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Coming up short: Women's empowerment and stunting in children 6 to 23 months in Sierra Leone
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Coming up short: Women's empowerment and stunting in children 6 to 23 months in Sierra Leone

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An abstract of

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Abstract

Coming up short: Women's empowerment and stunting in children 6 to 23 months in Sierra Leone

By Fodié Maguiraga

Background: Sierra Leone has some of the world's highest rates of maternal and child under-nutrition. Worldwide, many studies indicate that low status of women and gender inequality are factors that increase maternal and child malnutrition. CARE's Window of Opportunity project (2009-2012) initiated nutrition specific interventions to improve the nutritional status of children under two years of age. The objective of this study was to assess the relationship between women's empowerment (encouraged through women's civic and community group participation) in the household and stunting among children 6 to 23 months of age.

Methods: Cross sectional data were collected using a sample of 585 women with children 6 to 23 months in the intervention areas of the program. Data were analyzed using SPSS20. Anthropometric data were calculated using the World Health Organization's software, Anthro. The independent variable, stunting, was defined as length for age Z-scores <-2sd from the standard population. Model variables included women's empowerment, child sex, maternal age, maternal education and civic group participation. A logistic regression was run to assess the association between stunting and women's empowerment measured by their participation in the household decision-making.

Results: The mean age of children was 12.7 months (sd. =4.9). 52.2 percent of children were girls and 47.8 percent boys. Overall, 15 percent of children were stunted. The level of stunting was 10 percent among women who participated in household decision-making and 16 percent among those who did not participate in the household decision-making. Bivariate association showed that the women's empowerment index was significantly associated with stunting (unadjusted OR=.56; 95% CI=0.28, 1.13). Multivariate association confirmed the bivariate results (adjusted OR=0.51, CI=0.244, 1.059)

Conclusion: Women who participated in the household decision-making alone or jointly with their husbands, were considered as empowered and were less likely to have stunted children compared to women who did not participate in shared household decision-making. Public health interventions that aim to influence stunting among children 6 to 23 months should consider implementing programming aimed at increasing women's participation in household decision-making.

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List of Tables and Figures

List of Acronyms

CARE	Cooperative for Assistance and Relief Everywhere
FAO	Food and Agriculture Organization
ESL	English as a second language
IYCF	Infant and Young Child Feeding
MDG	Millennium Development Goals
MPH	Masters of Public Health
MtMSGs	Mothers-to-Mothers Support Groups
NGO	Non-Governmental Organizations
SLDHS	Sierra Leone Demographic Health Survey
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
UNFPA	United Nations Fund for Population Activities
WFP	World Food Program
WHA	World Health Assembly
WHO	World Health Organization

CHAPTER I: INTRODUCTION

Infant and young child malnutrition diminishes human capital development as well as the socioeconomic development of a nation (UNICEF, WHO, World Bank, 2012). Early childhood malnutrition has a long-term effect on children's health, cognitive development and learning capacity. Good nutrition is essential for adequate physical development (healthy growth and proper organ formation) of children. Thus, combating early childhood malnutrition may have positive impact on children's wellbeing in general and their nutritional status in particular (UNICEF, 2012). Nutrition is being recognized by international development organizations as one of the central pillars for achieving the Millennium Development Goals (MDG) especially the eradication of poverty, MDG1, and reduction in child mortality , MDG4 (UNICEF, 2012).To alleviate the burden of maternal and child malnutrition, the World Health Assembly (WHA) developed a 13-year comprehensive plan (2012-2025) composed of six global targets including child stunting, wasting, and overweight, anemia among women in reproductive age, low birth weight, and exclusive breastfeeding (UNICEF, 2012).

Global statistics from UNICEF indicate that stunting affects 165 million children under-five years of age or 26 percent of the world's under-five population, with more than 90 percent of these children living in Asia and Africa UNICEF (2012). Statistics on underweight indicate 101 million children under-five years of age, or 16 percent, were underweight in 2011. However, despite the negative impression these figures may provide on under-five malnutrition worldwide, some decline could be observed overtime between 1990 and 2011 UNICEF (2012). For instance, in sub-Saharan Africa, the prevalence of stunting was 47.2 percent in 1990, 40 percent in 2010 and 39.6 percent in 2011. The same trend was observed with underweight and wasting with respectively 29 percent and 10.3 percent in 1990, 21.8 percent and 9.4 percent in 2012 and 21.4 percent and 9.4 percent in 2011 (UNICEF, 2012). Despite this slight decrease in the overall malnutrition trends across sub-Saharan Africa, UNICEF (2012) estimates that the global target of 40 percent reduction of stunting among children under five years by 2025 is not

achievable if the current trends are maintained. Thus, nutrition interventions that have been implemented since 2010 by international organizations in collaboration with local governments appear to be insufficient to achieve the global malnutrition target set by the Millennium Development Goals. This situation demands a rethinking of these interventions to provide new insight and orientations on the problem of malnutrition. These new orientations require more research on sensitive areas with large potential impact on child malnutrition such as gender inequality and women's empowerment.

Sierra Leone is considered to be one of the world's leading countries in terms of child malnutrition (UNICEF, 2013). Length-for-age of children under five years in Sierra Leone was reported at 37.40 percent in 2008 while the underweight percentage was estimated to be 21.30 percent for the same period (World Bank, 2008). Moreover, a study on nutrition and poverty in Sierra Leone showed that stunting is closely linked to productivity and economic growth (Aguayo, Scott, & Ross 2003). Their results show that if the current prevalence of stunting is maintained, the adult population in Sierra Leone will lose 1.4 percent of productivity for each 1 percent reduction in adult height. Sustained investment in nutrition in Sierra Leone could bring a significant boost to the country's economy and human capital. These investments also will impact the social sector and reduce poverty (Aguayo et al. 2003)

As in many other West African countries, the low status of women and pervasive gender inequality that exist in Sierra Leone may put women in a position where they are not able to make decisions about their own health and the health of their children, including their nutrition (Shroff, Griffiths, Suchindran, Nagalla, Vazir & Bentley, 2011; Aguayo et al, 2003). This situation might be an important factor that contributes to the risk of child malnutrition and stunting in Sierra Leone. Thus, research on the relationship between women's empowerment and stunting may provide important insight on social factors that may serve to decrease children's risk of stunting by enhancing their mother's decision-making power on health and nutrition related issues in the household.

Problem statement

A growing body of the literature identifies gender inequality and women's low status as important factors associated with children's length-for-age (Smet, 2009; World Bank 2008; Bhagowalia, Menon, Quisumbing & Soundararajan, 2012; Shroff et al. 2009). For instance, maternal financial autonomy, which is a strong indicator of their empowerment, was found to be closely associated with stunting in India (Shroff et al, 2009). Women who scored higher on the financial autonomy scale had lower percentage of stunted children (Shroff et al, 2009). Other researchers found that women's decision-making power in the household was associated with child feeding practices and stunting. Women with high decision-making power in the household could influence intra-household food distribution and orient nutritive food toward their children, which in turn contribute to decrease stunting among their children (Shroff et al. 2009; Bhagowalia et al 2012; Bhutta, Das, Rizvi, Gaffey, Walker & Black. 2013). This research addresses the relationship between women's empowerment (measured through their participation in the household decision-making), and child nutritional status in a nutrition program context in Sierra Leone.

Purpose of the project

There is increasing demand for evidence based interventions that improve maternal and child nutritional status. This thesis will provide valuable information on: 1) the effect of women's empowerment on stunting among children 6 to 23 months of age; 2) other factors/variables that may influence the relationship between women's empowerment and the level of stunting among their children; and 3) potential programmatic interventions that may contribute to decreases in stunting among children 6 to 23 months of age. The thesis will also contribute to the growing literature related to women's empowerment and child nutritional status in developing countries.

CHAPTER II: LITERATURE REVIEW

This literature review explores the context in which previous scholars have defined, measured and conceptualized women's empowerment and its relationship to child nutrition. While embracing the concept of women's empowerment as a whole, the literature review pays specific attention to the dimension of women's participation in household decision-making as an indicator of their empowerment. The review first explores definitions and measures of women's empowerment in general and its application to children malnutrition in particular. Second, the review assesses how women's empowerment relates to maternal and child health. As primary care givers of children, women's wellbeing is an essential condition for their children's growth and health status in general. Third, a summary of the conceptual framework that presents the pathway through which women's empowerment (measured through their social capital) influences child nutritional status is introduced. The framework is adapted from existing conceptual frameworks around women's empowerment, social capital and child nutritional status. Next, women's empowerment and child nutritional status in Sierra Leone is explored through a context specific analysis. Finally, the literature review offers insights on the knowledge gaps in the research around women's empowerment and child nutrition and justifies why further exploration of the role of women's empowerment on stunting was important. The reviewed studies are analyzed for their contributions to the understanding of the relationship between women's empowerment and nutrition.

Defining Women's empowerment and gender

Women's empowerment, an overview of definitions

Zimmerman (1990) acknowledged that empowerment theory remained still an enigma at the beginning of the 90's. Women's empowerment is a concept that continues to be defined and debated over. The large variety of definitions and measurements that have been developed and used demonstrates that the achievement of common understandings and measurements of women's empowerment is ongoing. As reported in Kabeer (2001), the ambiguity of the concept of women's empowerment leads many individuals and organizations to tailor their definition of the concept to fit the need of their research and programmatic needs.

For the purpose of this research, it is important to explore the various definitions and measurements of the concept of empowerment and to have a clear understanding of what scholars agree upon, as well as their divergences on the definitions and measurements of the concept. Overall, it is agreed that regardless of the dimension of women's empowerment under consideration, improving women's decision-making power through their participation in those decisions remains a factor that contributes to improved health, both for the women themselves and for their children (Bhagowalia, Headey, & Kadiyala, 2012; Quisumbing & Maluccio, 2003; Smith & Haddad, 2000; & Shroff et al 2009). In the process of analyzing the link between women's empowerment and child nutritional status, it is useful to explore the factors that promote the empowerment of women in their communities.

The existing literature shows a close relationship between women's empowerment and their social capital. Specifically, increasing women's social network through their participation in civic and community groups increases their level of empowerment in the community (Mayoux, 2001). Furthermore, Grootaert (2004) noted that social capital and political actions were some of the activities that contribute to achieve broader empowerment. We then understand that increasing women's social capital and social networks may lead to their empowerment.

Microfinance projects and women's participation in saving groups is one of the most cited strategies that link social capital to empowerment (Mayoux, 2001; Kah, Olds & Kah, 2005; Downs, 2007). Recognizing the complexity of the relationship between social capital, empowerment and sustainability, Mayoux (2001) assumed that enlarging women's network (and social capital) and providing them with the opportunity to participate in microfinance projects contribute to their ability to positively influence their environment. Empowering women through civic and community group participation and microfinance projects thus, "contributes to their empowerment particularly for the poorest women" (Mayoux, 2001 p.437). However, the effect of social capital on women's empowerment has shown some down sides. Specifically, the first downside noted by Mayoux (2001) is the fact that while increasing women's social capital improves their access to market and increases repeated exchanges between them, this may exclude new entrants or women whose social capital is not large enough to integrate into these markets. The second downside is the potential community pressure on women who, as a result of their higher social capital, do not comply with social norms. Finally, a lot of social capital, particularly, if organized "alongside ethnic or religious lines can be harmful to the community as a whole" (Mayoux, 2001 P.439). Despite these downsides, Grootaert (2004), and Mayoux (2001) showed evidence of positive effect of social capital on empowerment.

Under the broader umbrella of the World Bank, Alsop & Heinsohn (2005) affirmed that women's empowerment is commonly used to refer to the process through which the change takes place as well as the outcome of the transformational process. While analyzing women's empowerment and domestic violence in India, Sethuraman, Lansdown, & Sullivan (2006), conceptualized women's empowerment as a function of their access and control of resources, which in turn would increase their decision-making ability in the household. According to Sethuraman et al. (2006) many domains can be affected by this decision-making power acquired throughout the access and control over resources such as, family planning, sexuality, and child feeding practices, among others. Regardless of the domain of women's

empowerment under consideration, Alsop (2005) and Sethuraman et al. (2006) agreed upon the importance of examining women's empowerment as a process instead of an outcome of spontaneous actions or interventions.

UNFPA (2014) took a slightly different view than the World Bank and Kabeer in defining women's empowerment in the context of development, and calls for a better collaborative system within the United Nations (UN) agencies and between these agencies, NGOs and governments to achieve women's empowerment. To achieve this, the proposed approach of UNFPA stresses the accountability of the international development community to make empowerment a worldwide reality for women. Five major components or dimensions have been identified by UNFPA (2014) as critical to achieving women's empowerment. The first dimension is women's sense of self-worth. To achieve women's empowerment, interventions should increase the self-worth and self-esteem of women and their belief in their own capacity or ability to identify and carry out positives changes for themselves and their families. The second component identified by UNFPA (2014) is women's right to have and determine choices (this component also exists in Kabeer's and the World Bank's definitions). Access to resources and opportunities is another essential component to fulfill women's empowerment in their community. Regardless of the resources available, women need to have the right to access to them and decide on how to use them efficiently for themselves and their families. Women's control over their own lives and their abilities to influence social changes has also been mentioned by UNFPA (2014) as essential components of the concept of women's empowerment in the context of development. These five components of the women's empowerment concept may also influence maternal and child nutrition.

Women's Empowerment is at the same time a process and an outcome, and is context specific. It is a multi-dimensional, and a multi-level concept. Ibrahim & Alkire (2007) noted that there were thirty-two different definitions that are currently in use. Most definitions define empowerment in terms of

agency - the ability/capacity to take action and make choices. Ibrahim and Alkire defined empowerment as an expansion of human agency. Kabeer (2001) also offered similar definition of empowerment and mentioned that human agency is not independent of the structure (which includes norms, culture, institutions and policies etc.). There is also a relational element between agency and the structure. Individual or household agency takes place within the structure which can help expand or constrain it.

Malhotra, & Schuler (2005) in their extensive review of literature suggested three broader dimensions of women's empowerment; socio-economic, familial and psychological. Socio-economic dimension includes women's role, economic contribution, control and ownership of economic assets. Familial dimension includes participation in household decision-making across multiple sub-dimensions like, purchase sale of assets, seeking health services, freedom of mobility etc. These dimensions or domains are not exactly transferable and as mentioned they are context specific and their measures, likely, will be adapted to the prevailing context.

For the purposes of this thesis we are using *participation in household decision-making* as an indicator of women's empowerment, which is aligned with the broader familial dimension. It is measured by six decision-making items (health care seeking for children and pregnant women, work outside the household, the use of income earned by women in the household, mobility and food distribution) these items composes the index that captures women's agency to be part of household decision-making and take action as needed within the prevailing context. Empowerment is not a "*commodity*" which can be given, rather a process which is facilitated by mechanisms. Hennink, Kiiti, Phillinger & Jayakaram (2012) suggest the following elements as essential to the mechanism of empowerment (see table 1 for detailed definition of each element of the empowerment mechanism):

a) Knowledge – formal, non-formal education, information training;

b) Opportunity structure (enabling environment, social and political);

c) Capacity building (community capacity to seek accountability of service providers and advocate for rights and services);

d) Resources (access to both physical and financial for community development

f) Sustainability (community ability to sustain initiatives over the long term as mechanisms of empowerment associated with the three broader aforementioned dimensions).

Table1: Mechanism of empowerment and their definitions

Mechanisms of women's empowerment in the context of international development	
Mechanism	**Definition**
Knowledge	Access to education, training and information from formal or other sources
Agency (a) Self-identity (b) Decision-making (c) Effecting change	Capacity to act independently and make choices – comprised of three components: (a) self-confidence and self-efficacy to set and achieve goals (b) ability to make informed decisions that are recognized and respected (c) belief in own ability to take action to effect change based on own goals
Opportunity structure	Existence of an enabling environment of social, political, institutional and community support to foster individual and community development
Capacity-building	Harness community capacity to provide or advocate for services or self governance, and to seek accountability from government service provision agencies
Resources	Access to physical and financial resources, or skills for seeking resources, to develop communities
Sustainability	Ability of communities to develop and support initiatives towards long-term sustainability

Sources: Hennink et al. (2012)

Knowledge and opportunity structure are the most relevant mechanisms of empowerment identified for the purpose of this thesis. Knowledge helps with informed decision-making; supporting norms and institutional policies provide the space for this to take place which in turn facilitates individual empowerment. Thus, this thesis considers women who participate in household decision-

making and are capable of making decisions alone or jointly with their husbands to be more empowered compared to those who are unable to do so in their prevailing context.

Defining gender and its relation to women's health

Like the concept of women's empowerment, the concept of gender has been the focus of much debate and its definition appears to be clearer and garnering more consensus than the concept of women's empowerment. However, organizations such as the World Bank noted a close link between gender and women's empowerment. According to the World Health Organization (WHO), "[g]ender refers to the socially constructed roles, behaviors, activities and attributes that a particular society considers appropriate for men and women" (WHO 2014). According to Lopez-Claros and Zahidi, "[g]ender is not synonymous with women, nor is it a zero-sum game implying loss for men; rather, it refers to both women and men, and to their status, relative to each other" (Lopez-Claros & Zahidi, 2005, p. 1) Thus, whether you are male or female determines your role, your status and your worth in life. Your gender creates implications and expectations within societies and within households (Lopez-Claros et al. 2005). According to WHO (2014), "[t]he distinct roles and behaviors may give rise to gender inequalities; i.e. differences between men and women that systematically favor one group"[1]. Smet (2009) sees gender as an aggregate of socially constructed personal characters, attitudes and behaviors that are expressed through some relative power and influence that society assigns to the two sexes. Smet (2009) defines 'sex' as a predetermined biological characteristic that differentiates males and females. Gender on the other hand is an acquired identity. Gender roles are learned through socialization and are not given once forever. They change over time and vary by cultural and geographical context and are defined by the society and they come with social expectations based on the individual's sex and or social position (Smet, 2009). Since expectations reflect one's actions and

[1] Retrieved from http://www.who.int/gender/whatisgender/en/.

perspective, gender norms have potential impact on women's actions (Smet, 2009). Not fulfilling these expectations will make an individual a "deviant" in the society and thus, subject to rejection and discrimination. Gender roles also define relationships in the society. Our behaviors, attitudes and expectations toward others (more specifically relationships between men and women) in the society depend deeply on our gender. Since it is not disputable that a society is composed of men and women with their particularities; Smet (2009) argued that 'gender equality', which refers to the existence of equal rights, responsibilities and opportunities for all human beings, both men and women, should be the golden goal to reach if we would like to create a "fair" social environment. Thus, according to Smet, each individual should be "considered free to develop his/her personal abilities and make choices without the limitations set by stereotypes, rigid gender roles, or prejudices" (Smet, 2009 p.150). It is very clear that the lack of opportunity for women and the non-recognition of their potential will influence their ability to perform their basic roles as women such as caring for children (healthcare seeking and nutrition and feeding practices). Gender equality also requires the consideration of different needs and should promote equal opportunity for men and women in the society. Gender equality is a key to poverty reduction (FAO, 2012).

The United Nations regards gender equality as a human right. It points out that empowering women is also an indispensable tool for advancing development and reducing poverty. Inequalities can lead to inequities between men and women in both health status and access to health care (WHO, 2014). For instance, it is recognized worldwide that women have less access to education and nutrition, and have less or no decision-making power with respect to their health and the health of their children (Lopez-Claros et al. 2005). Often, women have less time, power, and access to resources compared to men in the same community (Vlassoff & Moreno, 2002). FAO (2012) argued that "Gender inequality can be a cause as well as an effect of hunger and malnutrition" (p. 2). UNICEF & WHO (2012) reinforced the relationship between gender and children's nutritional status by stating "that gender discrimination and

other societal factors such as early age at marriage and childbearing can also contribute to poor maternal, newborn and child health outcomes" (p.39). Empowering poor women to make decision about their lives and their children nutrition may be a way to close the gender gap and leverage gender effect on poverty and children nutrition.

According to CARE, "equality between women and men - refers to the equal enjoyment by women, girls, boys and men of rights, opportunities, resources and rewards." (CARE, 2012 p. 2) A critical aspect of promoting gender equality is the empowerment of women, with a focus on identifying and redressing power imbalances. "Equality does not mean that women and men are the same, but that their enjoyment of rights, opportunities and life changes are not governed or limited by whether they were born female or male" (CARE, 2012 p. 2).

Gender, women's empowerment and maternal and child nutrition

Once women are affected by poor nutrition, they are caught in a vicious cycle accentuated by poverty and under-nutrition that may affect their health as well as the health and nutrition of their children (Oniang'o et al, 2002). Poverty can be a cause as well as a consequence of malnutrition with the two factors reinforcing each other. FAO (2012) presented this interdependence in the following way: malnutrition impedes women's physical and psychological ability to perform effectively in many, if not all, the domains of their life. These domains include school performance, physiological wellbeing to carry out pregnancy, physical strength to stand for daily activities especially in rural communities where agriculture is the main survival activity, and seeking healthcare for themselves and their children. The combination of these domains creates a favorable environment for poverty and discrimination which disproportionately affect women, especially in resource scarce settings. Poverty among women is usually accentuated and reinforced by the discrimination in terms of access to power, resources and opportunities. To preserve good maternal and child health and nutrition, it is important to prevent poverty. However, preventing poverty is solving only one half of the problem and the effectiveness of

poverty reduction strategies for women and children will be limited without interventions that tackle malnutrition among both women and children (FAO, 2012). The social position of women in many societies is the main factor that puts them at risk for poverty and malnutrition. Also physiological factors such as pregnancy, lactation and menstruation augment nutritional vulnerability among adolescent girls and women, according to FAO (2012).

Women are central to household production and reproduction. Besides their role as care givers to children, women often play the crucial role of providing the household with drinking water, preparing food, collecting firewood and ensuring household hygiene and sanitation (FAO, 2012). Oftentimes, however women's low social power and the discrimination they face because of their low social status in many settings does not allow them to successfully fulfill these expectations and practice a healthy life style from which their children will also benefit. Some essential factors that keep women from achieving these expectations are their lack of access to resources and their low decision-making power (Målqvist, Hoa & Thomsen, 2012; FAO, 2012). In many settings household production (food and economic resources) depends on women. Their physical and psychological health as well as their nutritional health is crucial to properly provide these resources to the household. To enable women to effectively play their central role in the household survival, there is a need to create a favorable environment for gender equality.

Interventions targeting gender equality may create the enabling environment needed for the effective expansion of women's potentials. When assessing issues related to maternal and child nutrition, it is important to consider gender and its implications. In many settings, gender roles confine women to poverty. Furthermore, commonly accepted sets of stereotypes classify women as incapable of meeting their own health and nutritional needs and thus needing external help, usually from husbands and other male relatives (Smet, 2009). Because of their *triple burden (*production, reproduction and social roles) women do not have enough time for themselves and their children (Oniang'o, et al. 2002).

Leisure time is important to women's health. However, many women in developing countries have barely enough time in the day to fulfill their role of care giver and provide sufficient attention to their health and nutrition of their children.

Gender equality and women's empowerment are considered to be crucial for improving maternal and child nutrition outcomes and there is plenty of research to back this up. According to Oniang'o et al. (2002), there is an interaction between the socially constructed and biological roles of men and women which in turn can affect the nutritional status of the whole family. In many cultural settings, when food is short, female family members often have very little or nothing at all to eat compared to what is given to men. Gender inequality contributes to putting women and their children at greater health risk and malnutrition (Oniang'o et al 2002). The relationship between poor maternal nutrition and children's nutritional status appears in the early life by decreasing the learning potential and increasing maternal and reproductive health risks. When recognizing the importance of women's empowerment in the community with respect to their role as caregivers for children, it is also important to note that empowering women may contribute to gender equality and may also (positively) affect their own well-being which in turn would be reflected in their children's nutritional status in the household.

Investing in nutrition specific programming and services for women and children is a necessary condition for improving human capital.. Access to good quality of food and food resources at all-time should be one of the focal areas of all nutrition programming in order to overcome the burden of poverty (Oniang'o et al. 2002). However, as we mentioned earlier and supported by Kabeer (2001), availability of resources does not necessarily guarantee their use for and by those who really need them. Women often do not have a say in household decision-making. This usually results from their low social status and the discrimination they face compared to men. Thus, promoting gender equality may contribute to poverty reduction. However, FAO (2012) called our attention to the fact that analysis of

gender issue in nutrition should include how both women and men are affected and address malnutrition issues in their community. Victimizing women or attempting to introduce any positive discrimination in favor of women may lead to negative outcomes such as jealousy among men or "turning men away from nutrition issues and actions, and/or stigmatize nutrition activities as "women's business" (FAO 2012, p 4)

Women's empowerment and women's nutrition

In order to improve children's nutritional status, women's malnutrition must be addressed at all stages of the life cycle. Physiological factors increase nutritional vulnerability among adolescent girls and women. During the reproductive years, women need more iron folate to sustain and compensate for biological processes including menstruation, pregnancy and lactation. Both pregnancy and lactation considerably increase nutritional needs in terms of dietary quantity (e.g. daily caloric needs increase) and quality (micronutrient intake, particularly folate/folic acid, iron and iodine), (Black, Victora, Walker, Bhutta, Christian & Onis, 2013). Adolescent females that become pregnant have even greater nutritional needs. Their bodies need extra energy to keep growing and for the fetus and for the production of breast milk. Adolescent pregnancies increase the likelihood of giving birth to infants of low birth weight (<2.5 kg), and more broadly speaking, perpetuate the intergenerational cycle of malnutrition (Chen, Wen, Fleming, Demissie, Rhoads & Walker 2007).

A woman's dietary intake and nutritional status can have profound impact on her health and well-being throughout her life as well as on that of her offspring (Stanner, 2001). Women of all age in developing countries face elevated risks of nutritional deficiency according to Medina-Mora & Pilar Torre n.d.). Studies on nutritional indicators that may affect women's health abound in the literature and the most frequent indicators identified include anemia, high BMI (overweight and obesity), weight gain during pregnancy, short stature, micronutrients deficiency. These indicators are pointed out by Medina-Mora et al. as major causes of maternal death in developing countries. The hypothesis of this

thesis project is that women who participate in the decision about their health and their children's would have more positive health outcomes related the health issues mentioned above.

Women's empowerment has been shown to be a strong indicator of women's health (Mahmud, Shah & Becker 2009). Do and Kurimoto (2010) used the last five Demographic Health Surveys (DHS) in Namibia, Swaziland, Zambia, Ghana, and Uganda to measure associations between choice of contraceptives and women's empowerment measured as "household economy, socio-cultural activities, health seeking behavior, fertility preferences, sexual activity negotiation, and attitudes towards domestic violence" (p. 1). Their results demonstrated that in all countries except Swaziland, the dimension of participation in household economic decision-making was strongly related to the choice of female and couple contraceptive methods. Similarly, Heise, Moore, Toubia, Cook, Bariagaber & Gomes (1999) found that women who had the ability to negotiate condom use with their partners or decided to use condom by themselves were more likely to use condoms to prevent sexual transmitted infections compared to women who reported their partners made the decision about condom use in their relationship.

Women's negotiation power and their social status also influence their access to food resources and their participation to intra household food distribution (Rahman, 2012). Households' access to available food has less impact on nutritional status than the intra household food distribution among members, particularly women and children (Adhikari2010). Men are seen in many cultural contexts as responsible for caring for the family and thus, need or have more right to food distributed in the household. This is true particularly in patriarchal societies where men are sole household heads. In these societies this means women and children are not prioritized when it comes to household food distribution. Rahman (2012) analyzed intra-household resource allocation issues related to nutrition and food distribution, nutrient demand, and child health and nutrition outcomes in rural Bangladesh. The study found that pregnant and lactating women tend to receive much less food and nutrients than their requirements.

The findings also suggested that a wife's negotiation power, as opposed to her husband's, significantly and positively affects the allocation of different nutrients for children and adolescents of both sexes and of adult women. Nevertheless, women's economic power in the household is a key determinant of their participation in food distribution decision-making (Djebbari, 2005). As women's economic contribution in the household increases, their involvement in how the food is distributed as well as their own portion of the distributed food increases (Djebbari, 2005). We can easily assume that this hypothesis also applies to children's nutrition since women are key caretakers of children.

According to Gittelsohn, & Vastine (2003), in many social and cultural settings, food taboos may affect women's and children's nutritional status, especially during pregnancy and lactation. In many cultures, animal source foods such as eggs are forbidden for pregnant and lactating women and often young children. Differential food allocation in household may be influenced by the characteristics of the household members such as age, sex, level of contribution to household income and social status (Gittelsohn et al. 2003)

Women's empowerment and nutrition of children under two

The health of a child is linked to the health and nutritional status of the mother. If a woman's nutritional status is poor at conception and if she does not gain sufficient weight during pregnancy, she will most likely give birth to a low birth weight baby. Her child may never catch up in terms of growth- and mental development and, as an adult, will run an increased risk of chronic illness such as heart disease and diabetes - causing the cycle of under-nutrition and poor health to continue. Under-nutrition contributes to up to 50 percent of all cases of child mortality (UNICEF &WHO, 2012).

According to Hendrickson, Dearden, Pachón, Hoi, Schroeder, & Marsh (2002) women's empowerment can have positive effect on their children's nutritional status. More specifically, participation in civic and community groups is an indicator of women's empowerment. Women's networks offer information and resources that can benefit themselves and their families, in particular in

a time of crisis (Oniang'o et al. 2002). De Silva, (2007), in a comparative study in four developing countries (Peru, Ethiopia, Vietnam and Andhra Pradesh (India)) on women's social capital and child nutritional status demonstrated that support from individuals and cognitive social capital, which women can get through their social network, was consistently associated with child under two nutritional status across countries. Women who participated in group meetings often shared the knowledge and information they gained with their family members (husband and mother-in-laws) and were better able to make decisions about their health in the household compared to women who did not participate in these community groups activities (Hendrickson et al 2002). Women's participation in in civic and community groups can also have a positive impact on children's nutrition (Malhotra, 2005). Hendrickson et al (2004) assessed women's empowerment through a nutrition program in Vietnam. The study demonstrated that knowledge sharing led to changes in mother-in-laws' child feeding practices in Vietnam.

Other studies demonstrated the relationship between diverse domains of women's empowerment and child nutritional status. For instance, in Egypt, women's ability to influence intra-household food allocation showed positive impacts on stunting and underweight among children under five (Roushdy & Region, 2004). Women who could take part in food resources distribution in the household tended to apply more of these resources toward children's nutrition and thus influenced positively the height-for-age and weight-for-age of their children. Women's autonomy is a strong indicator of their empowerment. Another significant study that explored women's autonomy and child nutritional status is from Shroff, Griffiths, Suchindran, Nagalla, Vazir & Bentley (2011) where the authors explored the relationship between women's autonomy and the level of stunting of children in India. The study concluded that financial autonomy of mothers increased the duration of breastfeeding of children aged between 3 and 5 months and mothers with higher participation in household decision-making had infants who were less underweight and less wasted. Imai, et al. (2012) also explored the

relationship between women's empowerment and stunting and underweight in rural India and concluded that mothers bargaining power in the household was strongly related to the height-for-age of their children. Their results also suggested that women's experience of spouse violence was associated with low weight-for-age. Maternal schooling and early marriage also was significantly associated with children underweight (Imai et al. 2012). Bhagowalia et al. (2012) made a major contribution to the understanding of women's empowerment and child nutritional status through a study carried out in Bangladesh using 2007 Demographic Health Survey data. They found that a greater degree of women's empowerment and endowment had a positive effect on the long term nutritional status of children 0 to 23 months. Moreover, Bhagowalia et al. (2012) demonstrated that domestic violence and mobility of women were associated with stunting while participation in decision-making and maternal schooling was associated with child dietary diversity. These findings demonstrate how women's empowerment is important to their child nutritional status.

Measuring women's empowerment

Women's empowerment is a multi-dimensional concept (Kabeer, 2005; Malhotra, 2005). Like its definition, measures of women's empowerment also differ by authors. Key dimensions used to measure women's empowerment include, but are not limited to, mobility, participation in household decision-making, attitudes toward household violence/gender based violence, and social capital. Other indicators are often used as proxies of these dimensions. These indicators include education, and economic power. Multiple authors including Kabeer (2005); Kishor (1995); Malhotra (2005); Mason (2000) & Mason (2003) agreed that despite the importance of these dimensions, they do not necessarily lead to empowerment. But UNICEF (2012) pointed out that education gives a good early childhood start to girls, helps them avoid HIV and improves maternal and child health[2]. Furthermore, women's

[2] Retrieved from http://www.unicef.org/mdg/index_genderequality.htm

participation in decision-making appears to be critical to improving child nutritional status through individual decisions regarding breastfeeding initiation, early breastfeeding, and complementary nutrition practices (Bhutta, Ahmed, Black, Cousens, Dewey & Giugliani, 2008).

How to measure women's empowerment has been an ongoing debate in the literature. However, as mentioned by Handy (2004) there is an increasing body of literature pushing for more direct measures of women's empowerment using process indicators such as decision-making, control, choice, mobility, education attitude toward household violence, etc. Such indicators are seen as the most effective in measuring empowerment by many authors such as Mason & Smith (2000) and Malhotra (2005).

Authors developed and used different indicators to measure women's empowerment depending on their specific research context. For example, to measure women's empowerment in Columbia, Moser & Moser (2003) used a composite indicator which included three different levels (individual, organizational and inter-institutional). Malena (2003) alternatively combined five main indicators (civil society, collective action, empowering poor and women, and building social capital) scoring from zero to three to create an aggregate women's empowerment score. Other indicators developed by Mason & Smith (2003) measured women's empowerment in 56 communities in Pakistan and India. Their scale measured women's participation in household decision-making such as economic decisions, participation in family planning decisions, freedom of movement, household violence and community gender attitudes toward women. Another common measure of women's empowerment by UNDP (1995) includes women's participation in parliamentary institutions as an indication of their empowerment within the society.

Methods used to measure women's empowerment reflect as much variation as the indicators and definitions. For instance, Kroeker (1996) used participant observation during follow-up visits in the community to measure women's empowerment after a community agriculture project in Nicaragua. In

Russia, Lokshin et al (2005) measured women's empowerment by giving participants the opportunity to place themselves on a ladder of nine steps. Based on their perception of their level of empowerment, participants may place themselves on a lower and higher level. Kevin (2001) in Botswana, Namibia, Zimbabwe, and Mozambique used a combination of qualitative and quantitative methods (individual interviews, questionnaires, participatory observations as well as case studies and focus groups). These methods asked women to reflect on their own situation and determine their level of empowerment.

According to the World Bank, as cited in Alsop (2005), women's empowerment measurements focus on three key elements which can also be used as direct indicators. The first element is related to whether or not the person as an individual has (alternative) options to choose from when she needs to. This element supposes that besides the actual and proposed behavior, there are alternative behaviors the person can choose to adopt without any consequences on her family or the group she belongs to. The second element considered in the direct indicator as described by the World Bank as cited in Alsop (2005 is related to whether the person decides to take advantage of the alternative solution/behavior or choice that is available to her. However, in this element the World Bank (2005) didn't consider two key factors that play and condition the person's choice to adopt the alternative behavior. First of all, does the person recognize the alternative behavior as equivalent to the standard and proposed behavior? Second, does the person have the ability to make that decision without any consequence on her or her family and the social organization she belongs to? In the case the alternative behavior is not equivalent to the standard behaviors from the person's point of view or if the alternative behavior does not show or promise any better outcome, the existence of the alternative behavior by itself would not be a sufficient condition to enable the person to make the decision. Thus, the alternative actions or choices offered should fit in the specific social, cultural and environmental context. The third element described by the World Bank (2005) as a direct indicator to measure women's empowerment is related to whether or not the person achieves the desired outcome from the alternative choice she made.

Interestingly, even though we could easily assume that intervening in the same arena of international development, World Bank and WEF would have the same view on how to operationalize women's empowerment measures. However, the two major international development organizations have quite different approaches to how to measure women's empowerment. Closing the gender gap is considered as a way through which women's empowerment can be achieved according to Lopez-Claros (2005). To this end, WEF (2005) used five key dimensions of women's empowerment to examine the gender gap between men and women using nationally representative data. These dimensions included economic participation, economic opportunity, political empowerment, educational attainment and health and well-being. The analysis quantified gender gap by country and by region and showed that while some countries have succeeded in significantly decreasing gender inequality, no country in the world has yet achieved gender parity by closing the gap between men and women in the various domains they assessed. Even though, the World Bank, Kabeer and WEF have slightly different approaches to measures women's empowerment, they made important contributions to capturing the effect of interventions related to women's empowerment.

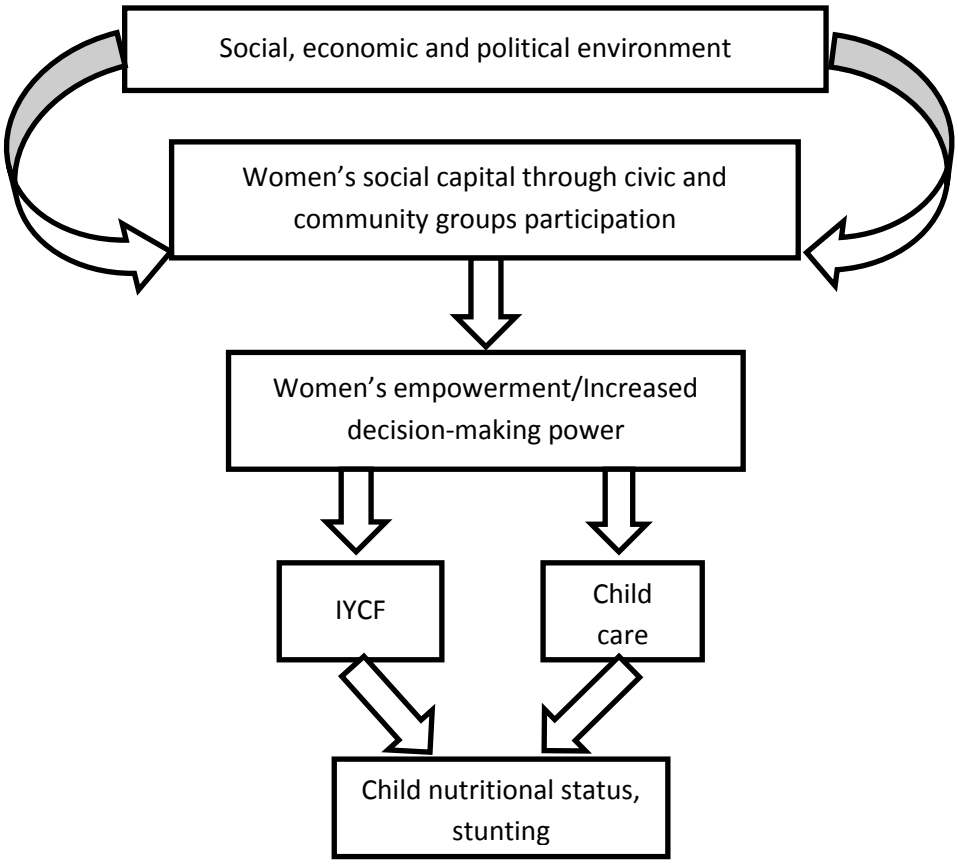
The complexity of how to capture and quantify women's empowerment may be attributed to its context specificity which drives the approaches used by different authors. Indicators and attributes that may be seen as a sign of empowerment in a specific context may vary and take a completely different meaning in other social and cultural context. The World Bank, as well as other major development agencies, has yet to develop a standardized method for measuring and assessing variations in the level of empowerment as a result of specific development interventions. In the absence of such measures, Malhotra (2005) argue that it is challenging for international development organizations to attest to the success of their efforts toward women's empowerment which is a key goal of the millennium development. However, Malhotra (2005) pointed out that beyond the apparent confusion on defining and measuring women's empowerment, there is a high level of agreement between authors on the fact

that “process” and “agency” are key elements of women’s empowerment regardless of the context and setting in which the empowerment intervention is taking place.

Conceptual framework

The pathway through which social, economic and cultural contexts determine and influence children’s nutritional status is presented in figure 1. Many authors, including UNICEF, made significant contributions to the development of this pathway. Because of the fact that malnutrition factors can be very context specific, the following framework was developed to describe how women’s empowerment through their participation in household decision-making can affect the nutritional status of children in Sierra Leone.

Figure 1: Women’s empowerment and child nutrition framework



Adapted from UNICEF (1998); Malhotra (2005); Kabeer (1999); Mosedale (2012); Bold, Quisumbing & Gillespie (2013)).

Women's empowerment is a process that takes place in a specific economic and cultural environment (Kabeer, 1999; Malhotra, 2005). This environment (social political, cultural and economic) can boost or inhibit the creation and development of women's social capital through participation in civic and community groups and political organizations. For instance, Malhotra (2005) mentioned that agency and resources which translate to achievement or outcomes are created through a process which itself is conditioned to the specific environment in which it takes place. Thus the existence of favorable environment for women's empowerment is relevant to maternal and child nutritional status (Maholtra, 2005).

An enabling environment for empowerment provides the foundation for social capital building (Mayoux, 2001). Once the enabling environment is created, through targeted economic interventions for example, Mayoux (2001) hypothesizes that a natural link will immerge between women based on some biological and social characteristics such as age, level of education and social position in the community or in their respective households. Therefore, civic and community groups are created and developed using these natural ties (Mayoux, 2001; Simon, Alayne, & Sangeetha, 2002). These natural ties contribute to the maintenance and development of the relationships between women in the same group created through the existence of an encouraging social political and economic environment (Mayoux, 2001). Through these relationships, women share knowledge and information on various topics such as positive healthcare seeking behavior, child feeding practices and hygiene.

Knowledge gained through civic and community group participation conditions and guides women's decisions in the household. Women's ability to make independent choices that impact their lives and the lives of their children indicates their social power, and women's social power usually develops via education, participation in economic life, social position, or through social relations with others. Participation in peer support groups has been shown to be an effective way to promote and

increase women's decision-making power (Simon et al. 2002). In contrast, social isolation excludes women from the decision-making processes within the family and within the broader community.

In summary, women's social capital influences, at some level, their decision-making power in a favorable social, cultural and economic environment. In turn, the decision-making power is a strong indicator of their empowerment in both the household and the community (Simon et al. 2002). This relationship between social capital and decision-making translates to women's empowerment, which in turn positively impacts women's health behaviors and children nutrition practice (Eklund et al 2008).

Women's empowerment and child nutritional status in Sierra Leone

In Sierra Leone, like in many other developing countries, the inequality between men and women is striking and accepted as the norm (Kumetat n.d.). Some key factors that contribute to lower women's social status and keep women from any social recognition according to Kumetat (n.d.) include a) the lack of literacy; b) early and forced marriage coupled with increasing gender-based violence; c) the non-participation of women in political (national and local) structures; d) the patriarchal structure of the society; e) religious values that forbid women to participate in community events or even speak in public; and f) the fact that single or unmarried women are not accepted in the society.

In a food insecure context, women's low social status is an aggravating factor for women and children nutrition. In Sierra Leone, families suffer from seasonal food insecurity for an average four out of twelve months, which in duration and timing corresponds to the traditional "hungry season." The period of greatest shortage falls between June and October, with the month of August exhibiting the time of greatest food insecurity. There are also cultural taboos against consumption of animal source foods for pregnant women and children in Sierra Leone. The taboos are usually restrictions against certain kind of meat or certain oils or even against food prepared a certain way. Women and children

face a greater number of food proscriptions compared with men[3]. These factors that contribute to and acccentuate women's and children's malnutrition might change when women are empowered and given the opportunity to make informed decisions for themselves and their children.

Window of Opportunity (an intervention that promoted infant and young child feeding practices though women's participation in community groups) in Sierra Leone did not specially focus on increasing women's empowerment. Nevertheless, some of key domains of women's empowerment such as group and civic participation, capacity building of community volunteers, and the promotion of optimal infant and child feeding practice through opinions leaders were implemented as means to improve women's knowledge and their ability to provide adequate healthcare and nutrition to their children. These activities were designed to promote positive infant and young child nutrition practices. For the purpose of this thesis, women participation's in household decision-making is used as the measure their level of empowerment in Sierra Leone.

Women's ability to access resources and information, as well as their ability to use these resources to the benefit of their children, is tied to their value in the society and in the household (Sierra Leone Demographic Health Survey (SLDHS), 2008).Women's economic contributions and their participation in the household decisions are important indicators of their level of empowerment. As such, SLDHS (2008) measured women's empowerment using three main indices: employment status, women's attitude toward violence, and participation in household decision-making. In terms of employment and use of earnings, it may be tempting to assume that women are the sole decision makers about how to use their income and that they should be able to use it to the benefit of their children by providing them with rich and nutritive food. However, SLDSH (2008) showed that many women in the country did not have the sole authority to make decisions about the use of their earnings.

[3] http://www.everyculture.com/Sa-Th/Sierra-Leone.html#ixzz2xNqKP6CS

Specifically, more than 25 percent of women surveyed reported that their husbands decided how to use their earnings while more than a third of women reported they decided jointly with their husbands and only the 34 percent of women decided alone how to use their earnings. Not being able to decide where and how to use the resources they are gaining is a sign that women in Sierra Leone do not have control of their resources and have very little decision-making power when it comes to how to use these resources.

Women's control over their resources increases with age, the number of children they have and the number of years of education (five or more) according to SLDHS (2008). For instance, the survey reported that 40 percent of women with secondary or higher level of education made independent decisions about how to use their resources compared to 30 percent of women with no education. To stress the relationship between income earning and women's decision-making power in the household, SLDHS (2008) indicated that women who had higher income than their husbands were more likely to decide how to use their husbands' income. On the same note, women who earned about the same amount of income as their husband were more likely to participate in the decision about how to use theirs and their husbands' income.

Decision-making as an indicator of women's empowerment was assessed in the SLDHS (2008) using five proxies such as decision in "Own health care", "Major household purchases", "Purchases of daily household needs" and "Visits to her family or relatives". Women were considered to be empowered if they made decisions alone or conjointly with their husband. As measured in SLDHS (2008), women's empowerment varies by the domain of decision-making. Three of four (except "Visits to her family or relatives") were directly linked to maternal and child health including child nutritional status. It is important to note that very few women (12 percent) were sole decision makers about their own health care, and in almost all the domains, husbands were decision makers (SLDHS, 2008). Only 25

percent of women made decision alone about daily household purchases. Thus, they did not have the choice of what kind of food to buy and give to their children.

In Sierra Leone, very few interventions or actions are put in place to address gender and women's empowerment issues. Only objective 1.4[4] of the nutrition and food security policy implementation plan 2012-2016 mentions some strategies to increase women's empowerment and to create an enabling environment for gender equity in Sierra Leone. These strategies however do not directly target women's participation in decision-making as key component of their empowerment.

Despite the apparent lack of or insufficient actions to improve child nutritional status through women's empowerment in Sierra Leone, the State Communication Unit released an article in September 2012 via the *Sierra Leone Media Express*[5] stating that the political sphere (the government) is in the process of prioritizing gender equality to improve women's status and their children's wellbeing by making women's participation in decision-making at central and local levels a national priority. This political commitment can be the trigger for a better recognition of gender and women's empowerment in Sierra Leone as a key factor for more social justice in general and for improved child nutritional status in the country.

[4] Sierra Leone National Food and Nutrition Security Policy 2012 – 2016: Objective 1.4: Explore avenues within programmes of relevant sectors to integrate nutrition using the "Nutrition Lens" (NL) approach.
[5] http://www.sierraexpressmedia.com/

State of malnutrition in Sierra Leone (SLDHS, 2008)

Fugmann, Nielsen & Madsen (2013) argued that Sierra Leone is the leading country worldwide in terms of maternal and child mortality where "Almost all families lose a child, several children or a mother related to pregnancy, birth or neonatal complications" (p. 6). According to Sierra Leone Demographic Health Survey (SLDHS, 2008), infant mortality in Sierra Leone is 89 deaths per 1,000 live births. The country had the greatest under-five mortality in the world in 2011 with 140 deaths per 1,000 live births SLDSH (2008). This means that " about one in eleven children born in Sierra Leone dies before the first birthday, and one in seven children dies before attaining the fifth birthday" (SLDSH 2008, p.106)

Stunting and underweight are major malnutrition issues especially for children under five. SLDHS (2008) estimated that 36 percent of children under five are stunted and 21 percent of these are severely stunted in Sierra Leone. The data suggests that stunting decreases as mothers' nutritional status increases and that birth spacing has some positive impact on stunting. For example, it appeared from SLDSH (2008) that children born 24 to 47 months after their prior sibling were more likely to be stunted than those born at longer birth intervals. SLDHS (2008) estimated that underweight in Sierra Leone ranged from 14 percent to 24 percent with a national average of 21 percent. Among those children, 7 percent were classified as severely underweight. Mothers' education and wealth level were identified as main factors for children underweight in Sierra Leone (SLDHS, 2008). However, the survey noted a very small improvement in child nutritional status compared to 2005. For instance, the proportion of wasted children decreased from 40 percent to 34 percent between 2005 and 2008, while the proportion of underweight did not change for the same time period. SLDHS (2008) warned that this tiny increase in children's nutritional status should be interpreted with caution.

According to SLDHS (2008), breastfeeding is known to be associated with child nutritional status. While 95 percent of children between 0 and 6 months of age were being breastfed at the time of the survey, 59 percent of children received some variety of prelacteal food and only 11 percent of children

(0 to 6 months) were exclusively breastfed. The SLDHS (2008) argued that there is no difference between boys and girls in terms of early breastfeeding initiation. However, the data showed that urban children are slightly more likely to receive breast milk in the first hours of birth than rural children. Here also, it appears that the country has a long way to go in terms of improving child nutritional status via optimal breastfeeding.

According to WHO and UNICEF cited in SLDHS (2008), solid and semi-solid food should be introduced in children's nutrition at the age of six (6) months when breast milk alone is not sufficient anymore to meet children's nutritional needs. Complementary feeding is highly practiced in Sierra Leone with 87 percent of breastfeeding children (6 to 23 months) receiving solid or semi-solid foods according to SLDHS (2008) and the proportion of non-breastfeeding children (6 to 23 months) receiving solid or semi-solid foods is greater than the proportion of breastfeeding children at the same age. However, in terms of minimum standard feeding practice, only 23 percent of children aged 6 to 23 months met this standard during the SLDHS (2008). The main issue with IYCF in Sierra Leone is the insufficient number of meals per day. Only 36 percent of children surveyed in SLDHS (2008) were fed the minimum number of times per day. At the age between 6 and 23 months, children are mostly fed by their mothers. However, mother's inability to perform this practice may be due to many external factors such as lack of food, or knowledge about optimal infant and young child feeding practices, or insufficient resources or power to practice the recommended behaviors.

Critical evaluation of gap in the knowledge

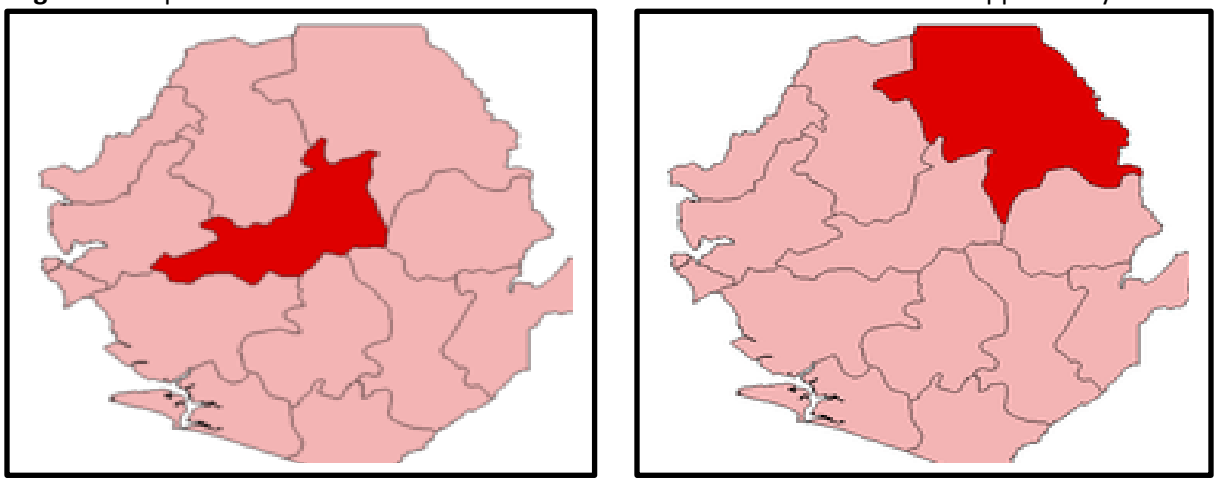
Despite the recognition by a large body of literature of the importance of women's empowerment in children health and nutrition (Oniang'o et al. (2002); FAO (2012); Kabeer (1999); Quisumbing (2013); Bhagowalia (2012); Malhotra (2005); World Economic Forum (2005), there is little research being done on this topic in Sierra Leone. Furthermore, extensive researche on women's empowerment as an indicator of child nutritional status in Sierra Leone is almost non-existent. While literature suggests a close link between women's empowerment and child nutritional status in other contexts, it is important to explore whether or not the same relationship exists between the two concepts in Sierra Leone. This research will fill the large gap that exists in this area. By analyzing the effect of women's empowerment (measured through women's participation in household decision-making) and child nutritional status, namely stunting, this research will provide useful information that would contribute to the existing efforts toward understanding the underlying causes of malnutrition in Sierra Leone.

Overview of CARE's Window of Opportunity Program

The objective of this thesis is to explore associations between women's empowerment and child stunting in Sierra Leone. This thesis achieves this objective through the analysis of endline data collected by CARE's Window of Opportunity project in Sierra Leone in 2012. Window of Opportunity was implemented between 2008- 2012 in five countries (Bangladesh, Indonesia, Nicaragua, Peru, and Sierra Leone) with the goal to protect, promote and support optimal Infant and Young Child Feeding (IYCF) and related maternal nutrition (rMN) practices. Window of Opportunity aimed to improve the enabling environment, strengthen health system support, and empower communities and individuals to make optimal infant and young child feeding and maternal nutrition choices.

In Sierra Leone, the Window project provided an opportunity to build upon the experience and lessons learned from a successful USAID funded Child Survival Project (*For Di Pikin Dem Wel Bodi* -The Health of the Child) which was implemented in five chiefdoms of Koinadugu District from 2003 until 2008. The Window project, which ran from January 2009 through June 2012, was able to expand these activities to cover 192 communities in 12 chiefdoms, 131 in 9 chiefdoms in Koinadugu including the original five Child Survival areas, and 61 communities in 3 chiefdoms in neighboring Tonkolili District (see figure 2) where CARE was also implementing malaria control and food security projects.

Figure 2: Maps of Sierra Leone with the two intervention districts of Window of Opportunity



Tonkolili district | Koinadugu district

Source: final report, window of Opportunity, 2012

Window of Opportunity was one of four health initiatives being implemented in the northern part of Sierra Leone during 2009-2012. CARE used an integrated and multi-sectoral approach in project communities to support improved nutrition, water and sanitation, food security and livelihood projects in the area.

The Window project expanded on the successful community-based strategies of a child survival project implemented from 2003- 2008 using a similar collaborative programmatic approach and worked with multiple stakeholders including community members and traditional leaders, other NGOs, the Ministry of Health and Sanitation (MOHS) and government councils. The primary implementing partner

was the District Health Management Team (DHMT) including staff from the 60 Peripheral Health Units (PHUs) in the twelve chiefdoms. Window field staff included 12 chiefdom supervisors that actively participated in communities and coordinated Window activities. Advocacy and communication activities were also undertaken to increase awareness and reinforce support for optimum infant and young child feeding (IYCF). The project initially utilized community health clubs (CHCs) as entry points into communities with community based growth promotion (CBGP) volunteers and village development committees (VDCs) to promote IYCF and rMN practices and strengthen linkages with community and facility based health services.

One of the key activities of the project was mother-to-mother support groups (MtMSGs) which provided a supportive venue for mothers to share experiences and gain information. MtMSGs also fostered support and solidarity among community women who traditionally have few opportunities to gather outside the home. More than half (51 percent) of eligible mothers with children under two years of age participated in mother-to-mother support groups and 44 percent had attended a meeting in the last month at the time of survey. More than three quarters of women who attended MtMSGs (77 percent) reported attending a group meeting three or more times, and more than half (54 percent) said they had attended four times or more.

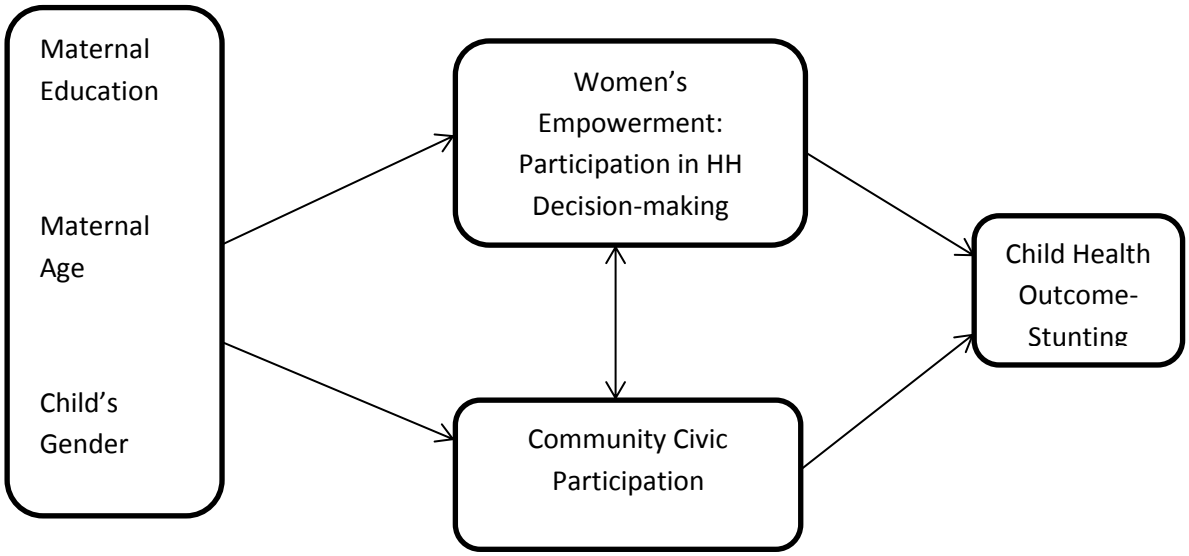
Research question and hypothesis

Empirical analysis allows us to examine the theorized relationships between these contextually measured dimensions of women's empowerment and child health outcomes. It is hypothesized that women who are empowered to participate in household decision-making and can make a decision alone or jointly with their husband and have access to resources via civic and community group participation are likely to have better nourished children. Specifically, this research aimed to answer to what extent does women's participation in household decision-making affects the level of stunting among children 6 to 23 months in Sierra Leone.

CHAPTER III: METHODOLOGY, MEASURES AND MODEL DEVELOPMENT

The objective of this thesis is to explore associations between women's empowerment and child stunting in children ages (6-23) months Sierra Leone. It achieves this objective through the analysis of endline data collected by CARE's Window of Opportunity program in Sierra Leone in 2012. The study also includes women's civic and community group participation as a dimension of social capital since access and use of resources is embedded in the networks of social relations. The conceptual model is shown in Figure 3.

Figure 3: Conceptual framework of the research hypothesis



Survey Design, Area and Tools

Survey Design

A cross-sectional survey was conducted for the final evaluation to measure IYCF knowledge and practice, coverage of program activities, and nutritional status of children under two. The survey used a design based on standardized World Health Organization (WHO) IYCF indictors and IYCF knowledge and practices measurement tools).

Survey Area and Sampling

The survey population was drawn from the project communities in 12 chiefdoms in the two districts. Both surveys followed a 30-cluster random sampling methodology. The survey was conducted only in project areas without a non-project control group and analysis was based on final evaluation data. Clusters were selected by population proportionate random sampling (PPS) using a list of project communities with the total population of children under two as the sampling frame. The survey was divided into two sampling frames: five chiefdoms which were former child survival areas and seven new chiefdoms, with 30 clusters drawn from each. At each cluster location, a starting household was selected at random and households visited sequentially until 16 households with eligible children were selected per cluster. Only one respondent was selected from each household.

The total sample size was 2 x 30 clusters x 16 respondents for a total of 960 children under age two. Among these children, 585 were aged between 6 and 23 months. The sample size for the survey was calculated based on expected changes in the WHO IYCF and nutritional status indicators using a significance level of 5 percent, a power of 80 percent, and a design effect of 1.5. The final sample size was based on the required number of children age 0 through 5 months required for the exclusive breastfeeding indicator, with equal numbers children approximated for each additional six month age group.

Survey Tools

The survey questionnaires were adapted from Window tools based on WHO recommended standard indicators for measuring infant and young child feeding indicators[6] and CARE's *Step by Step*

[6] WHO, *Indicators for assessing infant and young child feeding practices* http://www.who.int/nutrition/publications/infantfeeding/9789241596664/en/index.html

Guide for Data Collection.[7] For anthropometric measures, standardized WHO/UNICEF methods were used to measure and calculate underweight, stunting and wasting compared to 2006 WHO reference population. The questionnaire included the following sections: 1) Background demographic information; 2) Feeding history used to calculate standard IYCF indicators to measure adherence to recommended feeding practices for children under two; 3) Maternal and newborn care including nutritional counseling; 4) Coverage and exposure to information and messages; 5) Community participation and women's empowerment; 6) Participation in and coverage of program activities; 7) Household food security; 8) Weight and length measures for anthropometry

An English version of the questionnaires was used and enumerators were trained how to ask the questions using the local creole (*Krio*). Anthropometry data were collected using Salter spring scales and Schorr boards. Anthropometric measures age (in month), weight (in Kilogram) and height (in centimeter)) of children 6 to 23 were assessed. These measures were then entered using WHO anthro and transferred into SPSS for analysis.

Training of Enumerators

Survey training was conducted by the final evaluation consultant together with the survey coordinator and two survey team supervisors from Dalan Consultants. CARE Sierra Leone recruited the survey enumerators from the local area. Five-day training for enumerators was held in the town of Kabala from May 15 to 20, 2012. Survey training covered the following topics: purpose of the survey; random sampling methods; how to select households and respondents for the sample; interview techniques; review of the survey questionnaire and anthropometry. Training also included two practice sessions – an afternoon in a village to practice selecting respondents and conducting interviews, and a

[7] CARE, *Infant and young child feeding practices. Collecting and Using Data: A step by step Guide guide*.http://childhealthandnutrition.care2share.wikispaces.net/file/view/Infant%20and%20Young%20Child%20Feeding%20Practices%20-Collecting%20and%20Using%20Data-%20A%20Step-by-Step%20Guide.pdf

half day session at the Kabala District Hospital MCH clinic to practice measuring children. The final evaluation survey was conducted from May to June 2012 with preliminary data analysis completed in October.

Data Collection

Dalan, a local agency, managed the data collection with two teams of enumerators in the field from May 20-31, 2012. In addition to the two survey team supervisors, the final evaluation consultant and the WOP M&E officer observed teams in the field and supervised quality control.

Field teams were able to reach all of the randomly selected clusters with the exception of one which was inaccessible due to a broken bridge. The final evaluation consultant and M&E officer used PPS sampling to randomly select a replacement from nearby communities. Household visits were conducted at a time when respondents were expected to be home. In cases where eligible respondents resided in a household but were not home at the time of visit, effort was made to revisit the home within the next two days to complete the interview. Enumerators began each interview by reading an informed consent statement to gain permission for the interview.

Data Management and Analysis

Data entry was completed in Freetown by staff from Dalan using excel. Raw data were sent to CARE HQ where key indicators were calculated and frequencies generated. These were shared with the final evaluation consultant in September for program-related analysis and generating the report. No significance testing was conducted.

Variables and Measures

The variables of interest for this research were created and categorized as follows.

The women's empowerment index is a composite variable composed of six items related to women's participation in various decision-making domains in the household. The six items used to create the

index were: women and children's health seeking, women's participation in work, how money should be spent, whether women can visit relatives and how food should be distributed in the household. Women were asked who makes the decisions about each of these items. Original response options were: a) myself, b) husband, c) both myself and my husband, d) older men in the household, e) older women in the household, f) other, g) don't know. A woman was considered as empowered when she responded "alone" or "both me and my husband". For the purpose of the logistic regression analysis, responses to the decision-making items were collapsed into 2 main categories – husband / older women / men in the family (ie. woman excluded) or myself / myself and husband jointly (ie. woman included). A factor analysis was run to identify the six items that explained the most variation in the decision-making. Principal components analysis extracted (see table 2) two main factors composed of the following items: factor1: women health seeking/child health seeking and women's participation in work; factor 2: decision-making about visiting relatives, income use in the household and food distribution in the household. The women's empowerment (dichotomous) variable used in the final model was created by calculating the mean of the two factors identified in the factor analysis. From the factor analysis, the mean factor of the decision-making scale was 3.17. This figure was the cut off that classified women in terms of their empowerment. Women who scored 3.17 or above were classified as empowered and women who scored below 3.17 were classified as disempowered in the household. (See table 5)

Table 2: Concept of Women's Empowerment, its measures and factor loadings using the principal component analysis**.** Total variation explained = 64%

Questionnaire Items	**Factor Loadings**
Who makes decisions about seeking treatment if the child is sick?	0.857
Who makes the decision to go for health care if you are pregnant?	0.853
Who makes the decision about whether you can work to earn money in your household?	0.578
Who has the final say about how the money that you earn from the work should be used?	0.722
Who makes the decision about whether you can visit family, relatives or friends who live nearby?	0.823
Who makes the decision about how food is distributed among members of the family in your household?	0.627

Response Categories: (1= Other, 2=Older Men, 3=Older Women, 4=Husband, 5= Both Myself & Husband, 6=Myself)

Civic engagement (a dimension of social capital) was measured via women's civic and community group participation. Women were asked if they have ever participated in any formal or informal support groups including Mother-to-Mother support groups established by CARE in the context of window of opportunity. The following list of women's support groups in the area of the study was pre-established (Mother-to-Mother Support Groups, Saving Groups, Farmers Groups, Community Health Clubs, Religious groups). The specific question asked was: Does the mother currently participate in any group like a women's group, mother support group or savings group? A final variable of civic and community group participation was then computed using the additive score combining responses from all the response items. Women who declared they participated in at least one support group were classified as "Yes = participated" and women who did not participate in any support group were classified as "No=did not participate". Table 3 presents the original questionnaire items used to assess women's civic and community group participation

Table 3: The concept of civic and community groups participation in and its measures

Concept: Community Civic Participation
Questionnaire Items
If, Yes What organization or group you participate in
Mother to Mother Support Group
Savings Group
Church Group/Muslim Group
Community Health Club
Farmers Groups
Bele Woman Group
Other _____ (specify)
Check All That Apply (1= Yes, 0 =No)

Stunting among children 6 to 23 is the dependent variable of interest. It was computed using Length-for-age (LAZ) z-score, recumbent length relative to age. Low LAZ (< - 2sd) relative to a child of the same sex and age in the WHO 2006 reference population is referred to as "stunting". A child is considered stunted if the LAZ is below -2sd. WHO Anthrop software was used to asses stunting proportions.

Statistical Model

The thesis uses logistic regression to analyze the influence of women's empowerment and community group participation on stunting. Logistic regression is a statistical technique used to model the probability of discrete (binary or multinomial) outcomes. Logistic regression analysis provides more efficient and powerful insights into what attributes are more or less likely to predict an event outcome in a population of interest by estimating the probability of its occurrence. Binary logistic regression, utilized here, is a form of regression that is used when the dependent variable is dichotomous and the independent variables are continuous, categorical variables, or both.

Modeling strategy

This thesis presents the results of a secondary data analysis and thus the variable selection for model building was limited to variables collected during the endline evaluation of the Window of Opportunity program. Variables in the model were selected based on two main factors: a) key domains of women's empowerment and social and biological characteristics identified in the literature as strong predictors of child nutritional status and b) availability of potential dependent variables in the data. Knowing the nature of the outcome of interest (dichotomous) the logistic regression appeared to be the logical option for analyzing the relationships between the variables of interest. In the model building process, we first checked the distribution of all variables (histograms for normality and scatter plots for outliers). Second, direct modeling was used to include available variables identified as potential predictors of the outcome. The final model retained variables that, when included in the model, increase the overall R-Square of the full model. Based on this criteria we obtained an R-Square of 0.84 (the highest R-Square possible based on available variables in the data) when we included maternal age, maternal education, group participation, child sex and women empowerment.

There are several known and unknown potential factors that may confound the relationship between women's decision-making and child nutritional status. Known factors include but are not limited to birth order, child age, breastfeeding, household hygiene, seasonality, household size, women economic control, wealth quintiles, women education and husband's occupation. While we were able to control for some of these confounding factors (child sex, child age, maternal age and maternal education) using stratification and multivariate analysis, a significant number of the potentialconfounding variables were not collected during the final evaluation of window of opportunity in Sierra Leone. Thus, the regression model could not control for these variables.

CHAPTER IV: RESULTS

This chapter presents results of bivariate and multivariate analyses. Beside simple correlations to assess associations among dependent and independent variables, cross tabulation analyses were used to determine if variation in stunting is due to differences in the women's empowerment. Binary logistic regression was used to assess the relative influence of predictors included in the model.

Description of Population

Overall, the end-line survey of Window of Opportunity in Sierra Leone included 960 women with children aged between 0 and 23 months. Of those, 585 had children between 6 and 23 months of age. The mean age of women surveyed was 26 years (sd. =7, min=13, max=61). About 91 percent of the mothers were aged between 15 and 35 years (N=430). The majority of women (92.9 percent (N=538) were married or partnered. 73.6 percent (N=430) never went to school and 26.4 (N=155) had a high school or higher education level. The mean age of children aged 6 to 23 months was 12.7 months (N=585, sd. =4.9). Among these children, 52.2 percent were girls (N=280) and 47.8 percent were boys (N=305). Overall, 15 percent (N=88) of children 6 to 23 month were classified as stunted (z-score,-2sd). Among mothers with children aged between 6 and 23 months, 63.4 percent (N=371) participated in at least one mother-to-mother support group while 36.6 percent (N=214) had never participated in these group meeting. In terms of participating in the household decision-making, 18 percent of women (N=180) participated conjointly with their husbands in all six categories of decision-making and were categorized as empowered. It appears that women participated more in decisions related to how to spend their income and decisions about working out of the household (10.4 percent (N=62) and 7 percent (N=43) respectively). Food distribution in the household is the type of decision-making in which women participated the least (2.1 percent (N=13)) (see table 5). The mean score for the women's empowerment index 3.17 (sd. =.45). Reliability analysis of index items resulted in an alpha score of 0.756 and principal component analysis showed all factor loadings were 0.5 or above, explaining 64

percent of the variation (see table 2). Table4 presents the descriptive statistics of the demographic characteristics of the population (mean and standard deviation of the overall population and for the population of stunted for each characteristics). The table also presents the overall means and means by stunting for the women's empowerment index and the civic and community group participation. Cross tabulation of the mean score of the women's empowerment index by stunting shows that women who scored above the mean index of 3.17 have 17.7 percent of stunting among their children 6 to 23 months and those who scored below the mean index of 3.17 have 82.3% of stunting among their children 6 to 23 months (see table5).

Table 4: Description of socio-demographic characteristics overall and stunting

Description of socio-demographic characteristics of mothers and children, women's empowerment index, statistics of group participation and stunting			
Variables	**Overall, (mean± SD or %)**	**Stunted (mean± SD or %), n= 93**	**Not stunted (mean± SD or %), n= 492**
Mothers' age (n=585)	26.3± 7.2	27.37± 7.32	25.64± 6.57
Child age (n=527)	12.7± 4.9	13.10± 5.07	12.92± 4.87
Maternal education (n=580)			
Never went to school	73.6%	77.4%	73.3%
Attended some schooling	26.4%	22.6%	26.7%
Child Sex (n=585)			
Girls	52.2%	54.5%	46.9%
Boys	47.8%	45.5%	53.1%
Women's score on empowerment index, mean	3.17± 0.34	3.16± 0.29	3.18± 0.35
Community groups participation (N=576)			
Ever participated	63.4	68.6	63.3
Never participated	36.6	31.4	36.7

Table 5: Women's empowerment index and factors loadings

Women's empowerment index for each decision-making item (Yes=myself and husband conjointly; No=Husband and others)					
Scale items	**Yes**		**No**		**Loading factor**
	N	%	N	%	
Who makes decision when the child is sick?	32	5.3	552	94.7	0.857
Who makes decision to go for health care if you are pregnant?	40	6.9	542	93.1	0.853
Who has the final say about how the money should be used, if you earn money from work?	41	7	541	93	0.578
Who makes decision about how food is distributed among members of the family in your household?	12	2.1	571	97.9	0.627
Who makes decision about whether you can visit family, relatives or friends who live nearby?	40	6.9	541	93.1	0.823
Who makes decision about whether you can work to earn money in your household?	61	10.5	521	89.5	0.772
Final women's empowerment index (collapse of the six items)					
				N	**%**
Women scoring above the mean score of 3.17 (empowered)				103	17.7
Women scoring below the mean score of 3.17 (not empowered)				480	82.3

Bivariate Analysis

Tables below provide results of bivariate cross-tabulation between women's empowerment and stunting outcome and community civic participation and stunting. Households where women are capable of participation in decision-making are less likely to have stunted children (10.0 percent) compared to those who are *unable* to do so (16.5 percent). Similarly, women who are able to participate in community groups have lower stunting levelslevel among their children (14.9 percent) compare to those who did not participate in these community groups (16 percent)(see table 6).

Three way cross-tabulation results suggest that the prevalence of stunting is higher among women who are *unable* to participate in household decision-making and also *cannot* participate in community groups (54 percent) compared to those who are capable of participating in household decision-making and civic and community group participation (31.4 percent) (See table 6 below)

Table 6: Women's Empowerment, Civic and Community Groups Participation and Stunting

Percentage of stunting by categories of Women's Empowerment and three way cross tabulation (WE mean and community group participation and Stunting	
Categories	**Stunting**
Husband/Other Family Members	16.5 %
Myself/Myself & Husband Jointly	10.0 %
Do not Participate in Community Groups	31.4%
Participate in Community Groups	14.9%
WE index <3.17 **&** Do not Participate in Community Groups	54%
WE index ≥ 3.17 & **&** Participate in Community Groups	16%

Bivariate Association

The outcome variable (stunting) was modeled as a dichotomous variable with two levels (<-2sd=stunted and >-2sd=not stunted). Unadjusted models identified no statistically significant associations between stunting and education, child sex, civic and community group participation, or respondent age (table 7). However the association between stunting and scores on the women's empowerment index was statistically significant at p<0.1 level (Table 7); Unadjusted OR= 0.11; 95% CI= 0.88, 3.56).

Multivariate association

The study also reports results on multivariate analysis. Regression results suggest that households where women participate in household decision-making and are capable of making decisions alone or

jointly with their husbands (0.508, $p < 0.1$), have lower odds of having stunted children compared to those who live in households where husband or other family members make decisions on their behalf. Table 7 present the crude and adjusted odd ratios. Women who stated that their husbands and others make decision on their behalf have 0.51% higher odds of being stunted compared to those who make decision jointly with their husbands

Table 7: Crude and adjusted odd ration and 95 percent confidence interval of the multivariate association between women's empowerment and stunting

Crude and adjusted odds ratios and 95% confidence intervals for the association between stunting and women's empowerment among women with children 6 to 23 months in Sierra Leone (bivariate and multivariate association)

Domains	**Bivariate Association Crude**		**Multivariate Association Full/adjusted model**	
	OR	95% CI	OR	95% CI
Women's empowerment (ref=mean score < 3.17)[8]	0.11	0.88, 3.56	0.51	0.24, 1.06
Maternal education level (ref= never went to school)	0.93	0.55, 1.57	1.12	0.63, 1.98
Sex of the child (ref=girls)	0.74	0.47, 1.16	0.73	0.46, 1.16
Maternal age	1.02	0.99, 1.05	1.03	0.99, 1.06
Civic and community Group participation (ref= never participated)	0.92	0.58, 1.47	0.86	0.53, 1.38

Adjusted logistic regression also suggest that those who participate in community groups have lower odds of having stunted children though the odds are not significant (OR =0.86, CI 0.53, 1.38, $p>.1$) Both bivariate and multivariate analyses show that empowered women are less likely to have stunted children.

[8] The original women's empowerment index was collapsed into a dichotomous variable as follow: women originally responded "myself" or "myself and my husband" were recoded as "me and my husband". Women who responded "my husband" or Older men and older women" or "others" or "Don't know" were recoded as "husband and others"

When adjusted for education, age of respondent, sex of the child and civic and community group participation, higher scores on the women's empowerment index was associated with a borderline significant decrease in the odds of stunting. (OR =.51, 95%; CI=.24, 1.06; table 7)

CHAPTER V: DISCUSSION

Analyses presented above support the hypothesized relations between women's empowerment, civic and community group participation and child health outcomes. Women who make decisions alone or jointly with their husbands and those who participate in social groups are more likely to have better nourished children.

This research aimed to assess the relationship between women's empowerment, measured through their participation in household decision-making, and child stunting. We hypothesized that women with greater participation in household decision-making (considered as empowered for purposes of this study) were less likely to have stunted children than those who did not participate in such decision-making process. Women's empowerment has been defined and measured in diverse fashionsfashion. Many authors have drawn our attention to the complexity and the confusion around these definitions and measurements (Alsop, & Heinsohn, (2005); Do, & Kurimoto, (2010); Handy, & Kassam, (2004); Hennink, et al. (2012); Kabeer, (1999)). In the context of this research, women's empowerment was defined as women's participation in household decision-making that may affect their health and the health of their children.

In this study, women's decision-making power was calculated using a six-item scale. A factor analysis was run to determine which of the six items were closely related to each and explained the variability between the items. The loading factors of all six items were high enough to include them in the model (see table 5). The results indicated a weak relationship between women decision-making scores and the level of stunting of their children ($p<.1$, 95% CI=0.24, 1.06). Women who participated in household decision-making process conjointly with their husband had 49% lower odds of having stunted

children compared to women who did not participate in such decision-making process. The findings are consistent with the results from Haddad (1999) where the strength and the causal linkage between child nutrition outcome and women's status (decision-making) in seven Asian countries were analyzed. According to this study, the low status of women has a negative impact on their decision-making in the household in terms of healthcare seeking and optimal feeding practices of children, which in turns exposes children at greater risk of stunting.

Women's empowerment has been measured by the level of women's autonomy, which includes their ability to visit family or relatives outside the household without permission (Kishor, 2005). The women's empowerment index used in this thasis included a mobility item. Bivariate and multivariate analyses showed an association between women's decision-making and stunting among their children aged 6 to 23 months. These findings are similar to those from Kishor (2005). Their results suggest that women's autonomy over their own health had a positive influence on most child health outcomes, including stunting in Asia. Furthermore, their research indicated that "in families in which women were autonomous and played an important role in decision-making, the proportion of family resources devoted to children was greater than in families in which women played a less decisive role" (p. 56). They concluded that in Asian counties, women's decision-making power increases children height-for-age and reduces mortality. However, like this research, Kishor found a weak association between women's household decision-making power and child stunting in West Africa.

Maternal age

The results of this research did not find any association between maternal age and stunting amongst children 6 to 23 months, even controlling for maternal education, the sex of the child and women's participation in community groups. Thus, an inference cannot be made in the absence of statistical significance about the association between maternal age and stunting in children. Nevertheless, one can speculate that children from young mothers, especially from adolescent mothers,

might be at higher risk of stunting since pregnancies at this age are associated with poor health outcomes for both the mother and their children. The health outcomes associated with young maternal age include low education levels, low usage of family planning methods, feotal death, preterm birth (PTB), low birth weight, and adverse impacts on child development (cognitive, physical and social-emotional development (Baldwin & Cain, 1980; Reichman, & Pagnini, 1997 and Friede, Baldwin, Rhodes, Buehler, Strauss & Smith, 1987). Similar to the results of this study, Geronimus, Korenman & Hillemier, (1994), did not find an association between maternal age and child development in the Unites States. Their study concluded that children poor performance was due to the social disadvantaged situations of their mothers, but not due to their age (Geronimus, 1994).

Sex of the child

The bivariate and multivariate analyses did not show a statistically significant association between the sex of the children and their level of stunting even when controlling for civic and community group participation, maternal age and maternal education (Crude OR = 0.74, 95% CI = 0.47, 1.16; Adj. OR = 0.73, 95% CI = 0.46, 1.16, see table 7). It can be concluded from the results that children aged between 6 and 23 months in the sample have the same chance to be stunted regardless of their sex in Sierra Leone. These results are different from many published studies. Specifically, Sen (2001) argued that gender inequality appears in many aspect of human's life especially in terms child mortality, parents desire for boys rather than girls, and inequalities between the division of household work.

Maternal education

Results indicate that sex of the child, maternal age, maternal education are not associated with stunting (Crude OR = 0.93, 95% CI = 0.55, 1.57; Adj. OR =1.12, 95% CI = 0.63, 1.98, see table 7). These results contradict the findings of Hobcraft (1993); Bicego, & Boerma (1993) and Shroff (2001). Hobcraft (1993) compared the data from 17 Demographic Health Surveys (DHS) across Africa and found that low

maternal education was closely associated with growth retardation amongst children ages 3 and 23 months. Furthermore, Hobcraft's (1993) study revealed that health services utilization and women's education level are associated with improved child survival, vaccination and good nutrition in both rural and urban areas. Furthermore, in three of the countries (Burundi, Senegal and Togo) that were included in the study children from uneducated women were at least two times more likely to be stunted compared to children of educated women. However, it should be noted that Hobcraft, (1993) recognized that the association that was found between women's education and their children's growth retardation is "very weak" in sub-Saharan African countries such as (Burundi, Senegal, Togo, Kenya, Liberia, Mali, Zimbabwe, Botswana, Uganda, Ghana) compared to Asian countries.

Civic and community groups participation

For this study, it was anticipated that women's participation in civic and community groups may increase their ability to participate in the household decision-making, which in turn would positively influence the level of stunting of their children. However, even controlling for education, maternal age, and sex of child, women's civic and community group participation alone does not appear to be contributing to the increase the height-for-age of their children (crude OR: 0.92, 95% CI = 0.58, 1.47; adj. OR = 0.86, 95% CI=0.53, 1.38, see table 7). In contrast, Imai & Eklund (2008)) found that civic and community group participation is associated with an increase of women's knowledge in various domains such as IYCF, sign of childhood illnesses and positive healthcare seeking behaviors. Imai, et al. (2007) pointed out that interactions between members promote mutual empowerment and have positive influence on child nutritional status

Limitations

While this thesis provides some evidence about the association between women's decision-making power in the household and stunting among children between the age of 6 -23 months, there are some limitations to be considered when using the results of this study. These limitations may provide informative guidance regarding future research on women's empowerment and child nutritional status (namely stunting). First of all, women's empowerment was not a specific focus of the Window of Opportunity project. However, it was assessed at the end of the project in order to evaluate associations between household decision-making and nutritional outcomes in children under age two. It is plausible that a project with more intense and focused programming around gender and women's empowerment might result in a different outcome. Second, there are multiple definitions and a lack of clear theory regarding women's empowerment. There is no agreed upon measurement of the construct. Third, the women's empowerment index used in this study includes a small number of items, six in total. These six items were selected according to the indicators that were already collected in the baseline and the specific context of this research. Nevertheless, development of women's empowerment index in a different research setting may call for different scale items.

Additionally, while a multivariate regression analysis was run to assess the relationship between women's empowerment and stunting, the results presented here do not suggest a direct causal relationship between women's empowerment and nutritional status of their children. Furthermore, small sample size of the study might have had some impact on the level of association between variables.

CHAPTER VI: CONCLUSION

Women's empowerment appears to be an important tool to promote gender equality and improve children health and wellbeing in general. This study demonstrates that women's participation in the household decision-making has a positive effect of the level of stunting of their children. The results provide evidence that the effect of women's empowerment (their participation in decision-making) on stunting was independent from maternal age, education or participation in civic and community group participation. The conservative association between women's empowerment and stunting indicates that other potential indicators (which were not analyzed in this research) might influence this relationship. For instance, research has shown that things like adequate infant and young child feeding practices, domestic violence, child mortality, education, intra-household food distribution. among others, impact stunting in children under two years. There are no previous quantitative studies on women's participation in decision-making and the level of stunting of their children in Sierra Leone. This research adds to the existing literature on the impact of women's empowerment and children's nutritional status. Nevertheless, there is a need for additional research to understand mechanisms of empowerment and explore the pathways by which women's empowerment may influence maternal and child health and nutrition outcomes.

Despite data and measurement limitations, empirical findings tentatively support the theoretical assertion that empowered women are likely to have better nourished children Methodologically, the study shows the difficulty in measuring the concept, due to many variations in definitions, dimensions and sub-dimensions. This suggests that there is an absolute value to further research in understanding women's empowerment as a process and as an outcome and its relationship to mother and child health outcomes.

Recommendations for future researches and nutrition programming

The results of this study suggest recommendations that may improve future research and nutrition programs. First of all, future research on the relationship between women's empowerment and child nutritional status should use more comprehensive measurement of women's empowerment index. Specifically, some items that can be included are cognitive social capital, attitude toward household violence and the income level of women (not a comprehensive list). Second, stunting is long term nutritional status. To assess the change in height-for-age there is a need to collect data at different points of time on the same subjects (longitudinal data). It is recommended to use longitudinal data to follow the changes in children's growth over at least two-year time period starting at six months in age. In terms of nutrition programming, future interventions should use women's support groups to improve their social capital and promote interventions such as exclusive breastfeeding, IYCF practices (especially complementary feeding for children over six months), single and multiple micronutrients supplementation, as well as prevention of childhood illnesses. These interventions have been shown effective in many developing countries by Allen, & Gillespie (2001).

Other activities that may catalyze women's empowerment include but are not limited to economic support such as conditional cash transfer, girls' education, small agriculture, home gardening, girls, engaging women in the food value chain, training women in business (financial literacy), providing food technology such as improve quality of seeds, improving women's access and control over lands, encouraging supportive policies and legislations that recognize women's basic rights (WHO, 2011; Bhagowalia, 2012)

The results point to the need to create an enabling environment that provides opportunities for women to participate in the decision-making arena at all levels more freely, easy access to education, advocating to bring change in attitude toward young age marriages, and changes in attitudes toward gender equality to reduce preference for a male child. Findings also support the need for advocacy to

seek service provider and government accountability that will in turn further contribute toward the enhancement of women's rights and the creation of a favorable opportunity structure.

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