities by the father and the infant’s response. Behavior modification actions of fathers directly related to feeding included feeding the infant, introducing cereal, and introducing solid foods. Fathers used feeding to modify crying or fussing behaviors in infants. If infants’ responses were positive, then the behavior modification strategy continued. Though generally aware of infant hunger and satiety cues, these cues
were not always attended to, if there were other pressures exerted on the fathers, such as prescriptive advice from mothers. In situations where feeding the infant did not produce the desired behavior, the solution was to explore use of alternative infant formulas until the behavior was acceptably modified (i.e. lactose intolerance, spitting-up).

Introduction of cereal was another concept within the theme of control. Behaviors targeted for modification included quelling perceived extreme hunger (“…they weren’t getting enough”), sleeping through the night, or spitting up after feedings. If the infant’s response was positive, such as the infant appearing satisfied with the feed, extended duration of sleep, or spitting up less, fathers continued adding cereal to the infant’s bottle. Introduction of solid foods was initiated for similar reasons, though behaviors targeted for modification were less frustrating for fathers than those targeted by infant cereal. Though there was some recognition that pediatricians recommend starting solid foods at particular developmental stages, the primary motivation for introducing these foods was that the infant appeared to desire the food, by, for example, reaching for or staring at foods. The cyclical relationship between behavior modification and infant response was apparent in some situations, such as when fathers perceived that the infants’ diet would contribute to constipation and that offering juice would resolve this issue.

**Conceptual Model**

The conceptual model, shown in Figure 2, was created to show the relationship between the three identified themes described above. This conceptual model shows the relationship between the constructs of fathers’ roles and perceptions that affect control of
Figure 2: Conceptual Model Depicting the Relationship of Fathers’ Perceptions, Roles, and Control with Regard to Infant Feeding
infant feeding habits is mitigated by interaction between behavior modification and infant’s response.

The center of the circle represents the control of infant feeding as the convergence of the father’s roles and perceptions, and being directly shaped through behavior modification activities by the father and response of the infant. The center circle of “control” is not dissected by the horizontal line and represents the convergence of the fathers’ roles and perceptions directly related to the infant and the cyclical nature of behavior modification and infant response.

The outer layers of the model represent roles and perceptions, with distal and proximal concepts represented by distance to the infant, or center. The lower portion the model encompasses the main roles of the father. Layers closest to control in the center represent the most direct roles the father plays in the infant’s life. As layers get further from the center they represent roles that are increasingly less directly associated with infant feeding and care. The upper portion of the model represents the many factors that shape fathers’ perceptions related to infant feeding. These layers, too, respectively show the most to least influential factor from the center to the outermost layers.

**Discussion**

Research has shown that fathers can have an important influence on infant feeding decisions: in particular the decision to breast- or formula-feed has been well-documented\(^{(19-22)}\). However, to our knowledge little has been reported about how fathers
view their role in infant feeding. The objective of this study was to describe the roles and perceptions of low-income fathers regarding infant feeding practices.

**Control- Circle Center**

Behavior modification activities, such as feeding cereal in the bottle to alleviate infant fussing, increase the period of the infant’s sleep, decrease spitting-up behavior, and solid foods to satisfy the infant’s desire for these foods, are concepts supported by research with mothers\(^{28-30}\). The introduction of cereal and other solid foods earlier than medically recommended, as was found in this study, is common practice in the United States\(^{16, 17}\). These actions constitute control over behavior modification and are represented by the control function at the center of the circle.

**Roles- Lower Portion of Circle**

Included among the roles of the father are physical and emotional support to both the mother and infant, which have been documented as perceived roles of the father in several other research studies\(^{31-33}\). A study of families using a new infant’s “system’s perspective” delineated how mothers and fathers perceived their different roles. These researchers found that while fathers took a more central role in playing with the infant, the mother was more central to “caring” for\(^{34}\) and feeding the infant\(^{35}\). While there are mixed findings in the literature as to how new parents manage chores and tasks\(^{32, 34}\), our study found that parents divide tasks based on who has the time and energy for them. The role of providing financial support to the family reflects that found in other literature\(^{32, 36}\).
This study identified a father’s previous experience as the most influential factor in infant care within the theme of perceptions. Additional research similarly has identified that first time fathers are less secure in their abilities than experienced fathers\(^{(32)}\). In addition, mothers have been shown to receive advice on infant feeding from family members and healthcare professionals\(^{(18, 19, 30)}\), which were common sources of advice for these fathers. Several successful interventions targeting fathers have demonstrated that when fathers seek information from classes or experienced healthcare professionals, their infants are more likely to be fed in accordance with infant feeding recommendations than those who do not seek this trusted, accurate advice\(^{(19-22)}\).

**Strengths and Limitations**

There were several limitations to this study. First, the sample was self-selected. Several male caregivers who were eligible, chose not to participate or did not complete the interview process. The sample also included men from a wide range of ages and varying cultural backgrounds. In addition, permission to recruit via the WIC clinic was received rather late in the recruitment process. It is possible that a larger representation from male caregivers could have come from WIC and results could have been different had recruitment started earlier. Therefore, these results are not generalizable. However, due to the lack of research on the role that fathers play in early infant feeding decisions, this study provides a first step in filling that knowledge gap. In addition, the conceptual
model created may be tested, modified, and ultimately used by healthcare professionals to develop curriculums to educate fathers of low-income infants more effectively.

**Conclusion**

Fathers appear to play an important role in the lives of their infants and are both directly and indirectly involved with food and fluid introduction. Although it appears that it is the mother who is ultimately responsible for making the final decisions associated with infant feeding, fathers are an important filter for information, a researcher about infant feeding recommendations, and validator of those decisions.

**Implications**

Testing of this theory will be an important first step toward confirmation, modification, and ultimate use of the theory among healthcare providers. Healthcare providers seeking to increase adherence of low-income parents to infant feeding recommendations may wish to use this model to assist with interpreting actions of fathers regarding infant feeding. Understanding how advice may be interpreted by low-income fathers may increase effectiveness of nutrition education. Working collaboratively to include fathers in infant feeding education may increase adherence to recommendations and increase the health of their communities.


APPENDIX A: Expanded Methods Section
A general script was developed based on a topical literature review with input from a professional in the field (Dr. Katherine Kavanagh-Prochaska, Department of Nutrition, University of Tennessee). Additional advice on structuring questions was provided by a member of the Department of Educational Psychology and Counseling (Dr. Trena Paulus) at the University of Tennessee. The script, which was used to guide discussions with the male caregivers, included six content areas (see Appendix A-1 and A-2). However, if new topics arose during the conversations, the researcher probed more deeply and did not always follow the script verbatim. Content areas were not addressed in any specific order; rather they were addressed according to the flow of the interview. Questions were not always worded as they appeared in the script, but the researcher attempted to address each question if it was relevant to the father. This method of interviewing, referred to by Patton as the “general interview guide approach(1),” resulted in interviews with a loosely-structured conversation pattern, provided the researchers freedom to deviate from the scripted questions, and allowed for the emergence of ideas that may or may not have been predicted by the researchers at the time the script was developed. As new ideas emerged in the initial interviews, the script was modified to include both questions in these areas and questions from the original script.
Recruitment

Several recruitment strategies were employed to access this population, which consisted of male primary caregivers of infants less than 6 months old. Recruitment was conducted via the Anderson County Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) program, the East Tennessee Participant Database (ETPD), an advertisement in the University student newspaper (the Daily Beacon), and via word-of-mouth.

The WIC Program

Permission to recruit at Anderson County WIC was delayed secondary to obtaining approval of the study protocol from the State of Tennessee Department of Health. However, once permission was received, Anderson County WIC participants were recruited via flyers distributed at the 3 and 6 month nutrition education classes. An example of the fliers distributed to the WIC participants can be located in Appendix A-3.

The East Tennessee Participant Database (ETPD)

The ETPD is a database managed by researchers in the Departments of Psychology, Child and Families Studies, and Nutrition at the University of Tennessee, Knoxville. Approximately once a month letters are sent to all mothers who gave birth in the East Tennessee region since the date of the last mailing. The parameters of the mailing can be increased or decreased to capture more or less of the geographical area. Mothers return a postcard if they are interested in being registered with the database. This allows them to be contacted regarding participation in current or future studies.
Each mother provides information about her infant, including the infant’s name, date of birth, sex, and contact information with the understanding that the mother may be called to participate in studies involving her children, but is under no obligation to do so. A copy of the letter sent to mothers for database recruitment purposes is located in Appendix A-4.

*The Daily Beacon*

The University student newspaper, the *Daily Beacon*, was used in an attempt to recruit students with young infants who met eligibility requirements. The classified ad was circulated in print and online for two weeks. To view the advertisement submitted to the *Daily Beacon*, see Appendix A-5.

*Word of Mouth*

Researchers acquired participants through the use of their own social networking. Those acquaintances with young infants were given information to allow them to contact the researcher for project screening, if they were interested in participating. In addition, information regarding the study was given informally to mothers participating in a hospital-sponsored mother-to-mother social gathering. These mothers were encouraged to contact the research lab for screening.
Screening and Eligibility

Participants who called the Community Nutrition Lab at the University of Tennessee, Knoxville were screened by trained graduate students. Graduate students were trained to screen participants by providing an explanation about how to use the screening forms and how to screen each person to determine eligibility for study(ies) at the time of the call. This required that all graduate students who screened callers understood the recruitment and eligibility protocols of each study in the Community Nutrition Lab and how to communicate properly a person’s eligibility status to the primary researcher. A copy of the screening form can be found in Appendix A-6.

Mothers of infants were screened over the telephone to determine if their infants met eligibility requirements for this study. Eligibility requirements included having an infant who was 0-6 months old; being a WIC participant or, if a caller was not a WIC participant, meeting the WIC eligibility guidelines for income (WIC income eligibility is based on income level per particular household size based on 180% of the Federal Poverty Level); speaking English; and having a male caregiver in the infant’s life that was either the father or someone who functioned as a father figure to the infant. The male caregiver could not be a male family member (i.e. brother, infant’s grandfather, etc.) or companion (without father-figure role in infant’s life) of the mother. When a mother indicated that all these parameters were met, the researchers asked how they could contact the identified male caregiver. Contact with the father was established in a number of ways, including that the mother would: 1) allow the researcher to speak with the father when the screening portion of the call was finished; 2) provide a time that the
researcher could call back to reach the father; 3) provide the male caregiver’s phone number; or 4) have the father call the Community Nutrition Lab at his convenience. If male caregiver indicated that he was interested in participating in the study, a consent form was mailed to him and an interview time was established. Screening and recruitment continued while interviews were conducted until the researchers determined that data saturation was reached. Patton defines saturation as “sampling to redundancy”\(^{1}\), which means no new relevant ideas or comments emerged from the new interviews. Approval for this study was granted by the Institutional Review Boards from the University of Tennessee and the State of Tennessee. To view the consent form approved by both agencies, see Appendix A-7.

**Interview**

All interviews were conducted over the telephone by one researcher for continuity of questioning and to allow for more rapid identification of emerging themes. Interviews were audio-taped for documentation of verbal consent and for later transcription. Interview recordings were stored on password protected computers in the Community Nutrition Lab at the University of Tennessee, Knoxville and will be deleted within the next 10 years. Upon completion of the interview, the male caregivers were sent a $20 gift card as compensation for their participation. Interviews were transcribed verbatim by trained research assistants, and subject names were replaced with subject identification numbers.
Data Coding and Analysis

Data analysis and development of the conceptual model followed a systematic procedure of coding, constant comparison, categorizing, and memoing as outlined by Miles and Huberman\(^2\). The following discussion outlines the steps used for these processes. Definitions of the associated major terms are presented in the following section and a diagram showing the procedural steps in these processes can be found in Figure A-1.

Definitions of Selected Terms

- **A Priori Coding\(^3\)**: refers to the practice in which codes are developed by the researchers before the researchers begin the process of coding the text.
- **Code\(^2\)**: label attached to text by researchers to develop organization, and retrieval of the text; codes are organized by researchers to aid in the development of “concepts.”
- **Concept\(^4\)**: term used in the grounded theory approach to qualitative data analysis that refers to the linkage of common codes that result in a larger picture; concepts are used to form “themes.”
- **Conceptual Model\(^2\)**: the pictorial representation of the linkage of concepts within themes and how these themes converge to form a theory.
- **Descriptive Codes\(^2\)**: used to denote a theme’s basic description, but require little further understanding. **Example**: “We began putting cereal in the bottle when he was 3 months because he wasn’t gettin’ enough.” Using descriptive codes, it
Figure A-1: Data Collection, Coding, and Analysis Timeline

TIME

Screening

Script Development

Interviews

Transcription

Memoing

Descriptive Coding

Inferential Coding

Pattern Coding

Concept Development

Theme Development

Data Saturation

Theory/Conceptual Model Development
would simply be noted that the infant was fed cereal before 4 months of age (i.e., <4 CER).

- **Grounded Theory**: method of qualitative data analysis that functions under the assumption that the theory resulting from the analyzed data will “emerge from the field (pg. 17)” itself without interference from the preconceived ideas of the researchers at the start of the research.

- **Inductive Coding**: refers to the practice in which researchers develop codes for the text as they read and think about the text; opposite of *a priori* coding.

- **Inferential Codes**: used when researchers gain further insight into the field work and are able to associate additional meaning to different situations.

**Example**: Using the previous quote, as the researchers begin to understand that there were different, particular reasons that male caregivers introduced cereal, they would code the text with BOTH the descriptive code (<4 CER) and the inferential code to note why the father introduced the cereal earlier. In this case, the father added cereal to the bottle, because he thought his infant was still hungry when the infant was fed only formula. So, the researchers also would apply the inferential code, (CER-FUL), to this text; a code that the researchers agreed to use when they encountered this situation.

- **Memoing**: defines a broad spectrum of tangible manifestations of researcher reflection that may include thoughts recorded in the margins of transcripts, ideas about how different codes may interrelate, or thoughts on a particular text or set of texts that serve to aid the researcher in connecting ideas and developing concepts; may be as simple or complex, long or short as desired by the researcher.
- **Metaphorical Modeling** (2): the use of metaphors to aid the researcher 1) in “data-reduction;” 2) to “developing patterns;” 3) as “decentering devices;” 4) in “connecting findings to theory;” and 5) creating “significance.” (p 251-252)

- **Negative Cases** (5): those ideas of participants that do not fit within the theory that emerges; necessary to identify these even though they may not represent the sample norm.

- **Pattern Codes** (2): codes that “identify an emergent theme, configuration, or explanation (p 69)” and also are described as being used for “grouping summaries into a smaller number of sets, themes, or constructs (page 69).” Pattern codes can either be applied early in the coding process to identify “hunches” about how certain early coding begins to form patterns or researchers may prefer to develop pattern codes later in the process after more is known about how codes interrelate. Pattern codes may include “sub-codes” (a code within a larger code) that aid the researcher in labeling different aspects of an emergent theory as it becomes better understood. The sub-codes allow the researcher to organize and retrieve information more easily. **Example:** When the researcher began to re-read the text for pattern codes, she detected that a father was attempting to modify his infant’s behavior by playing with him to make him smile or laugh. At first, the researcher was not sure that there would be other instances of fathers attempting to modify infant behavior, but suspected there might be, so she simply coded this text (BEH-MOD), meaning “behavior modification.” As the researcher continued, many different types of behavior modification began to appear. To maintain order, sub-codes were created to keep track of the different types of behavior modification.
taking place. One of these was (BEH-MOD-FULL), which was used in instances where fathers attempted to modify the infant’s sleeping “behavior.”

- **Theme**: term used in the grounded theory approach to qualitative data analysis that refers to the over-arching idea that develops from several interrelated concepts.
- **Theory**: describes how the themes inter-relate to form a comprehensive model that describes the issue being researched.

**Coding Data**

Transcription was completed very shortly after each interview to allow for adaptations in the script of future interviews. As interviews were transcribed, each was coded by two trained graduate student researchers. Training of the researchers included thorough explanation and examples of qualitative data coding, with minimal training involving the subject matter so as to facilitate nonbiased coding of the researchers. Inductive coding (as opposed to *a priori* coding) was used to develop codes for organizing the data. Codes applied throughout this portion of the coding process can be described as either descriptive or inferential.

Each researcher inductively coded the first interview separately and each developed her own set of codes and detailed descriptions of each code for the content of that interview. Subsequently, the researchers met and examined the codes they had created separately, discussed these codes, and agreed upon final codes and definitions to begin to build a list of codes based on what they had read in the transcripts. These codes were used to code the second and third interviews, and the researchers continued to identify
new codes and to apply definitions throughout these interviews. The researchers met again to discuss the new codes and definitions, deliberate about the coded text and the coding, and determine the inter-coder reliability.

**Inter-coder Reliability**

Inter-coder reliability was determined using the following equation:

\[
\frac{\text{Number of Agreements of Codes/transcript}}{\text{(Number of Agreements + Number of Disagreements)/transcript}} = \text{Inter-coder Reliability}
\]

Miles and Huberman suggest that initial inter-coder reliability should be around 70% and should eventually be as high as 90%\(^{(2)}\). The average inter-reliability of the first three transcripts was 60%. Although this fell short of the 70% goal, all original disagreements in the descriptive and inferential coding were discussed until coding of the transcripts were mutually agreed upon. Inter-reliability scores were kept for each individual transcript, and for the average of the three transcripts coded at each meeting. Inter-coder reliability scores for each transcript can be found in Appendix A-8. With each meeting, inter-reliability increased until the researchers reached 97% original agreement. A complete set of the final list of codes is included in Appendix A-9. Both researchers continued to code every transcript. After every third interview had been analyzed, they met to deliberate the coding of each transcript. Few new codes surfaced after the first 6 transcripts were coded. Preliminary data analysis involved the creation
of an Excel spreadsheet that housed a tabbed worksheet for every code. Each segment of
coded text was placed under its respective tab or tabs (a single segment of text could be
linked with multiple codes). Further coding and memoing took place as a function of
data analysis and is described in more detail within the section of data analysis. A page
from the Excel file can be viewed in Appendix A-10.

Data Analysis

All descriptive and inferentially coded portions of text from the 21 transcripts
were organized and grouped together by code in an electronic spreadsheet (as described
previously). Each portion of coded text was kept intact and copied into every code
category that it had been coded with previously. In doing so, the coded text may have
been placed under several tabs in the spreadsheet file, while remaining associated with
any other codes that were applied to that segment of text. All codes associated with that
piece of text were kept together so that the researchers could easily identify other codes
associated with that particular piece of text and eventually identify codes that appeared to
be interrelated or linked.

The primary researcher examined each set of data by descriptive and inferential
code to determine whether there were patterns within each code. Memoing was utilized
several different ways within the electronic spreadsheet of organized codes. First, it was
used to summarize or question the content of short passages of coded text. Second, it was
used after reviewing all of the text related to a specific code. Third, memos were used to
summarize the ideas within all of the coded text. Finally, memoing was used to relate the
ideas within one code to those present among other codes.
In addition to memoing about how the information between codes related, because all codes were left attached to every section of coded text, the researcher was able to examine the reoccurrence of multiple codes that appeared frequently in association with the code group being examined. Codes that appeared together frequently were recorded at the top of each code category tab in the electronic spreadsheet. This not only identified patterns that emerged between codes, but also was helpful to cross validate linkages. For example, the researcher examined all of the text associated with the code “CER-BOT” and found it to be linked with the codes “<4 CER,” “CER-BEG,” “CER-SLP,” “CER-FUL,” and “CER-GERD.” When the researcher examined all of the text related to one of those linked codes, “CER-BEG” for example, she found that the text with the “CER-BEG” code also linked back to “CER-BOT.” The process of determining ideas and organization within each code and then between codes is similar to that used by Jacelon and O’Dell in nursing research(6).

Pattern codes were developed as the researcher began to identify linkages among coded materials. For this study, pattern coding occurred later in data analysis, after relationships between particular codes were better understood. As a pattern code developed, the researcher not only applied the pattern code to the text as it appeared within its originally coded context, but also developed memos about the pattern codes to explain the relationships to other codes from the transcripts as they evolved. This was helpful because sometimes the evolution of a pattern code would require that it be applied to a number of different situations that the researcher hadn’t foreseen. These memos allowed the researcher to create sub-codes from that pattern code, so that data could be more accurately explained and retrieved(2). Organizing robust pattern codes and pattern
sub-codes led the researcher to several related concepts, which were categorized initially into the following five major themes: 1) perceptions; 2) motivators; 3) roles; 4) behavior modification; and 5) control.

Theoretical Model Development

Once the initial themes were identified from the concepts that emerged, several exploratory theoretical models were created to delineate the relationships among the themes and concepts in a holistic fashion. After much consideration and discussion with the research team, the primary researcher produced a model that included the five themes. However, it became apparent during the process that two of the five themes, behavior modification and motivators, were actually minor, interrelated themes within the three major themes of perceptions, roles, and control. Eventually, through discussion of metaphorical modeling and revisiting the memos and pattern codes with two other researchers, a final conceptual model was created.
Appendix A
Appendix A-1: Content Areas of the Script

<table>
<thead>
<tr>
<th>Content Areas Included in Script</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Father’s role in supporting infant feeding</td>
</tr>
<tr>
<td>(2) Age at which foods other than breast milk or formula are being introduced to infants in this population</td>
</tr>
<tr>
<td>(3) The triggers associated with early introduction of these foods</td>
</tr>
<tr>
<td>(4) Primary influences on infant feeding decisions (external modifiers, such as grandmother, pediatrician, partner, or internal modifiers, such as beliefs in ability to follow infant feeding recommendations)</td>
</tr>
<tr>
<td>(5) Assessment of how one decides to start and stop a feed</td>
</tr>
<tr>
<td>(6) Perceptions and attitudes toward infant fatness</td>
</tr>
</tbody>
</table>
Appendix A-2: Draft of Script for Interviews

Intro
Hi, and thank you for agreeing to talk with me today. How are you doing? A few days ago I sent along a copy of the consent form for you to read before we did the interview. Have you received it?

If “No”: Well, do you mind if I read it to you now? It will take about 5 minutes. After I read it to you, then you may consent to participate in the study.

If “Yes”: After reading the consent form, do you find that you have any questions or concerns?

(Address concerns, if there are any.)

Do you give your consent to participate in this study?

If “No”: Without your consent we can not proceed with the interview. Thank you for your time today.

If “Yes”: Great! Though we will be recording this session today, only I and another student will listen to these recordings and they will be destroyed once we have completed the study. Anything you say to us will be kept in confidence.

Okay, let’s get started!

Opening – Now on to the fun stuff! How many children do you have, and how old they are. (1 minute)

Topic 1: Father’s role in infant feeding.

Key 1-- If I were to spend a normal day with you, what kinds of things would I see you do with your baby?

Key 2-- How did you and your wife/fiancé/girlfriend agree on who is in charge of certain baby-related tasks?
What kinds of new things did you have to learn to do to help with these tasks?

Key 3-- How would you compare your involvement in your baby’s life with that of other fathers?
Key 4— In what ways do help support your partner in caring for the infant? (Ask later in the interview)

**Topic 2: At what age foods other than breastmilk or formula are being introduced to infants in this population**

--Could you give me an idea of the things that your baby was being given before they were 4 months old? (5 min)

**Repeat the following questions for all foods in addition to breastmilk.**

Key 1 – When did you start giving your baby these foods?

Key 2 – How did you support your partner while she was breastfeeding?

   - Why did you and your partner decide to breastfeed?
   - Why did you stop breastfeeding?

Key 3 -- What is the strangest thing that your baby had to eat or drink before they were 4 months old?

**Topic 3: What are the triggers associated with early introduction of these foods**

Key 1 - Why did you give your baby these foods? *(Be specific about each food he has previously mentioned.)* (5 min)

Interviewer – *If anyone states developmental reasons, such as “reaching for food”, “mouthing for food”, etc, please probe as follows:*

Key 2 – Do you think your baby reaching for food, etc, means that he/she is ready for other foods?

   - **if yes**, ask “what is it about this behavior that makes you think your baby is ready for foods?”
   - **if no**, as “what makes you think your baby is not ready for foods, when he/she is reaching for food?”

Key 3 - Why did you think the baby was "not getting enough" or "needed more" (or other reasons stated)? *Interviewer – you are looking for behavioral cues from the baby.* (5 min)

**Explore why they think cereal works to solve behavioral problems:**

   - Key probe – How does cereal help your baby “get more”? (5 min)

   - Key probes (crying) - How much crying is ok?
     - Is it the type of crying or the place or the timing that matters etc?
Key probes (sleeping) – How much waking during the night is okay?  
- How do you help when your baby wakes up during the night?

Key 4 – Did offering your baby these foods change any behaviors/growth/hunger of your baby? (5 min)

Key probe – In what way did your baby change? *(Did the cereal reduce the child’s reflux or increase the number of hours they slept at night?)*

**Topic 3: Primary influences on infant feeding decisions (external modifiers, such as grandmother, pediatrician, partner, or internal modifiers, such as beliefs in ability to follow infant feeding recommendations)**

Key 1 – Who do you ask for help when deciding how to feed your baby? (5 min)

Key probe – How did you decide the advice was good?  
Key probe – How did you decide the advice was not good?  
Key probe – If you did not agree with that advice, what would you do?

*Interviewer – if participant followed advice they did not agree with probe for reasons.*

Key 2 – How easy was it to follow the advice given to you or your partner by WIC staff or your doctor? (3 min)

Key probe – Was the advice given to you always consistent from healthcare providers?

*Interviewer – probe for reasons participants were unable (or unwilling) to follow advice from health care providers.*

Key 3- *(Only ask if participant is on WIC and the baby is formula-feeding.)* Is the formula provided by WIC each month enough for your baby?

Key probe - How much formula do you have to purchase every month?  
Key probe - How has this influenced some of the decisions you have made when it comes to feeding your baby?

**Topic 4: Assessment of how one decides to stop a feed (is the caregiver or the infant in control?)**

Key 1 – How do you know your baby is hungry? (3 min)

Key 2 – Do you believe it is possible to overfeed a baby? (5 min)
Key probe - Please explain why you believe it is/is not possible to overfeed a baby

Key 3 – How do you know your baby is full? (5 min)

Key 4 – Do you think that an infant can be overfed? Can you tell me more about that?

**Topic 5: Perceptions of and attitudes toward infant fatness**

Key 1 – What are some ways mothers, fathers, and others decide a baby is healthy? (5 min)

*Interviewer – responses should be things like wet or soiled diapers, seems happy, sleeps well, and weight gain.*

*Key probe – Interviewer probe for definitions of each example, but focus on weight gain.*

**Closing: Final thoughts to inform future father education classes or materials.**

Key 1 – Was there anything that you wish someone had told you about your baby or being a father before you had the baby?

Key 13— If WIC or your pediatrician had held some sort of class or information session, would you have gone? Would you go now? What kinds of things would you like to have learned about?

Closing – Do you have any other ideas they’d like to share?

Thank you so much for your time.

I am putting your Wal-Mart gift card in the mail now. It will require your signature when it is delivered, so please be watching for it in the mail in the next day or two!
Is your baby less than 6 months old?

The UT Department of Nutrition is inviting you to call us to see if you are eligible for one or more studies about feeding babies.

If you are eligible and able to complete the study activities, we will give you a $20 gift card to Wal-Mart.

We are currently running studies with breastfeeding moms, formula-feeding families, and even dads and partners!

If you are interested in finding out if you are eligible, please call us at 865-974-2109 or email us at babystudies@utk.edu

Participating in our studies will not affect your WIC benefits.
Appendix A-4: East TN Participant Database Recruitment Letter and Materials

Dear Parents:

Congratulations on the birth of your new baby! This is an exciting time in the life of your family. It is also a time when you may begin to wonder about what your baby can do.

“Can your baby remember or pay attention to certain things?”
“How does my child begin to reach, crawl, and walk?”
“How will my family change as my child grows older?”
“What are the best foods for my child?”

Researchers in the Departments of Psychology, Child & Family Studies, and Nutrition at The University of Tennessee are studying questions like these. We try to find answers by conducting studies with the help of parents like you.

We would like to invite you and your child to become involved in these new discoveries. We conduct research with infants, children, and families. These studies typically require less than an hour of your time. In most studies you will be asked questions about your child and family. In some studies, we observe your child’s behavior. In other studies, we measure your child’s eye movements, brain activity, heart rate, or breathing while they engage in different activities. You are with your infant at all times and before you agree to participate, we explain what you and your child will be asked to do. In many studies, we contribute to your baby’s piggy bank just for participating.

We’ve enclosed a flyer describing the wide range of research projects in our departments. Opportunities to participate in these projects will become available at varying points in time. Some families we see while their child is an infant, while others we do not see until the child is several years old.

If you are interested in learning more about what we do, call the Infant Perception-Action Laboratory at (865) 974-6060, visit us online at http://web.utk.edu/~inflab/signup.html, or fill and return the enclosed postcard. A response at this time implies no obligation. We will contact you when we are conducting a study in your child’s age range to explain the study and then you can decide if you want to participate.

We do not keep a copy of your name or address after mailing this letter to you. So, this is the only time that we will contact you directly unless we hear back from you. We look forward to hearing from you soon.

Sincerely,

Daniela Corbeta, Ph.D.
Associate Professor
Psychology

Greg Reynolds, Ph.D.
Assistant Professor
Psychology

Hillary Fouts, Ph.D.
Assistant Professor
Child & Family Studies

Katie Kavanagh, Ph.D.
Assistant Professor
Nutrition
The departments of Psychology, Child & Family Studies, & Nutrition at the University of Tennessee seek to understand the development of children and families in our complex society. We want to use the information we learn to positively affect the growth and well being of children and their families in our community. In order to reach these goals we need you and your family to help. Below is a list of the research programs that are currently being conducted at UT. These descriptions provide a general idea of the kind of research projects in which you could participate. If you are interested in learning more about what we do, and eventually participate in these projects, fill out and mail the attached card. You can also sign up on the Infant Perception-Action Lab website at http://web.utk.edu/~infantlab/signup.html or call 974-6060.

**Early Experiences Research Center:**

The Early Experiences Research Center, co-directed by Hillary Fouts, Ph.D. and Rena Hallam, Ph.D., focuses on how infants and children develop socially and emotionally in different contexts (family, child care, community, cultural group). Research typically involves observations of infants and children in their normal settings at home or in child care, and parental interviews and surveys.

**Infant Perception-Action Research Laboratory:**

The infant perception-action research laboratory, directed by Daniela Corbetta, Ph.D., focuses on the development of infants perceptual and motor skills. Babies are observed while looking at toys, reaching for them, touching and manipulating them, and in some studies they are watched as they are crawling or walking toward toys. Sessions usually last less than an hour.

**Developmental Cognitive Neuroscience Research Laboratory:**

Greg Reynolds, Ph.D., serves as director of the developmental cognitive neuroscience research laboratory. Research conducted at the lab examines the development of attention and memory in infancy. A typical session lasts less than an hour. Infants’ brain waves, heart rate, and behavior are measured while watching TV or looking at interesting visual patterns.

**Infant-feeding Research Lab:**

Katie Kavanagh-Prochaska, Ph.D., R.D., studies how normal, term infants are fed and grow in East Tennessee. She and her research assistants conduct research on how to best support the breastfeeding or formula-feeding family. Research activities typically include weighing and measuring infants and parents, parent/caregiver questionnaires and/or focus groups, and recording of infant intake.
Infant Development Research at The University of Tennessee

Exciting opportunities to participate and learn with your infant!

Current research asks...

How do infants learn how to reach for toys?

What do infants pay attention to when reaching for toys?

How does task difficulty influence attention and decision making?

What types of patterns do infants find most interesting?

How do infant feeding patterns influence child development?

Want more information? Visit...

http://web.utk.edu/~infntlab

or call

974-6060
Appendix A-5: Daily Beacon Advertisement

CLASSIFIED AD

Infant-Feeding Studies

Do you have a baby 6 months old or younger? Researchers in the UT Nutrition Department are conducting several infant-feeding studies and would love to hear from you! Eligible participants will receive a gift card to Wal-Mart. To find out if you are eligible, please call 865-974-2109!

(47 words x 0.30) = $14.10 Daily Beacon
Appendix A-6: Screening Form

East Tennessee Participant Database Screening form

Mother's name: ___________________________ Subject ID #: __________
Phone #: ______________________   Date: __________ Screener:________

Hi, my name is ________________ and I am from the Department of Nutrition at the University of Tennessee. You responded to a letter about participating in research through UT and you indicated that you might be interested in a study involving you and your baby. I would like to ask you a few quick questions to see if you might be eligible. Is this a good time?

1. Do you participate in the WIC program? □ No (0) □ Yes (1)
   If “no,” continue to question 2.
   If “yes,” continue to question 3.

2. Do you receive Food Stamps? □ No (0) □ Yes (1)
   If “yes,” screen for Male Partner Study (color: blue). If “no,” ask:
   2a. How many people are in your household? __________
   2b. (Based on the number given in 2a, find the Annual income on chart).
   2c. Ask “Is your household income less than or equal to ________________?”
      If “no”, screen for Infant-feeding Study (color: yellow). (Amount from 2b)
      If “yes,” continue to question 3.

3. Is your baby currently breastfeeding or using formula, or both? __________
   If only breastfeeding, screen for Male Partner (color: blue).
   Eligible for Breastfeeding Study
   If formula only, screen for Infant-feeding Study (color: yellow) and Male Partner (color: blue). If combo, ask:
   3a. How many bottles of formula does your baby receive a day? __________
      If ≥ than two bottles, screen Male Partner (color: blue)
      If ≤ than two bottles, Eligible for Breastfeeding Study

4. What is your baby’s birth date? ___/____/____   (Pre-screen DOB:______)
4a. Age of baby in weeks and days: ________________________ (Screener calculates)

4b. Is infant more than 15 weeks and 1 day? □ No (0) □ Yes (1) □

**EXCLUSION CRITERION for Infant-feeding Study:**

If no = 0; If yes = 1 and check box

4c. Is baby > 26 weeks of age? □ No (0) □ Yes (1) □

**EXCLUSION CRITERION for Male Partner and Breastfeeding Study:**

If no = 0; If yes = 1, check box and let them know they are ineligible. Continue to thank them for their time and let them know that they will be called when other studies arise.
Male Partner Study Screening Questions

Subject ID:_______

IF THE PERSON YOU ARE SPEAKING WITH IS FEMALE:

5. We have a study that we’re doing talking to guys. We wanna talk to guys who are involved in feeding babies and we wanna talk to husbands, partners… not granddads or uncles- it may be someone who doesn’t live in the household. Do you have someone in your life who fits this description?

□ No (0)  □ Yes (1)

If, “No”. Well, thank you for your time! It doesn’t look like you’re eligible for this study, but if another study comes along that we think you might be eligible for, we will give you a call.

5a. Is person ineligible? □ No (0)  □ Yes (1)

If yes, check box

If, “Yes”. 5b. Is he your husband, boyfriend…?

□ Husband (0)  □ Boyfriend (1)  □ Brother (not eligible)(2)

□ Grandfather (not eligible) (3)  □ Other _______________

5c. Does he live with you? □ No (0)  □ Yes (1)

• Doesn’t Live With Her: Would you mind giving us his name and phone number and so that we can call him?

Record the partner’s name, phone number, and best time to call on separate form for Partner Study.

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

• Lives With Her: Is he available to speak with right now? Or is there a better time to call him back?

If he is immediately available go to “IF THE PERSON YOU ARE SPEAKING WITH IS MALE,”(page 3). Otherwise note the best time to call back for him.

_____________________________________________________________________________
IF THE PERSON YOU ARE SPEAKING WITH IS MALE:  Subject ID:_____

We have a study that we’re doing talking to guys. We wanna talk to guys who are involved in feeding babies.  

6. Are you the father, husband, boyfriend to the mother of the baby?  

   □  No  (0)   □  Yes (1) 

   6a. (What does he say he is? ___________________)  

If “yes”, skip to question 7.  

If, “No”, ask: 6b. Is there someone who would fit that description?  

   □  No  (0)   □  Yes (1) 

   If “no”, thank them for their time and terminate screen.  
   If “yes”, get name and contact info of the person fitting the description:  

   _________________________________________________________________  
   _________________________________________________________________  

7. In a few days we would call you back and ask some simple questions over the phone about what your baby eats, drinks and things like that, and we would record this interview. We type the interview out and take your name off, and then destroy the recording. It would take about a half hour and we would give you a $20 Wal-Mart gift card for your time. Does this sound like something you would be interested in helping us out with?  

   □  No  (0)   □  Yes (1) 

   Yes. -- Great! The first thing we’ll need to do is get your address so that we can send you the confidentiality form and then we’ll talk about a time in a few days when you and I can talk about your baby.  

   Get the participant’s address and set up a time if you can. Otherwise let him know that Kirsten will be calling very soon to set up an interview time.  

   _________________________________________________________________  
   _________________________________________________________________  

   No -- Could you please tell me why you don’t wish to participate?  

7a. _________________________________________________________________  

If refusal: Thank you so much for your time today. We appreciate your answering these questions and wish the best for you and your baby.
Appendix A-7: Consent Form

INFORMED CONSENT STATEMENT
University of Tennessee Infant-Feeding Interview

INTRODUCTION
You are invited to participate in a research study. The purpose of this study is to learn more about how babies are fed.

INFORMATION ABOUT PARTICIPANTS' INVOLVEMENT IN THE STUDY
We will be recruiting parents or other caregivers of infants less than 6 months old. If you decide to volunteer, we will ask you to participate in the following activity:

You will be asked to participate in one audio-recorded telephone interview of how parents and others feed babies who are less than 6 months old. This interview will be less than 45 minutes long.

RISKS
There are minimal risks to you for participating in this study.

BENEFITS
You will not personally benefit from this study, however this information will help us to understand more about how parents and other caregivers in East Tennessee feed their young babies and will be beneficial to future parents and their children.

CONFIDENTIALITY
The procedures for audio-taping include no identifying information to link you with the resulting audiotape or electronic text files. Your confidentiality will be maintained on the audiotapes and electronic files, therefore, because there will no way we can learn your identity from the data collected. (Deletion here)The project-related materials, including the audiotapes without identifiers, will be stored in a locked office on the UT campus. Only project staff will have access to data from the project. All audiotapes will be destroyed after 10 years.

Any information obtained in connection with this study will be used in a manner that does not publicly disclose your identity and will be kept confidential. Data will be stored securely and will be made available only to persons conducting the study unless participants specifically give permission in writing to do otherwise. No reference will be made in oral or written reports which could link participants to the study.

COMPENSATION
There is no cost to you to participate in this study. Participants will be compensated for their time and effort with a $20 gift card to a local department store. Compensation will be mailed to the participant upon completion of the phone interview.

_____ Participant's initials
EMERGENCY MEDICAL TREATMENT

The University of Tennessee does not "automatically" reimburse subjects for medical claims or other compensation. If physical injury is suffered in the course of research, or for more information, please notify the investigator in charge, Katie Kavanagh-Prochaska, at 865-974-6250.

CONTACT INFORMATION

If you have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study,) you may contact the researcher, Katie Kavanagh-Prochaska, at 229 Jessie Harris Building, and 865-974-6250. If you have questions about your rights as a participant, contact the Office of Research Compliance Officer at (865) 974-3466.

PARTICIPATION

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at anytime without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will be returned to you or destroyed.

CONSENT

I have read the above information. I certify that I am 18 years of age or older. I have received a copy of this form. I agree to participate in this study.

Participant's signature ______________________________ Date __________

Investigator's signature ______________________________ Date __________

This consent form will be stored for three years past the completion of the study.
## Appendix A-8: Inter-coder Reliability Scores

<table>
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<th>Meeting #</th>
<th>Subject</th>
<th>Agreements</th>
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<td>90%</td>
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<td>100%</td>
<td>97%</td>
</tr>
<tr>
<td><strong>Average Reliability</strong></td>
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<td><strong>79%</strong></td>
</tr>
<tr>
<td><strong>Total Reliability</strong></td>
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<td></td>
<td><strong>80%</strong></td>
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</table>
## Appendix A-9: Final List of Codes

### List of Codes

<table>
<thead>
<tr>
<th>Foods Introduced &lt;4 Months</th>
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</thead>
<tbody>
<tr>
<td><strong>&lt;4 FORM:</strong> Formula before 4 months of age</td>
</tr>
<tr>
<td><strong>&lt;4 BM:</strong> Breast milk before 4 months</td>
</tr>
<tr>
<td><strong>&lt;4 CER:</strong> Cereal given before 4 months</td>
</tr>
<tr>
<td><strong>&lt;4 OTH:</strong> Foods other than formula, breast milk, or cereal before 4 mo.</td>
</tr>
<tr>
<td><strong>&gt;4 OTH:</strong> Foods other than formula, breast milk, or cereal after 4 mo</td>
</tr>
<tr>
<td><strong>FORM-AMT:</strong> Amount of formula given</td>
</tr>
<tr>
<td><strong>FORM-MIX:</strong> How fathers prepare formula</td>
</tr>
<tr>
<td><strong>FORM-CANS:</strong> How many cans used per month</td>
</tr>
<tr>
<td><strong>WIC-FORM:</strong> Conversations about provision of WIC formula</td>
</tr>
<tr>
<td><strong>CER-BEG:</strong> When cereal given for first time</td>
</tr>
<tr>
<td><strong>CER-AMT:</strong> Amount of cereal given</td>
</tr>
<tr>
<td><strong>CER-SPN:</strong> Cereal given by spoon</td>
</tr>
<tr>
<td><strong>CER-BOT:</strong> Cereal put in the bottle</td>
</tr>
<tr>
<td><strong>BF-DEC:</strong> Why caregivers decided to breastfeed</td>
</tr>
</tbody>
</table>

### Reasons for Food Introduction

<table>
<thead>
<tr>
<th>Reasons for Food Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CER-SLP:</strong> Cereal introduced to make baby sleep longer</td>
</tr>
<tr>
<td><strong>CER-FUL:</strong> Cereal introduced to make baby full longer</td>
</tr>
<tr>
<td><strong>CER-GERD:</strong> Cereal introduced to curb baby’s spitting up</td>
</tr>
<tr>
<td><strong>CER-MD/RN:</strong> Cereal introduced due to doctor/nurse advice</td>
</tr>
<tr>
<td><strong>CER-DV:</strong> Cereal introduced for developmental reasons</td>
</tr>
<tr>
<td><strong>OTH-DV:</strong> Other foods introduced because of developmental reasons</td>
</tr>
<tr>
<td><strong>OTH-FUL:</strong> Other foods introduced because of health reasons</td>
</tr>
<tr>
<td><strong>OTH-CULT:</strong> Other foods introduced for cultural reasons</td>
</tr>
<tr>
<td><strong>OTH-HLTH:</strong> Other foods introduced because of health reasons</td>
</tr>
<tr>
<td><strong>BF-DEC:</strong> Why caregivers decided to breastfeed</td>
</tr>
<tr>
<td><strong>FORM-STOPBF:</strong> Start formula because breastfeed stops</td>
</tr>
</tbody>
</table>

### Father’s Role in Family

<table>
<thead>
<tr>
<th>Father’s Role in Family</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BBY-ACT:</strong> Baby activities that father participates in</td>
</tr>
<tr>
<td><strong>FPRT-INV:</strong> Father’s perceived involvement in baby’s life</td>
</tr>
<tr>
<td><strong>MOM-SUPP:</strong> How father supports mom breastfeeding and otherwise</td>
</tr>
<tr>
<td><strong>OBST-FD:</strong> Fathers address obstacles or lack-there-of</td>
</tr>
</tbody>
</table>

### Grandparents!

<table>
<thead>
<tr>
<th>Grandparents!</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GMO-INF:</strong> G-ma’s influence on infant feeding</td>
</tr>
<tr>
<td><strong>GMO-OPIN:</strong> G-ma’s opinion about how infant should be fed</td>
</tr>
</tbody>
</table>
Advice and Information Gathering

ADV-WIC: Advice given by WIC personnel
ADV-MD/RN: Advice given by doctor or nurse
ADV-FRD: Advice given by friend
ADV-FAM: Advice given by family members
ADV-OTH: Advice gathered from other sources such as websites, messages boards, books, classes, and magazines.
P-PRV-EXP: Father’s previous experience with children
ADV-EXP: Advice from people who have other child experience
ADV-PART: Father seems to get information or advice from his partner
A-DIFF: Conflicting advice from different sources (or lack there-of)
P-DIFF: Discussion of differences between parents reasoning (or lack)
ADV-GOOD: How it is determined that advice is good- justification for following certain advice
CLASS-PART: Classes that father participated in regarding baby
CLASS-PLUS: Things that fathers thought were good about class or would make a class good; things that fathers convey might be good advice for other fathers.

Father Perception of Infant Cues/Health

FULL: How fathers perceive that their baby is full
HUNG: How fathers perceive that their baby is hungry
HLTH: How fathers perceive that their baby is healthy
OVER-FD: Fathers perception of over-feeding a baby
CRY: How much crying is ok.
SCHDL: How often the baby is fed.
SLP: Amount of time baby sleeps.
SPIT: Description of baby spitting up
Appendix A-10: Excel Spread Sheet

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>O</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LINK to: ADV-MDRN; CER-SPN; Pattern: MAT-FOODINTRO, MDRN-GOOD, INF-CONTR-INTRO</td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>Subject</td>
<td>Code</td>
<td>Memoing</td>
<td>Pattern</td>
<td>Statement</td>
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<td></td>
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</tr>
<tr>
<td>3</td>
<td>CER-BEG; ADV-PART; ADV-MDRN; CER-SPN</td>
<td>can't remember the signs</td>
<td>MAT-FOODINTRO; INF-CONTR-INTRO</td>
<td>S403: Yeah, I think there was some signs. I don't know if I can remember any of them. I remember my wife saying, &quot;He's doing this.&quot; He was doing something, but I can't remember.</td>
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<tr>
<td>4</td>
<td>CER-BEG; MDRN; CER-DV; CER-BOT; CER-SPN</td>
<td>Doctor telling when to begin introducing certain foods AND HOW- MD tells parents to mix rice with formula</td>
<td>MDRN-GOOD</td>
<td>Yeah, maybe. Well, I wanna say, maybe a month, right. I guess since he's gonna be six tomorrow, right around when he turned five. The doctor said you know if he seems like he's doing fine and wants to experiment I guess they put some cereal mixed in with the formula. I suppose is what you're supposed to do. And then fed it to him that way, not like directly, you know. I guess it was more like milk to him ya know, or Cheerios, you know or something like that. I don't know. (laughter) So yeah that was always mixed with something though up until then.</td>
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<tr>
<td>5</td>
<td>CER-SPN; CER-DV; ADV-MDRN; OTH-DV</td>
<td>Combination of MD telling parents when and what to look for and then parents making the decision to go ahead and begin cereal-grabbing for the bottle, hold his head up more, opening mouth when presented with food</td>
<td>MDRN-GOOD; MAT-FOODINTRO; SELF-EFF; INF-CONTR-INTRO</td>
<td>Um, I guess, I guess like uh, he started grabbing for the bottle more and was able to like hold his head up more and stuff, and so he just seemed to like, if you held the bottle up for him, he would start to open his mouth for it and that kind of thing. So like he was anticipating food you know, like recognizing like that something was about to happen. And then, we were just like well you know, the doctor said wait for cereal so we made it real real squishy at first, you know almost just like spoon feeding him what we would have made in the bottle and then thickened it up slowly over the course of like a week or two. And I guess that was kinda how it was. Once he started responding to things we were thought well it seems like time and the doctor said that after the five months or whatever, five to six months we could start feeding him stuff, so he seems to like it, especially the real food, so. He just seems, it just seemed real easy, you know like he was tellin' us what was goin' on.</td>
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</tr>
<tr>
<td>6</td>
<td>CER-BEG; MDRN; CER-DV; ADV-MDRN</td>
<td>MD says, ready when you're ready</td>
<td>MDRN-GOOD; MOT-INF-LIKE</td>
<td>She does kind of do the rice cereal, like in the morning. He'll get like an ounce of milk and the rice cereal. But yeah he likes that, I just forgot about that all together. We just started doing that about three weeks ago too. So he seemed to like it. He was about five months old when we started with the cereal. Our pediatrician at that point was saying I think he's ready, he's ready when you're ready. So we just</td>
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</tbody>
</table>
References: APPENDIX A


Vita

Kirsten Anderson was born in Montana in 1984. She graduated from Custer County District High School in Miles City, Montana in 2002. Kirsten earned a Bachelor of Arts degree in Food, Nutrition, and Dietetics from Concordia College in Moorhead, Minnesota. Directly after her undergraduate schooling, in 2006, she attended the University of Tennessee, Knoxville where she completed the Dietetic Internship program, earned a Master of Science in Public Health Nutrition and a Master of Public Health in Community Health Education. She graduated from the University of Tennessee in 2008. Throughout her time at the University of Tennessee, she was a Public Health Nutrition Trainee funded by the US Maternal and Child Health Bureau. In the future, you will be able to find Kirsten enjoying life in Montana.

Permanent Address: 1708 43rd St. West

Billings, MT 59106