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“Hago lo possible”: An examination of infant feeding practices among indigenous women of Guatemala

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2004

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Abstract

"Hago lo possible": An examination of infant feeding practices among indigenous women of Guatemala

By Catherine Plumlee

Background: Guatemala, a nation rich in diverse culture of Spanish colonialism and Mayan ancestry, is a nation whose youngest citizens carry a tremendous burden of disease that they must bear for a lifetime. The nutritional deficiencies many children experience in infancy cause irreversible damage such as severe stunting and decreased mental capacity, of which they will never recover, despite the fact that from birth to six months, children have ideal nourishment literally made just for them, their mother's milk.

Methods: A cross-sectional study was conducted in the summer of 2010 in order to evaluate the infant and young child feeding practices among a group of indigenous Mayan Chuj women. Attitudes, as well as other influencing factors surrounding feeding behaviors were explored using qualitative methodology. A total of 13 in-depth interviews were conducted in and around the village of Calhuitz, in the municipality of San Sebastián Coatán, in the department of Huehuetenango, Guatemala, among mothers with a child aged one, three, six, nine, or 12 months in order to obtain views and attitudes toward infant feeding over the course of a child's first year of life.

Results: From the in-depth interviews which assessed the decision-making processes regarding infant feeding and how mothers weighed their immediate and long-term consequences and rewards, two main themes emerged: 1) Factors that Influence Intent to Practice a Behavior and 2) Factors that Cause Mothers to Negotiate between their Intent and their Practice. The themes, when explored further, reveal the multifaceted and nuanced behavior that is infant feeding and how its influencing factors can be explained through the Theory of Planned Behavior (TPB).

Conclusions: Findings from this study not only serve to build upon a global body of knowledge which positions infant and young child feeding within the context of the TPB, but also serve to better inform appropriate and lasting interventions that are greatly needed in Guatemala.

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Chapter 1: Introduction

Investments in early childhood nutrition, especially in children aged zero to 12 months are critical in combating lifelong, irreversible damage. Lack of essential vitamins and minerals lowers immunocompetence, increases the severity of infections and eventually may lead to death. In other cases, children suffer from severe mental and/or physical effects. The effects of delayed motor and mental development last a lifetime and are felt through a lack of productivity and a burden on caregivers and health systems. Studies have shown that children who were given proper nutrition in the early part of their lives grow up performing better both in school and out and are more productive adults (The Micronutrient Initiative, 2009).

From birth to 12 months is a critical period for a child's nutritional development. It is during this time that many mothers begin incorporating supplementary and complementary foods into the child's diet as well as begin to wean the child. This transitional phase is a delicate time in a child's life. By introducing other liquids or foods too early (i.e. before 6 months of age), women may be putting their infants at risk by not only decreasing the amount of breast milk given the child, but also by the possibility of exposing them to environmental hazards such as impure water or unclean or ill-prepared solid and semi-solid foods. As a zero to 12 month old child's immune system is not yet fully mature, this makes them more susceptible to infection. Undernutrition only serves to exacerbate an infection and prevent recovery. Yet it is this same infection that exacerbates undernutrition. This cycle of ill health is what leads to chronic undernutrition. The detriment that develops during this time cannot be undone.

While there is plenty of research on Guatemala and its state of emergency due to chronic undernutrition, there is a gap in the research with regard to the mother's role in the actual activity of infant and young child feeding not only in Guatemala but also in developing countries in Latin America in general. Many times, it is the mothers who are the sole, direct providers of food to their infants. While studies have been conducted on vitamin and mineral deficiencies of children and recommendations have been disseminated, this information has not lead to improvements in undernutrition as evident by the state in which Guatemala currently finds itself. Mothers are the key players in deciding, in some cases, which child will eat, what they will, when they will eat, and how they will eat.

The consequence of not understanding exactly what is happening during infant feeding and why it is happening that way is detrimental in two ways. First, it results in suboptimal feeding that has lasting, damaging effects, as mentioned above. Secondly, it impedes the development of intervention strategies that could possibly change attitudes and practices that would result in improved health statuses of infants and young children that would last throughout their lifetimes. By delving into the infant feeding practices and behaviors of the mothers, the multifaceted layers of that which is infant and young child feeding can be shed and the root causes of why mothers feed what they do and when they do, can be revealed thus, filling this gap in the research. It is at these root causes that true and lasting change can take place.

Therefore, the problem remains that Guatemala continues to not measure up to optimal nutritional standards, especially among the infant and young child population. And while there are interventions that take place in developing countries and particularly

in Guatemala, little qualitative research has been done in developing, Latin American countries that addresses the mothers' motivations with regard to infant and young child feeding.

The lack of perspective from a mother's point of view in understanding her motivations behind feeding her infant is what this study aims to remedy. Particularly, this study aims to gain the perspective from mothers living in rural poverty in Latin America in order to better inform more comprehensive intervention strategies that ultimately address the mother as a partner and key player in infant and young child feeding. Understanding mothers' motivations, the factors that influence their decision-making, and the barriers there are to following guidelines is critical in addressing this gap.

In order to ascertain this information, this study addressed the following research questions: What are women's decision-making processes with regard to infant feeding practices including breastfeeding, supplementary feeding, and complementary feeding? And how do women in developing settings weigh the immediate versus long-term consequences and rewards for themselves and their infants when deciding how to feed their infants?

The information and insight gained from this study will add to the body of knowledge surrounding breastfeeding worldwide. This is important because while breastfeeding may seem like a logical and simple behavior—globally, the research suggests that it is a much nuanced behavior, different in every country and in every setting. While this is the case, it is also the reality that the World Health Organization (WHO) has created one set of recommendations after thoroughly investigating the research. These guidelines are the same the world over yet for various reasons, mothers

the world over do not adhere to them. To understand why there is this lack of adherence one must fully understand the many factors that affect specific behaviors such as the cultural setting, the power dynamics, and an individual's place. This study will address those factors.

But it is not enough to simply understand the behaviors. The knowledge gained from this study should be able to inform progressive interventions that address not only interventions at the individual level of behavior change but also at the community level. Mothers must weigh the rewards and consequences of their decisions. At the individual level, this study will be able to address what mothers know and what mothers perceive as the rewards versus the consequences, and therefore, possibly inform knowledge-based education in the future. In addition, this study will be able to discover some of the factors that influence mothers' perspectives, be it other people, cultural norms, or station in life. Knowing this information may shed light on deep-rooted beliefs which may be addressed at the community level using appropriate techniques for this level of intervention. Because infant feeding practices and behaviors are influenced by such a variety of factors on multiple levels, the knowledge gained from this study will be able to elucidate those behaviors to modify and cultivate appropriate, long-lasting changes and ameliorate the plight Guatemala currently bears.

Chapter 2: Comprehensive Review of the Literature

Under-five undernutrition – Worldwide Recommendations

Every year, about 3.5 million children under five years of age die from undernutrition and its effects, mostly in developing countries (The Lancet, 2008). According to the Lancet (2008), 179 million children under the age of five are stunted. Of those children, 90% live in just 36 countries. These developing countries have a high burden of disease that is a result of lifelong and cyclical undernutrition. If a pregnant mother is undernourished during pregnancy this may lead to intrauterine growth restriction (IUGR) that may result in a low birth weight for the infant (The Lancet, 2008). Thus begins the life of an individual who may experience subsequent and repeated health burdens whose consequences result in prolonged morbidity, mortality, and possibly the continuation of creating a new life under similar, burdened circumstances.

As mentioned above, early childhood undernutrition is a major problem for many children throughout the world. A child's immune system is not fully developed until the age of two, and during that time, many children in developing countries are susceptible to micronutrient deficiencies including, vitamin A, iodine, iron and zinc (The Micronutrient Initiative, 2009). According to the 2009 Global Report, vitamin A boosts the immune system, and studies have shown a reduction in under five mortality among supplemented children. Iodine is important for fetal cognitive development and greatly affects the overall intelligence of a community. Iron is essential for hemoglobin development which may reduce iron deficient anemia, which has been shown to cause lower mental and

motor scores. Zinc is crucial for the development of the nervous system while also promotes growth, immunity, and fights infections (The Micronutrient Initiative, 2009).

These micronutrient deficiencies, in addition to other food insecurity issues, stand to create a very hostile environment in which an infant must try to thrive. If these deficiencies are not remedied in the first two years of life, irreversible harm such as stunting and cognitive damage will occur, the long-term effects of which are lives lost, lives impaired through disability and lowered intellect which leads to a loss of productivity, and an increased burden on health systems among an entire population (The Micronutrient Initiative, 2009). While the first two years are important for avoiding these deficiencies and irreversible damages, from birth to 12 months is a critical period for a child's nutritional development and the prevention of growth and cognitive development faltering, as it is during this time that an infant has the opportunity to receive ideal nutrition in the first six months through exclusive breastfeeding (EBF) and it is also the time during which an infant is weaned, thus requiring a greater intake of micronutrients and calories through the introduction of semi-solid and solid foods (K. Dewey, 2003). This is particularly precarious, as optimal infant and young child feeding is often times not adhered to and infants run the risk of deficiencies and infections detrimental to their underdeveloped immune systems.

Optimal infant and young child feeding includes initiation of breastfeeding within one hour, exclusive breastfeeding for the first six months of life followed by continued breastfeeding along with adequate and safe complementary feeding for up to two years or beyond (Michael S Kramer & Kakuma, 2002; WHO, 2002). By following these recommendations to achieve optimal nutrition, individuals can avoid the negative

consequences of morbidity, mortality, delayed development, and long-term productivity which result from undernutrition (K. Dewey, 2003).

Thus, breastfeeding is a matter of life or death, especially in developing countries (M. S Kramer et al., 2003). And while exclusive breastfeeding beginning at birth is not contested, earlier recommendations were ambiguous as to the duration of EBF be it from four to six months or around six months (Michael S Kramer & Kakuma, 2002). At the 55th World Health Assembly, the WHO released a global strategy for infant and young child feeding. In it, they recommend that children aged zero to six months be exclusively breastfed, meaning no other foods or liquids including water should be given to the child. Thereafter, continued breastfeeding partnered with hygienic complementary feeding of nutritiously adequate and safe foods should continue for up to the first two years of life or beyond (WHO, 2002).

Studies have shown that breastfeeding reduces mortality, "even into the second year of life" (M. S Kramer et al., 2003). Kramer et al. (2003) also showed a significantly lower incidence of gastrointestinal infections in children who were exclusively breastfed for six months as opposed to those only exclusively breastfed for three months (M. S Kramer et al., 2003). Often times, children in developing countries may maintain proper growth rates while being exclusively breastfed during the first six months of life and it is during the ages of six to 24 months that children begin to show a faltering in growth, deficiencies of micronutrients, and development of infectious diseases. This may be in part due to the combined reduction of breastfeeding and the "unhygienic preparation and storage of complementary foods" (K. G. Dewey & Adu-Afarwuah, 2008). As for complementary foods, semi-solid or pureed foods should be introduced first until the

child has developed the ability to munch and chew. By 12 months, children should be able to consume regular, family foods. Of course, as a child grows their nutrient and energy demands increase and must be met, requiring specific foods high in nutrient content as well as multiple meals a day (K. Dewey, 2003).

While the tendency in developing countries is to breastfeed for long durations and delay introduction of complementary foods, the duration of breastfeeding in Latin America is generally shorter than in other regions of the world (Cleland & Van Ginneken, 1988). Table 1 presents data from Lauer et al. who collected estimates on several different breastfeeding indicators by region and age in 2004. The estimates show that while Latin America and the Caribbean do not rank last in exclusive breastfeeding, they do fall below the other regions with regard to continued breastfeeding after six months (Lauer, Betrán, Victora, de Onís, & Barros, 2004).

"More than a food issue[1]*"*

From birth to 24 months is an important time in a child's life during which irreversible and permanent damage can occur due to nutritional deficiencies (K. G. Dewey & Adu-Afarwuah, 2008). But several studies have stated that food and nutritional security is dependent on more than just food alone. The health, care, and feeding of children and caregivers alike are necessary to combat malnutrition and food insecurity (Huffman & Martin, 1994; Smith, El Obeid, & Jensen, 2000). Burns et al. states "decision-making about infant feeding is a complex multifactorial process" and Myers, it would seem, concurs noting "…feeding is a social and developmental as well as a nutritional process" (Burns, Schmied, Sheehan, & Fenwick, 2010; Myers & UNESCO,

[1] (Huffman & Martin, 1994)

1992). Various behaviors as well as social, economic, and motivational factors all influence women's decisions about feeding (Simopoulos & Grave, 1984).

One study looking specifically at indigenous (generally, lower SES and at higher risk of morbidity and mortality) and Ladino (Spanish-speaking and generally, higher SES and at lower risk) Guatemalans, found that improved feeding practices among the indigenous mothers did not correspond with "improved nutritional status," and due to their severe deprivation, "improved feeding and care…may not be sufficient to improve children's well-being" (Ruel & Menon, 2002). However, Kramer and Kakuma (2002) state that among the studies they reviewed, in both developed and developing countries, none showed weight or length deficits among children exclusively breastfed for six months compared to those who received complementary feeding with breastfeeding beginning prior to six months (Michael S Kramer & Kakuma, 2002). These findings reveal the ongoing complexities of infant feeding and the need for continuing research and intervention. Studies have shown that educational intervention improves the rates of EBF and that the promotion of EBF reduces growth faltering and the risk of diarrhea (Bhandari et al., 2003). An analysis of child survival strategies identified exclusive breastfeeding for the first 6 months and continued breastfeeding until 11 months as the "single most effective preventive intervention in reducing child mortality," yet there are many factors surrounding breastfeeding and complementary feeding that affect their success (Quinn et al., 2005). This study aims to examine the breastfeeding, supplementary feeding, and complementary feeding practices of rural indigenous women in Guatemala and the factors affecting those practices. To better understand infant and young child feeding, this study will first consider the frameworks of the Theory of

Reasoned Action (Ajzen & Madden, 1986), Self-Efficacy Theory (Blyth et al., 2002; Dennis, 1999), and the Theory of Planned Behavior (Ajzen, 1991), and then examine individual feeding practices with regard to these theories.

The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) (Ajzen & Madden, 1986) states that "behavior under volitional control is best predicted by the intention to perform it" (Göksen, 2002) and that behavioral intention (the likelihood of performing a specific behavior in the future such as first feeding of the colostrum, EBF for six months, or introduction of solid foods after six months) is predicted by one's attitudes toward the behavior (an individual's perceived beliefs toward a behavior's outcome) and subjective norms (significant others' perceived beliefs) (Horodynski et al., 2007; Humphreys, Thompson, & Miner, 1998). The attitudes reflect beliefs held regarding the outcomes of the behavior, whereas the subjective norms are significant others' beliefs and the likelihood of an individual's compliance with the significant other(s) (Humphreys et al., 1998). The theory also considers the antecedents of attitudes and subjective norms, i.e. the beliefs relevant to the behavior. Behavioral beliefs influence the attitudes toward a behavior by linking a behavior to an outcome whose subjective value contributes to the attitudes. Normative beliefs constitute the underlying determinants of subjective norms. By multiplying and then summing a person's motivation to comply with each significant other, the strength of a normative belief can be determined (Ajzen & Madden, 1986). This theory later expanded into what is now the Theory of Planned Behavior (TPB) by the addition of the construct perceived behavioral control and how that *perception* of

control impacts intentions (Ajzen, 1991; Duckett et al., 1998). But before discussing the TPB in detail, it is important to include here the Self-Efficacy Theory which corresponds to the added construct seen later in the TPB.

Self-Efficacy Theory

With its foundations in Bandura's Social Learning Theory, self-efficacy is one's confidence in their *perceived* ability to control their motivations, thoughts, and environment to perform a specific behavior, although, not their true abilities necessarily (Dennis, 1999). Individuals must weigh four sources of information: personal performance accomplishments, which increase self-efficacy; vicarious experiences, or learning through observation; verbal persuasion, the appraisals of others such as healthcare workers, friends, and family; and inferences made from one's physiologic and/or affective state, such as positive arousal cues which enhance self-efficacy (Dennis, 1999). While many high risk factors that influence breastfeeding initiation and duration are demographic and thus non-modifiable, one modifiable variable is confidence in breastfeeding. Thus, applying self-efficacy theory to breastfeeding interventions in order to increase perceived ability to breastfeed leads to more mothers that are likely to choose and maintain breastfeeding (or EBF) even when confronted with difficulties (Blyth et al., 2002).

The Theory of Planned Behavior (TPB)

While the TRA maintains that intention is the predictor of behavior, one caveat to that is the required volitional control under which the behavior (also considered a goal to

be obtained) must be. However, control over a behavioral goal is not always complete therefore the TRA may be insufficient in certain cases where internal factors (such as knowledge, skills, and abilities) and/or external factors (such as time and opportunity) interfere with control. Thus, the TPB extends the TRA by including the concept of behavioral control (Ajzen & Madden, 1986). This self-efficacy belief (perceived behavioral control) can influence choice of, preparation for, and maintenance of any given behavior, including EBF (Ajzen, 1991). This construct can be applied in two ways. First, perceived behavioral control can affect behavioral intention which can predict behavioral goal attainment. Secondly, *perceived* behavioral control can be used as a proxy for *actual* control, depending on the accuracy of the perceptions, and thus directly predict the behavioral attainment (Ajzen, 1991). The relationship between the constructs, intention, and behavior is illustrated in Figure 1. According to Horodynski et al., TPB provides a framework for understanding women's perceptions of infant feeding by being "useful in predicting and understanding motivational influences on behavior that are not totally under a person's control" (Horodynski et al., 2007).

Intent to Breastfeed and Exclusive Breastfeeding

Intention, while an integral component of the TRA and TPB, is also the domain of breastfeeding that is perceived to be, "one of the strongest potentially modifiable predictors of breastfeeding" (Nommsen-Rivers & Dewey, 2009). Nommsen-Rivers and Dewey (2009) created the Infant Feeding Intentions scale which, by quantifying an individual's intention to perform a behavior, can predict with greater accuracy actual EBF duration more so than the mother's quantitative estimate of planned EBF duration

(Nommsen-Rivers & Dewey, 2009). Humphreys et al. examined breastfeeding initiation using the TRA, working with "the premise that breastfeeding intention correlates with actual breastfeeding" (Humphreys et al., 1998). In their study, as a mother progressed closer to intention, both the mean breastfeeding attitude scores and the mean subjective norms scores increased, signifying a stronger agreement towards the desired behavior, in this case, breastfeeding (Humphreys et al., 1998). In other words, as one's attitudes and one's significant others' attitudes were in stronger agreement with breastfeeding, intention to breastfeed increased. Other studies (Duckett et al., 1998; Swanson & Power, 2005) also cite breastfeeding beliefs as determinants of intention. Duckett et al. mentions other determinants of intention including attitudes towards breastfeeding as well as bottle feeding and perceived behavioral control. They also conclude that attitudes towards breastfeeding determine intent to breastfeed more so than subjective norms (Duckett et al., 1998). However, with regard to EBF, Swanson and Power cite positive beliefs and norms as determinants of EBF (Swanson & Power, 2005). They say the social norms of a woman's own mother, female friends, midwife or nurse, and partner are correlated with breastfeeding initiation. Nickerson et al. found, in a study conducted in the U.S., that fathers' beliefs play a key role in infant feeding and that many mothers made a mutual decision to breastfeed together with the father (Nickerson, Sykes, & Fung, 2012).

Additionally, Göksen concludes that subjective norms as well as perceived instrumental support influence intent to breastfeed (Göksen, 2002). Göksen's study involved two, postnatal follow up periods at one month and at two months. At one month postnatal, she concluded that social embeddedness (amount of time lived and amount of family members in a community) and positive norms, together with intention to

breastfeed determined actual breastfeeding. By two months postnatal, the determinants of breastfeeding had shifted to informational support and instrumental support, again, partnered with intention. Göksen highlights the fact that between the environment of the first month, where a mother is more influenced by subjective norms, and the second month, as her situation begins to return to routine, other social variables such as instrumental support, together with intention, affect the desired behavior (Göksen, 2002). It should be noted that the role of intention has only been explored as a determinant of initiation and duration of any breastfeeding. To date, no research has been conducted on the role of intention in exclusive breastfeeding.

Another determinant of intention is Hoddinott and Pill's concept of embodied knowledge which can include such experiences as previous feeding behaviors or having friends or family who have breastfed their children. They say, "embodied knowledge gained through exposure to breastfeeding may be more influential than theoretical knowledge" (Hoddinott & Pill, 1999). This embodied knowledge and experiences also reflect constructs of the TPB as previous experience feeding may influence a mother's attitudes, beliefs, and perceived control with regard to breastfeeding, and experience with friends or family may imply subjective norms.

While there have not been intervention studies focusing on one theoretical approach such as TPB, many studies have focused on individual components of theories (McMillan et al., 2009). Interventions improving self-efficacy of breastfeeding have been successful in increasing breastfeeding initiation (Noel-Weiss, Rupp, Cragg, Bassett, & Woodend, 2006; Schlickau & Wilson, 2005). Another study focusing on normative influences was successful at encouraging exclusive breastfeeding (Black, Siegel, Abel, &

Bentley, 2001). And still another study demonstrated how improved attitudes about breastfeeding show a positive impact on breastfeeding behavior (Khoury, Hinton, Mitra, Carothers, & Foretich, 2002).

Various barriers to mothers choosing to breastfeed include several factors that may be categorized in to one of the constructs of the TPB. Lack of information or awareness, the use of literature only, and the lack of professional support all influence a person's attitudes and beliefs (Andrew & Harvey, 2011; Racine et al., 2009). The time required to breastfeed may challenge a mother's perceived behavioral control (Racine et al., 2009). The isolation one may feel or the discouragement from others to breastfeed are subjective norms that may be imposed on a breastfeeding mother (Andrew & Harvey, 2011; Racine et al., 2009). And while increased SES is associated with increased initiation and duration of breastfeeding in developed settings, McCann et al. showed that in developing settings, determinants such as an increase in urbanization, education, and standard of living actually *decreases* rates of breastfeeding (McCann, Liskin, Piotrow, Rinehart, & Fox, 1981; Simopoulos & Grave, 1984). As for interventions promoting EBF, educational and peer support interventions, including the use of peer counselors greatly improved EBF rates (Bhandari et al., 2003; Dyson, McCormick, & Renfrew, 2005). This indicates the effect subjective norms have on the intention to EBF, not to mention one's increased knowledge which affects the attitudes toward EBF.

Early Initiation of Breastfeeding

Early initiation of breastfeeding is defined as breastfeeding initiated within one hour of birth. It is the recommendation of the WHO that early initiation of breastfeeding

being practiced as it helps establish lactation and stimulates milk production, reduces the risk of bleeding and infection for the mother, helps with the expulsion of the placenta, encourages the mother-child bond, and increases the duration of breastfeeding (Tawiah-Agyemang, Kirkwood, Edmond, Bazzano, & Hill, 2008). Early initiation exhibits protective properties. If a mother initiates breastfeeding within one hour of birth, the newborn will receive the colostrum which has protective qualities as it provides valuable antibodies to help develop the infant's immune system. Also, early initiation promotes infant-mother contact, which may result in more frequent feedings, which increases the likelihood of EBF and/or of a longer duration of breastfeeding which has been previously established to have protective qualities by reducing mortality even up to two years of age (Michael S Kramer & Kakuma, 2002). In fact, Tawiah-Agyemang et al. (2008) did see a reduction in neonatal mortality as did Edmond et al. (2006) (Edmond et al., 2006; Tawiah-Agyemang et al., 2008). Simopoulos and Grave also mention that the time of (early) initiation may also affect duration. They state that if a mother begins feeding within four hours, they are less likely to quit breastfeeding within two weeks. However, if breastfeeding initiation begins after 24 or more hours, they are more likely to stop breastfeeding within two weeks (Simopoulos & Grave, 1984).

While few early initiation studies have been examined thoroughly using the TPB, again, as McMillan (2009) pointed out previously, some do touch on components of the theory. In the case of early initiation of breastfeeding, Baker et al. (2006) describe the LINKAGES project that took place in Bolivia and Madagascar using mass media for behavior change. They adopted the indicator of timely (within one hour) initiation of breastfeeding and showed a significant increase, which they say, "suggests that this is a

relatively easy behavior to change at scale when communities and health providers are sensitized through training and behavior change communication to its importance to infant health" (Baker, Sanei, & Franklin, 2006). While they used behavior change communication, the fact remains that they suggest a change in the social background of the issue, thus influencing the normative beliefs and subjective norms surrounding early breastfeeding initiation.

Duration of Breastfeeding

With regard to duration of breastfeeding, Self-Efficacy Theory applies as mentioned earlier and is both "positively associated with and predictive of breastfeeding duration" (Dennis, 1999). Self-efficacy, postulated as perceived breastfeeding *confidence* to feed one's infant, is a "salient variable" with regard to duration "as it predicts (a) whether a mother chooses to breastfeed or not, (b) how much effort she will expend, (c) whether she will have self-enhancing or self-defeating thought patterns, and (d) how she will respond emotionally to breastfeeding difficulties" (Blyth et al., 2002). Other studies cite intention as a major determining factor (Duckett et al., 1998; Göksen, 2002). Duckett et al. also mentions increased education, knowledge and attitudes toward breastfeeding and bottle feeding as other factors correlated with increased duration (Duckett et al., 1998). However, attitudes, knowledge, and cost/benefit considerations are also determinants of the insufficient milk phenomenon, a frequently implicated barrier to increased breastfeeding duration (Duckett et al., 1998; Simopoulos & Grave, 1984). Another norm that determines duration of breastfeeding includes if the partner is pro-breastfeeding (Swanson & Power, 2005). Rempel and Rempel concur saying, "Mothers

are more likely to initiate breastfeeding and continue to breastfeed when they believe that their partners have positive attitudes toward breastfeeding" (Rempel & Rempel, 2011).

Other disincentives to continued breastfeeding may be informed by the economic theory of individual net-benefit maximization which "hypothesizes that individuals initiate behaviors—such as breastfeeding—that bring them some type of benefit and continue the behaviors as long as the benefits of doing so outweigh the disincentives of continuation" (Racine et al., 2009). Some of those disincentives that Racine et al. mention include discouragement from others; returning to work, routine, or school; and mastitis.

Breastfeeding Interventions to Improve Infant Nutrition

Much work has been done to assess effective breastfeeding interventions. As part of the Lancet series on maternal and child undernutrition, Bhutta et al. (2008) reviewed many interventions worldwide looking at various types of nutritional interventions including breastfeeding promotion and complementary feeding support. In their review, they found that any extra support that the mother receives increases duration of breastfeeding. While it increases any breastfeeding there was a greater effect on the duration of exclusive breastfeeding (Bhutta et al., 2008). McQueen et al. (2011) also revealed that interventions to increase mothers' self-efficacy increased breastfeeding duration. Promoting self-efficacy also increased EBF (McQueen, Dennis, Stremler, & Norman, 2011). Other interventions that show improved results of EBF include individual counseling, group counseling, mass media campaigns (Bhutta et al., 2008), and educational interventions at the community level (Bhandari et al., 2003).

Baker et al. (2006) analyzed data from the LINKAGES Project which implemented community-based models to promote breastfeeding behavior change. They concluded that "strong community behavior change" through training and behavior change communication improves not only EBF but also early initiation of breastfeeding within the first hour (Baker et al., 2006). Finally, research in Ghana showed that prenatal and perinatal counseling as well as health worker support aids early initiation in addition to EBF (Tawiah-Agyemang et al., 2008).

Overall, support of the breastfeeding mother appears to be an important strategy to increase duration and exclusivity. Increasing self-efficacy also greatly affects a mother's intention and overall execution of optimal breastfeeding. Other strategies, especially at the community level, are also key to optimal breastfeeding success.

Complementary Feeding

The introduction of semi-solid foods together with continued breastfeeding is recommended to be delayed until an infant reaches six months of age. According to the WHO, complementary feeding begins when breast milk no longer meets the nutritional needs of an infant and therefore other foods and liquids are incorporated into the infant's diet (K. Dewey, 2003). As mentioned previously, these incorporated foods must first be semi-solid until the child can chew, usually around 12 months of age. On average, if a child in a developing setting continues regular breastfeeding, the amount of additional caloric intake required from complementary foods is 200 kcal per day for six to eight month olds, 300 kcal per day for nine to 11 month olds, and 550 kcal per day for 12 to 23 month olds in order to offset the calories provided by the average intake of breast milk

(K. Dewey, 2003). These values differ for children who are no longer breastfeeding or who are supplementary feeding (the giving of other liquids or foods before the age of six months, regardless of breastfeeding status) (K. Dewey, 2005).

The intention to delay, according to Hamilton et al., is dependent on the TPB constructs of attitudes and subjective norms in addition to age and intention at three months to delay until six months (Hamilton, Daniels, White, Murray, & Walsh, 2011). Horodynski et al. (whose study looks at intent to delay the introduction of solid foods until at least four to six months rather than at six months) also concluded that subjective norms (especially the attitudes of the family) determine intention to delay. They also add that avoidance of the negative impacts of early introduction (as opposed to seeking the positive outcomes of delayed introduction) plays a determining role. Finally, they cite low perceived behavioral control as a reason to delay (Horodynski et al., 2007). Some surmise that this is due to infant factors, such as sleep patterns and satiety, implying that it is the infants with the perceived control (Hamilton et al., 2011). Although, others say it may be a child's dislike (Kasper, 2007) or a mother's aim to settle a child down (Alder et al., 2004) that, in fact, results in *introducing* solids earlier and therefore, could be considered a barrier to optimal complementary feeding. Though that would still imply the infant maintains the perceived control.

Complementary Feeding Interventions

While there are several complementary feeding interventions, the most effective interventions for developing settings involve the provision of complementary foods or food supplements (Bhutta et al., 2008; K. G. Dewey & Adu-Afarwuah, 2008). These

food-based interventions positively impact growth, motor development, and mental development. Increasing the energy density of complementary foods also positively affects growth. However, these two interventions can run the risk of increasing morbidity due to breast milk displacement and unhygienic preparation of foods. Therefore, it is important to couple these interventions with education on continued breastfeeding and hygiene (K. G. Dewey & Adu-Afarwuah, 2008).

Education interventions also impact growth but only when emphasizing the use of animal products in the diet, which is not always available in resource poor settings. Education also helped micronutrient status, again, if specific to iron rich foods (e.g. animal products). And lastly, education positively affected morbidity by decreasing the risk of infection. Dewey and Adu-Afarwuah also point out in their review that education interventions regarding complementary feeding is effectively delivered by both community health workers working within the community and health care workers providing individual counseling at health care facilities. Finally, food fortification, whether through processed foods or at point of use, is effective at increasing micronutrient intake and status (K. G. Dewey & Adu-Afarwuah, 2008).

Undernutrition and Infant and Young Child Feeding in the Guatemalan Context

According to Smith et al., within the Latin America and Caribbean region, Guatemala, together with Haiti, are most affected as they have the severest food insecurity (Smith et al., 2000), despite Guatemala's GDP, which is much higher than that of Haiti's (CIA, 2012). Guatemala ranks fourth in the world and first in Latin America for chronic malnutrition and is said to be the only country within Latin America that has

failed to decrease its rates of malnutrition in the last 10 years as seen in Figure 1 (Loewenberg, 2009; WFP, n.d.; WHO, 2011). Guatemala's infant mortality rate for 2010 was 25 per 1,000 population and, depending on the source, its current percentage of chronic undernutrition (stunting) is between 48 and 50 percent ("UNICEF - At a glance," n.d.; WFP, n.d.). With regard to infant and young child feeding practices, estimates of breastfeeding indicators from 2006-2010, show 50% of Guatemalan children aged zero to six months are exclusively breastfed, 71% are introduced to solid, semi-solid, and/or soft foods at six to eight months of life, and 46% continue breastfeeding up to 20-23 months of life ("UNICEF - At a glance," n.d.).

Focusing on just one behavior such as EBF or complementary feeding does not holistically address infant and young child feeding (Ruel & Menon, 2002). Other contextual determinants, such as culture, family, and social circumstance, play an important role on infants' well-being (Burns et al., 2010). While research on this topic has been done in the United States (Blum, 1999), there has been little research done in developing countries that look at factors specific to a region's cultural ideology, seasonality, and individual rationalization according to Sellen, who worked in Tanzania (Sellen, 2001). Understanding how those factors and barriers influence mothers' perceptions and decision-making with regard to infant and young child feeding practices through the lens of the Theory of Planned Behavior (TPB) may shed some light on Guatemala's chronic malnutrition.

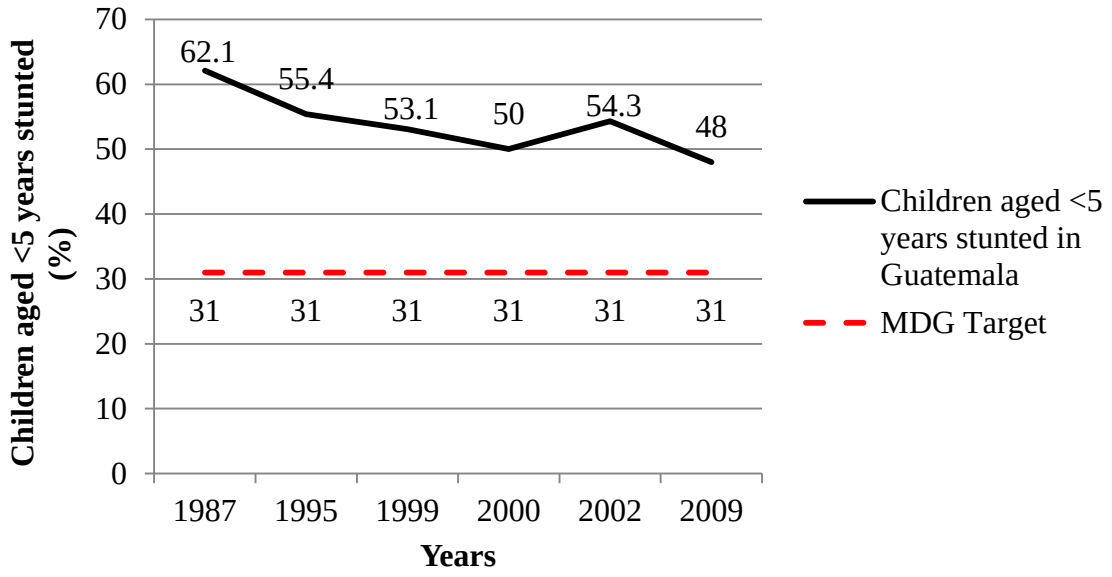
While there is much to be said of mothers' choices, decisions, influences, experiences, perceptions, and implications of infant feeding, a majority of the studies addressing these topics were conducted in developed settings where the social and

cultural constructs are quite different than those in the developing world. Much of the data that is conducted in developing nations revolve around specific health indictors and outcomes such as poverty, HIV, or diarrhea. There are studies that have looked at mothers' decision-making processes in developing nations, yet even then the studies are more often than not looking at other regions besides Latin America. While Latin America does not have as large a population as other regions of the world, the rates of childhood mortality are very high. Ruel and Menon (2002) even showed that the plight of indigenous Guatemalans is worse than Ladino Guatemalans. In addition, other studies have examined similar variables at birth or at one or two follow up periods within a short time span. In turn, this cross-sectional study examines five different postnatal periods in order to explore the differences in thought and behavior over the course of the first year of life. This paper will add to the body of knowledge by assessing the choices, decisions, influences, experiences, perceptions, and implications of infant feeding among one group of indigenous Guatemalan women over various postnatal periods in order to better inform the situation and possible, future interventions.

Table 1. Prevalence estimates for breastfeeding indicators by region and age in months (Lauer et al., 2004)

Region/Country	**Exclusive Breastfeeding <6 months (%)**	**Continued Breastfeeding 6-11 months (%)**	**Continued Breastfeeding 12-23 months (%)**
Africa	24.9	91.8	69.9
Asia (excluding Japan)	44.9	87.5	72.4
Latin America and the Caribbean	30.8	59.9	36.5

Figure 1. Under-Five Children Stunted: Estimated trend and Millennium Development Goal: Guatemala 1987-2004 (WHO, 2011)



Chapter 3: Methods

As mentioned previously, Guatemala's children under five are undernourished however undernutrition is complex and needs to be examined thoroughly and methodically. It is important to explore the settings and surrounding factors that determine the feeding practices of children under five, especially from birth to 12 months, as this is a period of important introductions and changes to a child's diet. To date, there is little qualitative research specific to breastfeeding in Guatemala, particularly on the roles and behaviors of indigenous Mayan women living in or near poverty. The purpose of this study, therefore, is to ascertain what influences the decision-making behind infant and young child feeding and to discover how mothers weigh the immediate versus long-term consequences and rewards for themselves and their children when deciding how to feed them.

For this study, a cross-sectional, qualitative design was chosen. Because the study explored decision-making processes with regard to infant and young child feeding practices, in-depth interviews were conducted to gain the emic perspective of the individual. Questions were open-ended and semi-structured in nature to allow the participant to better express their knowledge and experiences allowing for the application of grounded theory (Woodgate & Degner, 2003).

Study Site

The village of Calhuitz in the municipality of San Sebastián Coatán in the department of Huehuetenango lies high in the mountains of Guatemala's western

highlands. The residents of Calhuitz are indigenous Maya Chuj, the majority of whom practice Catholicism and are agriculturalists, many practicing subsistence agriculture and living in relative poverty. The village is very remote, approximately five hours in private vehicle from the departmental capital of Huehuetenango, where the closest national hospital is located, and transportation is limited with but one, daily round trip to Huehuetenango leaving at 4:00 a.m. While Calhuitz has no paved roads, it does have electricity and piped plumbing although the water is not potable and must be treated at point of use for safe consumption. The village has few shops that provide some basic necessities such as eggs, corn flour, and toilet paper. To purchase most of their consumer and food products, residents will either walk or bus a few kilometers downhill to the town of San José Pueblo Nuevo which has various stores and an open air market every Friday, the only day with regular microbus transportation between Calhuitz and San José.

There is one community pharmacy located in Calhuitz which is adjoined to the Casa Materna maternity clinic. The Casa Materna (CM) serves not only the community of Calhuitz, where it is located, but also 25 surrounding communities. The services they provide include weighing and counseling of children, vaccination, supplementation, prenatal consults, family planning, health education for children and community members, continuing education for traditional birth attendants (TBAs), and general consults and emergency care at the clinic in addition to child delivery. The majority of newborns in Calhuitz are delivered at the CM with the assistance of the nurses and a TBA while the children in the surrounding communities are usually delivered in the home assisted by a TBA.

Population and Sample

In order to address breastfeeding and complementary feeding practices of children aged one to 12 months, 13 women of childbearing age with infants within that age range were chosen as the primary participants due to the fact that, many times, they are the primary caregivers. In order to collect data across the entire timeframe, women from each of the following approximate postnatal periods were selected: one month, three months, six months, nine months, and 12 months.

Venue-based recruitment was conducted as the Casa Materna had all the records of births in those communities within the last year. A convenience sample was chosen from the records of mothers in those communities who fit the approximate postnatal periods. While ideally the participants would have been chosen considering other selection criteria such as income levels, due to the fact that there were so few births that met the timeline parameters within these small communities, such criteria were not able to be considered. In addition, Calhuitz is a fairly homogenous community. Participants were contacted by the Casa Materna staff and asked if they were willing to participate in an interview lasting approximately one hour in length. A total of 13 interviews were conducted: three from the one month postnatal period, three from the three month postnatal period, three from the six month postnatal period, one from the nine month postnatal period, and three from the 12 month postnatal period. Ideally, three to four mothers from each of the infant age groups were to be interviewed in order to reach saturation. However, due to time and eligibility constraints, only the above-mentioned interviews were conducted.

Ethics

The research was approved by both the administrator of the CM and the institutional review board of Emory University. The informed consent of each participant was obtained by first carefully reading the consent form in Spanish which described the purpose, process, risks, and confidentiality of the study and having the interpreter then repeat it in Chuj. The participants then gave oral informed consent to be a study participant.

Tool Development

An interview guide was developed to cover different aspects of decision-making around infant feeding (Appendix A). First, the participants were asked about their typical day and family. Second, the guide delved into the typical foods eaten in a typical day by mothers which led to questions about the foods eaten by their child. The key questions focused on what foods were eaten by the child, when foods were first introduced, infant feeding recommendations, other factors and influences, and risks and benefits. Questions varied according to the age of the child. For children six months and younger, the mothers were asked questions regarding exclusive breastfeeding and what other liquids and foods would be introduced in the future and at approximately what age, whereas with the older infants questions were asked pertaining to their early diet and which liquids and foods had been introduced at what age. To close, the participants were asked to give their recommendations to the Casa Materna on how to counsel mothers about feeding their infants. The questions were open-ended, allowing the participants to give a variety of answers. The guides were constructed in such a way as to allow the interviewer to adjust

the ordering of the questions according to the participant's responses. Also, after the initial interviews, the guide was edited to follow a more logical succession that was determined according to the initial responses. At the end of the interview, participants were given a light snack for having arrived and given of their time.

Procedures

The majority of interviews took place in private rooms at the Casa Materna. Two interviews took place in the Health Post of one of the communities served by the Casa Materna and two interviews took place in the participants' homes. The interviews lasted between approximately 22 and 41 minutes with the average length of an interview being 33 minutes. The first language of the participants is Chuj. Therefore, bilingual Spanish-Chuj interpreters were utilized. The two interpreters were health educators on staff at the Casa Materna and received training on the role of the interpreter. The participants were asked if the interview could be digitally recorded for easier analysis and clarity in addition to note taking. Only 10 of the 12 voice recordings were transcribed verbatim as the sound quality of two of the recordings was deemed too poor to transcribe. All transcriptions will be analyzed in Spanish. One participant declined the use of a recorder. Extensive notes of the three interviews lacking transcriptions were taken during the interview in order to include the data in the study, albeit not in the formal analysis.

Data Analysis

The Principal Investigator (PI) first transcribed the interview recordings verbatim. Some interviews were simultaneously translated into English and transcribed, however,

the analysis was done in Spanish in an attempt to maintain what data richness remained after interpretation. Using the methodology of grounded theory, the PI read each of the transcripts in detail, categorized the data, and created general themes or codes. After the initial read-through, the transcripts were re-read with the themes in mind, condensed into code groups, and patterns identified. During this process, careful attention was paid to the literature in order to better understand the themes that were emerging and to help identify other potential themes. A comparison analysis was also conducted among different infant age-groups of mothers in order to capture the differences among the mothers of different postnatal periods.

Limitations and Delimitations

To begin with, while the interview guide was deemed adequate by the research team and was revised after the initial interviews, the data collected, while rich in parts, is considerably thin. This is perhaps due to cultural nuances at play, the use of an interpreter, the dynamics of having an outsider interviewer, and the probing skills (or lack thereof) of the interviewer. The goal of the study was to interview three to four mothers from each of the five postnatal periods, resulting in 15 to 20 interviews, an amount recommended to reach saturation, but only 13 interviews were garnered thus limiting the potential of the data. However, after data analysis, it was determined that saturation was in fact reached despite the low number of interviews conducted. Also, the distribution among the comparison groups varies. While the goal of at least three interviews were met for some postnatal periods, as mentioned previously, only two interviews from the three month- and one interview from the nine month postnatal period were obtained. This

affects the outcome of the comparison groups, especially with but one representative from the nine month group. Also, originally, it was planned to interview puerperal women within one to two weeks of having delivered but due to certain constraints such as transportation, the availability of a trained interpreter, and the sheer lack of babies within that age group, the inclusion criteria was expanded to include one month old infants.

Another limitation to the study was the setting. While 11 interviews took place in a health clinic or health post, two of the interviews took place in the participants' homes. On both occasions, other family members, including the husbands, were present, which may have influenced the responses given by the participants. In addition, the use of interpreters greatly affected the quality of the data. Despite having acted as interpreters for previous studies and having been given a refresher course on the roles of interpreters, some richness of the data remained lost. Other hindrances included the weather, as rain and mud kept people away, and the lack of transportation limited the interviews, and therefore participants, to Calhuitz and one other village. Also, the Catholic church's holidays, such as the Feast of the Assumption of the Blessed Virgin Mary, commanded people's time and therefore they did not show up to scheduled interviews.

Chapter 4: Results

From the analysis of the transcripts, two major themes emerged. They are: 1) factors that influence intent to practice a behavior, in this case, the various components of infant feeding and 2) factors that cause mothers to negotiate between their intent and their practice. The results of these themes will be discussed in context with representative qualitative data in order to best illustrate the themes. All names of people have been changed to protect anonymity.

Theme 1: Factors that Influence Intent to Practice a Behavior

Cultural norms surrounding infant feeding in Guatemala

Breastfeeding is very common in Guatemala particularly among indigenous Mayan women. This is not surprising as many of the indigenous populations are among the country's severest poor, marginalized to the western highlands of the country by not only unique cultures, traditions, and languages but also by political strife. Breast milk, therefore, is seen as a natural, available source of nutrition for newborns in places where formula supplements are unattainable, either due to availability in markets or lack of monetary means. However, even in less remote areas where formula is readily available, breastfeeding remains a common behavior. From observations taken in the field, it is not uncommon to see women openly breastfeed their child on public transportation, in public areas, or at community meetings or gatherings. It is viewed as a natural and common occurrence. Behaviors may be different in other urban areas and Guatemala City, but in

the remote, mountainous region of Huehuetenango, where this study took place, breastfeeding is commonplace.

Attitudes of Key People in Mothers' Lives egarding Infant Feeding

Partners—Husbands play an important role as head of the Guatemalan household, (although in some cases, a young couple my live under the auspices of his parents so he may not have the final say in deciding family matters). They are usually the sole source of income for a family and may spend many hours outside the home. As for their attitudes toward infant feeding, in the interviews, the participants were asked to comment on the participation of their husbands with regard to feeding as a proxy for their attitudes. Responses varied as to the types of support provided. Three women simply mentioned that their husbands agreed with how she was (or they were) feeding the infant yet provided no other detail as to the husbands' personal beliefs or other types of support given. Two other women cited financial support the husband provided, again with little more detail. Some mothers mentioned that their husbands participate in the actual feeding process if the child was being given solid foods. Two mothers who were still exclusively breastfeeding their children mentioned how their husbands would help with the other children or household chores in order to allow the mother to attend to feeding the baby. Ana says,

> "Sometimes when I have something to do or perhaps I'm making dinner he helps me hold the baby or when [the baby] needs its milk, he helps me finish what we're going to eat and I sit down to breastfeed the baby. The two of us are working equally. But when he has to work far away, I stay with the baby alone."

Other Women and Family Members—As with the attitudes of the husbands, the attitudes of other significant others were ascertained by proxy in the interviews. While participants mainly discussed advice they had received from other mothers, be it their own, their mother-in-laws, or just other women with whom they were acquainted, much of the advice revealed positive beliefs in the recommended feeding practices. For example, Johanna, who is exclusively breastfeeding three month old Julio said, "Other women [including her mother-in-law] have told me that at six months their, their children eat because since I, it is the first baby that I have so…they have told me." She also said it is the other women who already had children who told her that breast milk is good for babies and that formula causes children to falter. Given this information, one may conclude that the attitudes of other women are pro-exclusive breastfeeding. In the case of Luisa, who lives with her parents and siblings and is a young, single mother of twelve month old Juan, a picky eater, the key people in her life are her parents who have advised her to prepare Juan's food well so that he does not get sick. And they advise her in other ways as well. "My dad has scolded me for, that it is not good to give all that's been given…candies and junk food," Luisa. Again, this reflects the attitudes of Luisa's significant others towards a more healthy and safe (aka recommended) diet.

Healthcare Workers—It perhaps goes without saying that the beliefs of the nurses and health educators at the Casa Materna are pro-recommendations. However, their attitudes should still be considered as they do influence mothers' intentions. From the interviews, it is clear that Casa Materna team, as well as TBAs, impart knowledge to the

participants on topics such as exclusive breastfeeding, when children may eat, and what they may eat. Antonia, when asked why she thinks "formula is bad when given to children," refers to the Casa Materna staff when saying, "They said that formula is, is not the same as breast milk."

Women's Attitudes toward Infant Feeding

In this study, many of the women gave birth at the maternity home and all cited having fed their infant the colostrum. Whereas in the past, there might have been apprehension towards feeding the colostrum, in this community, where there is a Casa Materna clinic that has a regular health education component to its provision of services, many women no longer feel that way. When asked why they fed the colostrum the majority of women (six) responded saying colostrum was "good" or "the best" milk. "They have taught us that it is good…good milk for the baby. So the first day that he was born, I gave him his exclusive breast milk," Johanna, mother of three month old Julio. Other participants, however, cited the specific reason of its nutritional value, however informally in terms. Manuela, the mother of six month old Basilio, said, "I had heard that it is the best milk because it has a lot of vitamins." Finally, Erika, a multiparous mother of one month old José simply stated matter-of-factly, "I just know that I have to breastfeed him, that is why I breastfed."

All the women interviewed for this study are currently breastfeeding their children. Of the five women with children six months or older, all are complementary feeding their children, one of whom, who receives supplementary income from her in-laws, also gives formula to her child. One mother began supplementary feeding her now

six month old at five months. And one mother, whose daughter is six months old and just began complementary foods, said, "I believe breast milk is the best for the best growth of my daughter." Of the other five women with children under six months of age, only two mentioned exclusive breastfeeding. Isabel, mother of one month old Rosa, is now only giving breast milk but mentioned having tried giving a supplement but Rosa did not want it so Isabel reverted to solely breast milk. Two women also cited their experiences with their previous children as reasons why they were going to delay liquids and foods until a certain month.

The attitudes surrounding breast milk versus formula are definitely pro-breast milk. As mentioned above, women believe formula will cause growth faltering mainly by causing illness. However, in the case that a woman feels she does not have enough breast milk, formula is the best alternative. Johanna, who is exclusively breastfeeding, says, "One disadvantage [to formula feeding] is the women who give formula to their baby, they [the baby] are going to get sick more…I have heard that women who give them formula, sometimes the, the babies get a lot of diarrhea." Antonia, who previously mentioned that the Casa Materna says formula is bad because it is not equal to breast milk, continues that they also say "Because we do not prepare it like it should be." But she also mentions formula as an alternative stating, "One of the advantages is because the child is full and now will not get very hungry, when they do not have breast milk."

Two mothers of one month old children in addition to breast milk mentioned serving bread to their newborns, one as early as three days old. Luisa, whose son is 12 months old, mentioned that she too had given bread at one month but then the baby stopped eating anything for the next three to four months until she started serving food to

him regularly. This concept of serving bread to very young babies is an interesting one as otherwise the women mentioned starting other foods and liquids at six months of age. They know the recommendation and yet, in practice, bread is seen as exempt from that recommendation. In fact, when asked to recall when they first began giving other liquids and foods to their children, the mothers of older children gave several varying answers. Some said at five months they began foods; others said six months. When asked why she did not begin other liquids or foods before six months, Lucía, mother of six month old Marta, said, "Because we cannot obligate her at four months or at three months. Until she reached six months did she begin to eat. She alone asked for her food." Two mothers mention started liquids at seven and six months, then gave foods at 11 and eight months, respectively. The types of liquids given include a liquid, corn mash or the liquid from black beans, "bean water," but not the beans themselves, which is inappropriate because they should have been given semi-solid foods beginning at six months of age.

Despite the varied feeding practices, all are currently breastfeeding and say that their current infant feeding practices have benefits, save Luisa, the young mother scolded for feeding her child junk food, although she intends to change her habits. The benefits mentioned were both for the positive aspects, "Gives strength to the baby," good growth, and weight gain, as well as opposed to the negative alternative, "They will get sick less." And while the knowledge of when and what to serve exists and the attitudes toward those recommendations are positive, in practice, the infant feeding outcomes are quite varied perhaps due to lack of awareness or barriers they may encounter. And as Isabel states, "It's like a custom to raise children. We have always done it like so, since we were born.

My mom did it like that with her family, so I go, watching and practicing…It's how I practice and after, later, another family…what I do is what they will do, just the same."

Theme 2: Factors that Cause Mothers to Negotiate between their Intent and their Practice

While the previous theme focused mainly on the subjective norms and attitudes of the mothers, theme two deals mainly with perceived behavioral control in the sense that much of what mothers actually practice is affected by factors beyond her control. These are factors that, while a mother has certain attitudes and lives within certain norms, force her to renegotiate her intent to practice in order to weigh the short- and long-term consequences and rewards facing her in her day to day life; she must find strategies to self-efficacy.

For example, one long-term reward previously mentioned deals with exclusive breastfeeding. As one mother states, "[With exclusive breastfeeding], babies grow more later than if a woman gives formula to her child, they stay behind." One mother mentions, "The benefit is because I am raising him right now. And later, when he is big, he will take care of me," demonstrating yet another long-term benefit of infant feeding.

Another factor that forces negotiation stems from the in vivo code, "to be 'full'" or satiation. In it, mothers describe satiation around two main topics: insufficient milk and the insufficiency of milk. In the first, the participants justify the need for formula feeding if a mother has insufficient milk and even then the reasons given are: "So that the child is full and not hungry" and "So that they are full and do not lose weight." Ana, who is complementing Jonathan's diet with formula, agrees, "The women that do not have milk…I have seen that perhaps it is true [because] the babies start to cry. They start to cry

and cry. Surely they do not get full by the milk," "When they do not get full, then it is then when they start to buy formula." If not in this capacity, the participants refer to fullness when regarding the needs of their growing infant. For Isabel, who is nursing a one month old, "The breast is sufficient so that she fills up." Johanna, mother of three month old Julio knows, "…at six months…perhaps they no longer are full with just the breast."

Crying and/or the need to placate a child is another factor that forces negotiation and is related to the satiation factor. Crying due to hunger, be it lack of milk or complementary foods, or want of shiny junk food bags in Luisa's case, forces women to weigh their short-term rewards and consequences in order to placate the child in the moment. In fact, one of the reasons given as to why bread is given as a supplementary food is if the child asks for food before the age of six months. In fact, as previously mentioned above, many times mothers' cues to begin giving additional liquids or foods is per request of the child, "It depends on if the child asks for it [their food]." This indicates that it is, in fact, the child with the perceived control of its own infant feeding as opposed to the mother.

Other barriers to a mother's perceived control include the amount of work she has to complete in a day, the amount of time needed to complete that work, added to the amount of time needed to feed her child. The majority of the women interviewed are housewives and as such, have the responsibility of daily cleaning, clothes washing, and food preparation which also involves trips to the market. While Calhuitz does not have a market, the neighboring town of San José does and it is a short walk downhill to the market on Fridays. However, two of the women interviewed were not from Calhuitz but

rather lived in one of the villages served by the Casa Materna. For these women, a trip to the market is a three hour walk by foot or a 30 minute ride by vehicle, which costs energy, time, and/or money. In some cases, the women must look after animals or go collect firewood in the forest. In the communities, where this study took place, there was piped water but in many communities throughout Guatemala yet another task to be completed by the woman is collecting water.

All of these responsibilities, in addition to looking after other children and an infant, can put pressure on a mother to weigh the outcome against what she must do and leads to her discovering self-efficacy strategies. Referring to the amount of work she has to complete in addition to feeding her infant, Manuela says, "I know he is a child [and] it is his turn to eat and I feed him." Two mothers said the same thing, "I do what I can," when speaking about how the time goes and how they try to make it last in order to feed their children. These negotiations and self-efficacy, together with their personal beliefs and the beliefs and attitudes of others, result in the actual behavior that takes place, which, as demonstrated by this cohort of women, is varied and multifaceted.

Chapter 5: Discussion

This cross-sectional qualitative study in Calhuitz, Guatemala explored indigenous mothers' decision-making processes, what mothers considered before deciding to breastfeed (whether exclusively or at all), supplementary feed, or complementary feed their infant. These considerations affecting infant feeding are social, economical, and motivational (Simopoulos & Grave, 1984), and include such factors as the perceived availability of breast milk (Hill & Aldag, 1991), one's SES (Racine et al., 2009), food diversity (or the lack thereof) (Loewenberg, 2009), one's own self-efficacy (Blyth et al., 2002; Dennis, 1999), the amount of social support (Bhutta et al., 2008), and the availability of time (Duckett et al., 1998). It explored these factors through the TPB lens (Ajzen, 1991). And while the TPB theorizes as to how different belief constructs affect the intention to complete or not complete a desired outcome, with regard to infant and young child feeding, it does consider how mothers must weigh their immediate and long-term consequences of their decision-making, which this study does include. This data delves into the concern the participants give to the long-term health benefits of optimal feeding (Bhandari et al., 2003; M. S Kramer et al., 2003) compared with the immediate necessities of the present (Duckett et al., 1998; Hamilton et al., 2011; Horodynski et al., 2007).

From the analysis of the data collected, two main themes emerge: factors that influence intent to practice a specific infant feeding behavior and factors that cause mothers to negotiate between their intent and practice. Factors that influence intent to practice a behavior consist of the cultural norms surrounding infant feeding, in particular,

breastfeeding, as well as the cultural and personal attitudes held by people who the participants deemed influential. These norms, within which the participants live out their daily lives, affect and are affected by the participants' own beliefs and attitudes. Specifically, some of the attitudes expressed by the women, their influencers, and the culture is pro-breastfeeding. The healthcare workers promote the recommended infant and young child feeding practices especially exclusive breastfeeding for infants less than six months of age. They also express a negative attitude towards the use of formula due to its less-than-ideal properties (i.e. it is not breast milk) and the dangers of improper use at point-of-use such as mixing with contaminated water and/or inadequate powder to water ratio. The participants' attitudes were also pro-breastfeeding, although the data reveal the use or experimentation with supplementary foods occurred in half of the participants whose data was included in the analysis. Some of their motivations behind their infant feeding practices are to make sure their child is strong, grows well, and does not get sick.

Factors that cause mothers to negotiate between their intent and practice consists of non-modifiable (or *perceived* non-modifiable) circumstances such as a woman's socioeconomic status, the time and distance it takes to perform certain tasks, and the phenomenon of insufficient milk. The insufficient milk phenomenon is a barrier to recommendations resulting in early weaning (Duckett et al., 1998; Kasper, 2007). According to Feinstein et al., less than five percent of lactating mothers may be physiologically incapable of providing a sufficient milk supply (Feinstein, Berkelhamer, Gruszka, Wong, & Carey, 1986). However, Hill and Aldag (1991) report that mothers who claim to have insufficient milk due to cues such as infant weight loss and crying

from dissatisfaction, were less informed, had less intention toward breastfeeding for a longer duration, and during pregnancy, were less confident about breastfeeding their infant (Hill & Aldag, 1991; Sacco, Caulfield, Gittelsohn, & Martínez, 2006).

Other aspects of this theme fall under the category of how one weighs the immediate versus long-term consequences and rewards of one's actions. In other words, mothers have to make moment by moment decisions as to how they are going to feed their infant. Ensuring that their infants are well-fed, content, satiated, and settled, are of great concern to mothers.

The data collected in this study reveal that the Theory of Planned Behavior remains relevant in an extremely impoverished setting in Latin America. The two themes reveal that the constructs of the theory, subjective norms, attitudes towards the behavior, and perceived behavioral control apply to the data (Ajzen, 1991). The first theme, dealing with the influences that affect a mother's intent, can be categorized as subjective norms. These norms are the attitudes of significant others and attitudes towards the behavior which are the personal beliefs of the mothers. The second theme can be categorized as perceived behavioral control as they are factors that warrant negotiation which ultimately reveals that there are many other factors that necessitate a certain behavior. Theme one which directly affects the intent to do a behavior also has the ability to act upon the factors of Theme two which then affects intent to practice a specific infant feeding recommendation. Yet finally, despite the intent, the outcomes of interest (the recommended behaviors) may be achieved or they still may not be.

The data also adheres to the *expanded* Theory of Planned Behavior model for breastfeeding (Duckett et al., 1998), which incorporates other antecedents and modifiers,

although with some slight differences. The antecedents Duckett et al. highlight include age and formal education, which affect all three previous constructs of the TPB, as well as breastfeeding knowledge, which affects the construct of attitudes toward a behavior. However, this author would argue that it is not age but rather embodied knowledge (Hoddinott & Pill, 1999) that has greater potential to influence the subsequent constructs, at least in a developing setting such as Guatemala. While the trends are changing in Guatemala, it is still a setting where plenty of young women are experienced, multiparous mothers or if not, they may have experience through witnessing close friends or family and their infant feeding practices. It is these experiences, which may occur earlier in a young woman's life, that garner knowledge and beliefs.

In addition, formal education was not addressed in this study. However, *informal* education (via the health education program of the Casa Materna) is explored. The women referred to the Casa Materna's staff and activities as sources of information when discussing their knowledge of breastfeeding. As the expanded model shows, formal education (and in the case of this study, informal education) may contribute to breastfeeding knowledge (another addition of the expanded model). This breastfeeding knowledge may then contribute to the previous construct of attitudes toward a behavior conceptualized by Azjen & Madden (1986).

Limitations and Strengths

While this study reveals many aspects surrounding infant feeding practices among indigenous Mayan women of Guatemala, it is not without its limitations. To begin with, the study sample is small. During data collection, 13 interviews took place, only 10 of

which were included in the analysis. The intention to compare among groups of women with roughly a three month age difference in their infants was not possible due to this fact. Another limitation was the quality of data gathered which is very thin. This could be due to several factors. First, an interpreter was used in all of the interviews. Some richness of the data could have been lost between the Spanish/Chuj translation. Also, cultural differences may be the cause of a lack of sharing on the part of the participant although measures were taken by the researcher and the interpreter to build rapport. However, analysis of the data was conducted in Spanish (not English) in an attempt to retain what richness there is in the data which can be considered a strength of the study. Another limitation to the data gathered has not to do with the quality of the data gathering but rather with the quality of the data provided. All of the women were asked to provide information about their first and other early feeding practices. Half of the women have infants aged six months or older. Recall bias must be considered when analyzing and interpreting the data. Finally, as this is a qualitative study conducted in a rural village in the highlands of Guatemala, the information gathered here may not be generalizable to other populations. However, this author feels that this reveals a strength of the study and of qualitative methodology in general. Through the use of this form of research, important, rich, and revealing data was gathered which not only illuminates more the difficulties facing Guatemala today but may also inform future undertakings in order to try to work toward a better resolution.

Chapter 6: Conclusion, Implications, and Recommendations

In Guatemala, children continue to suffer from chronic malnutrition. The rate of stunting is quite high and nowhere near reaching the MDGs set out for Guatemala (WHO, 2011). In a place where the gap between the rich and the poor is so great and infrastructure is still such that many populated places are lacking what are considered basic necessities, people are suffering and yet, because it is so commonplace, people are unaware of the gap in nutritional status (Loewenberg, 2009). The data shows that there are health education endeavors and that breastfeeding knowledge is being disseminated among the population at large. However, the data also reveal that despite this information, common practices of supplementation do regularly occur, the public health implications of which undermine the activities of the health educators and weaken the overall health and capacity of the community.

Edmond, et al. (2008) states that improving infant feeding in general is perhaps the most cost effective and feasible intervention for improving child mortality (Edmond, Kirkwood, Tawiah, & Agyei, 2008). As mentioned above, there are public health programs aimed at increasing breastfeeding knowledge and yet, as knowledge of the recommendations increases, adherence rates do not. Different approaches need to be taken that not only increase knowledge, but that also develop skills and change attitudes or beliefs surrounding specific infant feeding practices. Promotion of optimal infant and young child feeding should continue through a variety of effective programs. This should be done through the community by first listening to and observing what the practices are, and understanding the reasoning behind those behaviors. Only then can one fully

appreciate the behavior and use different tactics to change the behavior or correct misinformation.

By questioning a sample, albeit a small one, of the mothers living in two communities served by the Casa Materna of Calhuitz using qualitative methods, this study has been able to listen to and observe mothers' practices. From this data two main themes (factors that influence intent to practice a behavior and factors that cause mothers to negotiate between their intent and their practice) emerge that have significant public health implications, the first of which deals with key players who influence intent. While the participants regularly cited the CM staff as sources of breastfeeding knowledge, that information was not always followed, implying that perhaps there are other factors or key players who influence their intent and thus, need to be taken in to account when considering the greater public health implications. The second public health implication refers to the second theme, factors that cause mothers' to negotiate between their intent and their practice. While there are these factors, the data show that mothers do what they have to in order to feed their children, but the reality is many children in Guatemala do go hungry and are not receiving adequate nutrition. That "do what I can" attitude shows signs of encompassed self-efficacy. As discussed previously, increasing self-efficacy is a well-established and effective intervention that, if increased, has greater implications for affecting other behavior change. Thus, it would be greatly advantageous to incorporate promotion of self-efficacy into community health programs, especially among a marginalized population such as indigenous women in Guatemala or most of Latin America for that matter.

As for organizational implications and recommendations, the data gathered for this study, both observational and through in-depth interviews, have provided insight into the not only the behaviors of the mothers in the communities but also into the inner-workings of the Casa Materna and therefore some suggestions may be made. While breastfeeding is a common occurrence in Calhuitz, this study reveals that it is far from ideal. Therefore, one goal of the Casa Materna should be to move mothers closer toward optimal infant and young child feeding by promoting the early initiation of breastfeeding within the first hour, exclusive breastfeeding and delay of complementary feeding for the first six months of life, and proper complementary foods according to a child's age and energy needs.

With regard to early initiation of breastfeeding, the LINKAGES project shows that this is a behavior that is relatively easy to change, the results of which have lasting implications for subsequent, successful optimal breastfeeding, and yet is not commonly practiced (Baker et al., 2006). Community involvement is critical as there are usually long-held beliefs surrounding the first few moments after birth. However, the CM holds the unique position of delivering almost all the births in Calhuitz as well as offering continuing education lessons for the local TBAs who live and work in the surrounding communities. Therefore, the CM has ample opportunity of which it should take advantage to counsel women one on one immediately after birth in order to initiate breastfeeding in a timely manner and to ensure proper latch before the mother returns home. Also, as both prenatal and perinatal counseling is shown to be effective, the CM nurses, while performing their regular prenatal consults with the pregnant women of the communities which they serve, should be sure to incorporate a breastfeeding component

into their visit, taking time to ask the women about their concerns, fears, and doubts and to offer information that may serve the women later on, after the birth.

As the role of the TBA evolves, so should their practice of promoting optimal infant and young child feeding. And the CM may help dispel any previous, long-held beliefs as well as promote early initiation among that group of influencing women. In fact, other studies have suggested that not only mothers should be targeted for infant and young child feeding promotion, but also their TBAs, the grandmothers, and other influencing females as well since they are, many times and perhaps unknowingly, the perpetuators of suboptimal infant and young child feeding. The staff of the CM could incorporate these other influencing members of the community into their health promotion endeavors.

Of course, the other components of optimal infant and young child feeding should not be ignored. EBF for the first six months and appropriate complementary feeding also need to be fully communicated and practiced. This is especially true since, as mentioned above, breastfeeding is common among this community however, it is far from optimal. Community-led social support groups have proven effective at keeping up adherence rates to optimal infant feeding. It would behoove the Casa Materna to initiate such a community support group, ideally relinquishing control of the group to the group itself while still participating in a supporting role perhaps providing a meeting space and technical expertise, when solicited.

In conclusion, this study conducted among rural, indigenous mothers in Calhuitz, Guatemala has revealed in-depth information and understanding into not only the behavior of infant feeding but also the many influencing factors that are interconnected

with the execution of those behaviors. While infant and young child feeding has been well researched, it is rare that a qualitative study of this type is done 1) in a developing setting, 2) in Latin America, 3) in Guatemala, and 4) among rural, indigenous women. Thus, this study contributes to the vast body of knowledge that already exists in a much needed capacity. From the data gathered, much information has been revealed that may further serve not only public health endeavors at the local, community level but also worldwide.

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Appendix A:

In-Depth Interview Guide for Calhuitz, Guatemala, Summer 2011
Catherine Plumlee

Introduction:

- Introduce myself and thank participant for coming.
- Explain that this study is meant to assess the knowledge, attitudes and practices surrounding family feeding practices particularly for children aged 0-12 months.
- Explain that I will ask a series of questions pertaining to these topics and that the interview should last around 1 hour.
- Explain that the questions are not meant to make them feel uncomfortable but if they prefer not to answer a particular question or wish to stop the interview at any time they may without penalty.
- Explain that any information they disclose during the interview will be kept confidential among the research team and that specific names and identifying information will be changed to protect their identity. Also, the information will be stored in a password-protected computer and any original recordings will be destroyed.
- Explain that if they have any doubts, questions or complaints during or after the interview they may feel free to contact me at any time and I will direct their comments to the appropriate person(s), if necessary.
- Ask if they consent to participating in the interview. If consent is not given, thank participant and end interview.
- Document that informed consent was provided.
- Ask if it is alright if conversation is recorded. If not, ask if taking notes is alright.
- Demonstrate recorder.
- Ask if the interview may begin:
    - Está bien pasar a hacer la entrevista?

[Read Consent Form.]

Having said all this, do you have any questions for me before we start?

Do you consent to participate in this interview?
[Document consent on form.]

Will it be alright if I record our conversation?
If not, may I take notes during the interview?

'Warm-up' stage:

Okay. Let's start by talking about your family and what you do in a typical day.

1. Tell me about your family.
    - Who is in your family?

- Who do you live with?
- Number of children, their sexes, and ages

2. Tell me about your typical day.
    - tasks
    - washing
    - cooking
    - shopping
    - child rearing
    - fuel collecting
    - women's groups
    - church activities
    - enterprises
    - farming

Key Questions:

I'm now going to ask you some questions about what foods you normally eat.

3. In a typical day, what foods do you eat?
    - Why do you choose those foods?
    - Who does the majority of the food preparation in your household?

4. Where do you get your food?
    - grown
    - purchased locally
    - purchased elsewhere
        - What markets are available?

Now I'd like to ask about the foods your most recent child eats.

5. In the child's first day of life, what was done with the first milk?
    - Thrown out
    - Given to Child
    - Other

6. At what hour did you first feed the child?
    - What was the reason for feeding for the first time when you did?

7. What did you feed the newborn?
    - Did you exclusively breastfeed?
    - If not, what else did you feed the newborn?
        - Colostrum, breast milk, formula, other liquids, other foods?

8. How often per day did you feed the newborn?

9. For how long was each feeding session?

10. At what age did/will you give the baby other liquids?
    - What liquids were given?
    - How often were liquids given?
    - How were the liquids prepared?
    - Why were other liquids given to the child?
        - What were the benefits to giving the infant other liquids?

11. At what age did/will you give the baby food?
    - What foods were given?
    - Were they solid or semi-solid foods?
    - How often were foods given?
    - How were the foods prepared?
    - Why were the foods given to the child?
        - What were the benefits to giving the infant foods?

12. Who feeds the child the majority of the time?
    - The mother
    - A Sibling
    - Other family member
    - Why?

13. What are some of the recommendations as to how to feed infants?
    - Normally
    - When child is sick
    - If mother has insufficient milk

14. Who makes these recommendations?
    - Health care workers
    - Other women
    - Men

15. For each Recommendation explore:
    - Why or why not do it?
    - What are the benefits to following it?
    - What are the drawbacks to following it?

16. How would you ideally feed your infant?

17. What prevents you from ideally feeding your infant?

18. What impact does _____ have on feeding your child?
    - Season

- Money
- Time
- Workload
- Food access
- Health staff
- Illness
- Sex of the child
- Number of other children

19. What else influences how you decide to feed your infant?
    - American culture
    - Advertisements/ Television
    - What is your _____ involvement?
        - Husband's
        - Mother's
        - Mother-in-law's
        - Other family
        - Other people

20. What benefits are there to feeding your baby the way you do?

21. What risks are there to feeding your baby the way you do?

22. What benefits or risks are there to feeding your baby another way?

Closing questions:

Okay, I'm going to ask just a few more questions.

23. Of all the issues we discussed, which do you feel is most important?

24. What recommendations would you give the Casa Materna about how to counsel mothers on feeding their infants?

Closing remarks:

Well those are all the questions I have. Before we go, do you have any other comments or questions for me or about anything we discussed?

Thank you very much!

Appendix B: Letter of Approval from IRB Review

EMORY UNIVERSITY

Institutional Review Board

Date: August 1, 2011

Catherine Plumlee
Principal Investigator
Public Health

RE: **Exemption of Human Subjects Research**
IRB00051904
Assessing the Infant & Young Child Feeding Practices among the Communities Served by the Casa Materna of Calhuitz, Guatemala

Dear Principal Investigator:

Thank you for submitting an application to the Emory IRB for the above-referenced project. Based on the information you have provided, we have determined on 7/27/2011 that although it is human subjects research, it is exempt from further IRB review and approval.

This determination is good indefinitely unless substantive revisions to the study design (e.g., population or type of data to be obtained) occur which alter our analysis. Please consult the Emory IRB for clarification in case of such a change. Exempt projects do not require continuing renewal applications.

This project meets the criteria for exemption under 45 CFR 46.101(b)(2). Specifically, you will be surveying mothers about child feeding practices in Guatemala. The following document was reviewed with this submission

- Consent Document

Please note that the Belmont Report principles apply to this research: respect for persons, beneficence, and justice. CITI certification is required of all personnel conducting this research.

Unanticipated problems involving risk to subjects or others or violations of the HIPAA Privacy Rule must be reported promptly to the Emory IRB and the sponsoring agency (if any).

In future correspondence about this matter, please refer to the study ID shown above. Thank you.

Sincerely,

Andrea Goosen, MPH
Research Protocol Analyst
This letter has been digitally signed

CC:

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