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CHILD POVERTY IN GHANA

BY

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DECLARATION

I Mawuenyega Makafui Butu, do hereby declare that this thesis is the result of my research work and that neither the whole nor part of this work has been presented in the University or any other institution for an award of any academic degree. All references used in the work have been duly acknowledged.

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ABSTRACT

Poverty is a threat to the very survival of humanity and has life-long consequences on a child's physical development and academic performance. This study examines the impact of poverty on the well-being of children. Using the first three waves of the Ghana Socioeconomic Panel Survey, the study first measures child poverty in Ghana using the multidimensional approach. Results indicate that child poverty is prevalent in Ghana. Over the period under review, 44 percent of children in Ghana remained poor while 15 percent became poor. The results also show that higher rates of multidimensional child poverty are prevalent in rural communities and the northern parts of Ghana. The study also examines the determinants of child poverty and concludes that children in male-headed households are likely to be multidimensionally poor compared to their counterparts in female headed households. The study also reveals that children are less likely to be multidimensionally poor when their household heads are married. The study therefore advocates for proper family life training this is because a stable family creates a nurturing environment for children to grow and develop. Specifically, the Ministry of Gender, Children, and Social Protection (MoGCSP) should educate Ghanaians about proper family values. The study recommends that data collection and monitoring systems are improved to accurately measure and track child poverty rates and easily identify and track vulnerable groups. This will enable the evaluation of the effectiveness of poverty reduction initiatives and also help efficiently target resources and interventions. Another recommendation of this study is that poverty strategies aimed at improving the welfare of children should target improving the conditions of the household and the mothers since the household and mothers are the first point of contact for the child.

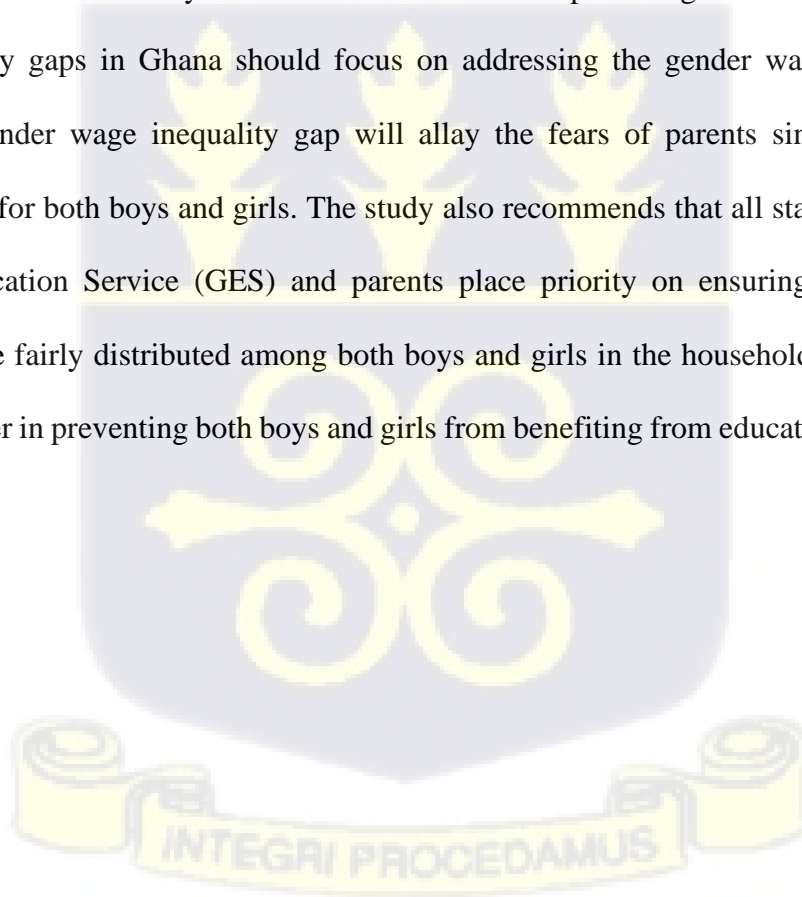
The study also examines the nexus between child poverty and child academic performance. The findings reveal that child poverty has a negative and significant impact on academic performance

measured by both English and Math scores. Thus multidimensionally poor children are more likely to perform worse than children who are not multidimensionally poor. The study also found that school conditions such as access to textbooks and the type of school the child attends influence the academic performance of the child. The interaction of child poverty with the type of school the child attends reveal that poor children who attend public school are likely to perform worse compared to their counterparts who attend private schools. The study confirmed that children who had only one class teacher performed worse than other children who have more than one class teacher in their various schools. This implies that school subject teachers are needed at the basic level to enhance the academic performance of the child. Household conditions such as the presence of the mother, father or both parents in the household, and the number of children in the household have no significant impact on the child's academic performance. Interestingly the study did not find the wealth index to be significant when it controlled for household wealth. This implies that the measure of poverty especially in child analysis is critical. Based on these findings, the study recommends that the government must be intentional about bridging the gap between urban and rural communities and provide the necessary infrastructure such as well-furnished classrooms, electricity and good sanitation. In addition, teachers posted to rural communities must be motivated with some incentives such as special allowances and free housing.

In the fourth empirical chapter, the study seeks to examine the drivers of stunted children in the household. The study reveals that the likelihood of finding a stunted child in households which had depressed mothers is high. Thus the health of mothers affects the health of their children. The study found that among urban dwellers, the presence of both parents in the household reduced the chances of having a stunted child in the household. The study therefore recommends that Parent-Teacher Associations in schools should focus on the role parents have to play in the overall well-

being of their children, especially in the prioritization of child nutrition. The study also revealed that improved toilet reduces the risk of stunting in the household and recommends that houses are built with improved toilet facilities like flush toilets/ water closets. Governmental departments such as the Town and Council Planning must engage stakeholders to ensure that houses constructed have their private toilets and as well as quality water.

Finally, the fifth empirical chapter examined son preference in the household. The study used the household's preference for whether it is better to school a boy than a girl to measure son preference. The findings of the study reveal that urbanization, modernization and education reduce son preference in Ghana. The study therefore recommends that policies geared toward bridging the gender inequality gaps in Ghana should focus on addressing the gender wage gap in Ghana. Bridging the gender wage inequality gap will allay the fears of parents since there is equal economic value for both boys and girls. The study also recommends that all stakeholders such as the Ghana Education Service (GES) and parents place priority on ensuring that educational opportunities are fairly distributed among both boys and girls in the household and that nothing becomes a barrier in preventing both boys and girls from benefiting from educational investments.



DEDICATION

I dedicate this thesis to the Almighty God the Father, Son, and the Holy Spirit for taking me through every step of this journey. Again, this research is dedicated to my family for their unflinching support, prayers and encouragement.



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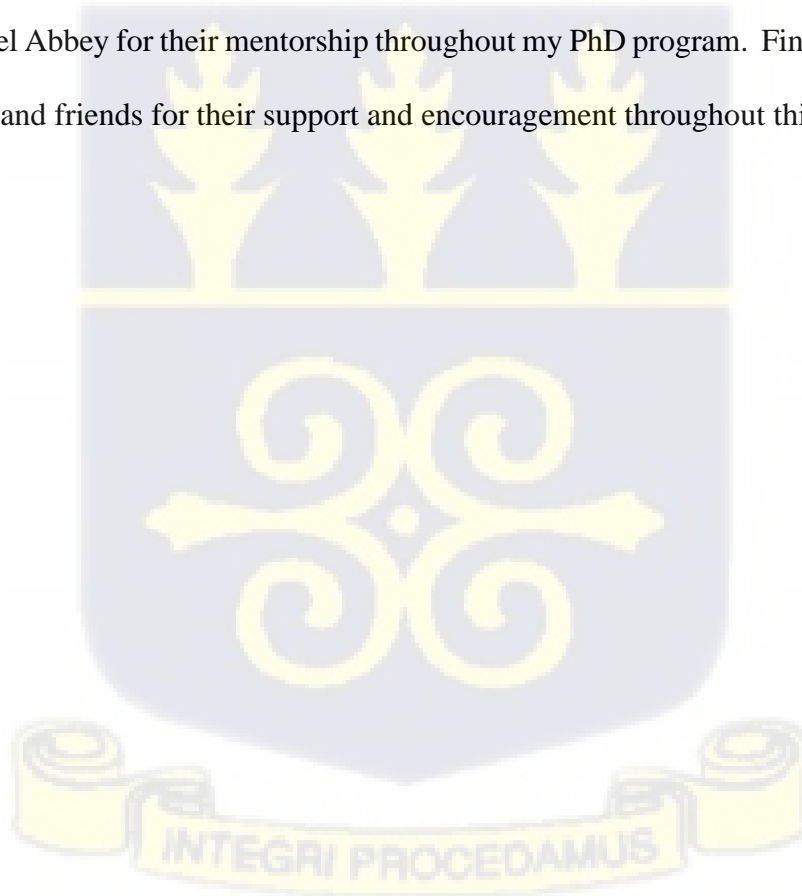


TABLE OF CONTENTS

DECLARATION	i
ABSTRACT.....	ii
DEDICATION.....	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS.....	vii
LIST OF FIGURES	xi
LIST OF TABLES	xii
CHAPTER ONE.....	1
INTRODUCTION	1
1.1 Background to the Study.....	1
1.2 Problem Statement.....	11
1.3 Objectives of the Study.....	17
1.4 Research Questions.....	17
1.6 Justification for the Study.....	18
1.7 Outline of the Thesis.....	19
CHAPTER TWO	20
LITERATURE REVIEW	20
2.1 Introduction	20
2.2 Concept of Poverty	21
2.3 Child Poverty	25
2.4 Theoretical Review	30
2.4.1 Human Capital Theory.....	30
2.4.2 Education beyond human capital.....	31
2.4.3 Educational Production Model	34
2.4.7. Basic Needs Approach.....	40
2.5 Empirical Review.....	48
2.5.1 Determinants of Child Poverty	48
2.5.2 The Nexus between Child Poverty and Child Academic Performance: Empirical Evidence.....	55
2.5.3 Drivers of Stunting among Children.....	69
2.5.4 Determinants of Son Preference	75

2.6 Gaps in Literature	84
2.7 Conceptual Framework.....	87
CHAPTER THREE	90
MEASURING CHILD POVERTY IN GHANA	90
3.1 Introduction.....	90
3.2 Methodology.....	92
3.2.1 Multidimensional Approach to Measuring Child Poverty.....	92
3.2.2 Identifying Child Poverty Based on Household Poverty Status	96
3.2.3 Source of Data.....	97
3.3 Dimensions and Indicators.....	99
3.4 Deprivation and Contributions of Indicators	104
3.5 Identifying Child Poverty Based on Household Poverty Status	111
3.6 Poverty trends and dynamics in 2010, 2014 and 2018.	113
3.7 Comparison between multidimensionally poor children and child poverty based on household poverty status.....	114
3.8 Chapter summary	117
CHAPTER FOUR.....	119
DETERMINANTS OF CHILD POVERTY.....	119
4.1 Introduction.....	119
4.2 Methodology.....	120
4.2.1 The Panel Logistic Model.....	120
4.2.2 Empirical Model: Determinants of Child Poverty.....	121
4.3 Descriptive statistics	126
4.4 Estimation Results and Discussion.....	128
4.5 Chapter Summary and Conclusion	134
CHAPTER FIVE	137
EXAMINING THE NEXUS BETWEEN CHILD POVERTY AND CHILD ACADEMIC PERFORMANCE.....	137
5.1 Introduction.....	137
5.2 Methodology.....	138
5.2.1 The Educational Production Model	138
5.2.2 Data.....	139
5.2.3 Estimation technique.....	140

5.2.4 Measures	142
5.3 Descriptive statistics	146
5.4 Results and Discussion	156
5.4.1 Children at Primary Level (9 to 11 years)	156
5.4.2 Children at JHS Level (12 to 15 Years).....	160
5.4.3 Robustness checks – Household wealth	164
5.5 Chapter Summary	171
CHAPTER SIX.....	172
DRIVERS OF STUNTING AMONG CHILDREN IN GHANA	172
6.1 Introduction.....	172
6.2 Methodology	173
6.2.1 Model Specification.....	173
6.3. Results.....	176
6.3.1 Descriptive statistics	176
6.3.2 Discussion of Results.....	180
6.4 Chapter Summary	191
CHAPTER SEVEN	193
WHO SHOULD GO TO SCHOOL? DETERMINANTS OF SON PREFERENCE.....	193
7.1 Introduction.....	193
7.2 Methodology	195
7.2.1 Data.....	195
7.2.2 Variables	195
7.2.3 Estimation technique.....	197
7.3 Discussion of Results.....	199
7.3.1 Descriptive Statistics.....	199
7.3.2 Empirical Results.....	203
7.4 Chapter Summary	212
CHAPTER EIGHT	214
SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS	214
8.1 Introduction.....	214
8.2 Summary of key findings.....	214
8.2.1 Measuring Child Poverty in Ghana.....	214

8.2.2 Determinants of child poverty	216
8.2.3 Examining the Nexus of Child Poverty and Child Academic Performance	217
8.2.3 Drivers of Stunting in the Household.	218
8.2.4 Who should go to School: A Son Preference Analysis.....	218
8.3 Contributions to Knowledge	219
8.4 Policy recommendations	220
8.5 Limitations of the study and suggestions for future studies (or) Area for further research	224
REFERENCE.....	Error! Bookmark not defined. 225
APPENDIX.....	259



LIST OF FIGURES

Figure 1: Primary School Enrollment	9
Figure 2: Secondary School Enrollment	9
Figure 3: Overview of Completion Rates	10
Figure 4: Profile of Children who do not Complete School by Sex	10
Figure 5: Child undernutrition over time (%)	14
Figure 6: Child undernutrition over time (no.)	14
Figure 7: Conceptual Framework	89
Figure 8: Stunting by Gender and Wave	181
Figure 9: Prevalence of Stunting by Location and Wave	181
Figure 10: Stunting Prevalence by wealth quintiles across waves	182



LIST OF TABLES

Table 3. 1: Impact of Parental Level of Education on the Presence of Stunting in the Household	97
Table 3. 2: Deprivations and contributions of indicators to MCP, Wave 1, 2 & 3	102
Table 3. 3: Multidimensional Child Poverty per Waves	104
Table 3. 4: Sub-group decomposition of Multidimensional Child Poverty	104
Table 3. 5: Sub-group decomposition of Multidimensional Child Poverty by Waves	107
Table 4. 1: A Prior Expectations	131
Table 4. 2: Summary Statistics of Household Heads	134
Table 4. 3: Determinants of MPI CP based on HHH Characteristics	138
Table 5. 1: A Prior Expectations	148
Table 5. 2: Average of test scores by Region across the three waves	150
Table 5. 3: Average of test scores by Gender across the three waves	151
Table 5. 4: Average test scores by Location across the waves	151
Table 5. 5: Average test scores by MPI across the waves	152
Table 5. 6: The impact of Child, household and School conditions on Math and English Test – Primary Level (9 -11 years)	153
Table 5. 7: The impact of Child, household and School conditions on Math and English Test – JSS (12-15 years)	158
Table 5. 8: Robustness Checks: The Impact of Child, Household and School Conditions on Math and English Test -- Primary School	162
Table 5. 9: Robustness Checks: The Impact of Child, Household and School Conditions on Math and English Test –JSS (12-15 years)	164
Table 6. 1: Descriptive Statistics on Households	172
Table 6. 2: Prevalence of Stunting according to Waves (Individual Level)	174
Table 6. 3: A Prior Expectations	175
Table 6. 4: Effect of Poverty on Stunting in the household	178
Table 6. 5: Effect of Changes in Household Welfare on Stunting Status of the Household	180
Table 6. 6: Drivers of the presence of a stunted child in the household	185
Table 6. 7: Impact of Parental Level of Education on the Presence of Stunting in the Household	187



CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Poverty is a global phenomenon. It has serious implications for the total well-being of its victims. About 1.3 billion people across 101 countries are multidimensionally poor (23.1%) while close to 440 million people in low-income economies including Africa are multidimensionally poor (Oxford Poverty and Human Development Initiative, 2019). In addition, Sub-Saharan Africa (SSA) and South Asia are identified as the poorest developing regions based on the international poverty line. The situation in these regions may worsen as more people are likely to fall below the poverty line due to inequality, war, crime, and diseases. Over the years, international institutions like the United Nations, the World Health Organization (WHO), and the International Monetary Fund (IMF) have engaged leaders of governments in the fight against poverty. Aside from the formation of organizations such as the United Nations Development Program (UNDP) and Food and Agriculture Organization (FAO) to address global poverty, the Millennium Development Goals (MDG) of the past and now the Sustainable Development Goals (SDG) were also instituted to join the fight against global poverty. SDG 1 aims at ending poverty in all forms and dimensions while almost all the other goals are indirectly linked to poverty reduction (United Nations, 2015).

The deprivations children experience are different from what adults experience due to differences in their needs. Children are among the most vulnerable groups in the world. Just like adults, poor children also suffer from multiple deprivations, making child poverty a multidimensional concept (Minujin, Delamonica, Davidziuk, & Gonzalez, 2006). Multidimensional poverty goes beyond monetary poverty and it is entrenched in the concept of human development. According to the

2019 Oxford Poverty and Human Development Initiative Report, children form fifty percent of the 1.3 billion multidimensionally poor people. One-third of these children are below the age of 10 years.

Although Africa is making major strides in economic growth, poverty reduction within the region is crawling sluggishly due to factors such as rapid population growth, structural impediments (e.g. inequality, especially gender inequality, low human capital and large infrastructural deficits), over-dependence on natural resources and conflict (Beegle & Christiaensen, 2019).

There is a clear distinction between child poverty and adult poverty. Children are not expected to earn income and are highly dependent on their parents or caregivers for their sustainability. In cases where children work, they may not always have control over the income they earn. This makes children very vulnerable (Roelen et al., 2010). The employment status of a parent is important in determining child poverty (Thévenon, Manfredi, Govind, & Klauzner, 2018). Due to the vicious nature of the poverty cycle, children are easily trapped in poverty from conception. When children are deprived of the opportunity to grow and develop in a conducive environment, they tend to have poor health, difficulties in learning, poor grades in school, drop out of school, girls become pregnant at an early age, have low aspirations, have lower skills, earn relatively lower income in the future and or become unemployed. The poor conditions of these children may persist in adulthood and lead to life-long abridged occupational fulfillment (Hair, Hanson, Wolfe & Pollak, 2015).

It is therefore important to prioritize child poverty for a number of reasons. First, child poverty is a violation of a child's rights (UNICEF, 1989). Second, child poverty has a devastating effect on children and society as a whole. Third, if poorer households tend to have more children, then more children are likely to live in poverty than adults (Cooke, Hague, Tiberti, Cockburn & El Lahga,

2016). Fourth, poverty could last a lifetime for children and deepen the poverty cycle. Fifth, child poverty is transmitted across generations. Poor children are likely to grow up to become poor adults. This is because the deprivations children experience in their childhood are also associated with adult poverty (Oduro & Osei Akoto, 2008). Sixth, child poverty is costly as it has the potential to destroy national potential.

Children from poor households are likely to have lower academic performance compared to their counterparts from non-poor households (Hair et al., 2015; Ge & Wang 2019). These children are also likely to suffer from malnutrition and other health problems. Poor academic performance coupled with health, social, and emotional challenges put a limitation on the child's opportunity for employment as well as earning sufficient income in the future. This situation prolongs the poverty cycle as poor children are likely to become poor adults and give birth to poor children.

Enabling children to reach their full potential in life, through human capital development will physically and intellectually open doors to a prosperous future for them. Human capital is the primary driver of the economic growth of a nation (Beegle & Christiaensen, 2019). It is the sum of a population's health, skills, knowledge, and experience. Human capital development according to the Organization for Economic Cooperation and Development (OECD) is defined as "the knowledge, skills, competencies, and attributes embodied in individuals that facilitate the creation of personal, social, and economic well-being" (Brian, 2007, p. 28). It is also referred to as the stock of knowledge, skills, and other personal characteristics embodied in people that help them to be more productive (Botev et al., 2019).

Having access to learning material facilitates the cognitive development and academic performance of the child (Burnett & Farkas, 2009). Lack of cognitive stimulation in the home is

one main reason accounting for the negative impact of poverty on a child's intellectual development (Walker et al., 2007).

Children are unable to reach their full growth and developmental capacity in an atmosphere of insufficient social and material resources (Black et al., 2013). Socioeconomic and demographic conditions within which a child is born influence the health status of the child (Chowdhury et al., 2020). Child undernutrition has been a major challenge in global health. Undernutrition among children makes them susceptible to illness and mortality. According to the World Health Organization, addressing the issue of undernutrition will aid prevent 45% of deaths among children. Children who survive undernutrition are not spared from its consequences. These children usually suffer from delayed cognitive development which is a severe short-term effect (Black et al., 2013), lower school achievement (medium-term), lower earnings in the future and the likelihood of contracting chronic non-communicable diseases in their later life, which is a long term effect (Martin-Gronert & Ozanne, 2012).

Malnutrition is a global public health concern, which manifests in various forms, especially in middle and low-income countries. Malnutrition in the form of undernutrition and overnutrition hinders economic development and worsens poverty. Undernutrition makes children wasted (extremely thin for their height) or stunted (linear growth retardation). Stunting is a suboptimal health condition that indicates nutritional deprivation over a while. It sets in very early in life, usually from in utero to 6 years of age.

Good nutrition is highly associated with good health and is linked to cognitive development, especially among children (Black et al., 2013). Children who are deprived of macro-nutrients such as carbohydrates, protein and fats and micro-nutrients such as vitamin A and zinc are prone to or at risk of being stunted (Hendrayati, 2015). Stunting is a growth disorder that is influenced by both

genetic and environmental conditions. These environmental conditions may include access to nutritious meals as well as household demographic conditions and household composition (Ntshebe, Channon & Hosegood, 2019). Children who live in large households and rural communities are more likely to be stunted than those who live in smaller households in urban areas (Bogale, Bala, Tadesse & Asamoah, 2018). In addition, children of less educated mothers are more likely to be stunted than children whose mothers are highly educated (Glewwe, 1999; Nketiah-Amponsah, Boakye-Yiadom, & Agyemang, 2016). The environmental conditions such as malnutrition one experiences during early life have a long-term effect on the physiology, metabolism and subsequently, the health of the individual. A suboptimal health condition such as stunting can lead to a permanent change in the structure and function of critical organs in the body such as the brain, the endocrine, the pancreas and the kidney. This hinders optimal development and can make the person susceptible to chronic diseases later in life (Martin-Gronert & Ozanne, 2012).

Gender inequality is a global and social phenomenon. It is the discrimination on the basis of gender. It is a major setback to economic growth and has the potential to water down the impact of poverty reduction strategies. Gender inequality has long-term implications for the health and the future earning ability of children. Marphatia et al. (2016) showed that children tend to benefit in terms of good health when women can participate equally with men in society. Different groups experience gender inequality differently. Gender inequality among children is premised on the background of gender-based discrimination (Hirsu, Hashemi & Quezada-Reyes, 2019) and in a subtle form gender-based preference. Gender-based preference tends to determine how children are treated within the household. Most cultures around the globe value male children more than female children (Tafuro & Guilmoto, 2020). Modern reproductive technology has made prenatal

sex detection possible. This has given rise to sex-selective abortions and sex-ratio imbalance in some Asian and European countries (Tafuro & Guilmoto, 2020). The concept of the imbalance in the number of men and women was first noted by the Indian Nobel Prize-winning economist Amartya Sen in an essay titled *"More Than 100 Million Women Are Missing"* in The New York Review of Books in 1990. The issue of son preference has generated research interest in recent years. Son preference is the situation whereby sons are valued over daughters. In some households, sons are valued above daughters and this affects their level of investment in these children along some dimensions such as health and education. Intra-household food distribution is even son-biased in some Asian communities (Brown, Calvi, and Penglase, 2021; Rahman, 2019).

Some parents are likely to make fertility decisions based on gender preference (Norling, 2018). Gender preference has consequences on the economy and demographic status of a nation. At the microeconomic level gender preference could lead to selective abortion, maternal mortality, discrimination in breastfeeding, differential in infant and child mortality impacts, bias in the intra-household allocation of food (Brown et al., 2021) and imbalanced sex ratio (Asadullah et al., 2021; Rahman, 2019). Puri et al., (2011) studied migrant Indians in the United States and revealed that 40 percent of the women interviewed had terminated prior pregnancies with female fetuses and that 89 percent of women carrying female fetuses in their current pregnancy pursued an abortion. These women, though in an immigration context, had access to medical technology and also suffered family violence and reproductive coercion (Puri et al., 2011).

Son preference influences fertility, especially in North Africa (Rossi & Rouanet, 2015). So far as couples have not had boys, they are likely to shorten birth spacing and have additional children. This leads to gender inequality as the average girl child is likely to be weaned sooner, compared

with the average boy and would have to compete quickly with the other siblings. The sex of a child is likely to influence the decision to have additional children (Norling, 2018), thereby affecting family size. Religious affiliation and family system also influence the gender preference of the household (Rossi & Rouanet, 2015).

Girls and young women have the right to quality education just as boys do. Achieving gender equality is central to achieving SDG goal 1, thus ending extreme poverty. It is therefore important to ensure that all stakeholders, the household inclusive, place priority on ensuring that educational opportunities are fairly distributed among both boys and girls in the household and that nothing becomes a barrier in preventing both boys and girls from benefiting from educational investments. Poverty affects the ability of a girl child to access and complete her education. Multiple disadvantages such as low household income, having a disability or living in a rural area or vicinity can affect the girl child's ability to access and complete high levels of education.

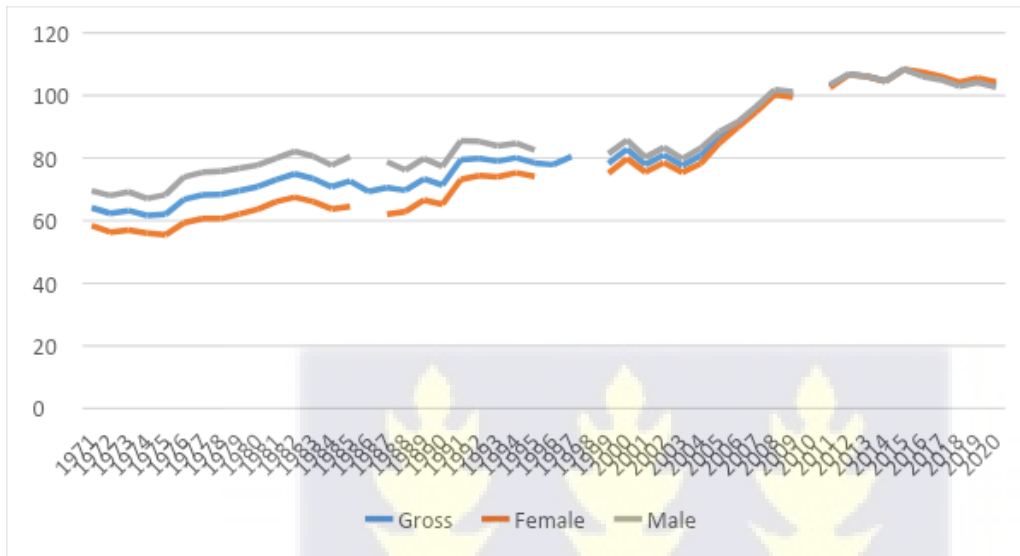
Girls' education benefits both individuals and the nation at large. Women who are well educated tend to have more and better information about nutrition and healthcare. These women are likely to marry at a later age and have well-spaced and healthy children (Wodon, Montenegro, Nguyen, and Onagoruwa, 2018). The children of these educated women are less likely to be stunted (Glewee, 1999). Through their education, they can participate in the formal labour market and earn a higher income. According to the World Bank, the limited educational opportunities for girls and barriers to completing 12 years of education cost countries between US\$ 15 trillion and \$30 trillion in lost lifetime productivity and earnings (Wodon et al., 2018). The study confirmed that less than two-thirds of girls complete primary education and only one-third of girls complete secondary school education in developing countries. Those girls who complete secondary school education are likely to work in the future and earn twice as much as girls who had no education

(Wodon et al., 2018). UNESCO estimates that approximately 129 million girls around the globe are out of school. About 32 million and 97 million are out of primary school and secondary school respectively.

Ghana has crossed some great milestones within the educational sector. Enrollments from the primary to the secondary levels have increased over the years (Figures 1&2). The Free Senior High School (Free SHS) programme has contributed greatly to this feat. As of March 2020, the total enrollment in the secondary level was 404,856. Irrespective of the high levels of enrollment across the various levels of education, there are disparities in the completion rates (Figure 3 & 4). According to the Ghana Education Facts Sheets 2020 report, 71 percent of Ghanaian children complete primary education. This does not however reflect in the completion rate for lower and upper secondary education. There is a steep decline in lower and upper secondary education completion rates as 47 percent and 35 percent complete lower and upper secondary education respectively. A higher share of boys do not complete primary and lower secondary. The narrative changes at the upper secondary where more girls compared to boys do not complete upper secondary. The report attributed the high level of decline in completion rate to dropouts and repetition. This challenge was found mainly among very poor children and those who lived in rural areas. The report confirmed that the gap between the completion rate of children from the richest and poorest quintile widens as they progress through the educational system. Thus only 9 percent of children from the poorest quintile complete upper secondary education compared to the 71 percent in the richest quintile who do so. At the regional level, the high level of disparity and the wide gap raises an alarm. According to the report, regions in northern Ghana lag behind the south at the primary level. The Ashanti, Eastern, and Greater Accra Regions have high completion rates at the lower secondary level while the Upper West Region has the lowest. No region in Ghana is

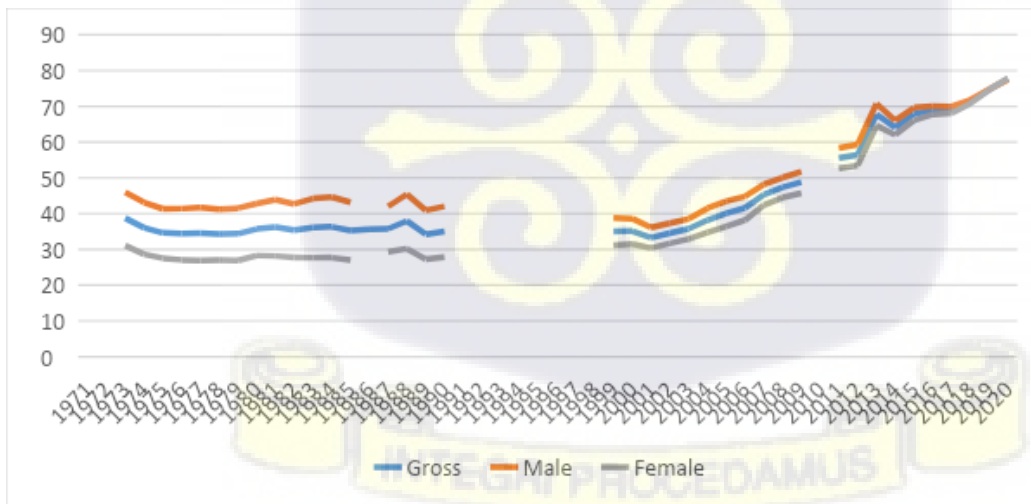
close to achieving universal completion. Volta Region has the worst decline in the rate from primary to upper secondary, with 63 percent of children in the Volta Region completing primary education compared to 15 percent who completed upper secondary education.

Figure 1: Primary School Enrollment



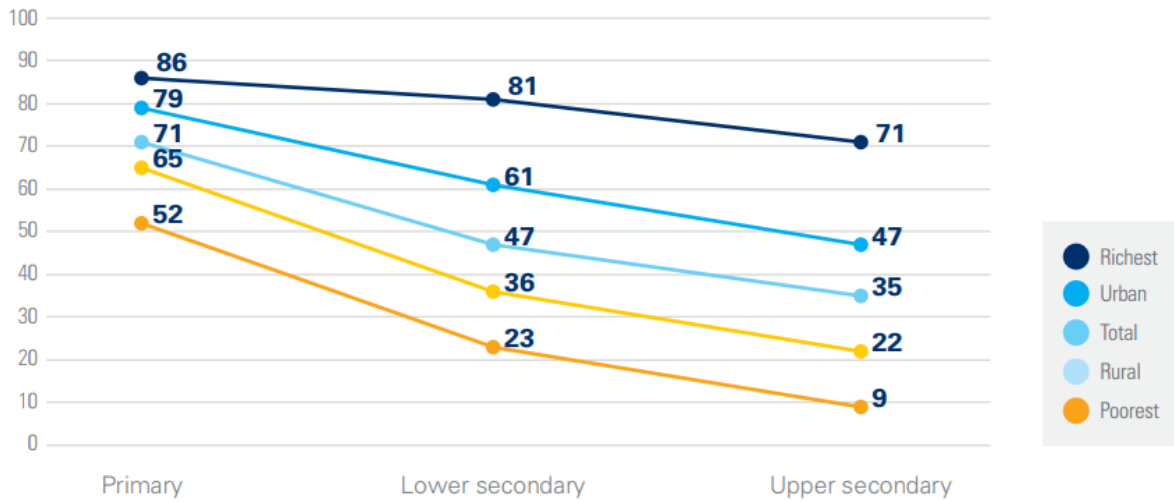
Source: Author’s computation with data from the World Bank

Figure 2: Secondary School Enrollment



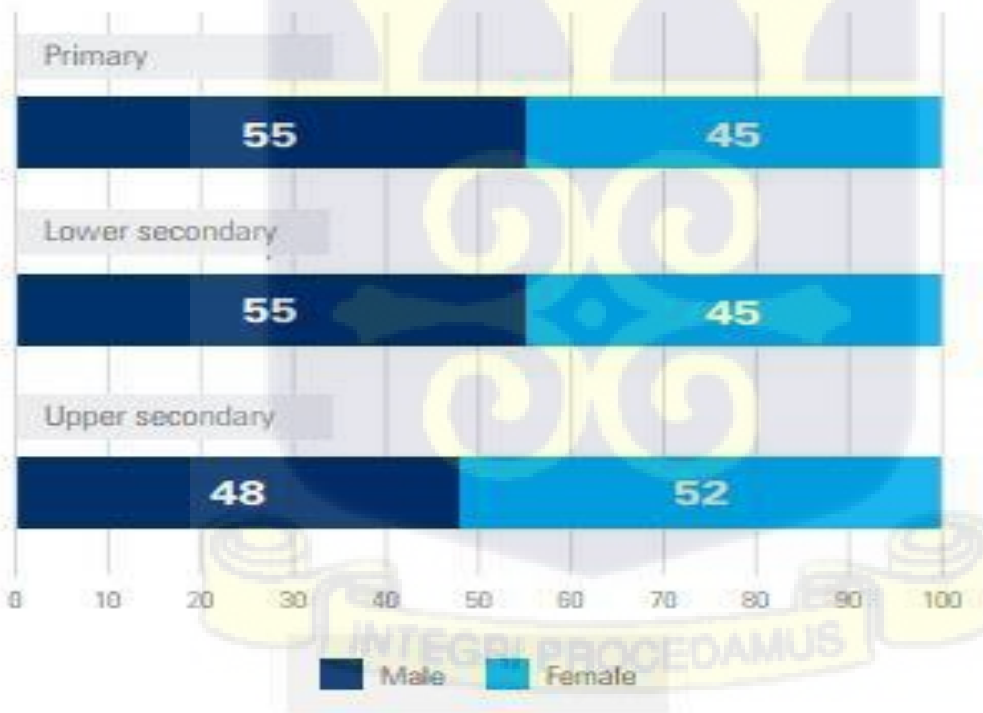
Source: Author’s computation with data from the World Bank

Figure 3: Overview of Completion Rates



Source: Ghana Education Fact Sheets 2020 Report

Figure 4: Profile of Children who do not Complete School by Sex



Source: Ghana Education Fact Sheets 2020 Report

The disparities in the rate of completion cannot wholly be explained by school-based factors. It is important to examine parents' attitudes to get a clear picture of the situation and appreciate the situation at hand. Parental need for child labour, cultural beliefs, poor economic conditions and parents' assessment of a child's potential in educational attainment all contribute to the decision of the household, concerning who goes to school and for how long (Davison, 1993). In addition, education gives the individual the opportunity to participate in activities associated with high returns (Oduro, 2000). Therefore, as important as education is in the route out of poverty, the quality of education provided is critical to having a positive impact of education on poverty reduction (Oduro, 2000).

1.2 Problem Statement

The Ghana Statistical Service Poverty Report reveals that there was not much change in the poverty rates between 2012/2013 to 2016/2017. Individuals living in urban households on average, have a much lower poverty rate than rural households. Out of the then ten administrative regions in Ghana at the time, three regions, i.e. the Northern Region, Upper East Region and Upper West Region of Ghana record the highest level of poverty (GSS, 2018)

According to the National Development Planning Commission (NDPC) Report on Multi-Dimensional Child Poverty in Ghana, about 40 percent of children are likely to be poor in Ghana. The same report reveals that 73.4 percent of children in Ghana are multidimensionally poor. These children are mostly deprived in sanitation, housing, learning and protection dimensions (NDPC, 2020). The sixth Sustainable Development Goal requires that everyone has access to clean water

and sanitation. Sanitation plays a very important role in the health and development of a child (Peracchi & Arcaleni, 2011).

Although Ghana was one of the fast-growing economies in 2017, poverty was still prevalent in Ghana. The country has implemented some social interventions to alleviate poverty among vulnerable groups in Ghana. These social interventions include the Free Senior High School Education, the School Feeding Programme, free distribution of exercise books and textbooks, the capitation grant, the Livelihood Empowerment Against Poverty, (LEAP), the Community-Based Health Planning Services (CBHPS), National Immunization Against polio, etc. (GSS, 2018).

Although these programs have improved the welfare of some Ghanaians in one way or the other, child poverty and its adverse effects on children continue to be a major concern. Children who are deprived may not have a conducive environment to study and perform well academically. The wealth status of the household may not duly reflect the welfare of the child. Hence, examining the effect of poverty on children's academic performance using household wealth status may not give a true picture of how poverty or deprivation affects the academic performance of children.

Firstly, children do not live on their own. They rely on parents or guardians for their needs. Hence the rule of thumb should be that the needs of children would be prioritized in the households. As emphasized earlier household resources are not equally distributed among members of the household. Hence, measuring child poverty based on household welfare could be problematic. In addition, a child's poverty status is usually the result of multiple deprivations which goes beyond the household welfare. For instance, a child who is identified as non-poor based on his or her household's welfare status maybe deprived in terms of schooling, nutrition, health and or poor sanitation (Alkire and Foster, 2011). It is therefore important to take into account the level of

deprivation of a child when measuring child poverty. For instance, it will be unfair to compare a child who is deprived of only education to one who is deprived of both education and health.

Secondly, studies on child poverty gives direction to policymakers as it is more prudent to channel resources to children who suffer from multiple deprivations as compared to those who suffer from single deprivations. This procedure supports priority-based interventions.

Health forms an important component of the dimensions of child poverty. The health status of children can be reflected in whether the child is stunted or not. Stunting is a linear growth disorder, experienced by children below 6 years. Stunting among children is a challenge both at the national and international levels. Stunting is the effect of chronic undernutrition. Approximately, one million children die from stunting. Reducing the prevalence of stunting among children who are below 6 years is, therefore, a global priority. In 2017, over 150.8 million (22.2%) children under five years were stunted even though, there had been a downward trend in stunting since 2000. Africa has recorded a decline in stunting from 38.3% to 30.3%, however, the absolute number of stunted children in Africa has increased due to population growth (Eshete et al., 2020). According to a joint report by UNICEF-WHO-The World Bank (2021), two out of five children who are affected by stunting live in Africa. In Sub-Saharan, Africa 32.3 percent of children are stunted.

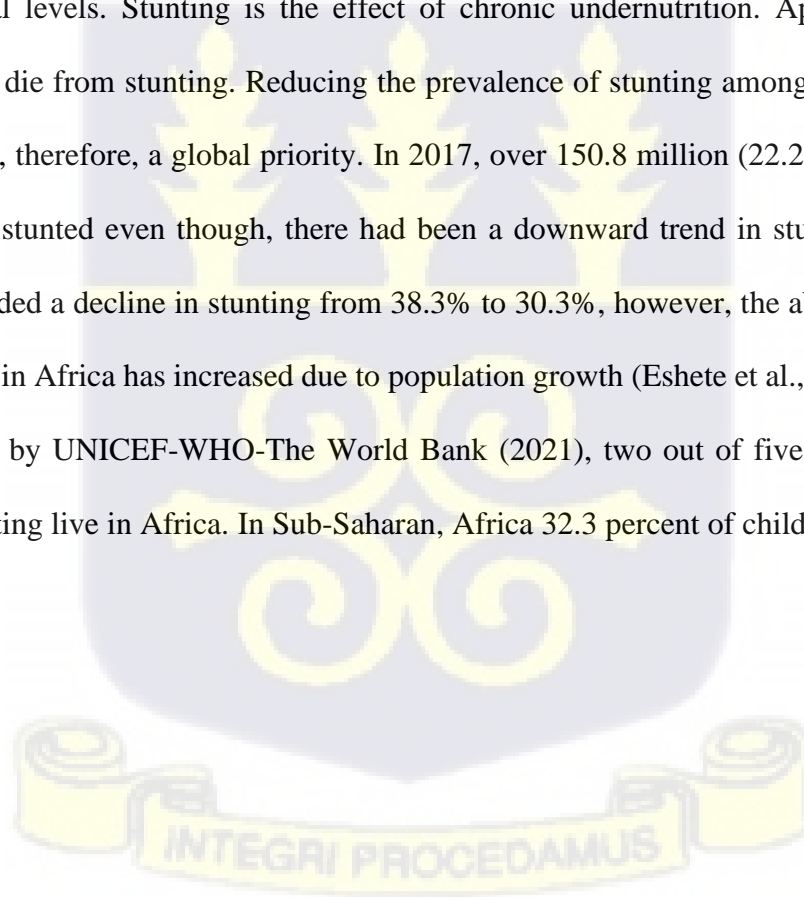
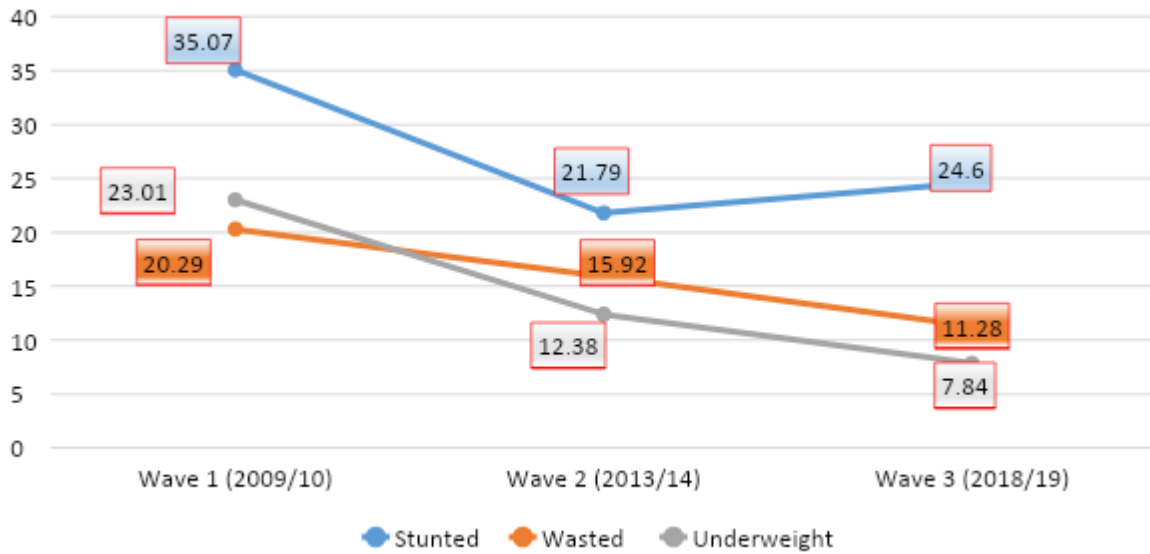
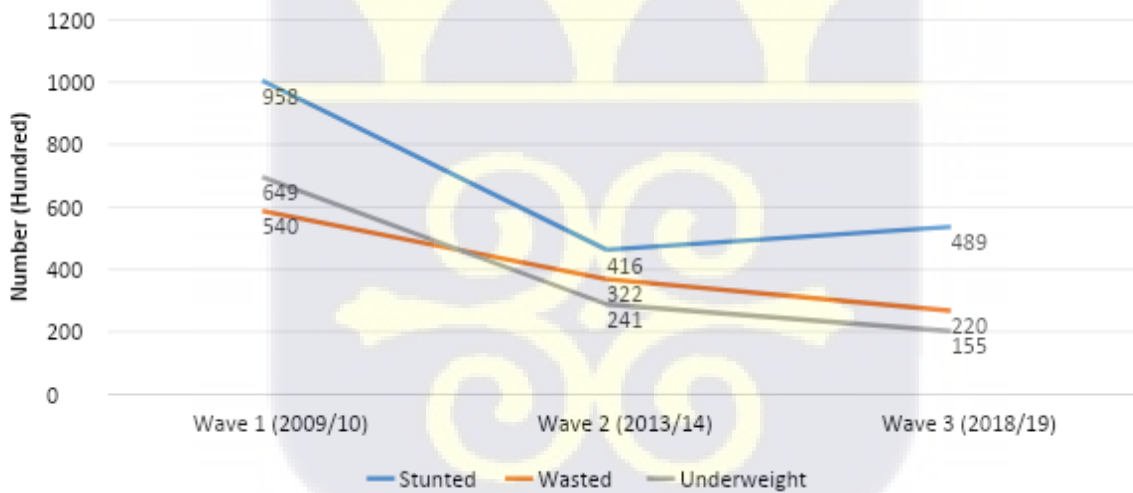


Figure 5: Child undernutrition over time (%)



Source: Author’s construct based on the Ghana Socioeconomic Panel Data

Figure 6: Child undernutrition over time (no.)



Source: Author’s construct based on the Ghana Socioeconomic Panel Data

Compared to the other forms of undernutrition i.e. wasting and underweight, the prevalence of stunting in Ghana declined to 22% in 2013 but increased to 25% in 2018. Aside from the decline and rise of stunting from 2009 to 2018, it is the highest (in terms of rate) compared to underweight, and wasted. This situation is worrying and requires interrogation to assess the rationale for the

rise in the prevalence of stunting to 24.6 percent in 2018/2019 after the country witnessed a decline from 35.1 percent in 2009/2010 to 21.8 percent in 2013/2014 (Figure 5). Stunting has an intergenerational effect. Studies have shown mothers who were stunted during their early developmental years are likely to be vertically impaired. The height of these women has an impact on the children they give birth to (Addo, Stein, Fall, Gigante, Guntupalli, Horta, Kuzawa, Lee, Norris, Osmond, Prabhakaran, Richter, Sachdev & Martorell, 2015; Andersen, Stein, Reynolds, Behrman, Crookston, Dearden, Penny, Schott, & Fernald, 2016). These vertically impaired women are likely to have complications during delivery (Black et al., 2013) such as small for gestation age (Addo et al., 2015).

Poverty alleviation programs such as the Livelihood Empowerment Against Poverty (LEAP) are targeted at improving the welfare of members of the households. LEAP for instance has increased enrollment at the secondary level (De Groot et al., 2015). Nonetheless, shocks such as Covid19, floods, droughts and hikes in prices are likely to water down the progress of poverty alleviation programs. Resources in the household are not equally distributed and the sharing of resources could depend on the bargaining power of household members (Majumder & Mitra, 2023; Sen, 2002). Due to some arrangements in the household, some members of the household are likely to benefit from these interventions while others may be worse off. Children may be in a disadvantageous position since they may have low bargaining power. This could reflect in the poor health of the children in the household.

Studies have shown that possession of household assets has a positive impact on a child's academic performance. Specifically, children from households, which owned at least one household asset, scored almost one point higher in English than households, which had no household possession. (Chowa et al., 2013). Children from low socioeconomic households are locked into poverty traps,

which creates achievement gaps (Burnett & Farkas, 2009). The longer children stay in poverty, the greater their academic deficits (Hair et al., 2015). Some studies (Chowa et al., 2013; Fang et al., 2018; Mollborn et al., 2014) have used household wealth conditions as a proxy for poverty to assess the impact of poverty on child academic performance. As stated earlier, this is problematic as household wealth is not evenly distributed among members of the household. The use of household wealth may not reflect the true impact on a child's academic performance.

As shown earlier, there are great disparities in the school completion rate between boys and girls in Ghana. These disparities go beyond school-based factors. It is important to examine parents' attitudes for a clearer picture of the situation. Compulsory universal educational reforms increase enrollment and educational attainment (Björkman-Nyqvist, 2013; Gu, Hua, McKenzie & Zheng, 2022). The introduction of Free Compulsory Universal Basic Education (FCUBE) in Ghana has increased enrollment, but it has not been able to remove the disparity in the access to education between girls and boys, nor has it improved the completion rate, especially at the secondary school level (Figure 3 &4). Although the government is responsible for providing quality education, the household also has a part to play in giving equal opportunities to daughters to go to and stay in school.

Gender preference has a subtle way of perpetuating gender inequality. The preference of households for boys may create some biases against girls. Gender bias within the household may water down girls' ambitions and their ability to fully participate in their educational activities and formal labour participation in the future. Preference for a specific gender, particularly males may lead to bias and discrimination against the other gender in this case females. This means that gender discrimination in the workplace and society at large could take its roots in the household where females are discriminated against. Gender preference is subtle. It however has the tendency to

evolve into gender discrimination if measures are not put in place to nip it in the bud. Households often prioritize the needs of their sons over those of their daughters due to son preference. Sons are therefore likely to have superior education, nutrition, and health in homes where they are chosen over daughters, whereas daughters are ignored. As the disparity between boys and girls in health, nutrition, and education grows, this might keep girls in poverty (Rahman 2019)..

1.3 Objectives of the Study

The overall objective of this study is to examine child poverty in Ghana. The study sets out five specific objectives to analyze the main objective. These objectives are

- i. Measure and assess child poverty in Ghana.
- ii. Examine the determinants of child poverty.
- iii. Examine the nexus between child poverty and academic performance.
- iv. Examine the driver of stunting in the household.
- v. Examine son preference in Ghana.

1.4 Research Questions

The specific research questions that the study seeks to answer are:

1. What is the level of child poverty in Ghana?
2. What factors influence child poverty in Ghana?
3. To what extent does child poverty affect children's academic performance?
4. What factors affect having a stunted child in the household?
5. What factors influence son preference in the household?

1.6 Justification for the Study

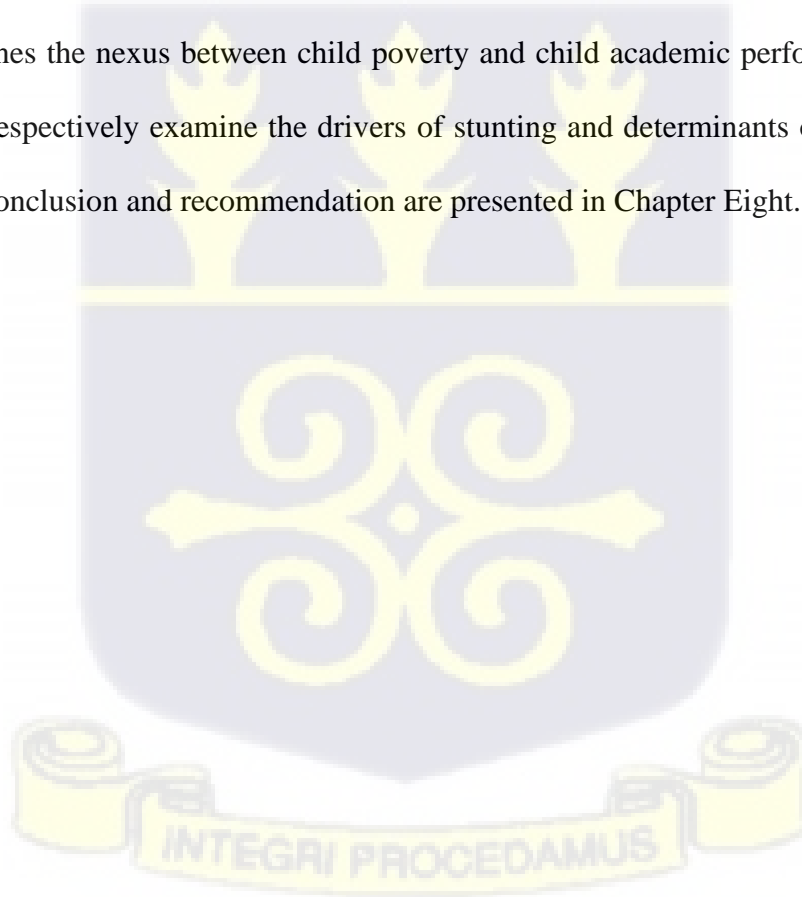
Extensive studies have been executed on the concept of poverty. As a concept on its own, child poverty deserves an extensive consideration in researching it. Thus the general poverty metrics cannot be used because as stated in the previous sessions, children do not earn income and are highly dependent on their parents or caregivers.

The justification of this study is based on three main grounds. First, the study revolves around three specific targets of the SDGs. These are (i) SDG 1.2, which aims at reducing by at least half the number of men, women, and children of all ages living in poverty by 2030, (ii) SDG 2.2 which requires all countries to end all forms of malnutrition, including achieving the international target on stunting in children under 5 years of age by 2025, and (iii) SDG 5.1 which highlights elimination of gender inequality and requires countries to end all forms of discrimination against women and girls everywhere. Secondly, this research will provide policymakers and analysts of poverty with the necessary tools to address issues concerning child poverty. Thus, through this study, the specific needs of children come to light or are revealed thereby providing a concrete blueprint for policymakers in the fight against child poverty. As Haughton & Khandker (2009) have revealed, it is important to measure child poverty because measuring child poverty keeps poor people on the agenda so policymakers do not lose sight of its issues, it also identifies the poor people so appropriate interventions could be targeted towards them. In addition, it helps to monitor and evaluate projects and policy interventions geared toward poor people.

The study also contributes to the debate on stunting in Ghana. Stunting influences immensely the intergenerational cycle of poverty. The fight against stunting is necessary not only for the present generation but for the generations to come (Addo et al., 2015; Andersen et al., 2016). It has therefore become critical to identify the drivers of stunting among children.

1.7 Outline of the Thesis

This thesis is presented in eight chapters. Chapter One presents the introduction of the thesis. The background of the thesis, the problem statement, the research objectives, the research questions, and the justification of the thesis are presented in the introductory chapter. Chapter Two presents the Literature Review where the concept of child poverty, the definitions of child poverty by some institutions as well as the reviews of relevant literature and the theoretical underpinnings needed to carry out the empirical analysis are presented. Chapter Three, the first empirical chapter presents results for the measurement, trends and dynamics of child poverty in Ghana. This is followed by Chapter Four where the determinates of child poverty are examined. In Chapter Five, the study examines the nexus between child poverty and child academic performance. Chapters Six and Seven respectively examine the drivers of stunting and determinants of son preference. The summary, conclusion and recommendation are presented in Chapter Eight.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Poverty from an economic stance has been viewed from the perspective of income and consumption levels. The new approaches to understanding poverty have evolved over the years. Michael et al. (1997) recommended a new approach to measuring poverty which more accurately categorized poverty across groups, time, and space. Their study recommended the use of an equivalent ratio to account for economies of scale as well as factor in money and near money disposable income to determine appropriate thresholds for establishing a poverty status. Although this approach is still relevant today in examining material deprivation of households other contemporary approaches such as the multidimensional poverty, the capability approach and social exclusion measures of poverty go beyond the household income and consumption level.

It has become necessary to consider and analyze the new approach to poverty that can better tell the story of development. Since each approach to the study of poverty has its unique strengths and weakness, the choice of an approach to measuring poverty or studying poverty should be backed by the purpose of the study. In addition, no poverty theory is self-sufficient; an integrated approach to poverty analysis is essential for a comprehensive appreciation of the dynamics associated with poverty, specifically child poverty. This section reviews the concept of child poverty and extends a focal lens to the definition of child poverty by some international institutions. It also presents the literature review of this study. It begins with the concept of child poverty. It also presents a review of theoretical and empirical literature relevant to the study.

2.2 Concept of Poverty

According to Adam Smith, “No society can surely be flourishing and happy, of which by far the greater part of the numbers are poor and miserable” (Smith, 1776, p1). The devastating effect of poverty has a destructive influence on life’s trajectory from conception to old age. Its cyclical nature thus, the likelihood of households being plunged into periods of poverty after relatively short periods of economic stability has raised concerns in the past and currently, its reduction and or eradication has become one of the main targets of most governments, especially African governments. Although poverty is a widely used concept in economics and on the global front, its definition has raised some debates. Poverty could have different interpretations depending on the context of its usage (Gordon and Spicker, 1999; Gweshengwe & Hassan, 2020). The many diverging views about the definition of poverty are a clear indication that the definition of poverty is not straightforward.

Rowntree (1901) considered a poor family as one whose total earnings are insufficient to obtain the minimum necessities of merely physical efficiency.

According to Townsend, individuals, families and groups in the population can be said to be in poverty when they lack the resources to obtain the types of diet, participate in activities, and have the living conditions and amenities which are customary, or at least widely encouraged or approved, in the societies to which they belong (Townsend, 1979, p.1).

Beveridge had this to say, “In considering the minimum income needed by persons of working age for subsistence during interruption of earnings, it is sufficient to take into account food, clothing, fuel, light and household sundries, and rent, though some margin must be allowed for inefficiency in spending” (Beveridge, 1942, p.1).

The World Bank has referred to poverty as the inability to meet basic needs such as physical (food, health, shelter, education) and non-physical needs such as participation and identity required for a meaningful life (World Bank, 1996).

The United Nations Development Programme (UNDP) defines poverty as the “denial of opportunity and choices most basic to human development. To lead to a long healthy creative life. To enjoy dignity, self-esteem, the respect of others and the things that people value in life.” (UNDP, 1998, p. 25).

The Ghana Living Standard Survey (GLSS) identifies poor people using an economic index. It thus characterizes the poor as those subsisting on a per capita income of fewer than two-thirds of the national average. It also identifies “hardcore” poor people as those with income below one-third of the national average. Currently, the poverty line is GH 1,314.05 while the extreme poverty line is GH792.05 (GSS, 2018). From the method used to identify the poor, it suggests that GLSS conceptualizes poverty as does Townsend (1979) and Beveridge (1942).

Some schools of thought view poverty as a voluntary phenomenon while others view it as self-imposed. According to the classical school of thought, poverty is self-imposed, thus the individual is responsible for his or her own behaviour or decisions which in one way or the other can make them poor or rich. The neoclassicals however believe that there are some external factors that directly and indirectly affect individuals such as employment, poor health care, lack of assets, etc. which the individual has no control over. The individual therefore may not be entirely responsible for his or her own poverty (Davis, & Sanchez-Matinez, 2015).

Poverty is a universal concept, however, its definition is usually contested. Depending on the area of discourse, poverty could have overlapping meanings. (Gordon and Spicker, 1999). Poverty is a

dynamic concept. While Townsend (1962, p. 219) clearly explained that “poverty is a dynamic, not a static concept”, Berghman, 1995 differentiates poverty from social exclusion and argues that Poverty is a static concept while social exclusion is dynamic.

According to the 1999 Opportunity for All (OFA) reports, “poverty affects different aspects of people’s lives, existing when people are denied opportunities to work, to learn, to live healthy and fulfilling lives, and to live out their retirement years in security. Lack of income, access to good quality health, education and housing, and the quality of the local environment all affect people’s well-being. Our view of poverty covers all these aspects. Low income is an important aspect of poverty. However, short spells of low income may not damage an individual’s wellbeing or prospects in the longer term. Our strategy focuses on those who are or are at risk of becoming trapped on low incomes for long periods, especially those who have limited opportunities to escape. The problem is not restricted to limited income.” (Department of Social Service, 1999, p 23)

According to the United Nations (UN), absolute poverty is “a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income but also on access to services” (UN, 1995, p 57). In Rowntree’s (1901) and Orshansky’s (1965) definitions of poverty, the absolute minimum is identified as the ‘basic need’ which includes food, clothing, and shelter. The minimum amount needed to meet these basic needs are compiled to determine the poverty line. This is also referred to as the *Basic Needs Approach* of absolute poverty.

Relative poverty is defined as a minimum acceptable standard of living in relation to a specified standard. To Peter Townsend, poverty was “objectively and applied consistently only in terms of the concept of relative deprivation.... The term is understood objectively rather than subjectively.

Individuals, families, and groups in the population can be said to be in poverty when they lack the resources to obtain the types of diet, participate in the activities, and have the living conditions and amenities that are customary, or at least widely encouraged or approved, in the society to which they belong” (Townsend, 1979, p 31). Thus, relative poverty is when a person is identified as poor when the quality of their lives does not reflect or is not in line with the standards of the society or culture in which they live.

Hagenaars & de Vos, (1988), identified 3 categories of poverty definitions under which other definitions would fall. Thus; (1) Poverty is having less than an objectively defined, absolute minimum, (2) Poverty is having less than others in society (3) Poverty means not having enough to get along.

Rowntree (1901) and Beveridge (1942) definitions of poverty are uni-dimensional, thus focusing only on income. However, income as a single indicator is not enough to define poverty. The definition of poverty over the years has evolved from a monetary perspective to a wider range of issues such as political and social exclusion. As Amartya Sen’s capability approach depicts, income is an inadequate measure of poverty (Sen 1993;1999). A multidimensional approach to the definition of poverty seeks to define poverty beyond a monetary concept. A person is considered to be multidimensionally poor if the person is deprived in a number of indicators such as education, health, good standard of living, or good housing. Multidimensional poverty, therefore, occurs when a person experiences multiple deprivations at the same time.

Although poverty has been defined from the perspective of inadequate income, the definition of poverty from multidimensional deprivation best suits this study. This is because children, the main unit of analysis in this study do not earn income. In addition, poverty is a complex and multidimensional phenomenon (Chakravarty & Chattopadhyay, 2018), hence a uni-dimensional

approach to the study of poverty is inadequate. Adopting a multidimensional approach therefore provides a comprehensive perspective of the level of deprivations households are likely to experience. The dimensions of poverty are interconnected. For instance, individuals from multidimensionally poor households may lack quality education and also have limited access to high earnings, as well as be in the position to afford quality healthcare. Policy makers acknowledge the comprehensiveness and interconnectedness of poverty, hence need to adopt a comprehensive redress of poverty. Furthermore, a multidimensional approach to poverty analysis gives policymakers insight into specific areas (in this case dimensions) that need to be addressed. Subsequently, specific interventions or policies are then earmarked to address specific deprivations within a targeted population, thereby increasing the effectiveness of poverty reduction strategies.

2.3 Child Poverty

According to UNICEF, a child is someone between the ages of 0 to 17 years. In Ghana, the Children's Act of 1998 defines a child as a person below the age of 18 years. Child poverty may be easily comprehended as the children or young people who experience poverty. Defining child poverty is necessary because it has implications on the type of poverty reduction strategies, which are adopted as well as provides indicators for measuring the progress of these poverty reduction strategies. How then should child poverty be defined? Should it be different from the definition of adult poverty or should it be defined in relation to adult poverty? Child poverty is different from adult poverty as it has different causes and different effects.

Child poverty can be defined as poverty experienced by children. The approach used to measure poverty presents a unique definition of child poverty. For instance, the deprivation approach

defines child poverty by identifying a child's access to some basic needs and services required for the holistic development of the child.

A study conducted by the University of Bristol and the London School of Economics defined child poverty by focusing on the child's deprivation of food, clean water, sanitation facilities, healthcare services, shelter, formal education, and information (Gordon, Nand, Pantazis, Townsend, & Pemberton, 2003). Thus 'child poverty is when a child experiences deprivation of the material, spiritual, and emotional resources needed to survive, develop and thrive, leaving them unable to enjoy their rights, achieve their full potential, or participate as full and equal members of society' (UNICEF, 2005, p.3). The UNICEF definition of child poverty implies that economic security, as well as a human rights approach, should be incorporated into policy recommendations aimed at fighting against child poverty. The definition implies that UNICEF is an advocate of a human rights-based approach.

Recently, Biggeri & Cuesta (2021) proposed a new framework for child poverty, thus the Integrated Framework for Child Poverty (IFCP). This new framework is a combination of three conceptual approaches, thus the Human Rights, Basic Needs, and Capability Approach. The IFCP Framework describes how the dynamics of the multidimensional Child Poverty link with the resources (goods and services) available to the child's capabilities (opportunities) and achieved functionings (Outcomes). The framework explains the mediating role the individual, social, and environmental factors play in this framework. It also helps to differentiate the child's outcomes i.e. (achieved functions), opportunities (child capabilities), and resources available to a child. The framework takes into account the mediating role of the household, individual, and community play in this framework and explores the constraints that contribute to a child's overall well-being.

The Childhood Poverty Research and Policy Center (CHIP)

The CHIP is a United States-based research organization, committed to addressing issues of child poverty in the United States. They provide resources for improving the lives of children through research, policy development, and advocacy. CHIP (2004) identifies child poverty as young people growing up without access to different types of resources that are vital for their well-being and enable them to fulfill their potential.

According to CHIP, child poverty means a child

1. growing up without an adequate livelihood such as access to financial and nutritional resources needed for survival and development.
2. growing up without opportunities for human development such as quality education, healthcare and good sanitation.
3. growing up without good family and community structures that nurture, protect and provide for them.
4. Growing up without the chance to voice out their opinion.

Like UNICEF, CHIP also identifies child poverty as multifaceted and supports anti-poverty strategies that address the different aspects of child poverty.

United Nations Development Program (UNDP)

UNDP advocates a hybrid approach to measuring child poverty, thus a mixture of the basic needs approach and the human rights approach. It is of the view that to break the cycle of child poverty, essentials such as security, nutrition, education, shelter, water and sanitation needed for children to develop holistically should be provided for them (UNDP, 2004; 2020). It explains child poverty as the denial of the socio-economic rights of a child that have been stated in Articles 26 and 27 of

the Convention on the Rights of the Child (CRC). According to Article 27, children have the right to a standard of living which is adequate for the child's physical, mental, moral or social development (UNDP, 2004).

Save the Children

Save the Children, a Non-Governmental Organization also links child poverty to issues of human rights. According to this NGO, the fight against child poverty is more of a human rights issue than a development issue. It builds its human rights concepts on the 'A World Fit for Children' principles, which were officially championed during the 2002 UN special session on children (Save the Children, 2003). These are

1. To place children first and seek their best interest.
2. To invest in children.
3. Leave no child behind, thus ensuring equality and nondiscrimination.
4. Care for every child.
5. Educate every child.
6. Protect children from harm and exploitation.
7. Protect children from war.
8. Combat HIV/Aids.
9. Listen to children and ensure their participation.

According to Jones and Sumner (2011), the rights-based approach identifies child poverty as a violation of human rights. Although material and human indicators are important in determining the developmental well-being of a child, they give limited information as to whether a child is flourishing in a society or not (Jones & Sumner, 2011). They proposed a three-dimension (3D)

measure of well-being which ensures that all indicators that are necessary for the holistic development of a child are brought together. It expands the focus from the body/physiology to mind/psychology (Jones & Sumner, 2011). The 3D approach to child poverty puts children and their agency, thus what they can do and be into a holistic view where they are made the focal point of analysis. Within the 3D analysis, the child is made the active agent in terms of voice, vision and visibility. It also discourages tagging deprived children as poor and attaching a stigma that is associated with inferiority to them. In all, the 3D approach integrates the subjective (values, perception and experiences) and relational perspectives (social and personal relations) of well-being in the material perspective (practical welfare and standard of living) of well-being and identifies these three perspectives as independent, co-evolving and dynamically interactive (Jones & Sumner, 2011).

After reviewing available literature on the definition and measurement of child poverty, Minujin et al. (2006) conclude that aside from child poverty being a violation of children's rights, it also results in adult poverty. They argue that given the effect of the definition of child poverty on policy design and implementation, the development of issues relating to child poverty must not be derived from a monetary or income angle but must be done independently. In other words, child poverty must be addressed as a unique phenomenon which demands direct mediation since indirect interventions have failed to address the special needs of children.

In conclusion, poor children and their intensity of deprivation are important for policy making otherwise scarce resources will be wasted without really addressing issues with regard to the deprivation children face. Therefore, identifying a child as poor should not be seen as an inferior association as Jones & Sumner (2011) debate, but rather such identification is necessary for policy interventions in our society. Thus calling a spade a spade and not 'a big spoon' may bring about a

limitation of the essence of a spade. Secondly, it is obvious that there is no single definition of child poverty. Nonetheless, all the studies reviewed in this section make reference to one key term thus ‘deprivation’.

2.4 Theoretical review

2.4.1 Human Capital Theory

Human capital has a role to play in poverty reduction. Human capital is the stock of knowledge or skills or social attributes that indicate the ability to perform a task to produce economic value (Becker, 1962; Rosen, 1976). The human capital theory was first formulated by Becker (1962) and Rosen (1976). They argued that the individual has a set of skills that can be improved through deliberate training and education. By accumulating human capital, the value of the student who would later become a worker increases due to the high expertise and productiveness the student gains from training. The assumption of the high returns on accumulated human capital is partly dependent on the ability of future employers to possess relevant information needed for hiring. Employees can therefore present a formal reward or certificate as a signal to employers to confirm human capital accumulation.

The human capital theory is relevant to this study especially the five research questions because it reveals the role of education and health in economic growth and development. The Human capital theory is based on the assumption that the productivity of a nation or population greatly depends on the investments made in education and health. Years ago, economists placed much emphasis on the role of physical assets in economic strength. Though labour was considered to be important,

the economic value of an enterprise was based on the amount of capital investment. Most of the literature on economic development after World War II ignored the role of education and training in economic development (Domar, 1946). Much emphasis was placed on physical assets. Although physical assets such as machines and plants are important in enhancing productivity, skilled labour is needed to run and man them to produce efficiently.

Education and health are key elements of enhancing human capital to improve economic productivity (Becker 1993). Education according to Sen, has an empowering and distributive role. It can redistribute resources within the society, the household and families through the reduction of gender inequality (Sen, 1992;1999). “Education within the capability approach is an unqualified good for human development freedom” (Walker, 2006: p. 168), therefore as a matter of substantive freedom, any hindrance to its achievement is tantamount to deprivation of empowerment as well as economic well-being.

According to the human capital theory, providing children with quality education, health care, and nutrition are investments that have positive and long-term economic prospects for children.

2.4.2 Education beyond human capital

Human capital is a stock of productive skills and technical knowledge embodied in the labour force. Capable of generating private and social returns, Adam Smith (1776) labelled human capital as part of the four fixed capital. Human capital theory (Schultz, 1961; Becker, 1964; and Mincer, 1984) analyzes the ability of how a stock of capabilities in the labour force can generate returns from an economic point of view.

According to the human capital theory, there are costs and benefits associated with building capacity through training, education (be it formal or informal), and work experience. The cost here

includes the direct cost of training or education incurred by the student or worker and the earnings forgone as a result of going through training or education. The forgone earning here refers to what the individual could have earned from gainful employment if he or she had not embarked on the training or education. The benefits on the other hand accrue to the individual in the future in the form of higher earnings. Thus education or training is an investment while the returns are recorded as the difference in earnings they would have received with education and training and the earnings received without education and training. The human capital theory first assumes that education or training will increase the productivity of an individual and secondly, in line with neoclassical economics, such higher levels of productivity will attract higher wages from employers (Spence, 1973).

Vandenberghe, (1999) demonstrates that education policy goes beyond human capital theory. Thus the accumulation of human capital through education depends on the dynamics and structure of the educational service and the individual's background and goes beyond the individual's effort. He argues that the human capital theory is optimistic and assumes that an individual's demand for education will automatically translate into real human capital. According to him, Becker's (1962) human capital theory which presents an individual's cost-benefit analysis is not enough as a foundational theory for education policy. He argues from first a logical point of view and a theoretical point of view. From a logical point of view, he argues that economic analysis of education, the analysis of human capital production previously focused solely on the demand side, ignoring the supply side. The supply side of the educational process is better understood through the production function, which compliments the human capital theory's focus on the demand side. The education production process predicts a much more complex process with organizational and non-monetary inputs, than what the human capital theory conveys. Thus educational participation

takes place through a complex social process. Coleman et al (1966) in the process of exploiting the production function of education found that a child's educational outcome is correlated with his or her socioeconomic background.

Public education has a redistribution effect, thus providing a 'good' to children, independent of the wealth status of the parents (Stiglitz, 1974). Education according to Schultz (1963) has a tripartite description 1) a consumption component where education is perceived as a commodity, in that, people seek education because of the utility derived from acquiring new knowledge, 2) a future consumption component which considers education as having the ability to improve one's capability to consume other goods in life and 3) an investment component where current income opportunities are renounced for higher income projections in the future. Fershtman, Murphy and Weiss (1996) on the contrary perceive education as a process which provides higher social status. Hence people demand education because they want to be esteemed highly by others.

The theory of human capital predicts that an individual will demand education up to the point where the marginal benefit of education is equal to the marginal cost of education. The additional benefits of education depend on the conditions of the labour market, the ability of the individual and the resources invested in education. The amount of education demanded differs among individuals. The amount of education demanded depends on the talent of the individual which boosts the accumulation of human capital in the individual.

The theory of utility maximization, therefore, predicts that the optimal demand for education will be at the point where the marginal utility of additional knowledge is equal to the marginal disutility of renouncing alternative uses of the time involved.

2.4.3 Educational Production Model

The educational production model explains the technical relationship between school and student input and school output (Hansen, 1970). This theory assumes that the effect of schooling can be traced to the development of cognitive skills and attitudes if there is an established link between schooling and productivity and earnings. According to Hansen (1970), school output usually measured by the score of a scholastic achievement is dependent on the school environment, non-school environment as well as the student's ability. Variables used to measure the school environment include the physical endowment of the school, the quality of teaching services and the duration of students' exposure to these inputs. The non-school environment is measured by factors that affect learning outside the school environment such as parents' educational achievement, students' urbanism as well household socioeconomic conditions of the child. The study measured students' ability using the student's attitudes, specifically attitudes towards student's self-concept and sense of control of the environment.

2.4.4 The Grossman Model

The Grossman (1972) model illustrates the theoretical underpinning of the demand for health. With reference to the fourth empirical chapter, the Grossman model offers the underlying framework for exploring the dynamics that influence the demand for health. Health according to the Grossman Model (Grossman 1972) is a durable capital stock that has healthy time as an output. Thus, health production is an investment that has the capacity to increase the capital stock of health. Health investment is achieved through inputs such as medical services, which is a curative input, and one's effort, which is a preventive input. Preventive inputs involve a positive lifestyle such as exercising and good nutrition.

The model also considers health as a commodity that can be demanded or produced. Therefore, just as utility is derived from the consumption of goods, good health as a commodity could also yield some level of satisfaction. Therefore, the utility of an individual is a function of the available stock of health as well as other goods. Hence,

$$U = f(H_t, Z_t) \quad t = 0, 1, 2, \dots, n \quad \dots\dots\dots \quad (2.1)$$

Where

U is the utility level of the individual

H_t is the stock of health at time t

Z_t is the vector of goods at time t

The stock of health of the individual can increase by investing in health. As stated earlier, such investments include good nutrition, exercising and acquiring medical services. With time, the stock of health of the individual also depreciates. The individual derives utility from a healthy time and disutility from a sick time. The two main effects of the demand for health are the consumption effect and the investment effect. The consumption effect of the model depicts that there is a direct utility associated with health. Thus, an individual feels better when healthy. The investment effect depicts that health increases the number of days at the disposal of an individual to participate in market and non-market activities. The stock of health can therefore be expressed as

$$HStock_t = H Stock_{t-1} - \delta H_t + Inv H(I) \quad \dots\dots\dots \quad (2.2)$$

An individual is born with an initial stock of health. The stock of health increases through investment $Inv H(I_t)$ at time t . The rate of production of health is also dependent on the efficiency of the investment in health. For instance, consuming three meals a day is not enough. The meals ought to be balanced with the right amount of calories. The stock of health depreciates

(δH_t) through aging, illness, accidents, and or negligence. The relationship between the individual's current health stock and future health stock is expressed as

$$HStock_{t+1} - H Stock_t = Inv H(I) - \delta H_t \quad \dots\dots (2.3)$$

According to the Grossman model, the individual combines factors such as medical services, nutrition, exercise, sanitation, wealth, etc. to produce health. The household production function for investment in health is given as

$$I_t = f(M_t, T_H; E) \quad \dots\dots (2.4)$$

While that of consumer goods is given as

$$Z = f(X, T_C; E) \quad \dots\dots (2.5)$$

Where

I = investment in health

M = Market for health care inputs

T_H = Time spent on improving health

Z = Composite consumption goods

X = Market produced goods

T_C = Time spent on composite consumption goods

E = Education

The production function of health implies that education and the combination of health inputs such as quality health service, nutritious meals, etc. can yield a certain stock of health over a period of time. Therefore, education empowers the individual to translate information into desired health outcomes. Education, therefore, influences the consumption patterns of households and also plays a critical role in influencing the efficiency of health capital.

The model assumes that the individual has perfect knowledge and maximizes their lifetime utility.

The model also propounds that the individual faces some constraints which hinder their ability to produce or consume their desired level of health. The individual can only consume limited quantities of health based on his or her available resources. This is because health inputs are obtained at a price and the individual has limited resources. The income level of the individual, therefore, determines the amount of health the individual can afford.

2.4.5 The Family Stress Model (FSM)

The family stress model was first propounded by Conger et al. (1994). It illustrates how family stress influences and affects children's physical, social-emotional and cognitive domains across their developmental stages. Over the years, the FSM has evolved through mediators i.e. (new explanatory pathways) and factors that moderate FSM pathways and joint tests of competing models. In other words, researchers have simultaneously tested some models to determine which factors efficiently explain the connection between the family stress model and child poverty (Masarik and Conger, 2017).

The FSM provides channels through which economic hardships and pressures are likely to affect the overall well-being of a child. The FSM starts with economic hardship which comprises extremely low levels of income, loss of job or unemployment, or any negative financial events. The model hypothesized that economic hardship would lead to economic pressure. These economic pressures entail the day-to-day hassle poor families go through to pay bills, put food on the table and cater for life in general. Next, the FSM propounds that families experience psychological distress due to the economic pressures that are generated by hardships. This psychological distress is predicted to increase the likelihood that parents in distressed families would have inter-parental or marital relationship problems. Thus, distressed parents are likely to

transmit stress to other relationships, especially their marital and caregiving relationships. The next step of this model assumes that the spillover of parental distress to children will lead to child and adolescent maladjustments. This implies that distressed parents may be inconsistent in the discipline of their children. They may be harsh or may ignore these children or withdraw their affection or support for the children because of what they might be going through. The model ends with factors that may affect the family stress process. These factors comprise individual and family influences that are likely to worsen or mitigate the family stress process. According to Neppl, et al. (2016), economic pressures could also affect the interpersonal distress between parents, which sparks conflicts between parents. The model, therefore, theorizes that economic stress leads to distress among parents, which in turn leads to disruption in warm, involved and encouraging parenting practices. These disruptions affect child outcomes such as academic performance and health. The study, therefore, uses the Family Stress Model to analyze the association between child health and parental level of depression. Good parenting is important for children's development. Parental depression and other forms of psychological distress parents face due to economic hardship have an impact on child performance.

2.4.6 A Capability Approach

Amartya Sen's capability theory (Sen, 1985;1999) offers a key theoretical lens through which to explore the factors relating to gender discrimination. According to Sen, development is a process of increasing the freedoms people are entitled to. These freedoms, he argues, serve as the foundation of development since they enable people to help themselves and contribute meaningfully to society (Sen 1999). Freedom to achieve is usually influenced by some social and economic arrangements. It is therefore important that mechanisms are put in place to remove sources of 'unfreedom' such as gender discrimination which translates to gender inequality and

economic poverty. In Sen's capability approach, the concepts of 'functionings' and 'capability' emphasizes the disparity between achievement and the freedom to achieve or the opportunity to achieve. Functionings according to Sen are the various things a person values being or doing. This is reflected in one's actual achievements or the daily choices an individual makes to depict what he or she aspires to be or do with given resources. Capabilities on the other hand reflect the freedoms that a person has in terms of one's choice of functioning and command over commodities. It is the freedom to achieve a combination of functions or the kind of life one has reason to value. To Sen, what matters most is the real opportunities or freedom to achieve some combinations of functions and not so much the achieved functions. According to Sen, "there are systematic disparities in the freedoms that men and women enjoy in different societies," and "these disparities are often not reducible to differences in income and resources". These disparities in freedoms contribute to differences in the opportunities that people enjoy. For instance, gender disparities in the form of division of household chores, unequal distribution of household resources as well as the quantum of education a member of the household can access or the opportunity available to them.

Children are considered to be poor not due to some actions or inactions on their part, but it could rather be due to some circumstances of their households. Sen's Capability Approach, therefore, makes the issue of gender discrimination worth exploring, especially in the situation where households' decisions or choices discriminate against a child. This leads to a loss of opportunity to 'achieve' or to be. As Robeyns, (2005) puts it, the capability approach provides the framework for conceptualizing and evaluating phenomena such as education and inequality which may affect individual well-being.

2.4.7. Basic Needs Approach

Streeten et al. (1981) propounded the Basic Needs Approach of examining poverty and it has formed the foundation of the multidimensional child poverty. The basic need approach conceptualizes that every individual needs some basic goods and services for their holistic development and growth. Thus, it focuses on the distribution and accessibility of basic requirements for living a decent life such as education, nutrition, health, water, housing and sanitation. In developing the Multiple Overlapping Deprivation Analysis (MODA), Neubourg et al. (2012) acknowledged the heterogenous nature of children's needs across their childhood and adopted a life-cycle approach where analysis is conducted for different age groups (i.e. early childhood, primary childhood, and adolescence) to reflect their peculiar needs. Similarly, in examining child poverty in the developing world, Gordon et al. (2003) and Gordon (2015) have identified poor children based on the deprivations in basic human needs such as food, safe drinking water, sanitation, health, shelter, education, information, and basic social services.

2.4.8 Theory of Household Decision Making

The theory of household decision making is linked to the last empirical chapter of this study where the determinants of son preference are examined. The Ghana Socioeconomic Panel Survey identifies the household as a group of people who share a common housing unit or eat from the same pot. Yanagisako (2015) defines the household as a residential unit where members cooperate in production consumption and the raising of children. Social relations within the household also influence how resources are allocated or how economic decisions are made within the household. The dynamics of the household moreover influence how policies play out in the economy. This study examines the unitary household model and the collective household model. Examining these

models is important because they influence how households make decisions. As established earlier, children may experience poverty due to some circumstances of their household and not due to their actions or inactions. Furthermore, the decision of their household could push them into poverty, cause them to remain poor or take them out of poverty.

The unitary approach has been heavily criticized in the past. The unitary household model, the benevolent dictator model or the common preference model, considers the household as a single unit. Thus, the household is regarded as an individual who maximizes a single utility function subject to a common budget constraint. The budget here is a pool of all incomes of the household members. In this approach, the household is identified as a single decision-making entity, with no individual decisions. Due to its nature, Sen (1983) labels this model as the “glued-together family”. This model is spurious because it assumes members of the household living under one roof do not have distinct preferences and do not take into consideration the behaviour of individual members of the household (Alderman et al., 1995; Doss, 2021).

The common preference model treats the household as a unit of analysis where individual preferences are aggregated into household preferences. This is done under the assumption that (1) all the members of the household have the same, homothetic utility function (this implies that maximizing individual utility function yields the same results as maximizing the utility of the entire household) or (2) there is a fundamental rule for aggregating the utility functions of the household members.

Three main antidotes have been proposed to address this shortfall thus, the dictatorship model, the consensus model and the altruism model. The first is to assume that the household has a head or leader who is a dictator. This leader, referred to as “paterfamilias” by Deaton (1997) has sovereign power over all the other members of the household. Under this assumption, the head has a final

say, all other members of the household follow his instructions and their preferences are not considered in decision making. In the dictatorship model, the issue of power imbalance becomes obvious. In this framework, the issues of who earns income or household production do not count and the share of individual wealth or income does not affect allocations.

The second is the consensus model, which was formulated in the Bergson-Samuelson Social Welfare Function (Samuelson, 1956). According to this model, all members of the household agree on a common objective function, which is an increasing function of the utility function of all household members. Although this model observes household behaviour from the preferences of all members of the household, it fails to explain how the objective function of the household is chosen. Harmonizing a household's objective function can be challenging especially in large households. Arrow (1951) has demonstrated that in the process of aggregation, some important information about individual preferences is likely to be lost.

The third antidote is to consider the unitary approach as an altruistic model and the 'Rotten Kid Theorem' as propounded by Becker, (1974). In this model, the household comprises members who have individual preferences. However, the household head is an altruistic agent whose utility depends on the utility of other household members who are egoistic agents. This approach makes it possible to account for the views of multiple decision-makers in the same household. According to him, even in a situation where members of the household have different preferences or have selfish kids, the provision of a transfer from an altruistic parent incentivizes the kid to behave in order to maximize household income. According to Hirshleifer, (1977), the "rotten kid theorem" will hold only if the transfer to the child is made after the child has chosen an action. This is because if a parent irrevocably commits to a transfer before an action is taken by the child, the rotten kid will behave selfishly to gain more allocations than the parents will prefer.

There are serious theoretical challenges associated with the unitary model, hence using that approach would have policy implications (Alderman et al., 1995; Doss, 2021). First, the model assumes that all household resources are pooled, however, it allows prices to differ for various household members. This assumption creates the problem of information flow and control as one member of the household would have to monitor and sanction other members who fall foul of this rule. The model also fails to incorporate how the distribution of resources within the household is done. This could be problematic as differences in individual welfare within the household could be exhibited systematically by one relation to household head, gender or age. The allocations within the household could lead to inequalities, especially in the situation where distribution is tied to one's ability to earn higher incomes (Alderman et al., 1995).

Individual members of the household have different preferences, hence each individual's preference would have to be considered in assessing the total welfare of the household. This is quite difficult. Samuelson (1956) suggests that a consensus among household members could be used as a platform for aggregating preferences and pooling household resources, however, he did not specify how such a consensus could be achieved. One other solution proposed by Becker (1974) is for individuals to engage in assortative mating, the situation whereby the individual seeks a spouse with a similar preference. This solution according to Alderman et al. (1995) is not consistent as it does not solve the problem of potential intergenerational differences in preferences.

Due to the weakness of the unitary approach to account for the individual members of the household, it has become important to identify alternative approaches such as the altruism or collective model which better account for individual members of the household and for that matter identify power inequalities between household members. Under this approach, it is assumed that the well-being of the individual is dependent on his or her consumption as well as the consumption

of other people in the household. This study, therefore, follows a collective approach where the preferences of individual members of the household are accounted for.

Collective Models of Household Behaviour

The collective model addresses the issue of how individual household members resolve different preferences of household members. This approach can be divided into two thus, the cooperative solution and the non-cooperative solution. These models are sometimes referred to as bargaining models. Like Alderman et al. (1995), a more generic label like the “collective” model is preferred since some collective models do not explicitly deal with bargaining.

The collective model, proposed by Chiappori (1988) and later expounded by Chiappori (1992) and Bourguignon and Chiappori (1994) assumes that the household reaches a Pareto efficient outcome as it produces on the frontier of its production possibility set. Thus in the distribution of consumption goods, no one could be made better off without making another worse off. This model is founded on the four assumptions thus, 1) some goods are private 2) members of the household have the utility of others in their utility function (preferences are caring) 3) each member’s sub-utility function is separable with respect to private consumption and lastly 4) at least one private good is assigned so the person who consumes the good is known. The collective model was modified by Apps and Rees (1997) to include domestically produced household goods. They argue that domestic production is a significant empirical phenomenon, and hence must not be ignored. The main underlying principle of the collective model is how it directly address how individual members reconcile different preferences (Alderman et al., 1995).

The Cooperative Bargaining model

Similar to the unitary model, the cooperative model assumes that individuals would form a household when it is more beneficial to them than when they stay alone (Alderman et al., 1995).

The collective model departs from the unitary model based on how benefits that accrue to members are distributed. The main point of divergence is the rule governing the distribution.

McElroy and Horney (1981) and Manser and Brown (1980) used a cooperative Nash game to formulate a bargaining framework for household decision-making. In this model, two people receive utility from a pure public good. These two people also place value on leisure and the consumption of private goods. They then solve a Nash bargaining problem where the individuals identify their threat point as their utility outside marriage. Some authors have however argued that the dissolution of the marriage may not be the threat point. Lundberg and Pollak (1993) claim that a threat point is reached at a point where there is a non-cooperative outcome. That is, in a “separate sphere model” in which members of the household bargain over the gains from marriage. If no agreement is reached among the partners, then gender roles will determine each individual’s activity and contribution to the household. According to Lundberg and Pollak (1993),

Because socially prescribed gender roles assign primary responsibility for certain activities to the husband and others to the wife, the separate spheres default equilibrium may be established and maintained without negotiation (p. 12).

Both partners in this model contribute to the public good within their spheres of influence (for example, men provide housing while women provide child care). These public goods are likely to be underprovided since they are done voluntarily.

The cooperative bargaining model forecasts that even if individuals and resources are not altered, distribution in households would be affected by the factors that influence the threat points of individuals. Thus, a divorced woman with a child will have her utility increased if a policy guarantees to support payments to divorced women with children. This policy will therefore alter the intrahousehold distribution of resources in favour of women. The model also predicts allocations of resources in the household will be affected when the wages of women rise (Doss, 1996).

The non-cooperative model

The foundation of the non-cooperative model is built on the public good literature of welfare economics. This model assumes that income is not pooled. The model allows individuals to have different preferences as well as permits members of the household to make their consumption and production decisions based on their labour and access to resources. Households in many developing countries do not pool their income (Alderman et al., 1995). In the non-cooperative model, it is assumed that members of the household do not have different preferences, however, the individual makes decisions on consumption and production based on his or her access to resources or their labour.

It is important to note that in the cooperative model, the level of shared goods is based on the traditional gender roles (from Lundberg and Pollak's separate models) and is exogenous to the model. However, in the non-cooperative model, the level of public goods is determined endogenously through a bargaining process. How much each person in the household spends on public or private goods is determined through the bargaining process.

Using the Cournot-Nash framework, Woolley (1993) predicts how income differentials affect expenditure patterns, how the family's financial system is managed and the properties of the household demand function. The framework assumes that members of the household maximize their welfare given the expected action of other members. An individual's welfare depends on his or her preferences on consumption and the utility of his or her spouse. The model predicts that both spouses make contributions to household expenditure when incomes are the same. However, the household moves to a corner solution as income becomes unequal, and the spouse with the highest income finances all shared household goods.

Most of the literature admitted in this study is based on a direct measure of the relationship between decision-making and bargaining gaining power. A few studies analyze household preferences. Preferences usually form the basis for household decisions.

According to Doss (2013), an individual's participation in a household decision may depend on the extent to which the decision is important to the individual or the partners involved in the decision-making have different preferences. For instance, a woman may allow her spouse to decide for the household if the decision has little influence on her utility. This implies that one's participation in a household decision may be a good measure of control of utility gained from cooperation. Lack of participation may not necessarily be a result of low bargaining power.

Information on preferences is important because it determines if the individual truly has bargaining power or not. Making a decision alone may imply that the individual can make decisions based on his or her preferences. This however may not be entirely so especially in the situation whereby a woman making the decision lacks interest or fears the possibility of being punished for going contrary to her spouse's preference or some stipulated social norms. In such instances deciding alone may not reflect bargaining power. It is therefore difficult to determine if deciding alone

reflects bargaining power especially when there is no information on preferences (Doss, 2013). The preferences of the individual influence his or her choice. Hence in the situation where resources are limited, the choices of members of the household may reflect their preferences for a particular gender in the household. In this situation, gender preference could lead to inequality of opportunities, leading to a higher risk of child poverty, especially among girls.

2.5 Empirical Review

2.5.1 Determinants of Child Poverty

Children are an important part of the household. Although household resources are unequally distributed among members of the household, children tend to depend on and also benefit a great deal from the resources of the household. Children are therefore susceptible directly to economic hardship or indirectly through their households as they are most vulnerable in the intra-household distributions of resources (Ravallion, 1996). They are nonetheless affected by the wealth status of their households, especially the characteristics of the household head.

Household characteristics

Size

Studies have shown that there is a significant and positive relationship between poverty and the number of people in the household. The tendency for a household to fall below the poverty line increases as the number of people in the household increases. That is the situation especially if the number of economically inactive people in the household outnumber those who are economically active, thus increasing the dependency ratio in the household. Makhalima, Sekatane, & Dunga

(2014) in studying the determinants of child poverty in a South African Township of Biopatong found that the household size worsens child poverty. The study administered 300 questionnaires to heads of households and used logistic regression for its analysis. The study used the OECD equivalence scale to determine household poverty. The OECD equivalence scale assigns values to members of the household to reflect disparities in household size and composition. This calculation thereby accounts for the economies of scale large households enjoy. To do this calculation, single adults were used as the reference group and were given a value of one. Any additional adult in the household is given a value of 0.5 while child children are given a value of 0.3. Child poverty was derived by counting children from poor households. In other words, children from poor households were identified as experiencing child poverty. Findings from the study revealed that out of the 265 children in the 300 households, 122 children were from poor households. Thus giving a child poverty rate of 46% in the Biopatong township. Likewise, studies by Olagunju, Ogunniyi, & Olufadewa (2018) have revealed that children from large household size are more vulnerable to poverty compared to their counterparts who belong to smaller household sizes. Additional children tend to increase the competition for scarce resources in the household.

In a relatively recent paper, Makhlima (2020) used South Africa's 2018 General Household Survey data to examine the determinants of child poverty in South Africa. With a sample of 10,902 households, the study sampled only households with children and measured child poverty based on the characteristics of the household head. Similar to Makhlima et al. (2014), the study found that children living in large households are more likely to be poor. In the same vein, a study in Taiwan by Leu, Chen, & Chen, (2016) disclosed that children who live in families with a large number of children are likely to suffer higher levels of deprivation.

Sex of household head

The Theory of Household Decision Making entails negotiation and bargaining of household resources. The sex of the household head is likely to influence the allocation of household resources especially, those particularly important for the wellbeing of children. The debate however between poverty and the sex of the household head is inconclusive. As a result of the patriarchal influences and differences that trace back to history and persist in our current society, female-headed households are susceptible to challenges compared to their male counterparts (Nwosu & Ndinda, 2018; Sun, Li & Li, 2020). Women usually have less income to run the family because they tend to earn lesser compared to men. The relationship between child poverty and the sex of the household head is not certain. Makhalima et al. (2014) have shown that children from female-headed households have a higher chance of being poor than other children from male-headed households. This has also been confirmed by Biyase and Zwane (2018) in a studies in South Africa. The study found that female-headed households are likely to be poor compared to male-headed households. In examining the spatial structural determinants of child poverty in Nigeria, Adebayo, Olagunju, Samuel, & Ogundipe, (2016) have also shown that children who live in female-headed households in the South-East geopolitical zone of Nigeria are more likely to be poor.

Contrary to these findings, Makhalima (2020) has revealed that children living in male-headed households are more vulnerable to being poor. The results from the Makhalima (2020) studies are in line with the findings from Bose-Duker, Henry and Strobl (2021). Bose-Duker et al. (2021) have shown that the gender of the household head plays a role in the determination of resource shares within the household. The study used a rotating panel of households from the Jamaican Survey which spans from 1990 to 2010 (over 21 years) to estimate a household collective model. Results

from the study reveal that children who live in female headed households receive larger resource shares than children who live in male headed households.

Age of household head

The age of the household head has an impact on poverty. The older the household head, the lower the probability of the household being poor. Thus, age correlates with experience. It is also in line with studies in the US by DeNavas-Walt, Proctor & Smith (2012). This could be explained by the finding of Šoltés & Šoltésová (2016) where older household heads were less likely to suffer from low work intensity. According to the study which used data from the European Union Statistical on Income Living Conditions for Slovak households in 2014, low work intensity was measured as the situation where adults between the ages of 18-59 years worked less than 20% of their total potential during a specific time. Iwacewicz-Orłowska (2016) in similar studies using the EU SILC data, for Czech Republic, Hungary, Poland and Slovakia found that younger persons are more likely to be exposed to poverty than older persons. Makhallima et al, (2014) have also confirmed that children who live in households where their household heads are younger are at risk of being poor compared to their counterparts who live in households where their household heads are relatively younger.

Education level of household head

Research has shown that the educational level of household heads significantly influences child poverty. According to Malat, Oh, & Hamilton, (2005) education plays a key role in improving child outcomes and reducing child poverty. Using Ordinary Least Squares regression, results from the study show that the likelihood of children living in poverty decreases as the number of years of schooling completed by the head of the household increases. The study used data from the Panel

Study of Income Dynamics and its Child Development Supplement for White and African American children.

Another study by Fertig & Tamm, (2010) using the German Socio-Economic Panel (GSOEP) confirms that higher levels of education among household heads are associated with lower levels of child poverty. The GSOEP which is a representative longitudinal study of private households in Germany found that the years of education of the household head is the driving force behind the exit or re-entry into child poverty. According to the study, the children of highly educated household heads tend to exhibit shorter poverty spells and longer durations out of poverty.

Employment status of household head

At the household level, the most important factor in determining child poverty is the employment status of parents (Thévenon et al., 2018). According to the International Labour Organization (2008), employment in the formal sector is a reliable and efficient strategy for poverty alleviation. Makhalima et al. (2014) study on child poverty in the Biopatong township has confirmed this assertion. According to the study, the likelihood of children living in households where their heads of households are formally employed to be poor is low. Likewise, studies by Ranjith & Rupasingha (2014) confirm that a high unemployment rate worsens child poverty in the United State of America. These studies are in line with the family stress model and confirms that the economic conditions of the household head, specifically his or her employment status could influence child poverty.

Marital status

Children need a conducive environment to be nurtured and develop holistically. The marital status of the household head has an impact on the poverty status of the child. This is because such

children are likely to benefit from wealth accumulation from both couples in the case where the household head is married (Anyanwu, 2014). Studies have shown that children are likely to be non-poor when they grow up in households where their household head is married. Thus, marriage is associated with greater wealth compared to singlehood. This is because couples are able to accumulate wealth over time. Thus married people are wealthier than unmarried people. Frémeaux and Leturcq (2022) examined the nature of wealth accumulation among couple-headed households. The study used longitudinal data from the 2015-2018 French Wealth Survey to conduct a multivariate regression analysis. The finding from the study reveals that married couples are wealthier than unmarried couples. The study also compares wealth accumulation among three marital regimes in France thus, married, and non-married cohabitation and found that wealth accumulation is highest among the married. On the contrary, other studies have found that married heads of household are found to be poor (Makhalima, 2020; Sun, Li and Li, 2020). Similar to the findings of Sun, Li and Li (2020), Makhalima, (2020) revealed that married household heads are also likely to be poor. As expected, however, children who lived in widowed households were also found to be poor this could be attributed to the unfavourable economic conditions widowed household heads face. This is in line with the findings of Biyase and Zwane (2018) which showed that households are likely to be poor when it is headed by a widow. Concerning household heads who are divorced, Makhalima, (2020) has revealed that children who live with divorced household heads are less vulnerable to poverty.

Location

The geographical location of the household has an impact on multidimensional child poverty. Children who live in rural communities are likely to be multidimensionally poor compared to children who live in urban communities. In disaggregating multidimensionally child poverty and

its drivers in the Mouhoun region of Burkina Faso, Fonta, Yameogo, Tinto, Huysen, Natama Compaore and Fonta (2020) conducts a study using primary data from a cross-sectional survey of 772 households. The study found that child poverty is more prevalent in rural households compared to urban households. In a similar study in Ghana, Agyire-Tetteh et al. 2021 found that children from rural communities are likely to be multidimensionally poor compared to children who live in urban communities. Following Alkire and Forster (2011), Agyire-Tettey et al. (2021) measured multidimensional child poverty using data from the 2008 and 2014 Ghana Demographic and Health Survey. The deprivation cutoff in the studies was set at one-third of the indicators. Findings from the study indicated that poor living standard is the main contributor to multidimensional child poverty in Ghana. The results also revealed a decline in the intensity and incidence of child poverty in Ghana. Still, in Ghana, Kofinti and Annim (2016) used the fifth and sixth rounds of the Ghana Living Standards Survey to examine five dimensions of deprivation of children between the ages of 7 and 17. The five dimensions used in the study are water, sanitation, education, shelter and information. Based on the first-order dominance methodology, the study revealed that there is a decline in child deprivation over the period under review. The results from the study also showed that among all the other indicators, children were worse off in sanitation than any other indicator. The spatial comparison showed that children in rural communities were worse off. In addition, at the regional level, the Greater Accra Region and the Ashanti Region have the least deprived children compared to the Brong Ahafo Region, Northern Region and Volta Region which recorded the worse rank in terms of child deprivation

Beyond Africa, Ranjith & Rupasingha (2012), in studying the social and cultural determinants of child poverty in the United States concluded that metro areas thus urban areas have lower child

poverty measures compared to non-metro areas thus, rural areas. The study also found that religion is associated with positive economic outcomes hence a reduction in child poverty.

2.5.2 The Nexus between Child Poverty and Child Academic Performance: Empirical Evidence

Assessing Child Academic Performance

The conceptualization of academic performance generates or begins its complexity. Academic performance is mostly used synonymously with academic achievement, and school readiness. Teaching activity by the teacher and learning by the student produces the academic performance of the student. Academic performance therefore depends on learning process (Lamas, 2015) and it is usually expressed through school grades. Academic performance is about the ability of a student to meet laid down achievement, goals or objectives of a specific course or program the student enrolls in. It is usually expressed or shown through grades or test scores. These scores are used to assess if a child passed or failed a test (Lamas, 2015). The test scores reveal the extent to which an educational objective has been attained by a student, teacher, or school in general.

According to the educational production model, several factors influence a child's performance. Factors such as study habits, intellectual ability, motivation, self-esteem, personality as well as the kind of teacher-student relationship established influence the academic performance of the child (Lamas, 2015). Considine and Zapalà (2002) also revealed that factors such as the educational background of the parents, sex of the child, place of residence, age and ethnicity of the student as well as unexplained absenteeism also affect a child's academic performance in school. Certain conditions may hinder a student from achieving the set goals or targets. This creates

a diverging of performance thus, the situation where there is a gap between the student's expected performance and the student's actual academic performance.

According to Parrales et al., (2020), learning is linked to cognitive processes. The cognitive process plays a critical role in education. The cognitive process is often required during academic activities, hence according to Lamas (2015), intelligence could be used as an independent variable or predictor of academic performance. Another predictor of academic performance is working memory, which is a component of Executive Function. Alloway & Alloway, (2010) has confirmed that working memory is not a proxy for intelligence quotient (IQ), however, it is a separate cognitive skill which has a unique connection to academic performance.

Evidence of household wealth condition on child performance

The wealth status of the household influences the academic performance of the child. Studies have shown that household wealth status has the potency to predict the academic performance of a child (Chowa, Masa, Wretman & Ansong, 2013; Fang, Huang, Curley & Birkenmaier, 2018; Mollborn, Lawrence, James-Hawkins & Fomby, 2014; Shanks, 2007). Poverty, specifically child poverty has a detrimental effect on the academic performance of the child. Poverty influences a child's learning and achievement potential (Hair et al., 2015). It can limit the opportunity for a child to access quality education. The effect of poverty on a child's cognitive potential is mediated through the structural brain development of the child. Using sociodemographic and neuroimaging data from the National Institute of Health Magnetic Resonance Imaging Study of Normal Brain Development, Hair et al (2015) analyzed a longitudinal cohort of 823 magnetic resonance imaging scans of 329 typically developing children and adolescents between the ages of 4 and 22 in the United States. The study found that children from low-income households scored 4 to 7 points lower on standardized tests than children from high-income households. According to the study,

poverty affects the child's structural brain development, which impedes the child's learning and achievement. Thus, children living in poverty experience less cognitive stimulation due to their experience of less parental nurturance, exposure to violence as well as over-crowding.

In 2019 Ge & Wang (2019), conducted a school-based self-reported questionnaire survey in the most underdeveloped rural area of Southwest China, involving 775 children in grades 4 to 9. A multi-stage cluster random sampling was used to select these children. The study measured academic achievement by students' grades in Chinese language/ grammar and math in the previous academic semester. Using a structural equation modeling, the study found that multidimensional child poverty had a direct and significant negative effect on a child's academic achievement. The study also revealed that the effect of multidimensional child poverty on a child's academic achievement was mediated by the effect of the parent-child relationship and peer relationship. Interestingly, female participants in the study performed better than their male counterparts.

To identify the relationship between household economic status and academic achievement in Ghana, Chowa et al (2013), used baseline data from the Ghana Youth Save Experiment. This experiment is a five-year study that investigates the impact of a savings account as an instrument for youth development. The study in Ghana randomly selected one hundred schools from eight out of the ten regions of Ghana. The study assigned 50 schools to the treatment condition while the remaining 50 schools were assigned to the control condition. Sixty students (youths) were randomly selected from each school. Their results revealed that on average youth from households which owned at least one of the five household possessions scored almost one point higher in English than their counterparts from households which did not own any. The study also revealed that ownership of household possessions has no significant impact on math scores among the

youth. The household possessions used in the study included ownership of a television, electric iron, refrigerator, kerosene stove, and electric or gas stove.

After using cross-sectional data to prove that ownership of assets has a positive impact on the academic performance of the child (Chowa et al., 2013), some years later Chowa and Masa. (2019) sought to examine associations between asset ownership and academic performance based on asset type and academic subject. The study found a positive impact of assets on child academic performance however, this according to the study depends on the academic subject and the type of asset. Thus homeownership and ownership of transport-related assets were positively and significantly related to Math and English achievements respectively.

In a similar study in China, Fang et al (2018) found that families that saved towards a child's education had a positive effect on the child's educational achievement. Using the 2014 China Family Panel Studies and Structural Equation Modeling (SEM), the study examined the association between a family's savings for child education and a child's educational achievement. The study concluded that a family's saving for a child's education is positively associated with the child's educational achievement. These findings imply that, especially for families with disadvantaged socioeconomic backgrounds, assets in the form of Child Development Savings Accounts could be an effective policy to promote child educational development.

Studies conducted in developed countries also confirmed that children from high-income households performed relatively better academically/cognitively. For instance, Shanks (2007) found that household wealth has a significant influence on the test scores of a child. He used the Panel Study of Income Dynamics (PSID), a US-based national longitudinal survey. One of the study's objectives was to identify the effect of including household wealth as a measure of the socioeconomic status (SES) of a household when investigating child development outcomes.

Household wealth was measured by permanent income (a summation of total household income from the previous tax year, all transfer income, and social security income) and household net worth (aggregating the value of businesses, checking and savings accounts, real estate and other assets) while child development outcomes were measured by one behaviour problem score and two achievement scores. Specifically, the test was administered to children between the ages of 3 and 12. As a measure of achievement and not intelligence quotient (IQ), the tests included the two age-standardized reading and math subscales, the letter-word identification (ie matching pictures with words for symbolic learning) and applied problem (ie skills in solving practical problems in mathematics). A mother's report of a version of the Behaviour Problem Index used in the National Longitudinal Survey of Youth was used to assess the child's externalizing and internalizing behaviour problems. The study found that including wealth in addition to income as a measure of SES is important in the study of child wellbeing since wealth significantly predicts applied math score and reported behaviour problems. Except for having a female household head, all other control variables such as the educational level of the household head, the mother's cognitive ability and household composition were found to be significant and had a positive influence on test scores. Later, Mollborn et al (2014) conducted a similar study in the US using the Early Childhood Longitudinal Study Birth Cohort (2001 to 2007) to identify a change in the relationship between SES and cognitive and behavioural development for 8600 children over time. These children were studied from infancy through to the entry of kindergarten. The study modelled a growth curve to analyze change within children over time in the relationship between socioeconomic resources and cognitive and behavioural outcomes. The measurement of outcomes in this study is quite different from the Shank (2007) study. Children in the early waves (waves 1 & 2) were assessed using the Bayley Short Form-Research Edition (BSF-R) because they were too young for the reading and

math tests. The BSF- R measured the child's early cognitive development skills such as communication, problem-solving, comprehension, and expressive and receptive vocabulary skills. Early reading and math assessments were administered to children in wave 3 and kindergarten. The study also measured child behaviour at different waves. In waves 1 and 2, the study measured child behaviour using the Interviewer Observations of Child Behaviour Assessment and in the later wave (wave 3 and kindergarten), the study used the Preschool and Kindergarten Behaviour Scales-Second Edition, the Social Skills Rating System, the Family and Child Experience Study and new questions developed for the ECLS-B at waves 3 and kindergarten. The results showed that socioeconomic resources were positively related to child development and in a supplementary model that did not interact SES measures with age, all three measures of SES used thus, income, maternal education and assets significantly predicted test scores.

A conducive home environment has an impact on the developmental process of a child. Using family care indicators, derived from the Home Observations for Measurement of the Environment (HOME), Hamadani, Tofail, Hilaly, Huda Engle & Grantham-McGregor (2010) used data from 801 mothers of 18 months old children from Bangladesh. The study found that 'play activities' and 'varieties of play materials' were the essential scales which had a strong impact on the development measure of a child. The study used the Mental and Psychomotor Development Indices (MDI and PDI) from the Revised Version of Bayley Scales of Infant Development (BSID-II) to assess the child's mental and motor development.

Influence of parent's educational level on academic performance

According to the human capital theory, investments in education yield higher returns in the form of higher earned income (Schultz, 1963). Aside from parental education serving as a proxy for a household's economic status, it influences the performance of children in the household.

According to Lee & Kushner (2008), uneducated parents may fail to provide the needed support or encouragement to their children through school. This affects the academic performance of such children negatively.

In a study conducted by Khan et al. (2015), it was revealed that parents with high levels of education have a positive influence on their children to perform well in their academics. This study was conducted in the district of Rajanpur, south Punjab, Pakistan. Parents with a high level of education usually show interest in the issues concerning the education of their wards and are involved in the education of their children (Lam and Ducreux, 2013).

In a study conducted in Indonesia, Mare & Maralani (2006) used the Indonesia Family Life Survey which interviewed a longitudinal household sample in 1993, 1997, 1998 and 2000. Using large samples of Indonesian women and their families, the study found a positive effect of a woman's educational attainment on the educational attainment of the next generation. This benefit is however partially offset at the population level because of the low number of children the educated woman bears.

Likewise, Sharma & Jha (2014) randomly selected 200 students from different institutions in India specifically (the Raipur district of Chhattisgarh State). The students were tested in Mathematics, English, Science, Social Studies and Hindi. The study found that children whose parents had more education performed better than children whose parents had less education. They concluded that highly educated parents were likely to provide a conducive home environment for learning.

Evidence of School Condition on child performance

School conditions influence the learning environment of the child. This goes a long way to affect the performance of the child. School conditions such as access to textbooks, and having more than

one class teacher enhance the teaching and learning process. Studies have shown that access to textbooks has a positive impact on the academic performance of children. Children who have access to textbooks tend to perform better in school than children who lack textbooks. On the contrary, using randomized evaluation in rural Kenya, Glewwe, Kremer & Moulin (2009), reveal that access to textbooks did not improve test scores for average students but rather, only the strongest or above-average students benefited from textbooks. Textbooks primarily benefited academically strong students. Based on a case study of a public basic school in the Ashanti Region of Ghana, Opoku-Amankwa (2010) found that textbooks may be available in schools but children may not have full access to the textbooks. Hampden-Thompson, (2013) also confirm that access to textbooks positively influences the academic performance of the child.

The presence of adequate teachers in a school affects the performance of the child. In their bid to explore factors that influence teaching and learning in primary schools in Zimbabwe, Mupa & Chinooneka (2015) in a qualitative study, where convenience sampling was adopted found that poor teacher quality had an adverse impact on the performance of children. These teachers according to the study did not employ a variety of media in the process of teaching and learning. Thus, teacher limited their instruction manuals to only the syllabuses and textbooks. Secondly, the teachers had very low morale and the students also studied in an uncondusive teaching and learning environment.

Similarly, a study conducted in Kenya by Mabeya, Gikuhi & Anyona, (2019) revealed that attrition of teachers has a negative impact on the student's academic performance. The study employed a mixed-method approach involving both descriptive and inferential statistics. Teachers who had left teaching form 3 and 4 public secondary school students within the Uasin-Gishiu County formed the target population. The target population was 166 public secondary schools, 2732 form

3 and 4 students, 1792 teachers, 166 principals and 6 County Education officials in Uasin-Gishu County.

Likewise, Sarfo & Adusei (2015) examined the effectiveness of ‘One-Teacher-To-All-Subjects’ in Ghana’s public primary schools. Using convenience and purposive sampling techniques, thirty-seven interviews were conducted among some stakeholders in the educational sector including pupils, teachers, retired directors, and parents. Findings from the study revealed that there is a high level of boredom among both pupils and teachers when a single teacher is required to teach all subjects. In addition, some teachers have difficulty in teaching all subjects. This affects the general performance of pupils. The studies also showed that there is “no-teacher syndrome” when a class teacher is absent from school. Amidst all the disadvantages, the study revealed that a strong bond is developed between teachers and pupils when a single teacher teaches one class in the formative years. This enhances teacher-pupil relationships and mentorship.

The type of school the student attends also has an impact on the performance of the child. The choice of attending a public or private school is also influenced by the economic condition in which the child lives. Compared with students from high-income households, there is a high probability that children from low-income families will attend public schools (Choy, 1997). The main difference between private and public schools is their source of funding. Public schools are usually funded by the government, or local community while private schools are usually funded by the proprietor’s resources, school fees or NGOs.

Adopting purposive sampling and simple random techniques, Windrick, Walela and Sande (2015) conducted a study on the academic performance of girls in public schools. The data was collected using questionnaires and interview guides. And analyzed through descriptive statistics. The rationale of the study was to identify why girls in public schools performed poorly. The study

concluded that girls in public schools performed poorly due to a shortage of qualified teachers, absence of library and toilet facilities in schools, walking a long distance to school as well a hostile school environment. Similarly, Sharma & Jha (2014) revealed that children who attended private schools performed better than those who attended government schools in the Raipur district of Chhattisgarh State (India). Hochschild (2003) also postulates that poor students who attend urban public schools drop out of school frequently. Girls from poor homes within rural communities spend most of their time doing domestic chores. For such girls, their parents or caretakers feel that time spent in school takes them away from their chores (Windrick, Walela and Sande, 2015)

Evidence Household Characteristics and Child Performance

Studies have shown that household family characteristics have an impact on the academic performance of a child. The family structure such as the presence of the parent and the number of children in a household affects the resources of the parents or household heads. Resources are diluted when the children in the family are large. The “resource dilution” effect impacts strongly on households which have a large size where especially the dependents are more. Children with many siblings usually have lower academic achievement. The impact of large family size on the academic performance of a child usually affects households with lower socioeconomic status (lower-income households) more than households with higher socioeconomic status (high-income households) (Marks, Cresswell & Ainley, 2006). Ge & Wang (2019) also confirmed that children with more siblings who lived together performed worse. This is because children with more siblings tend to have lower levels of parent-child and peer relationships which tend to predict worse academic performance.

The presence of parents in the home influences a child’s academic achievement. Children who live in single-parent homes are more likely to struggle with reading than their counterparts who live in

two-parent homes (Hampden-Thompson, 2013). The literacy gap between children who live with single-parent households and their counterparts who live in two-parent household decreases in countries which have policies that support single- parents. High education determines the level of one's socioeconomic status such as earnings, health condition, as well as ability to participate in political activities. Low educational achievement can be regarded as an underwriting cause of intergenerational poverty in developing countries (Shapiro & Oleko Tambashe, 2001).

Using data on approximately, 115,000 students from 18 countries, (thus some North American Countries, Pacific Rim Countries and European Countries) Hampden-Thompson, (2013) employed the Multilevel modelling technique to examine the impact of family structure on academic performance and also, the association between family policymaking and child performance. The study found that children from two-parent families performed better in terms of reading and science literacy than children from only mothers' families. However, the literacy gap decreases between children who reside with single mothers and those who reside with two-parent families in countries where there are policies which favoured low-income single mothers.

Similarly, Nguyen, & Vu, (2022) found that compared with children from single-parent families, children from two-parent families have a higher probability of enrolling at all levels of education. This study was done using a large dataset from Vietnam. The study examined the impact of parental absence due to divorce, death and migration on the school enrollment of children between the ages of 7 and 22. According to the study, the cause of single parenthood influences the magnitude of the negative effect on a child's education. Thus the negative effect of single-parenting due to divorce is higher than the effect on children who lost a parent through death. The effect is however lowest on children whose parents have migrated. The study confirmed that

mothers play a critical role in the education of their children as children living with single mothers had higher chances of enrolling in higher education than those who lived with single fathers.

Although absent parenthood has a negative impact on the academic performance of children, the impact on children with low academic performance is severe. In a study in a Spanish province, Casanova, García-Linares, de la Torre & Carpio (2005) sought to compare the reports of parents' educational styles and test scores of their children based on socioeconomic factors and family characteristics. The children selected for this study had 105 adolescents with normal achievement while 205 had low achievement. The study found that socioeconomic variables such as family structure, order of birth and number of children best predicted achievement for adolescents with normal academic achievements while family variables such as control, acceptance, expectations and involvement best predict achievement for students with low levels of achievement.

Improved parenting skills have a positive impact on the cognitive development of a child. Using a randomized trial, Doyle (2022), studies the impact of 'Preparing for Life' (PFL) on outcomes of middle childhood. The PFL programme starts from pregnancy until the child is 5 years. The programme aims at optimizing the development of a child by offering support and coaching to parents. In his work in Ireland, Doyle (2022) sort to establish if the significant impact of the PFL persisted even at age nine of participants. The study concluded that parental investment is associated with improved test scores. A mediation analysis done as part of the studies revealed that improvement in early parenting behaviour accounted for 46% of the treatment effect on cognitive skills (Doyle, 2022).

The location of the household also influences the performance of the child. Living in an urban area also has a statistically significant effect on the cognitive development of the child. In most cases, Children who live in urban communities have access to an environment that supports learning and

playing (Duc, 2011). In a relatively recent study, Fang et al (2018) found that children who resided in urban areas had an academic performance of 0.1 standard deviation higher than children who resided in rural areas. This could be considered an urban-rural inequality in education.

Evidence of child innate ability on child performance

Studies have shown that working memory, an important component of executive functioning of the child is linked to academic achievement during the first years of compulsory schooling (Best, Miller & Naglieri, 2011; Vandenbroucke, Verschueren & Baeyens, 2017). Working memory is the ability to store, retain and retrieve previous information (Cowan, 2017). It has a positive relationship with specific academic achievements like language art and mathematics (Mulder, Verhagen, Van der Ven, Slot, & Leseman, 2017). Working memory can be categorized under the cognitive index of executive functioning. Quílez-Robres, Moyano, & Cortés-Pascual (2021), identify executive functioning as a multifactorial structure that influences neurocognitive processes and controls the thoughts and behaviour of the child. Quílez-Robres et al., (2021) conducted a study to analyze the predictive power between executive functions and academic performance for children between the ages of 6 and 9 years. The study also analyzed the relationship between the components of executive functioning (such as initiative, working memory, organization of materials, flexibility, inhibition, task monitoring and emotional control) and academic performance in the area of language and mathematics. They found that higher executive functioning has a positive effect on overall academic achievement. The study also found that cognitive executive factors have higher predictive power on academic performance than behavioural (inhibition and self-monitoring) and emotional (flexibility and emotional control) executive factors.

In an earlier study, Alloway & Alloway, (2010), sought to investigate whether or not working memory is a proxy for IQ. The study found that children's working memory at age 5 was a significant predictor of literacy and numeracy 6 years later. In addition, the study concluded that working memory is not a proxy for IQ, however, it is a separate cognitive skill which has a unique connection to academic performance. According to the study, working memory at the start of formal education has a more predictive power of academic achievement than IQ. The study tested 98 children (51% boys and 49% girls) at two time points in the United Kingdom. The first test was taken when the children were 5 years and were attending kindergarten full-time. These children were tested on standardized measures of memory, IQ and learning 6 years later. The study also found that a mother's education is significantly associated with the literacy skills of the child

In a similar study in the Netherlands, Mulder et al., (2017), tested 552 children at age 2 on various executive functionings and later tested the same child at age 5 on some emergent mathematics and literacy tasks. Using the structural equation model and after controlling for parental education, receptive vocabulary and home language, the study found that early executive functioning at age 2 had a positive and significant impact on both emergent mathematics and literacy at age 5.

Vandenbroucke et al., (2017) also confirmed that executive function has a significant and positive impact on academic achievement. The study aimed to investigate the development of core executive functions, thus working memory, inhibition and cognitive flexibility from kindergarten to first grade and also analyze the predictive powers of these executive functions on academic performance. The results show that the development of executive functions increases performance. Specifically, working memory increases performance and performance in kindergarten increases performance in the first grade. In addition, the study found that working memory is related to all aspects of academic achievement. The study, therefore, concludes that working memory is the core

executive function that predicts academic performance when the executive function is examined as a broad, multidimensional construct.

Gender

The achievement gap between boys and girls has raised concerns in recent times. Using 126 participants from the Concordia Longitudinal Research Project, Kingdon, Serbin, & Stack, (2017) examined how a transition to secondary education differently affects the long-term trajectories of boys and girls in Canada. The study found that children from low-income samples show a decreasing trajectory of academic performance over time. The decreasing trajectory of academic performance intensified after the transition from elementary to secondary school. The study also found that girls outperformed boys when they transitioned into secondary school. The academic performance of boys declined across secondary education, this can be explained by how boys demonstrated higher levels of attention problems than girls. Similarly, Ge & Wang (2019) confirmed that girls performed better than boys. Their result was however mediated by peer or parent-child relationship. Earlier on, Lee & Kushner (2008) used the United States Educational Longitudinal study and revealed that girls performed better than boys, however, these girls who performed better lived with single fathers than sons who lived with single fathers or daughters who lived with single mothers.

2.5.3 Drivers of Stunting among Children

Household socio-demographic and economic characteristics

Household socio-demographic and economic characteristics such as household income (Boah, Azupogo, Amporfro, & Abada, 2019; Christian, Agula, & Jayson-Quashigah, 2020; Darteh, Acquah & Kumi-Kyereme, 2014), and household size (Bogale et al., 2018; Darteh et al., 2014) are

associated with stunting. Studies have also shown that stunting is more prevalent among boys than girls, (Darteh et al., 2014; Khara, Mwangome, Ngari, & Dolan, 2018).

Both Christian et. al, 2020 and Boah et al. (2019) used data from the 2014 Ghana Demographic and Health Survey and found that the odds of having stunted children were lower for high wealth households. Similarly, Darteh et al. (2014) using data from the 2008 Ghana Demographic and Health Survey have found that compared to the poorest households, children belonging to richer households are 0.43 less likely to experience stunting. In the same vein, Chowdhury et al. (2020) using the Bangladesh Multiple Indicator Cluster Survey (MICS 2012-2013) found that children from rich households have lower odds of experiencing stunting.

Using a cross-sectional study among 633 children aged 6 to 12 years old living in the Humbo district in Southern Ethiopia, Bogale et al. (2018) embarked on a study to assess the prevalence and factors associated with stunting among 6 to 12 years old. Simple and multiple logistic regression analyses were used to examine factors associated with stunting in the study sample. The results showed that the prevalence of stunting was 57 percent. About, 3.5 percent were severely stunted, 27.3 percent moderately stunted and 26.4 percent mildly stunted. Children between the ages of 10 to 12 years were highly stunted compared to children 6 to 7 years. In addition, children from large households thus eight and above were 4.6 times more likely to be stunted as compared to children who belong to smaller family sizes. The study also revealed that domestic waste disposal, a proxy for poor sanitation affects stunting as the results showed that children from households that dispose of domestic wastes in the field were 2.7 times more likely to be affected by stunting compared to those children whose households either dispose of by burning or used for biogas or compost. Although the study showed that stunting among boys and girls had no major difference, severe stunting was higher among girls.

Maternal health and stunting

Maternal health and education have a role to play in the health of a child, especially in the nutritional status of the child. A mother who suffered from linear growth retardation could make her vertically impaired. This mother is more likely to have small-for-gestational-age (SGA) children (Addo et al., 2015). SGA is a term used to qualify children who are smaller than the usual size for the number of weeks of pregnancy. In addition, depression among mothers increases the likelihood of a child being stunted (Wemakor & Mensah, 2016).

Nutrition is linked to cognitive development. Women with short stature are at risk of complications in delivery. Nutrition at the time of conception and during pregnancy is crucial for fetal growth. Maternal undernutrition leads to fetal growth restriction which leads to stunting and in the worst-case scenario, neonatal deaths (Black et al., 2013). Infant mortality and maternal morbidity can be traced to maternal overweight and obesity (Black et al., 2013).

In some middle and low-income countries, the increasing rate of overweight and obesity, which used to be much associated with developed or Western economies is becoming a commonality in developing countries. Nonetheless, undernutrition continues to be a headache, leading to the issue of a simultaneous burden of undernutrition and overnutrition, herein referred to as double burden of malnutrition are the coexistence of child stunting and maternal overweight. The double burden of malnutrition is usually traced to the consumption of high calories but low nutrient foods which cause adults to gain weight and children to be stunted (Fookan & Vo, 2021). A shift to the Western culture of food consumption is usually characterized by fast foods and junk foods that contain many calories and fewer nutrients.

In a cross-sectional study conducted in Ghana, Wemakor & Mensah (2016) found that children of depressed mothers are more likely to be stunted. The study was performed on mothers between the ages of 15 to 45 years and children below the age of 5 years. Interestingly, the study also found that mothers who were younger, unmarried, and belonged to the poorest household wealth quintile were more depressed and more likely to have stunted children. The study, therefore, concluded that the high prevalence of depression among mothers in the Northern Region of Ghana is associated with child stunting.

Stunting and maternal education

The educational level of parents, especially a mother's level of education influences their healthcare behaviour. Due to the educational level of these mothers, they are able to cultivate good healthcare such as vaccination, and hospital /clinic visitation. Using the data from the 1942 Peruvian children in the Young Lives Cohort, Anderson et al (2016) found that mothers of stunted children were less likely to have completed primary education. Similarly, using the Bangladesh Multiple Indicator Cluster Survey (MICS 2012-2013), Chowdhury et al. (2020) found that the prevalence of stunting was relatively lower among children whose mothers had completed secondary education in Bangladesh. The narrative is not different in Ethiopia where Eshete, Kumera, Bazezew, Marie, Alemu, & Shiferaw, (2020) using the 2016 Ethiopian Demographic and Health Survey (EDHS 2016) data have illustrated that mothers with secondary or higher education are less likely to have stunted children.

On the contrary, a study by Hanson et al. (2018) in South Africa found no significant association between maternal education and stunting. They used data from the 895 participants in the Birth-to-Twenty Plus Cohort. As part of their analysis, they controlled for maternal characteristics such

as maternal height and maternal education and found that lower maternal height was associated with children who were stunted at 24 months while maternal education was not significant.

In a similar study rolled out in the Dodoma region of Tanzania, Semali et al. (2015) sought to determine the factors that influence stunting. They randomly selected 678 households with children under the age of five years. The mothers of these children were interviewed while they took the anthropometric data for these children. The results showed that mothers who had little education had children who were stunted.

Stunting and Gender

Most Asian and African countries have a strong preference for the boy child and discriminate against the girl child (Asadullah, Mansoor, Randazzo, & Wahhaj, 2021; Rahman, 2019). This affects how much attention is given to girls and boys respectively in terms of nourishment, healthcare and education. The narrative is however different in Bangladesh, where a study conducted using the Bangladesh Multiple Indicator Cluster Survey (MICS 2012–13) revealed that the boy child is more likely to be stunted than the girl child (Chowdhury et al., 2020)

In a similar study conducted in Peru, Anderson et al. (2016) found that boys are more likely to be stunted than girls. After reviewing many empirical studies, Black et al. (2013) revealed that boys are more likely to be stunted than girls (Black et al., 2013). During a Tanzanian study, (Modern et al., 2020) found that the risk of stunting was highly associated with the male child. This however decreased within the context where the family practiced hand washing before meals.

From a global perspective, Khara et al. (2017) found that girls are significantly less likely to be concurrently wasted and stunted than boys. This global study used data from Demographic and

Health Survey and Multi-indicator Cluster Surveys datasets from 84 countries to estimate the prevalence and burden of stunting and wasting among children aged 6 to 59 months.

The story is not so different in Sub-Saharan Africa and specifically, Ghana. Using the 2008 Ghana Demographic and Health Survey (DHS), Darteh et al. (2014) found that stunting was a common phenomenon among boys as compared to girls in Ghana. The high risk of stunting among boys could be attributed to the downward trend of discrimination against girls in terms of food rationing and health care due to much education. Secondly, baby girls tend to cope better with less sufficient food than baby boys.

On the contrary, other studies have revealed girls are more likely to be stunted than boys. For instance, in a study conducted in the Humbo district of South Ethiopia between March to April (2015), Bogale et al. (2018) showed that school-aged girls between the ages of 6 to 12 years are twice more likely to be severely stunted than boys. In the same vein, using the Ghana Demographic and Health Surveys, (Amugsi et al., 2013) have revealed that, there are significant declining trends among boys than girls in Ghana.

Stunting and other household demographics

Unhealthy children are more prone to stunting. The sanitation situation of households has an impact on the health of the members of the household, especially children. In a Tanzanian study, Modern, Sauli, & Mpolya (2020), used a hospital-based cross-sectional to estimate the association between stunting and its associated factors in children below 5 years. The study revealed that stunting was not directly associated with drinking water, the type of toilet or toilet sharing or the child's use of the toilet or the child's fecal disposal. The study however found that the risk of a child being stunted was reduced in households where the children practiced hand washing before

meals. The study, however, confirmed that diarrhoea is however associated with toilet sharing, the use of the household's toilet, and rinsing child feces into a toilet.

More children in rural areas are stunted compared to children in urban areas (Wemakor & Mensah, 2016). Using cross-sectional data, Wemakor & Mensah (2016) found that in Ghana, children living in rural areas are more likely to be stunted and also more likely to experience other forms of malnutrition. Similarly, Andersen et al. (2016) also revealed that stunted children were more likely to live in rural regions and were from poorer households. Controlling for the area of residence, Chowdhury et al. (2020) found that the prevalence of stunting was relatively less among urban dwellers than among rural dwellers in Bangladesh.

Parents have a role to play in the overall development of the child. The household composition has an impact on the holistic well-being of the child. Using multilevel logistic regression models and the Botswana Family Health Survey (BFHS), Ntshebe et al. (2019) found that stunting among children is associated with whom the children lived. The results showed that stunting was relatively higher among children who did not live with their parents. The study also confirmed that stunting was high among children who lived with non-relatives. In addition, compared to households with both parents, children who lived with only their mothers or grandparents had higher levels of stunting.

2.5.4 Determinants of Son Preference

The concept of gender preference

In this study, gender preference is identified as the situation or condition whereby one gender, in this case, the son is valued above the daughter. Inequality of opportunity may begin at the household level. Parents may claim equal love for their children regardless of gender or age.

Nonetheless, gender preference may lead to some level of bias which may result in an unequal allocation of household resources (Asadullah et al., 2021; Rahman, 2019). Unequal opportunity to household resources has an impact on child development. With limited resources, parents may be faced with the decision between the quantity and quality of their children.

Some families have embarked on strategies to meet their need for a son. For instance, one main rudimentary strategy referred to as “son-targeting” is to continue having children until a boy is delivered. In other situations, parents may deliberately focus their attention and resources on the well-being of the male child while the girl is ignored (Arnold, Choe, & Roy, 1998; Asadullah et al., 2021; Rahman, 2019). In China and India for instance, female infanticide is common in some regions. Though this practice is waning, female child neglect is comparatively more systematic and has led to high mortality of female children in some Asian countries (Alkerna, Chao, You, Pedersen, & Sawyer, 2014). This has created a skewed sex ratio, leading to demographic imbalances.

In their study, Rossi and Rouanet (2015) used birth spacing as a new indicator of gender preferences in some African countries. They found that there is no daughter preference. There is however son preference in North Africa (i.e. Morocco, Tunisia, Egypt), Mali, Senegal, Burundi, Kenya, Uganda, Mozambique and Tanzania. There is evidence of preference for variety in Namibia and South Africa, while countries such as Ghana, Togo, Niger, Nigeria, Cot d’Ivoire, Burkina Faso Swaziland, Sudan, Lesotho, Madagascar and Zambia had no evidence of gender preference. The study computes the predicted median (The predicted median birth spacing is \leq 24 months) birth spacing and the probability of short birth spacing to identify the extent to which gender preference influences fertility choices. The study found that South Africa and North African countries exhibit large magnitudes in the impact of gender preference on birth spacing. In

that, couples with a perfectly balanced gender composition tend to wait seven months or more before the next birth than couples with only boys or girls. The situation is different in the rest of Africa where the impact of gender preference is weak. The test of religious impact on gender preference reveals that just like Christians, Muslims have a taste for a balanced gender. The study also showed that wealth and educational status influences the magnitude but not the nature of gender preference.

Although in their studies on some African countries, Rossi and Rouanet (2015) found no gender preference in Ghana, another study on Ghana revealed contrary results. Frempong & Codjoe (2017), using the 2014 Ghana Demographic and Health Survey found that there is son preference in Ghana however, this preference disappears at higher levels of education. Furthermore, they also found that gender preference is gender-specific, thus men indicated a preference for sons while women indicated a preference for daughters. The indicator used to measure son preference was based on the responses from the GDHS. That is, respondents living with children were asked “If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be? Alternatively, respondents without children were asked “If you could choose exactly the number of children to have in your whole life, how many would that be? There was a follow-up question for these two categories of respondents, thus “how many of these children would you like to be boys, and how many would you like to be girls, and for how many would it not matter if it’s a boy or a girl?”. A three categorical variable is created from the responses to measure the sex preference of children, that is “son preference”, “daughter preference” and “no sex preference”. Respondents who stated that they would like more sons to daughters were classified as having “preference for sons”. On the other hand, respondents who indicated that they would prefer more daughters to sons were

classified as having “preference for daughters” and those who stated that they would like equal numbers of sons and daughters are classified as having “no sex preference”.

Economic development is expected to erode gender discrimination in society (Tafuro & Guilmoto, 2020). Modernization, urbanization, and media are expected to influence the perception and the behaviour of people (Gu, Hua, McKenzie, & Zheng, 2022). It is expected that modernization will lead to a preference for a variety of sex of children due to the equalization effect of economic development which tends to neutralize parental value for sons (Rossi & Rouanet, 2015). Even in non-poor households, Brown et al. (2021) have demonstrated that women, especially older women and children are likely to live in poverty due to the unequal distribution of household resources.

The motive for gender preference

The rationale for preference for sons over daughters ranges from religious motives to economic or social considerations. The nature of inheritance also places more value on the male child especially in a patrilocal system where daughters leave their natal homes after marriage to join their in-laws or in a patrilineal system where family heritage and name flow only along the male lineage (Das Gupta et al., 2003). In the absence of pension and social security schemes, the sons are expected to provide support to their parents in their old age (Bélanger, 2002; Nugent, 1985).

According to Becker (1981), the underlying economic conditions of the household could account for the differential treatment meted out to children in a household based on their gender. In India for instance, Rosenzweig & Schultz, (1982) assert that households selectively allocate resources to children based on their differences in sex and variations in their expected earning opportunities in their adulthood. Björkman-Nyqvist, (2013) revealed that household income is a key determinant of educational choices, especially for girls and also during periods of negative income shocks, girls

are used by the household for consumption smoothing. Similarly, in China, Qian, (2008) established that increasing total household income has no impact on the sex ratio and as the income of women increases, there is a corresponding increase in the survival rate of girls and educational attainment for both the boy and girl child. An increase in the income of men on the other hand does not affect boys but decreases the educational attainment and the survival rate of girls.

Contrary to these studies, (Hassan et al., 2019) found that parental care towards boys and girls were not different regarding breastfeeding and material resources. There were however differences with regard to parental care in other aspects of care. For instance, while maternal care was more intensive and not related to the sex of the child, fathers were more favourable towards their sons in the area of feeding, supervising and washing. The study was conducted in Tanzania. Data for this study was derived from surveys conducted in 506 households which had a child below the age of 5 years.

In most developing countries, differential treatment of boys and girls in the household is revealed in the predominant gender bias in education (Aslam, 2009). In rural areas especially, girls tend to receive less education than boys. Many studies have not been directed to the possible cause of the gender gap in schooling. The kind of relationship that exists between differential treatment in the education of children and a household's economic conditions is worth unveiling.

Gender inequality in the family system

The main motive for gender preference lies within the traditional structure of the family system. In patrilineal and patrilocal family systems, men are conceived as instruments of investment while investments in girls are seen as not so beneficial since it becomes an investment in another family's daughter-in-law. In Asia for instance there is an economic incentive to produce sons since the

amount spent on a son's marriage stays in the family. The amount spent on the girl child in marriage however is considered a net expense. Sons also serve as insurance (widowhood insurance) for their mothers, in that, widows with sons tend to enjoy higher social intimacy when making claims on their late husband's property (Das Gupta et al., 2003). In addition, mothers prefer sons because their status improves when their sons get married as they have the power to exert their control over their daughters-in-law. Studies by Aslam (2009) in Pakistan have also revealed that though the returns on girls' education are high (despite higher total earnings for men compared to women), the bias in household education decisions could be attributed to the fact that most women in Pakistan above the age of 21 are married and reside with either their husbands or in-laws. Hence any returns from their daughter's schooling will be accrued to their husbands or in-laws and not to their parents.

The situation in Ghana is quite different due to the presence of two different forms of inheritance; the patrilineal and matrilineal inheritance systems, which may bring or have a desire for a particular sex of a child. The right to inheritance in patrilineal communities such as Ga, Ewe, Krobo and Dangbe, is obtained through one's father while in the matrilineal communities, such as the Ashanti, Fanti and Akyem the right to inherit property is obtained through membership in the family of one's mother (Cooper, 2011). Frempong & Codjoe, (2017) therefore assert that households from a patrilineal background mostly prefer boys while households from a matrilineal background are likely to prefer girls. As boys are appreciated in patrilineal societies, girls are preferred in matrilineal societies. In other words, son preference is wide spread in societies which inherit patrilineally.

Religion and gender preference

Religious affiliation has an impact on gender preference. Some studies have revealed that son preference is prevalent among Christian and African Traditional Religions (Asogwa et al., 2020). Sex preference could lead to variation in parental care for children.

In Nigeria, Asogwa et al. (2020) found that the two main religious affiliations thus Christianity and African Traditional Religion contribute to the patriarchal power relations as well as the patrilineal structure among the Igbos hence could account for the preference for the male child among Christians and the African Traditional Religion. The study was a cross-sectional study, conducted in the Enugu State in Nigeria.

A similar cross-sectional study in Ghana by Frempong & Codjoe (2017) revealed that respondents who had a preference for sons belonged to the Islamic fraternity while those who had a high preference for daughters belonged to the Christian fraternity. This study used the 2014 Ghana Demographic and Health Survey.

Modernization and gender preference

Modernization has an impact on gender preference. According to the modernization hypothesis, economic development could lead to the equalization of the value of sons and daughters to their parents. This equalization could lead to a preference for variety. This is operationalized through a change in the perception and the behaviour of people (Gu et al., 2022), thus as people get educated, urbanized or wealthier their preference for a specific gender diminishes. This is because education, urbanization and wealth expose people to modern lifestyles and therefore influence their behaviour and attitudes. There is a tendency for birth control within the context of modernization. Birth controls tend to reduce family size and promote sex-selective reproductive behaviour.

Parents have a direct and indirect influence on the educational opportunities and attainment of their children. Attitudes of parents towards the education of their children have an impact on the educational attainment of their children, especially the girl child. Using perceptions of gender-specific academic potential, educational aspirations and opinions of how some primary school subjects and various careers are appropriate to some specific genders, Davison (1993) compares the attitudes of some Kenyan and Malawian rural parents to educating girls. Most Kenyan mothers prefer to educate their daughters because compared to sons, daughters are more responsible in remembering their families once they are schooled. They tend to assist in the educational cost of their younger siblings and also support their parents financially when they are less productive in their old age. They, therefore, find the return on the educational investment on daughters to be higher compared to sons who more often than not after being educated migrate to the urban areas and forget their parents. In Malawi, none of the fathers and very few mothers thought it was more important to educate girls than to educate boys. Their rationale was that more often than not the educational investment of girls is lost when they get married or become pregnant. To these fathers, boys needed to be educated to secure good jobs.

In another study in Bangladesh, Rahman (2019) confirms that asset ownership (television) influences household behaviour. For poor households in Bangladesh, ownership of an asset like television influences girls' calorie allocation. The study used television as a proxy for modernization and concludes that in a village, access to television has a significant and positive impact on girls' allocation (Rahman, 2019). Television, though an indicator of household wealth has the potential to influence the behaviour and attitudes of households as it exposes people to modern lifestyles.

Household demographics

The gender preference of a family influences the family size. Jayachandran (2015), in a study on developing countries, confirmed that some son preference has a tendency for influencing family size. According to Jayachandran (2015), son preferences are higher among smaller families. Rossi and Rouanet, (2015) on the other hand in a study on 37 African countries, found that small size families have a preference for a variety while middle-sized and large families have son preference and no preference respectively. For more than half the couples in Africa, Asia and America, the sex of a child is likely to influence the decision to have additional children (Norling, 2018). Using a model-based approach for inferring sex preference, Norling (2018) found that 24 percent of couples preferred sons and 18 percent of couples preferred daughters in these regions. The study also confirmed that survey reports tend to underreport the extent to which parents in these regions prefer sons or daughters.

Similarly, in a very recent study in Bangladesh, Asadullah et al., (2021) found that women who had not yet had a child had a desire for both sexes, in other words, they had no gender preference. However, for respondents with children, the presence of a son had a strong and negative effect on additional sons and the presence of a daughter had a strong and negative effect on the desire for an additional daughter. The study also confirmed that the decision on fertility is based on son preference although most women expressed the desire for both sexes (Asadullah et al., 2021). The study was conducted in 2014 with a nationally representative sample of women in Bangladesh of childbearing age.

Changes in household economic conditions have an impact on how boys and girls in especially developing countries are treated differently. Son preference is high among non-working women in Africa while working women have a preference for variety (Rossi & Rouanet, 2015). The likely

reason for this is that non-working mothers are highly dependent on their husbands and their sons when they become widows. Similarly, Asadullah et al. (2021) in a study in Bangladesh found that women who had completed secondary school and who lived in areas with more opportunities for female-paid jobs had a stronger desire for gender balance.

Household income has implications for the household decision on the education or educational choices of the child. Björkman-Nyqvist, (2013) showed that in Uganda, households respond to income shocks by varying the quantity of girls' education however boys are protected from these shocks. In other words, girls are used for consumption smoothing in periods of income shocks, and in periods of transitory shocks, girls are used for domestic work and reduced consumption. The study used enrollment data, test scores data and rainfall data from the Education Management Information System, Uganda National Examination Bureau and Meteorological Department at the Ministry of Water, Land and Environment respectively.

The household preference to school a son rather than a daughter could be based on the perceived return from investing in the education of a son. In a society where child marriage is prevalent, parents may fear that investing in their daughter's education may not be rewarding due to the high tendency of the girl child to get pregnant and drop out of school. On the other hand, parents who fear their sons may become combatants in the event of civil unrest may prefer to invest in the education of their daughters instead of their sons (Asiedu, Azomahou, Getachew & Yitbarek, 2021).

2.6 Gaps in Literature

Most of the studies reviewed used household wealth or household assets as a yardstick to measure the economic condition of the child. This measure is spurious as household wealth is not equally

distributed among members of the household and mainly depends on who has the power to determine how household resources are allocated. This study therefore measures child poverty using a multidimensional approach. There are limited studies on measuring child poverty in Ghana, however, the few studies like Agyiri-Tetteh et al, (2021), fail to account for key indicators that have an impact on the overall well-being of children such as access to health insurance, exposure to violence and overcrowding. Furthermore, while the Agyiri-Tetteh used only two rounds of the Ghana Demographic and Health Survey, this study will use the first three waves of the Ghana Socioeconomic Health Survey. The use of the first three waves of the Ghana Socioeconomic Panel Survey in this study gives more reliable parameter estimates as higher time periods give a better degree of freedom (Hsiao, 2010).

The study further examines the impact of multidimensional child poverty on a child's academic performance. None of the literature reviewed in this study used multidimensional poverty in their assessment of the effect of poverty on a child's academic performance. This is problematic as mentioned earlier because household wealth is not equally distributed among all members of the household. This study proposes that studies regarding the welfare of children would be incomplete without first examining the multidimensional child poverty status of the children. Examining the multidimensional poverty status gives a more nuanced picture of the deprivation of children. In addition, such studies help to identify the most vulnerable and provide information to assist in designing policies for target groups.

In addition, children need a conducive environment to grow and function effectively. A progressive school environment or a child's innate abilities are not enough to ensure the children perform well academically as the education production model claims. Parental efforts are needed to complement the efforts of the school conditions. Most studies especially in Ghana limit their

studies to the influence of the level of parental education on the child's health and or education without considering parental presence in the household.

The availability of panel data for socioeconomic studies is a major concern for panel analysis in Ghana. Most studies on child education and health in Ghana have focused on cross-sectional analysis. These studies, therefore, ignore the dynamic properties of some variables in their cross-sectional analysis. Almost all of the studies reviewed in this section used cross-sectional data. This study however uses panel data hence giving room to detect changes in households over time. By using panel data, the study is able to control for individual-specific factors that remain constant over time but have an impact on the dependent variable. Thus, the findings of this study are robust as the use of panel data helps to reduce collinearity among explanatory variables (Hsiao, 2010). In addition, the panel nature of the study enhances the study of trends over time, a time-dynamic analysis that is impossible with cross-sectional data.

Lastly, there is inadequate evidence to conclude on the determinates of son preference in Ghana. A few studies have tried to study son preference in Ghana (Rossi and Rouanet, 2015; Frempong & Codjoe, 2017). The existence of son preference in Ghana is unclear. Although Rossi and Rouanet (2015) found no son preference in Ghana, Frempong & Codjoe (2017), using the 2014 Ghana Demographic and Health Survey conclude that there is son preference in Ghana but the degree of son preference declined with the education of the individual. This study contributes to the ongoing debate by examining determinants of son preference in Ghana. This topic is worth exploring because son preference has a subtle way of causing gender inequality as well as inequality of opportunities. We also get the sense that gender inequality takes its roots in the household unit even before a child is conceived through gender preference (Asadullah et al., 2021).

Gender preference, therefore, causes households to discriminate against a particular gender, leading to gender inequality which in the long run worsens child poverty.

This study therefore adds to the limited studies in Ghana by focusing on measuring child poverty in Ghana. determinants of child poverty, the impact of child poverty on child academic performance, the drivers of stunting in the household and the determinants of son preference in Ghana.

2.7 Conceptual Framework

Based on the theoretical and empirical reviews the study conceptualizes that child poverty affects the education of a child. As indicated by the human capital theory, the household decision model and the family stress model, the academic performance of the child is influenced by a spectrum of factors such as the school conditions, the deprivation of the child as well as household conditions. School conditions such as the number of teachers per class, availability of textbooks, and type of school influence the performance of the child. In terms of the household conditions, the wealth of the household, the presence of parents in the household, the educational status of parents, the location of the household, the size of the household as well as the level of depression of the mother of the child are likely to affect the academic performance of the child. In addition, the characteristics of the child such as the innate ability of the child, gender, health condition, as well as deprivation status of the child are likely to influence the performance of the child.

The study further conceptualizes that the health of the child is likely to be influenced by household conditions such as the wealth of the household, parental education, the presence of parents in the household and the decision of the household to own national health insurance. The level of

depression of the mother as well as the sanitation of the household influences the health of the child.

According to Sen's capability approach, social constructs such as gender preference could cause a child to be discriminated against through the household decision-making process. The study, therefore, conceptualizes that household wealth, level of education of parents, access to information and ethnicity influence the preference of the household for or against a son. Son preference tends to lead to unequal resource allocation. Households with strong son preference are likely to allocate more resources for education, nutrition and healthcare to sons at the detriment of their daughters. This could lead to unequal distribution of resources. Furthermore, this could increase the disparity between male children and female child in terms of health, education and general well-being, thereby leading to child poverty among female children.

The conceptual framework of this study encapsulates how child poverty and son preference could affect the education and health of a child. Aside poverty, school conditions also influence the education of the child. The household decision forms a very important part of the study. Household decisions directly affect child poverty and indirectly through son preference.

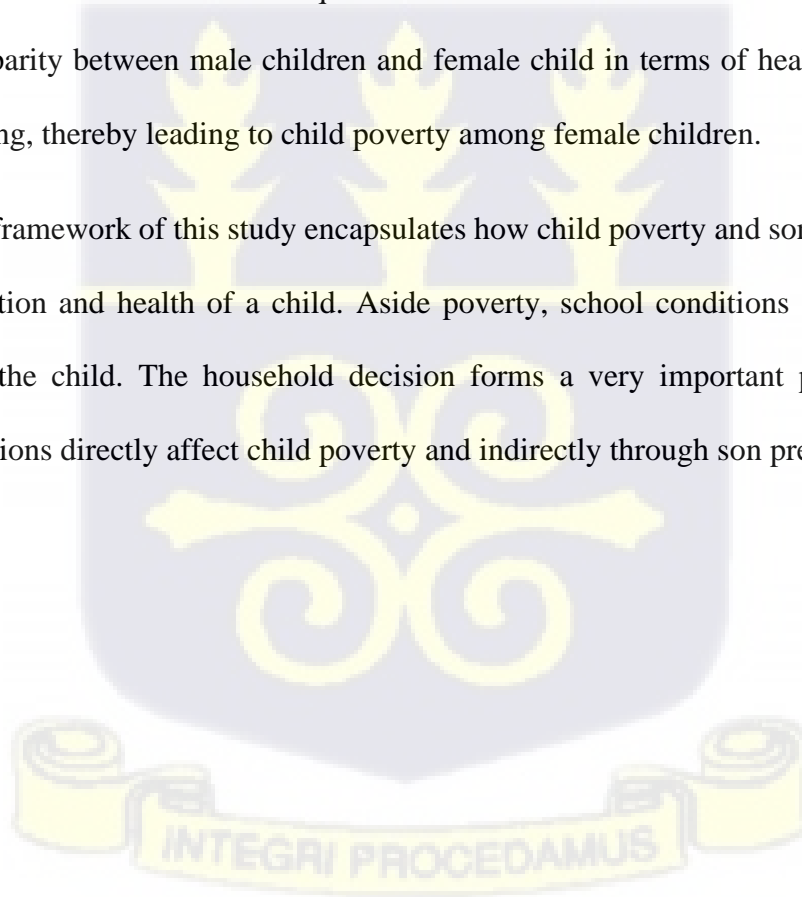
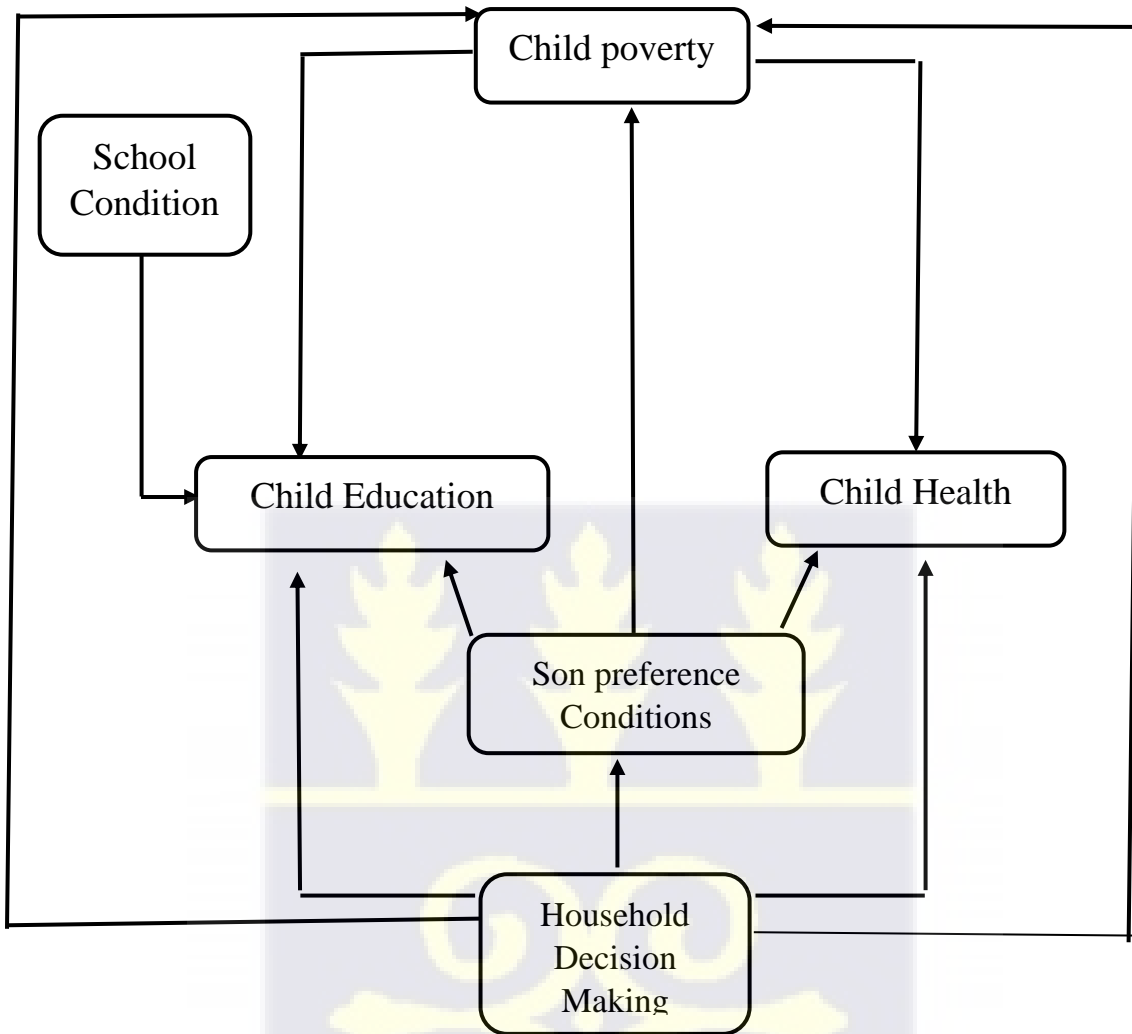


Figure 7: Conceptual Framework



Source: Author's own construct



CHAPTER THREE

MEASURING CHILD POVERTY IN GHANA

3.1 Introduction

The main objective of this chapter is to measure child poverty in Ghana. The study measures child poverty in Ghana using two different approaches i.e., the multidimensional approach and the household poverty status approach. The study goes further to compare the two approaches and analyses the rate of transition of child poverty from 2010 to 2018. Ravallion (1992) has emphasized that the main purpose of measuring poverty is not just to derive numbers for a place or date but rather, to be able to do comparisons. Measuring poverty has some implications. It is important for monitoring poverty alleviation policies. Measuring poverty brings to light the prevalence of poverty which enables policymakers to make informed decisions with regard to policy on poverty alleviation (Ravallion, 1998). This means that the poor are likely to be ignored or forgotten if they are not identified statistically. Measuring child poverty therefore helps identify the poor children, where they are located and other specific demographics associated with such children. In such measurements, the size of the household in which the child lives, the characteristics of the household head and the presence of the parents in the household are considered.

Measuring poverty, in general, has changed over the years, from a monetary-based approach to a multidimensional approach. The measure of poverty could be the headcount index (P_0), which measures the proportion of the population that is poor. This criterion is commonly used because it is easy to understand and measure. However, it does not indicate the extent of poverty. The poverty gap index (P_1) measures the extent to which people within the population fall below the poverty gap. This measure gives the cost required to eliminate people from poverty if transfers were

perfectly targeted. One weakness of this measure is that it does not reflect improvement or worsening of inequality among the poor. The squared poverty gap index (P_2) measures the severity of poverty. It averages the squares of the poverty gap in relation to the poverty line. Measuring the squared poverty gap index helps identify those who are worse off or better off with respect to the poverty line. For instance, two individuals or households fall below the poverty line. Nonetheless, the individual or household further away from the poverty line may be worse off than the individual or household who is just below the poverty line.

Alkire & Foster (2011) use two forms of cutoffs to identify the poor. The first identification is to ascertain if a person is deprived with respect to a particular dimension. The second defines the extent of deprivation to be considered a poor person, thus the cutoff specification is a minimum number of dimensions of deprivation. This identification procedure of dual cutoff adopted by Alkire and Foster (2011a) highlights or focuses on those suffering from multiple deprivations.

In a study on Ghana, Agyire-Tettey et al. (2021) following the Alkire and Foster Approach use data from the 2008 and 2014 rounds of the Ghana Demographic and Health Survey to measure child poverty in Ghana. The study found the incidence and intensity of multidimensional child poverty are declining. Nonetheless, the differences in sub-groups remain significant. The study also found that the main contributor to child multidimensional poverty in Ghana is the standard of living. The indicators for the standard of living used in the study include (1) if the household has no electricity (2) the household cooks with biomass (firewood, cow dung, wood, charcoal) (3) the household sanitation facility is not improved, or it is shared with other households and (4) the household does not have access to safe drinking water or access to safe drinking water is more than 30 minutes away). This sub-section contributes to the literature on child poverty in Ghana by using relatively recent data to measure multidimensional child poverty in Ghana. This data is

relatively new and such studies have not been used to study child poverty in Ghana. furthermore, this study uses the first three waves of the GSPS which gives better degrees of freedom and by extension, better estimates (Hsiao, 2010) compared with Agyire-Tetteh et al. (2021) who only use two rounds of the Ghana Demographic and Health Survey.

This study employs two methods for measuring child poverty. These two methods are discussed in this section, thus the multidimensional approach and child poverty status identification based on household poverty status. The child poverty status identification based on household poverty status may be considered a crude method. This is because it identifies a child in a poor household to be poor. The study goes further to compare the multidimensional approach and child poverty status identification based on household poverty status. The essence of this comparison is to explore the possibility of a child in a non-poor household being multidimensionally poor or a child in a poor household being multidimensionally non-poor. The study also takes advantage of the availability of three waves of data and examines child poverty trends and dynamics from 2010 to 2018. The Ghana Socioeconomic Panel Survey (GSPS) data is used in both measurements.

3.2 Methodology

3.2.1 Multidimensional Approach to Measuring Child Poverty

The poverty status of a child goes beyond the monetary inadequacy of the household to which the child belongs. The poverty status of a child may come from a simultaneous deprivation of the child. For instance, a child from a poor household (monetary measure) could be deprived of education while at the same time deprived of health, malnutrition and or adequate housing. In some circumstances, a child from a non-poor household could be identified as a poor child if that child is deprived of what he or she needs for total well-being. A poor child could be identified in a non-

poor household. This could be because household resources are unequally distributed among households, and/or caretakers do not prioritize the well-being of children (Asadullah et al., 2021; Rahman, 2019).

The measurement of poverty has evolved over the years. Most economists now appreciate poverty as a multidimensional phenomenon. The Foster-Geer-Thorbecke (FGT) approach (Foster, Greer and Thorbecke (1984)) has contributed to studies in poverty and in recent times has birthed Atkinson (2003), Chakravarty and D'Ambrosio (2013), Alkire and Foster (2011a and 2011b) and de Neubourg, Bradshaw, Chzhen, Main, Martorano, & Menchini, (2012). This study follows the Alkire and Foster (2011) measure of overlapping multidimensional poverty. This is because this method is comprehensive and reveals the various dimensions of deprivation that a child may experience. Secondly, as explained earlier, this method accounts for non-material deprivations such as healthcare and education. Finally, this method makes it easy for policy makers to design targeted interventions to address specific deprivations children experience in a particular location. The child is the unit of analysis of multidimensional poverty in this study. The multidimensional child poverty computation is done at the individual level. It focuses on children below 18 in the household. It is worth noting that the Alkire-Foster (AF) measure takes its roots from Sen's capability approach to poverty. It presents a multidimensional approach to measuring poverty. Just like the FGT measure, the AF measure works with a parameter α which satisfies all the axioms of poverty such as poverty focus, replication invariance, weak monotonicity and symmetry associated with multidimensional poverty. The AF approach makes room for indicators which are ordinal or binary. The approach measures the breadth, depth and severity of multidimensional child deprivation. The two main steps associated with this methodology are identification and aggregation. Based on the deprivation cut-off, the approach first identifies children who are

deprived in each dimension and then identifies the multidimensionally poor individual. Thus the cut-off is identified by counting the number of dimensions in which an individual is deprived. The next stage is aggregation.

The indicators may be weighted equally or given different weights. However, for this study, equal weights are assigned to the dimensions. This is because the study attaches equal importance to each dimension (Alkire and Foster, 2009). Atkinson (2002) asserts that assigning equal weights to each dimension has an intuitive appeal and easy interpretation of results. In this case, a child is identified as multidimensionally poor if the weighted sum of their deprivation is equal to or greater than the poverty cut-off. Table 3.1 (page 99) presents the various dimensions and their associated indicators for children between the ages of 5 and 18 years.

The indices developed from this methodology i.e. AK measurement are relevant for planning and monitoring policy. This is because the application of this method can be used to measure well-being and monitor the economic progress of the target groups. The method is also appropriate for policy analysis since it gives room or allows for the decomposition of population subgroups and deprivation domains.

The AF method -Identifying poor children

Assume a sample of N children and $D \geq 2$ deprivation indicators. These indicators are grouped into deprivation domains called dimensions according to how related they are.

Let $N \times D$ matrix be denoted by Y , whose entry y_{ij} denotes the level of indicator j for individual i .

In the $1 \times D$ vector $z = (z_1, \dots, z_D)$, is the deprivation cutoff of D indicators, which indicates if a child is deprived in a particular dimension. A child is therefore deprived if y_{ij} is below the respective cutoff. Thus for an indicator j and a child i , $y_{ij} < z_j$ implies the child is deprived.

Weights are then assigned to each indicator. This study assigns equal importance to all the indicators. Hence equal weights are assigned to them, where a $1 \times D$ vector, $w = (w_1, \dots, w_D)$, $0 < w_j < 1$ and $\sum_{j=1}^D w_j = 1$. All weights are equal to $\frac{1}{D}$.

Assume g^0 is the $N \times D$ matrix. According to the Alkire and Foster (2011) deprivation matrix, the entries are given by $g_{ij}^0 = w_j$ if $y_{ij} < z_j$ and $g_{ij}^0 = 0$ if $y_{ij} \geq z_j$. Therefore $c_i = \sum_{j=1}^D g_{ij}^0$ represents the number of weighted deprivations a child i faces. This is given by the row sum of g^0 . A poverty cutoff where $0 < k < 1$ is fixed to determine the weighted deprivation a child must exceed to be identified as poor. The identification function of a poor child is given by $\rho_k(y_i, z) = 1$ if $c_i > k$ and $\rho_k(y_i, z) = 0$ if $c_i < k$. The row vector g^0 is zero if the child is not poor.

The incidence of child poverty given by the headcount ratio in the population is

$$H = \frac{\sum_{i=1}^N \rho_k(y_i, z)}{N} = \frac{q}{N} \dots \dots (3.1)$$

Where q is the number of poor children identified in the deprivation function c_i , and N is the total number of children under review. The headcount ratio is limited in revealing the changes in the level of child poverty if a child becomes deprived in a new dimension or if the child's condition improves such that he or she comes out of a particular deprivation. In this case the censored deprivation matrix $g^0(k)$, provides a solution by giving an index that reveals changes in the number of deprivations a child experiences.

The censored deprivation matrix is given by:

$$g^0(k): |g^0(k)| = \sum_{i=1}^N \sum_{j=1}^D g_{ij}^0(k) \dots \dots (3.2)$$

According to Alkire and Foster (2011), A is the ratio of the number of deprivations ($|g^0(k)|$) a poor child faces and the number of poor children (q). Therefore $A = \frac{\{|g^0(k)|\}}{q}$ gives the breadth of deprivation.

The product of H and A gives the poverty measure M_0 (in this study, child poverty measure) which accounts for both incidence (H) and intensity (A). According to Alkire and Forster (2011), M_0 is the multidimensional poverty index or the adjusted multidimensional headcount ratio.

The *mpi* command is used to compute the multidimensional child poverty in Stata. The survey design is declared before using the *mpi* command in Stata. The command *svyset*, is used in Stata to account for the survey design parameters such as the primary sampling unit (PSU), the strata and the probability weights. This way, there is an adjustment for the over-sampling of the Upper East and Upper West regions due to their relatively small population size.

3.2.2 Identifying Child Poverty Based on Household Poverty Status

The second approach to measuring child poverty in this study is to confer the household poverty status on the child. This may look like a crude method, nonetheless, as established earlier in the introductory chapters, children do not live on their own. The immediate environments within which they grow have an impact on their growth and development. The household within which children grow up has an impact on children.

The units or methods used to measure a variable or a concept influence the outcome of the analysis. Following other works where child poverty is based on the household poverty status (Makhalima, 2020), the poverty status of a child is linked to the household poverty status. The child poverty status of a child is therefore derived by connecting the household poverty status to the child. Thus a child from a poor household is identified as poor while a child from a non-poor household is identified as non-poor.

3.2.3 Source of Data

The dataset for this study is obtained from the Ghana Socioeconomic Panel Household Survey. Also referred to as the EGC/ISSER Socioeconomic Panel Household Survey, it is a collaborative project among Yale University Economic Growth Center, the Millennium Challenge Corporation (MCC), the Robertson Foundation and the Institute of Statistics, Social and Economic Research at the University of Ghana, Legon. The Ghana Socioeconomic Panel data is nationally representative. The main objective of the survey is to make available information on the patterns of household consumption and expenditure at a highly disaggregated level. This makes it possible for researchers to monitor the economic conditions and standard of living of Ghanaians over a period of time. The data also provides baseline data to enable the monitoring of projects (such as The Hunger Project and the Millennium Challenge Corporation interventions in Ghana) as well as track the progress of the standard of living for Ghanaians.

The dataset contains information on household income, consumption and expenditure; health and fertility behaviour, education and skills/ training, employment and time use; demographic characteristics, housing and housing conditions, prices of consumer items and non-farm household

enterprises (general enterprise, trade/wholesale enterprise, food enterprise and services). It also contains information on migration as well as basic information and assets.

The first three waves are used for the study. As at the time of this study, only the first three waves were readily available. Wave I was collected in 2009-2010 using paper-and-pencil survey forms, Wave II data were collected in 2013-2014 using tablets with Balise software while Wave III was collected in 2018 using SurveyCTO software.

The survey covered the then 10 administrative regions of Ghana. The survey began before the division of the regions into sixteen regions. About 5010 households from 334 Enumeration Areas (EA) were sampled from the first wave. The EAs were sampled proportionally from each region based on the 2009 population share. However, there was oversampling for Upper East Region and Upper West Region due to their relatively smaller population size to make room for a good number of households to be sampled and interviewed. The surveys follow a two-stage stratified sample design. The first stage was based on the 2000 Ghana population and housing census where a total of 334 clusters (Enumeration Areas) were selected. While in the second stage households within the EA were systematically listed, of which 15 of the listed households were randomly selected to make up the total number of households needed for the survey. The main objective of the second stage of sampling is to ensure that the data has enough representation at the regional level and also, reduce the effects of intra-class correlation within a sample area. In the second wave, 4774 households were sampled, which accounts for an attrition rate of 4.7%. In the third wave 5669 households were sampled. The differences in the sample across the waves could be due to attrition, the split of households, and new dimensions added to the project. For instance, the inclusion of the Ghana Ultra Poor Project in Wave 3 of the survey could be the rationale for the increase in the sample to 5669.

3.3 Dimensions and Indicators

To measure child poverty based on the multidimensional approach, the study identifies dimensions of a child's well-being that depict poverty within a Ghanaian context. A set of indicators are used to measure each dimension of a child's well-being. These indicators are unique to this study. Grounded on the Human Needs Approach and availability of data, the indicators were chosen to reflect the various aspects of child development. Table 3.1 shows the dimensions, indicators deprivation cut-offs and weights for measuring the multidimensional child poverty index for children below 17 years.

Health

Three indicators used to measure the health dimension of multidimensional child poverty are access to valid health insurance, absence of disease & sickness and child mortality (NDPC (2020); Agyire-Tettey et al., (2021)). While this study used Access to NHIS, Child Mortality, and Disease and Illness under the Health Dimension, Agyire-Tettey et al., (2021) paper used place of delivery, disease and sickness, nutrition, child mortality, and immunization as indicators for the Health Dimension. Access to valid health insurance implies that the child can have access to free medical services. Children who lack access to valid health insurance are therefore considered to be deprived. The child mortality indicator captures if a child lives in a household where the total number of children living is less than the total number of births in the household. Children who live in such households are considered to be deprived. This is because child mortality reveals the overall well-being of the household. Thus, there could be some underlying health or economic conditions that may have caused the early deaths of some children in the household. The health status of the child is measured by the disease and illness indicator. A child is considered to be deprived if he or she has suffered any illness in the last 2 weeks before the survey.

Table 3.1: Dimensions, indicators deprivation cut-offs and weights for measuring multidimensional child poverty index for children below 17 years.

Dimension	Indicator	Deprivation cutoffs/Threshold	Weights
Health			0.33
	Access to health insurance	A child is deprived if he or she is not covered by health insurance	0.11
	Disease and sickness	A child is deprived if he or she has suffered from cough, diarrhoea, fever or anaemia in the last 2 weeks	0.11
	Child mortality	A child is deprived if any child has died in the household	0.11
Education and Child Protection			0.33
	Textbook	A child is deprived if he or she has no textbook	0.11
	Lateness in schooling	The child is deprived if he/she is 2 or more years behind in schooling	0.11
	Violence	A child is deprived if there has been any physical violence in the household or a neighbour's household in the last 30 days	0.11
Standard of living			0.33
	Safe water	A child is deprived if he or she has no access to safe drinking water. Unsafe drinking water sources include unprotected wells, rivers/streams, Rainwater/springs, Dugout/ponds/lakes/dam	.07
	Main light	A child is deprived if he or she lives in a household where there is no electricity	0.07
	Improved Toilet	A child is deprived if he or she lives in a household where they lack access to an improved toilet facility and have to resort to a public toilet or toilet in another house or use a pit/pan/bucket	0.07

	and in extreme cases use the bush or the beach as a place of convenience.	
Overcrowding	A child is deprived if he or she lives in a household where three or more people sleep in one bedroom.	0.07
Housing	A child is deprived if he or she lives in a household where the roof, wall or floor materials are made of low-quality materials	0.07

Source: Author's computation

Child Education and Protection

The educational system of Ghana was restructured in 1987 with the introduction of the junior high school (formally the junior secondary school) program. The 6-3-3-4 system was introduced under the new structure. Currently, the educational system of Ghana is grouped into three main categories. These are (1) basic education; (2) secondary education; and (3) tertiary education. It begins with basic education, which is free and compulsory and targets children between the ages of 4 and 15. The basic education in Ghana starts with kindergarten or pre-school (2 years), then primary school and Junior High School (JHS) which have a duration of six years and three years respectively. Technically, a Ghanaian child is expected to start primary education at age 6 and end at age 15 with the Basic Education Certificate Examination. The child continues into secondary cycle education after a successful BECE. The secondary cycle education which has a duration of about three years could either be a general that is, Senior High School (SHS) or a vocational that is, Technical Senior High School. By the age of 18, a child in Ghana should have completed secondary education. Children who are not in school or are two or more years behind in school are classified as being late in school enrolment and are coded as deprived. The second indicator for education is access to textbooks. Children who do not have access to any textbook are classified

as deprived. The GSPS asks ‘Does (Name) have access to all the textbooks needed for school?’ The options for answering are (1) yes, has all; (2) has some, but not all; (3) has none. According to the GSPS, children could access books provided by the school and can take them home, or cannot take them home. The textbook could also be newly purchased from the school, newly purchased from the private market or a gift or passed down by older siblings.

Children need to be protected from every form of violence. In this study, a child is deprived if there has been any physical violence in the household or a neighbour’s household in the last 30 days. Neighbour is included because violence in a neighbour’s household could have a negative spillover effect on other neighbours, especially children. Secondly, children observe and learn from their environment. Hence, being exposed to violence either from the household or the neighbourhood could have negative repercussions on the child. This study differs from the Agyire-Tettey et al., (2021) paper. While this study has education and child protection as a dimension (with access to textbook, lateness to school, and violence as indicators), the Agyire-Tettey et al., (2021) paper had education, care and social inclusion as a dimension (with care and guidance, school gap, early child development and birth certificate as indicators).

Child Living Standards

The physical conditions of the household reflect the standard of living of the child and have an impact on the emotional, physical and cognitive development of the child. The main indicators selected to measure the living standards of children are access to electricity, sanitation, access to safe drinking water, overcrowding, and housing conditions. These indicators differ from the Agyire-Tetteh et al. (2021), which has cooking fuel included in its indicators. The indicators and dimensions chosen for this study are appropriate for the age of the child under consideration. In this study, a child is deprived if he or she lives in a household which does not have access to

electricity or uses candles or a torch as their main source of light. A child is also considered to be deprived if he or she lives in a household with unimproved sanitation and or a shared toilet facility. In this study, unimproved toilet facilities include, using a pit, bucket, or latrine, and using the bush or beach as a place of convenience. Access to clean water is important for the growth of the child. Children who are exposed to unimproved sanitation and unsafe drinking water are at risk of diarrhoea and other water-borne diseases. A child is deprived if he or she does not have access to safe drinking water. Children who live in households where their main source of drinking water is unsafe are at risk of infection from water-borne diseases. Unsafe drinking water sources include unprotected wells, rivers/streams, rainwater/springs, Dugout/ponds/lakes/dams.

Children who live in houses where more than three people share a bedroom are considered deprived. The last indicator for the standard is the type of house in which the child lives. The type of materials used to construct the wall, roof, and floor of the house reflect the quality of the house. Walls and floors of houses made of undeveloped materials such as cow dung, and earth provide breeding grounds for pests and rodents. This puts occupants of these houses, especially children at risk. A child who lives in a household where either the walls, floor or roofs are made of rudimentary materials is regarded as deprived.

A child is considered to be multidimensionally poor if the weighted deprivation score of the child exceeds the stipulated deprivation cut-off. Following Alkire and Fang (2019), the deprivation threshold or cut-off (k) point is set to $k=3$. This means that a child is considered to be multidimensionally deprived if he or she is deprived in at least three or more indicators concurrently. There are two extremes in setting the poverty cutoff; the union approach and the intersection approach (Alkire and Fang, 2019). The union approach identifies multidimensional poor as one whose household is deprived in at least one indicator. On the other hand, for the

intersection approach, the individual is categorized as multidimensionally poor if the household to which the person belongs is deprived in all indicators. This study takes a middle ground between the two extremes hence setting the deprivation cutoff at 33.33 percent.

Based on the deprivation cut-off, a deprivation matrix is aggregated across the population of children to derive a child-level MPI. The analysis presents three main indices of multidimensional child poverty, thus headcount ratio (H) which measures the percentage of children who are poor, the intensity of deprivation (A) which measures the average number of deprivations that the multidimensional poor child faces and the adjusted deprivation (M_0) which measures the extent of the deprivation. The adjusted deprivation is the product of the headcount ratio and the intensity of deprivation ($H \times A$). To examine variations in child poverty across groups, the child poverty index is then decomposed by some demographic and socioeconomic characteristics of the child.

3.4 Deprivation and Contributions of Indicators

The level of deprivation and the contribution of each deprivation to each dimension of child poverty for waves 1, 2 and 3 are presented in Table 3.2. The analysis is restricted to only children (observations below the age of 18). There were 3,785 observations in Wave 1, while Wave 2 and Wave 3 involved 3,458 and 3,116 observations respectively. The level of deprivation and contribution of each deprivation is derived from the MPI computation (through the *mpi* Stata command). According to the results, the levels of deprivation for some of the indicators declined from Wave 1 to Wave 3. Thus, there was a decline in the incidence of the deprivation of housing conditions from 7.4 percent to 3.4 percent. Overcrowding and deprivation in housing conditions declined from 54.1 percent in Wave 1 to 37.1 percent in Wave 3 and 7.4 percent in Wave 1 to 3.4 percent in Wave 3 respectively. In addition, deprivation in access to safe drinking water declined

from 16.4 percent in Wave 1 to 12.8 percent in Wave 3. A reduction was observed in the deprivation of access to the National Health Insurance Scheme (NHIS). The decline could be attributed to the expanded access to National Health Insurance all over the country. The proportion of children who experienced violence in their households or neighbourhood also declined from 17.2% in Wave 1 to 14.1 percent in Wave 3. The proportion of children who were deprived in terms of access to electricity, and textbooks, lateness to school and child mortality, increased from Wave 1 to Wave 2 but later declined in Wave 3. The level of deprivation in improved toilets declined from 78.5 percent in Wave 1 to 73.8 percent in Wave 2 but later increased to 74.5 percent in Wave 3.

Table 3. 2: Deprivations and contributions of indicators to MCP, Wave 1, 2 & 3

Indicators	Deprived (%)				Contributions			
	All	Wave 1	Wave 2	Wave 3	All	Wave 1	Wave 2	Wave 3
Health					0.32	0.33	0.314	0.3
Access to NHIS	35.4	50.0	27.3	20.6	0.16	0.21	0.13	0.1
Child mortality	21.8	18.1	29.0	19.6	0.11	0.09	0.14	0.13
Disease and illness	8.6	6.2	10.7	10.1	0.04	0.03	0.05	0.06
Education & child protection					0.29	0.28	0.301	0.32
Access to Textbook	10.8	10.4	12.2	10	0.07	0.06	0.08	0.09
Lateness to school	36.4	26.0	45.9	38.1	0.14	0.14	0.15	0.15
Violence	15.9	17.2	15.5	14.1	0.08	0.08	0.08	0.07
Standard of living					0.39	0.39	0.39	0.39
Access to safe drinking water	15.4	16.4	16.4	12.8	0.05	0.04	0.05	0.05
Electricity	27.4	24.4	33.7	25.3	0.08	0.07	0.09	0.09

Improved Toilet	76	78.5	73.8	74.5	0.15	0.15	0.14	0.15
Over Crowding	46	54.1	43.2	37.1	0.1	0.11	0.09	0.08
Housing Condition	5.4	7.4	4.4	3.4	0.02	0.02	0.014	0.02

Source: Author's computation. Total number of observations is 10,359

The major contributor to child poverty in Ghana is the deprivation in the standard of living, contributing 39 percent to child poverty in Ghana. This is followed by the health dimension, contributing 32 percent and the education and child protection, contributing 29 percent to multidimensional child poverty (MCP) in Ghana. All in column 2 and 6 capture all the three waves together. A glance at Table 3.2 (column six) reveals that overall (All three waves), access to NHIS and child mortality indicators contributed 16 percent and 11 percent to MCP, respectively. Under the education and child protection dimension, lateness to school contributed 14 percent while under the standard of living dimension, deprivations in toilet and overcrowding contributed 15 percent and 10 percent to MCP respectively. The study takes into account the oversampling of the Upper East Region and Upper West Region due to their low population.

Subgroup decomposition of multidimensional (MCP) in Ghana

Estimates of the headcount, severity of deprivation and the MCP are presented in Table 3.3. The results reveal a decline in the headcount poverty (H) from 30 percent in Wave 1 to 18 percent in Wave 3. The average intensity of child deprivation or severity of child deprivation (A) did not change much. There was a slight increase in the severity of child deprivation from 42 percent in Wave 1 to 43 percent in Wave 2. This increase was short-lived as there was a 1 percent decline in wave 3 (42%).

Table 3. 3: Multidimensional Child Poverty per Waves

Wave 1			Wave 2			Wave 3		
H	A	MPI	H	A	MPI	H	A	MPI
0.3	0.42	0.13	0.26	0.43	0.11	0.18	0.42	0.08
(0.02)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)

Source: Author's computation (Standard Errors in parentheses)

The multidimensional index declined from 0.13 in Wave 1 to 0.08 in Wave 3. The decline in the multidimensional index was a result of the decline in the headcount poverty. This implies that though the number of multidimensionally deprived children is on a downward trend, there has not been much improvement in the average intensity of the deprivation of these children.

Table 3.4 presents the decomposed MCP according to socioeconomic subgroups from 2010 to 2018. Decomposing MCP into subgroups assesses differences in multidimensional child poverty across some socioeconomic characteristics, thus the location of the child (rural/ urban), the sex of the child (male/ female) and the region in which the household is located. The decomposition by sex reveals that compared to girls, boys (32%) in Ghana are multidimensionally poor than girls (30%). Children in rural areas (42%) are poorer than children in urban areas (18%). Compared with Greater Accra Region which has the lowest proportion of multiple deprived children (18%), the Upper West Region and Northern Region have the highest proportion of multiple deprived children, thus 45 percent and 44 percent respectively.

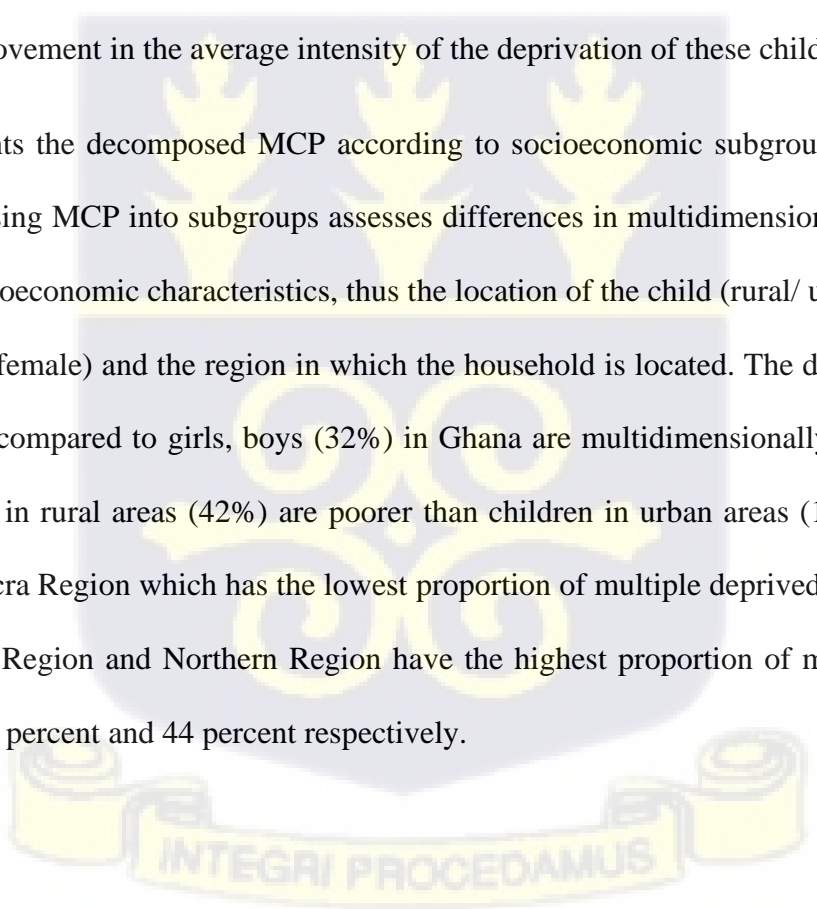


Table 3. 4: Sub-group decomposition of Multidimensional Child Poverty from 2010 to 2018

	H	A	MPI
National	0.254 (0.01)	0.422 (0.00)	0.107 (0.01)
Sex of child			
Male	0.317 (0.02)	0.449 (0.00)	0.142 (0.01)
Female	0.307 (0.01)	0.448 (0.00)	0.137 (0.01)
Residence			
Urban	0.176 (0.01)	0.418 (0.00)	0.074 (0.00)
Rural	0.417 (0.01)	0.458 (0.00)	0.191 (0.00)
Region			
Western	0.306 (0.03)	0.457 (0.00)	0.140 (0.01)
Central	0.457 (0.01)	0.466 (0.01)	0.164 (0.01)
Greater Accra	0.181 (0.02)	0.425 (0.01)	0.077 (0.01)
Volta	0.291 (0.02)	0.421 (0.00)	0.123 (0.01)
Eastern	0.340 (0.04)	0.432 (0.01)	0.147 (0.01)
Ashanti	0.242 (0.03)	0.456 (0.01)	0.110 (0.02)
Brong-Ahafo	0.323 (0.02)	0.447 (0.00)	0.144 (0.01)
Northern	0.436 (0.03)	0.455 (0.01)	0.198 (0.01)
Upper East	0.350 (0.03)	0.437 (0.01)	0.153 (0.01)
Upper West	0.447 (0.01)	0.456 (0.01)	0.204 (0.01)

Source: Author's computation (Standard Errors in parentheses)

Table 3.5 presents a breakdown of the decomposition by the three waves (Wave 1, 2 & 3). The figures reveal that multidimensional child poverty is declining over time. A critical observation of male and female categories shows that the multidimensional child poverty for boys (13%) is slightly higher than that of females (12%) in Wave 1. On the contrary, multidimensional child

poverty for both boys and girls in Wave 3 reduced to 8 percent. This can be considered a great feat, thus aside from the decline, there was no difference between multidimensional child poverty for males and females in Wave 3. Same cannot however be said for the residence of the child. The disparity between the urban and rural locations of children persists throughout the three waves. While 6 percent of children in urban areas and 17 percent in rural areas were multidimensionally poor in Wave 1 the proportion of poor children declined in Wave 2 and Wave 3 respectively to 5 percent (urban) and 15 percent (rural) in Wave 2 to 2 percent (urban) 12 percent (rural) in Wave 3. With regards to the multidimensional child poverty at the regional level, there was a decline in multidimensional child poverty across wave 1 to wave 3 in all the regions except for Western Region, Central Region and Upper East Region. This implies that much attention should be channeled to these regions to ensure that children within these regions are not deprived. Not surprisingly, the national capital, Greater Accra had the lowest proportion of multidimensionally poor children (1%) while the Northern Region recorded the highest proportion of multidimensionally poor children.

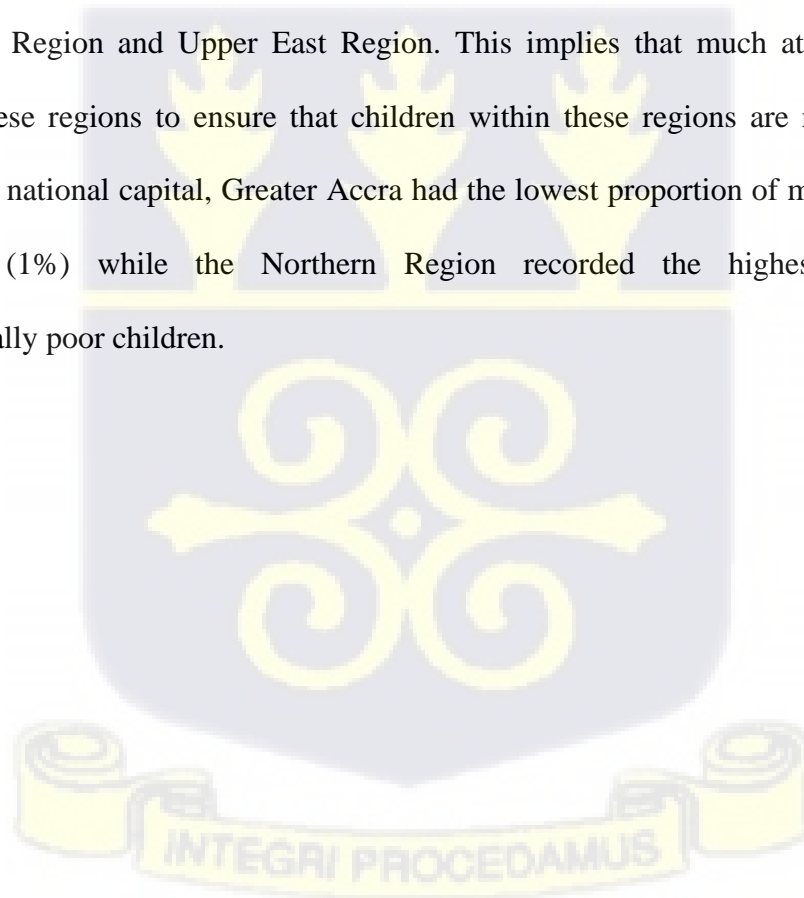


Table 3. 5: Sub-group decomposition of Multidimensional Child Poverty by Waves

	Wave 1			Wave 2			Wave 3		
	H	A	MPI	H	A	MPI	H	A	MPI
National	0.3 (0.01)	0.42 (0.00)	0.13 (0.01)	0.26 (0.01)	0.43 (0.00)	0.11 (0.01)	0.18 (0.01)	0.42 (0.01)	0.08 (0.01)
Gender									
Male	0.31 (0.02)	0.42 (0.00)	0.13 (0.01)	0.27 (0.02)	0.43 (0.00)	0.11 (0.01)	0.18 (0.02)	0.43 (0.01)	0.08 (0.01)
Female	0.29 (0.02)	0.42 (0.00)	0.12 (0.01)	0.24 (0.01)	0.43 (0.01)	0.1 (0.01)	0.18 (0.02)	0.42 (0.01)	0.08 (0.01)
Residence									
Urban	0.16 (0.01)	0.40 (0.01)	0.06 (0.00)	0.13 (0.01)	0.4 (0.01)	0.5 (0.01)	0.06 (0.01)	0.4 (0.01)	0.02 (0.00)
Rural	0.41 (0.01)	0.425 (0.00)	0.17 (0.01)	0.35 (0.01)	0.43 (0.00)	0.15 (0.01)	0.27 (0.02)	0.43 (0.01)	0.12 (0.01)
Region									
Western	0.33 (0.03)	0.42 (0.01)	0.14 (0.01)	0.18 (0.03)	0.43 (0.01)	0.8 (0.01)	0.21 (0.03)	0.42 (0.01)	0.09 (0.01)
Central	0.42 (0.02)	0.43 (0.01)	0.18 (0.01)	0.19 (0.03)	0.43 (0.01)	0.08 (0.01)	0.24 (0.04)	0.43 (0.02)	0.1 (0.02)
Greater Accra	0.21 (0.02)	0.38 (0.01)	0.08 (0.01)	0.14 (0.03)	0.42 (0.02)	0.06 (0.01)	0.03 (0.02)	0.42 (0.00)	0.01 (0.01)
Volta	0.24 (0.03)	0.39 (0.00)	0.09 (0.01)	0.33 (0.03)	0.42 (0.01)	0.14 (0.01)	0.11 (0.03)	0.41 (0.01)	0.05 (0.01)
Eastern	0.34 (0.05)	0.42 (0.01)	0.14 (0.02)	0.26 (0.04)	0.44 (0.01)	0.11 (0.02)	0.14 (0.03)	0.4 (0.01)	0.05 (0.01)
Ashanti	0.23 (0.2)	0.43 (0.01)	0.1 (0.01)	0.24 (0.03)	0.43 (0.01)	0.1 (0.01)	0.13 (0.02)	0.41 (0.01)	0.05 (0.01)
Brong- Ahafo	0.43 (0.03)	0.47 (0.01)	0.2 (0.01)	0.34 (0.03)	0.43 (0.01)	0.15 (0.01)	0.16 (0.03)	0.43 (0.01)	0.07 (0.01)
Northern	0.28 (0.04)	0.41 (0.01)	0.12 (0.01)	0.4 (0.02)	0.44 (0.01)	0.17 (0.01)	0.31 (0.04)	0.44 (0.01)	0.14 (0.02)
Upper East	0.29 (0.03)	0.41 (0.01)	0.12 (0.01)	0.29 (0.04)	0.39 (0.01)	0.11 (0.02)	0.26 (0.04)	0.45 (0.03)	0.12 (0.02)
Upper West	0.48 (0.03)	0.43 (0.00)	0.2 (0.01)	0.4 (0.03)	0.42 (0.01)	0.17 (0.01)	0.28 (0.05)	0.43 (0.01)	0.12 (0.02)

Source: Author's computation (Standard Errors in in parentheses)

3.5 Identifying Child Poverty Based on Household Poverty Status

This study follows the work of Makhhalima (2020) where child poverty is measured based on household poverty status (Makhhalima, 2020). The child poverty status of a child is therefore derived by connecting the household poverty status to the child. Thus, a child from a poor household is identified as poor while a child from a non-poor household is identified as non-poor. The household poverty status is generated by using the household expenditure module, specifically the average monthly household per capita consumption expenditure (PCE). Expenditure on food consumption (own produce, in-kind received, and gifts given) education, health, durable goods, and housing expenditure are aggregated for the various modules to derive an average monthly expenditure. The household characteristics are then merged with aggregate data of the various expenditure modules. From the merged data, the adult equivalent per capita expenditure (a measure of the cost of living of a particular household with reference to its size and composition (adults & children and males & females in the household)) is computed. It is necessary to account for the household composition because it reflects the varying calorie needs of the household. The Ghana equivalent scale is used to derive the actual household consumption expenditure. According to the Ghana Statistical Service (GSS), the upper poverty threshold is 1,314 GHS (\$295.35) per adult equivalent per year. This is divided by 12 to reflect month expenditure. The poverty status is created using the poverty line and the real household consumption expenditure. Any household with an adult equivalent PCE below 109.50 GHS is considered to be poor (0 not poor, 1 poor)

A summary of household poverty measures and child poverty measures are presented in Table 3.6 and Table 3.7 respectively. To derive the child poverty status in Table 3.7, only households with children are considered. Children in poor households are identified as poor children. From Table 3.6, 71 percent of households were non-poor while 29 percent of households were considered poor

in Wave 1 (2010). In Wave 2 (2014), poor households were reduced to 20 percent while the percentage of poor households increased to 32 percent in Wave 3 (2018). Narrowing down the poverty rate to only children, thus considering households with children, the child poverty rate decreased from 35.72 percent in Wave 1 (2010) to 23.32 percent in Wave 2 (2014). The poverty rate however rose to 39.26 in Wave 3 (2018). Based on the decline and rise in the poverty rates for household poverty and specifically child poverty rate, it is expedient to examine the rate of transition in poverty from 2010 to 2018. The study, therefore, examines the transition in poverty in the next section.

Table 3 6: Household Poverty Status (%)

Wave	Non-poor	Poor	Total
1 (2010)	71	29	100
2 (2014)	80	20	100
3 (2018)	67	32	100
Total	73	27	100

Note: Authors' computation from GSPS, 2010, 2014 & 2018; observations: 12,864

Table 3 7: Child Poverty Status (%)

Wave	Non-poor	Poor	Total
1 (2010)	64.3	35.7	100
2 (2014)	76.7	23.3	100
3 (2018)	60.7	39.3	100
Total	67.1	32.9	100

Note: Authors' computation from GSPS, 2010, 2014 & 2018 observations: 8,202

3.6 Poverty trends and dynamics in 2010, 2014, and 2018.

Although some structural or external forces may worsen or alleviate poverty, the poor are also vulnerable to some level of pressure or limitations from the non-poor. This more often than not drives them to make some choices that potentially reinforce their poverty level. Thereby trapping households in poverty. Being trapped in poverty could therefore be backed by internal forces or behavioural factors thus choices that are made under extreme scarcity and external forces such as market failure which favours the wealthy against the poor (Ghatak, M., 2015). Some governmental interventions are geared towards alleviating poverty and may contribute in one way or the other in reducing poverty. The study uses a transition matrix (Table 3.8) to explore the transition in poverty from Wave 1 (2010) to Wave 3 (2018).

Table 3 8: Transitions in multidimensionally deprived children from Wave 1 (2010) to Wave 3 (2018)

Multidimensionally deprived Wave 1 (%)	Multidimensionally deprived Wave 3 (%)		
	No	Yes	Total
No	85.1	14.9	100
Yes	55.6	44.4	100
Total	77.3	22.7	100

Source: Author’s computation from GSPS; Number of observations is 10,359

Table 3.8 presents a transition matrix of multidimensionally deprived children from 2010 to 2018. We first explore the transition from a non-poor status in 2010 to a poor status in 2018 and secondly from a poor status in 2010 to a non-poor status in 2018. Percentages of the row totals in a cross-tabulation are used to measure the probability. According to Table 3.8, 85.05% of children remained non-poor from 2010 to 2018 while 14.95 percent transitioned from being non-poor to

being poor from 2010 to 2018. Likewise, 55 percent of children who were poor, become non-poor while 44.43% of children who were poor remained poor. This implies that 85 percent of the children remained multidimensionally non-poor while 44 percent of children remained poor from 2010 to 2018. Of those children who experienced a transition in their welfare, 15 percent became poor while 56 percent became non-poor. The high rate of transition from poor to non-poor is consistent with the high decline in child poverty from 2010 to 2018.

3.7 Comparison between multidimensionally poor children and child poverty based on household poverty status

In the previous section child poverty has been measured using two different approaches, thus the multidimensionally approach and the poverty status of the child with reference to the household poverty status to which the child lives. Bearing in mind that different methods are employed in these two measurements, the study goes a step further to examine if multidimensionally poor children also come from poor households or non-poor households. To do this analysis, the study uses a cross-tabulation to derive the relationship between the two measurements according to the three waves. This gives a vivid impression of what takes place at each point in time, thus in 2010, 2014 and 2018.

Table 3.9 presents a comparison between multidimensionally poor children and those who are poor based on the poverty status of the households to which they belong in Wave 1. The results show that 74.46 percent of children in Ghana who are non-multidimensionally poor come from non-poor households. On the other hand, 25.54 percent of these children who come from non-poor households are multidimensionally poor. This implies that for these children (25.54%) although they are in non-poor households, they experience multiple deprivations. Another explanation could be attributed to the fact that since resources are unequally distributed in the households, custodians

of household resources may not prioritize the well-being of the children within the households. Although the study is unable to determine the proportion of children who live in households whose poverty status is close to the poverty line, the study projects that if a household's poverty status is just above the poverty line, children from such a household are likely to suffer from multiple deprivations since little distortions or changes will cause them to fall below the poverty line. Interestingly, 58.62 percent of children who live in poor households are not multidimensionally poor. This implies that although these children (58.62%) live in poor households, however, they are not deprived in terms of health, education and their standard of living. With regards to children who live in poor households and those who are multidimensionally poor, the study reveals that 41.38 percent of these children fall within this category.

Table 3 9: Wave 1-multidimensionally deprived children and poverty status

Poverty Status (%)	Multidimensionally deprived Wave (%)		
	No	Yes	Total
Non-Poor	74.46	25.54	100
Poor	58.62	41.38	100
			100

Source: Author's computation from GSPS Pearson $\chi^2(1) = 100.8936$ Pr = 0.000 observations = 3,698

Remarkably in Wave 2 (Table 10), the proportion of children who are non-multidimensionally poor and also live in non-poor households increased to 78.11 percent while those who are non-poor (based on their household poverty status) but multidimensionally poor declined to 21.89 percent. There is also a decline in the proportion of children who are non-multidimensionally poor and also live in poor households. This implies that compared to child poverty based on household poverty, there is improvement in the welfare of children based on a multidimensional approach.

The proportion of children who live in poor households but are non-multidimensionally poor declined to 54.43 percent while the proportion of children who live in poor households and are multidimensionally poor increased to 45.57 percent. This implies that in Wave 2 (2014), there was an escalation in the proportion of children who were multidimensionally poor and also lived in poor households.

Table 3. 10: Wave 2 -multidimensionally deprived children and poverty status

Poverty Status (%)	Multidimensionally deprived Wave (%)		
	No	Yes	Total
Non-Poor	78.11	21.89	100
Poor	54.43	45.57	100
			100

Source: Author's computation from GSPS Pearson $\chi^2(1) = 168.5640$ Pr = 0.000 observations = 3,240

As expected, in Table 3.11 (2018), the proportion of children who are non-multidimensionally poor and non-poor based on their household status increased to 87.22 percent in Wave 3. Unlike in Wave 2, the proportion of children who are not multidimensionally poor but come from poor households increased to 71.18 percent. Children who are multidimensionally poor but live in

Table 3. 11: Wave 3 -multidimensionally deprived children and poverty status

Poverty Status (%)	Multidimensionally deprived Wave (%)		
	No	Yes	Total
Non-Poor	87.22	12.78	100
Poor	71.18	28.82	100

Source: Author's computation from GSPS Pearson $\chi^2(1) = 107.4816$ Pr = 0.000 observations 2,695

non-poor households decreased to 28.82 percent. Similarly, children who are multidimensionally poor and also live in poor households declined to 12.78 percent in wave 3.

3.8 Chapter Summary

This chapter measured child poverty using a multidimensional approach and a relatively crude method thus imposing the household poverty status on the child. The study reveals that multidimensional child poverty has been declining over the years. Nonetheless, there is more room for improvement as a lot more children are deprived and there is a tendency for the situation to worsen as the improvement is only marginal. The regional disparity in MCP is also a matter of concern in the fight against inequality. The analysis confirms that the main contributor to poverty among children (from 2008 to 2018) is the standard of living followed by health and education respectively. The findings of this study are similar to the findings of a study conducted in Ghana by Agyire-Tettey et al., (2021). In terms of the trends and dynamics of child poverty, the study found that during the period under study, 85 percent of the children in the study remained multidimensionally non-poor, while 14 percent became poor. On the other hand, 44 percent of children remained poor while 56 percent became non-poor. In addition, the findings reveal that children who live in poor households may not necessarily be multidimensionally poor. This is because the approaches used in determining both measures of poverty are different. Secondly, household resources are not equally distributed among members of the households hence there is a tendency for children from non-poor households to be multidimensionally. It is worth noting that frantic efforts are being made by the state to improve education, health, and the standard of living of Ghanaians hence the rationale behind some children from poor households who are multidimensionally non-poor.

The study acknowledges that measuring child poverty has some implications. The poor are likely to be ignored if they are not identified statistically. Measuring child poverty therefore brings to light the incidence and prevalence of child poverty, thereby enabling policy makers to make informed decisions with regard to poverty alleviation policies (Ravallion, 1998). It is worth noting that data is important for the purposes of tracking child poverty rates. Hence the national identification project should be enhanced to ensure that data of all Ghanaians including children are well captured. This will make it easy and more efficient to track or monitor changes in the child's poverty status or child well-being, and also, provide interventions to targeted people.



CHAPTER FOUR

DETERMINANTS OF CHILD POVERTY

4.1 Introduction

As mentioned in the introductory chapter, the objective of this chapter is to investigate the factors that are likely to determine child poverty in Ghana. This is to give an understanding of the scenario of poor children in Ghana. The research question to be answered in this chapter is: What are the determinants of child poverty in Ghana? Following the two measurements of child poverty explored in the previous chapter, this chapter focuses on analyzing the determinants of child poverty in relation to household characteristics with specific reference to the characteristics of the household head. The multidimensional child poverty index computed in the previous chapter is used as the dependent variable. The study banks on the Ghana Socioeconomic Panel Survey (GSPS) Data.

It was observed from the literature review that household characteristics especially characteristics of the household head influence child poverty. Employment status (Thévenon, 2018; Makhallima et al., 2014); Ranjith & Rupasingha; 2014) and education (Malat, Oh, & Hamilton, 2005; Fertig & Tamm, 2010) of the household head significantly reduces child poverty. Nonetheless, there are some inconsistencies in the determinants of child poverty in the literature reviewed in this study. For instance, the effect of the sex of the household head (Rahman, 2013; Makhallima et al., 2014; Adebayo, Olagunju, Samuel, & Ogundipe, 2016; Nwosu & Ndinda, 2018; Sun, Li & Li, 2020) and the marital status (Frémeaux and Leturcq, 2022; Makhallima, 2020; Sun, Li & Li, 2020; Anyanwu, Kayizzi-Mugerwa & John, 2013) on child poverty is unclear. This chapter, therefore, contributes to the ongoing debate on the determinants of child poverty by using the multidimensional poverty

index (MPI). The poverty status of the child is presented as the dependent variable while the characteristics of the household head are presented as the explanatory variable.

It is worth noting that although the characteristics of the household head have an impact on child poverty, parental characteristics in one way or the other have an influence on child poverty. This study therefore first examines whether children whose parents are the household head are less likely to be poor than those whose parents are not the head of the household. The prior expectation is that household heads who are parents of the child will have a significant impact on the poverty status of the child. Hence in the investigation of the determinants of child poverty, the study limits the analysis to children whose parents are the household heads of their households.

4.2 Methodology

The determinants of multidimensional child poverty in Ghana are estimated using the first three waves of the Ghana Socioeconomic Panel Data. Details of the data source are explained in the previous chapter. The probability of a child being multidimensionally poor (the outcome variable) is examined using panel logistic regression. The random effects are applied since the individual heterogeneity is not correlated with the independent variable.

4.2.1 The Panel Logistic Model

Using ordinary least squares (OLS) in this analysis could be problematic, especially in relation to the functional form of the technique. The OLS assumes a linear functional form. This implies that there is a constant level of change in the dependent variable for all the dependent variables. This, however, may not necessarily be the case when the dependent variable involves a probability, since the influence of the independent variable is likely to increase or decrease as the predicted

probability approaches 0 or 1 (Long and Freese, 2006). Another issue of the linear probability model is the presence of heteroscedastic errors (Greene, 2003). This implies that the confidence interval may not be valid and the estimated coefficient may be inefficient. This study, therefore, uses logistic regression. The logistic regression is used because the dependent variable is binary. The data for this study is an unbalanced panel. The logistic regression equation can be presented as

$$\text{logit}[P(Y = 1)] = \text{logit}[p_i] = X_i' \beta \dots \dots \dots (4.1)$$

Where:

$\text{logit}[p_i]$ is the natural log odds that a child is multidimensionally poor

X_i' is a vector of covariates

β is a vector of regression coefficients

The exponential form of equation 4.1 is given as

$$\text{odds} = \frac{p_i}{1 - p_i} = \exp\{X_i' \beta\} \dots \dots \dots (4.2)$$

The probability p_i is resolved by

$$p_i = \frac{\exp\{X_i' \beta\}}{1 + \exp\{X_i' \beta\}} = \Lambda\{X_i' \beta\} \dots \dots \dots (4.3)$$

Where $\Lambda(\cdot)$ is the cumulative distribution function of the logistic function

4.2.2 Empirical Model: Determinants of Child Poverty

The empirical model for this chapter is represented by Equation 4.4. This is based on the theoretical framework of the Human Capital Theory, Capacity Approach, the Basic Needs Approach, and the

Theory of Household Decision Making. Based on these theories, the empirical model of this chapter is modeled and presented in a function form as

$$CPS = f(HS, Dem, EC, Sp, SC, HHH, CC) \dots\dots (4.4)$$

Where CPS is child poverty and is a function of household structure (*HS*), demographic (*Dem*), economic condition (*EC*), spatial (*Sp*), social & cultural factors (*SC*), child characteristics (*CC*) and characteristics of household heads (*HHH*). Each of these is made up of a vector of independent variables and is estimated as

$$CPS_{ij} = \beta_0 HS_{ij} + \beta_1 Dem_{ij} + \beta_2 EC_{ij} + \beta_3 Sp_{ij} + \beta_4 SC_{ij} + \beta_5 HHH + \beta_6 CC_{ij} + \varepsilon \dots\dots\dots (4.5)$$

Where CPS_{ij} is the outcome variable for child poverty status for the i^{th} child in the j^{th} wave. The child poverty status is computed from the multidimensional child poverty index discussed in the previous chapter. β_0 to β_5 are the parameters of vectors to be estimated.

Child poverty status (CPS) is a dichotomous variable which is operationalized as 1 for a poor child and 0 for a non-poor child. It is presented as

$$CPS \{1 \text{ if the child is poor } 0 \text{ if the child is non - poor} \dots\dots\dots (4.6)$$

Independent variables

Household structure: Household structure influences the child’s wellbeing. The main measure of household structure is the number of children in the household. Households with a large number of children are likely to be poor compared to households where there are fewer children (Leu et al., 2016); Makhalima 2020) this is because these children are likely to compete for scarce resources in the household.

Demographic characteristics: The location of the household, the age, gender, and years of schooling of the household head represent the demographic characteristics of the household head. The location of the household head is operationalized as urban and rural. Child poverty is highly related to parents' educational level (Malat, Oh, & Hamilton, 2005). Children of educated parents are better off because their parents are likely to be gainfully employed, thereby providing these children with the utmost care. They are also in the position to provide quality health care to their children as well as serve them nutritious meals. Higher educational attainment of the household head is expected to have a negative impact on child poverty. The Household Decision Making Theory which requires bargaining and negotiating household resources, including those relevant to the welfare of children, propounds that the sex of the household head is likely to influence the welfare of children. The impact of the gender of the household head on child poverty is however not conclusive. While some studies have concluded that children from female-headed households have a higher chance of being poor than other children from male-headed households (Makhalima et al., 2014; Biyase and Zwane, 2018) other studies (Makhalima, 2020; Bose-Duker et al., 2021) have revealed that children living in male-headed households are more vulnerable to being poor than those living in female-headed households.

Economic characteristics: Children do not earn income. The economic power of their parents determines the level of their material well-being. This is measured by the employment status of the household head. The employment status of the household depicts a steady source of income which is necessary for the alleviation of poverty. Compared to children whose male household heads actively participate in the labour market, children are less likely to be poor when they live in households where their female heads are active participants in the labour market. (Thévenon, 2018; Makhalima et al., 2014; Ranjith & Rupasingha, 2014))

Social and cultural factors: The social and cultural factors influence child poverty. The social and cultural factors likely to influence child poverty in this study are the marital status and the religion of the household head. Marital status is considered as a social or cultural factor because it is defined within the context of societal and cultural norms. Studies have shown that the marital status of the household head is associated with child poverty. The effect of the marital status of the household head on child poverty is higher for female single household heads than for male single household heads. The situation could be different if the female-headed household is actively involved in economic activities. This therefore implies that the gender of the household head may not be an issue if the household head, whether a male or female is economically stable (Ranjith & Rupasingha, 2012). This, therefore, implies that the level of family income in determining child poverty is key irrespective of whether the household is headed by a female or a male. The study, therefore, interacts the gender of the household head with the employment status of the household head. To test the impact of religion on child poverty, the study categorizes religion into Christians, Muslims, Traditional and Others.

Table 4.1 presents the *a priori* expectations of the study. The prior expectations are based on the literature reviewed in this study. Based on the literature reviewed, child poverty is expected to worsen when the number of children in the household increases (Makhalima et al., 2014; Leu, Chen, & Chen, 2016; Makhalima, 2020) while the employment status of the household head (Thévenon; 2018; Makhalima et al., 2014; Ranjith & Rupasingha, 2014) and years of schooling of the household head (Fertig & Tamm, 2010; Malat, Oh, & Hamilton, 2005) are expected to reduce child poverty.

Table 4. 1: A Prior Expectations

Variable	Operationalization	Expected Sign	Reference
Number of children in the household		+	Makhalima et al. (2014); Leu, Chen, & Chen (2016); Makhalima (2020)
Age of household head		+/-	Šoltés & Šoltésová (2016); Iwacewicz-Orłowska (2016); Makhalima et al (2014)
Gender of household head	Female (Reference) Male	+/-	Rahman (2013); Makhalima et al. (2014); Adebayo, Olagunju, Samuel, & Ogundipe (2016); Nwosu & Ndinda (2018); Sun, Li & Li, (2020)
Location	Rural (Reference) Urban	+	Agyire-Tetteh et al. 2021; Fonta, Yameogo, Tinto, Huysen, Natama Compaore and Fonta (2020)
Religion of Household head	Christian (Reference) Muslim Tradition Others	+/-	Ranjith & Rupasingha (2014)
Years of schooling of household head		-	Fertig & Tamm (2010); Malat, Oh, & Hamilton (2005)
Marital status of household head	Unmarried (Reference) Married	+/-	Frémeaux and Leturcq (2022); Makhalima (2020); Sun, Li & Li (2020); Anyanwu, Kayizzi-Mugerwa & John, (2013).
Employment status of household head	Unemployed (Reference) Employed	-	Thévenon (2018); Makhalima et al. (2014); Ranjith & Rupasingha (2014)

Source: Author's computation

The impact of the age of the household (Šoltés & Šoltésová, 2016; Iwacewicz-Orłowska, 2016; Makhlima et al., 2014) and gender of the household head (Rahman, 2013; Makhlima et al., 2014; Adebayo, Olagunju, Samuel, & Ogundipe, 2016; Nwosu & Ndinda, 2018; Sun, Li & Li, 2020) on child poverty is uncertain. In addition, the impact of the religion of the household head (Ranjith & Rupasingha, 2014) and the marital status of the household head on child poverty is also not clear (Frémeaux and Leturcq, 2022; Makhlima, 2020; Sun, Li & Li, 2020; Anyanwu, Kayizzi-Mugerwa & John, 2013).

4.3 Descriptive statistics

The summary statistics of the households, the household heads and children are presented in Table 4.2. In all, there are 7191 household heads. The average age of the household head is 48 years. The youngest household head is 18 years old while the oldest is 114 years. Most households are under the leadership of men (69%) and 72 percent of these household heads are the parents of the children in the household. With regards to their location, 33 percent of these household heads are urban dwellers. Most of them are Christians (62%) followed by Muslims (20%). Traditional household heads make up 10 percent while others are 6.9 percent. With regards to the marital status and the employment status of the household heads, 73 percent of the household heads are married and 76 percent of the household heads are employed. The average years of schooling per household head is 8 years. These households have at least one child and the maximum number of children in a household is 15. The average number of children in a household is 4. The mean age of children in the household is 8 years. Approximately, 26 percent of children in the household are multidimensionally poor and 52 percent are males.

Table 4. 2: Summary Statistics

	Variable	Mean	Std. Dev	Min	Max	Observations
<i>Household Heads Characteristics</i>						
HH is parent	overall	0.72	0.45	0	1	N = 23641
	between		0.45	0	1	n = 5027
	within		0.22	-0.25	1.66	T-bar = 4.7
Gender	overall	0.69	0.46	0	1	N = 29595
	between		0.49	0	1	n = 7191
	within		0.03	-0.11	1.55	T-bar =4.1
Age of HHH	overall	48.19	15.04	18	114	N = 29593
	between		17.14	18	109.5	n = 7191
	within		3.84	12.35	82.99	T-bar = 4.1
Religion	overall	1.62	0.93	1	4	N = 29572
	between		0.79	1	4	n = 7180
	within		0.45	-1.05	4.39	T-bar = 4.1
Years of schooling	overall	8.02	3.72	0	18	N = 18654
	between		3.39	0	17	n = 5093
	within		2.09	-3.58	23.02	T-bar = 3.7
Marital sta.	overall	0.73	0.44	0	1	N = 29544
	between		0.46	0	1	n = 7186
	within		0.16	-0.18	1.61	T-bar = 4.1
Employment	overall	0.76	0.43	0	1	N = 29573
	between		0.38	0	1	n = 7175
	within		0.29	-0.20	1.63	T-bar = 4.1
<i>Household Characteristics</i>						
Number of kids	overall	3.50	1.95	1	15	N = 23641
	between		1.43	1	13.31	n = 5027
	within		0.85	-2.88	6.59	T-bar = 4.7
Location	overall	0.33	0.47	0	1	N= 27251
	between		0.49	0	1	n = 5854
	within		0.00	0.33	0.33	T-bar = 4.7
<i>Child Characteristics</i>						
mpi_d	overall	0.26	0.44	0	1	N = 10359
	between		0.37	0	1	n =3121
	within		0.28	-0.65	1.20	T-bar = 3.32
Age	overall	8.01	4.96	0	17	N = 23641
	between		3.96	0	17	n = 5027
	within		3.98	-4.36	20.03	T-bar = 4.7
Gender	overall	0.52	0.50	0	1	N = 23641
	between		0.36	0	1	n = 5027

within	0.41	-0.42	1.46	T-bar = 4.7
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Source: Author's Computation from GSPS 1, 2 & 3

4.4 Estimation Results and Discussion

This section reports the discussion of the Logistic Regression results from the determinants of multidimensional child poverty. The individual statistical significance as well as the p-values of the parameter are presented as well. Each household has at least one child and some households have more than one child. Hence the information of the household head will be repeated for each child. The likely issue of clustering is addressed by applying the *'cluster'* option of the *'vce.'* Table 4.3 presents the results from the bivariate logistic regression for household heads who are the parents of children in the household. Column A shows the marginal effects. The results show that children whose household heads are their parents are likely to be multidimensionally poor. Specifically, children whose household heads are their parents are likely to be 3 percent points more likely to be multidimensionally poor compared to those whose heads are not their parents. Based on these results, the study limits the investigation on the determinants of child poverty to heads of households who are the parents of the children in the households. This is to reduce the level of clustering in the analysis. Table 4.4 exhibits marginal effect result from the determinants of multidimensional poverty. In Table 4.4, Column A presents the bivariate estimation results. Columns B show logit results for the original model. The last Column C presents results after the two different interaction terms are introduced in the model. The purpose of the first interactive term *Male_EmplHHH*, is to examine whether the relationship between child poverty is different between men who are employed and women who are employed.

The purpose of the second interactive term, *Married_EmpHHH* is to examine whether the relationship between child poverty is different between married household heads who are

employed and unmarried household heads who are employed. The rationale for introducing the interactive terms helps to examine the joint effects of the gender and employment status of the household head, as well as the marital and employment status of the household head on child poverty.

The results show that children from male-headed households are more likely to be multidimensionally poor. Specifically, the results show that children from male-headed households are 7 percentage points (p.p.) more likely to be multidimensionally poor compared to households that have female household heads. This finding confirms results from Makhhalima (2020) which reveals that children from male-headed households are likely to be poor compared to female-headed households. On the contrary, the results in this study are contrary to findings from Adebayo et al. (2016), Makhhalima et al (2014) and Ranjith & Rupasingha (2012) who published that children from female-headed households are more likely to be poor compared with children from male-headed households. The gender of the household head is important especially for children because it determines the nature of the resource shares within the household. Children in female-headed households are likely to receive more resource shares than those in male-headed households (Bose-Duker et al. 2021).

Children from households with many children are also likely to be multidimensionally poor compared to households with fewer children. Thus, as expected, the probability of multidimensional child poverty increases by 3 p.p. with a marginal change in the number of children in the household (Column B). Consequently, the likelihood of a child falling into multidimensional poverty increases as the number of children in the household increases. The results from this study resonate with prior studies from Makhhalima (2020), Leu et al. (2016) and Makhhalima (2014). A plausible justification of the results is that there is likely to be a *resource*

dilution effect in households with many children. This implies that household resources are finite. Hence an increase in or the presence of additional children in the household leads to a decline in the proportion of resources accrued to members of the household.

According to the results, the age of the household head had no significant association with the deprivation status of the children. This is contrary to findings by Makhalima et al (2014) and Iwacewicz-Orłowska (2016) who found that children whose household heads are older are less likely to be poor. The age of the child was found to be highly significant at 1 percent. The results also reveal that older children are likely to be multidimensionally poor compared with younger children. Thus, children are likely to be multidimensionally poor as their age increases. Thus additional age of the child increases the likelihood of multidimensional child poverty by 0.03 percent points. The study also found that male children are likely to be multidimensionally poor compared to female children. Male children are 2 p.p. more likely to be multidimensionally poor compared to female children.

Estimation results from the study show a great disparity between children living in urban areas and those living in rural areas. Thus, children who live in urban areas are less likely to be multidimensionally poor compared to their counterparts who live in rural areas. As expected, children who live in urban communities are 17 p.p. less likely to be poor (Column B). This resonates with earlier results from studies such as Fonta et al. (2020), Agyire-Tetteh et al. (2018) and Ranjith & Rupasingha (2012). The disparities in multidimensional child poverty between these children in rural and urban communities according to Agyire-Tetteh et al. (2018) could be attributed to the differences in rural and urban household characteristics.

Interestingly, children whose household heads are married are less likely to be multidimensionally poor. Estimation results of the study show that the children who live in households where the

household head is married are less likely to be multidimensionally poor compared to children who live in households where the household heads are not married. Precisely, the results showed that children whose household heads are married are 8 p.p less likely to be multidimensionally poor than household heads who are unmarried. These results could be attributed to the fact that marriage is associated with greater wealth accumulation (Frémeaux and Leturcq, 2022), hence children who live in households where heads of the household are married are likely to be better off than those household heads who are unmarried.

The years of schooling and employment status of the household head are not statistically significant. Column C presents results for the interaction between the gender and the employment status as well as the interaction between the marital status and employment status of the household head respectively. The estimation results show that both interactions are not statistically significant. The two interactive terms Male_EmpHHH and Married_EmpHHH are not significant (Column C). Thus male – household heads who are employed have no statistically significant impact on the multidimensional poverty status of the child, and neither do household heads who are married and employed. All other forms of religion are insignificant, nonetheless, households who belong to ‘Other’ religion are 10 p.p. more likely to be poor compared to Christian households.



Table 4.3 Bivariate Logistic Regression for Household Heads who are the parents of children in the household

VARIABLES	B Marginal Effect
Household Head is a parent	
Yes	0.03* (0.02)
Constant	
Observations	10, 344
Number of PID	

Robust standard errors in parentheses. Std. Err. adjusted for 2,950 clusters in households

*** p<0.01, ** p<0.05, * p<0.1



Table 4.4 Determinants of MP CP

VARIABLES	A	B	C
	Marginal Effect	Marginal Effect	Marginal Effect
Gender of Household Head			
Male	0.07*** (0.02)	0.05* (0.03)	0.04 (0.05)
Number of kids		0.03*** (0.01)	0.03*** (0.01)
Age of Household head		-0.0003 (0.001)	-0.0002 (0.001)
Location of household			
Urban		-0.17*** (0.01)	-0.17*** (0.01)
Religion (Ref: Christian)			
Islam		-0.02 (0.02)	-0.02 (0.02)
Traditional		0.07 (0.05)	0.07 (0.05)
Others		0.1*** (0.03)	0.1*** (0.03)
Years of Schooling of HHH		-0.001 (0.002)	-0.001 (0.002)
Marital status of household head			
Married		-0.08* (0.04)	-0.15* (0.09)
Employment status of Household head			
Employed		0.01 (0.02)	-0.08 (0.06)
Age of Child		0.003*** (0.001)	0.003*** (0.001)
Gender of the child			
Male		0.02* (0.01)	0.02* (0.01)
1.Male_EmplHHH			0.003 (0.06)
1.Married_EmpHHH			0.08 (0.07)
Constant			
Observations	9,068	6,033	6,033
Number of PID			

Robust standard errors in parentheses. Std. Err. adjusted for 1,932 clusters in hhno *** p<0.01, ** p<0.05, * p<0.1 (The differences in the number of observations is attributed to the fact that some of the additional independent variables have some missing values)

4.5 Chapter Summary and Conclusion

The main objective of this chapter was to examine the determinants of child poverty in Ghana with specific emphasis on the characteristics of the household head. The dependent variable, multidimensional child poverty status was computed in the previous chapter. The main variables of interest in this section of the study based on reviewed literature were the household structure, operationalized as the number of children in the household; the demographic operationalized as the location, gender, years of schooling, and age of the household head; economic condition of the household operationalized employment status and child characteristics operationalized as gender, and age of the child. Social and cultural factors are operationalized as marital status and religion of the household head.

Results from the Panel Logistic Regression show that the gender, marital status, location, of the household head, and number of children in the household are significant determinants of child poverty in Ghana. The estimation results indicate that children are likely to be poor when they have male household heads compared to female household heads. These children are less likely to be multidimensionally poor when their household heads are married. This could be because married couples can accumulate wealth and may enjoy economies of scale, hence being able to increase the welfare of members of their households. The study also confirmed that children who live in rural communities are likely to be multidimensionally poor compared to their counterparts who live in urban communities. Interestingly the years of schooling and the employment status of the household head had so significant association with the poverty status of the child.

Based on the findings of the study, it is recommended that there is advocacy for proper family life training to encourage people especially household heads to marry and remain married as children

are likely to be poor when their household heads are unmarried. Specifically, the Ministry of Gender, Children, and Social Protection (MoGCSP) should educate Ghanaians about proper family values. In addition, stable family structures create a nurturing environment for children to grow and develop holistically. Household heads in marital unions tend to benefit from sharing expenses such as housing costs, transportation costs and utilities. They also have the opportunity to pool resources together to achieve better financial management which can help reduce the risk of child poverty.

Per the estimation results children from male-headed households are likely to experience child poverty compared to their counterparts in female-headed households. Based on this, the study recommends that men are conscientious of the need to prioritize the needs of children in their households. This will make men especially male household heads positive role models to their children. This will also foster nurturing relationships between fathers and their children, promote gender equality and promote stronger families and communities. This will also go a long way to create a conducive environment to ensure holistic development and enhance children's outcomes. As part of the social advocacy of the MoGCSP, the ministry should prioritize educating Ghanaians about the importance of being deliberate about attending to the overall well-being of children in the household.

The study recommends the development of a comprehensive social policy that provides support systems to households with particular attention to households with children. With regards to monitoring, the study recommends that data collection and monitoring systems are improved to accurately measure and track child poverty rates and easily identify and track vulnerable groups. This will enable the evaluation of the effectiveness of poverty reduction initiatives and also help efficiently target resources and interventions.



CHAPTER FIVE

EXAMINING THE NEXUS BETWEEN CHILD POVERTY AND CHILD ACADEMIC PERFORMANCE

5.1 Introduction

This section presents the empirical analysis of the third objective, thus examining the nexus between child poverty, school conditions, and child's academic performance. The research question associated with this objective is, to what extent does child poverty affect the academic performance of the child? This chapter seeks to throw light on the impact of child poverty on the academic performance of the child. As illustrated in the previous chapters, poverty deprives children of the opportunity to learn in a conducive environment at both home and school.

Contrary to previous studies on child academic performance in Ghana, this study examines the impact of child poverty on child academic performance in Ghana. Other studies (Chowa et al., 2013; Fang et al., 2018; Mollborn et al., 2014) use household wealth conditions in examining the impact of poverty on child academic performance. This is problematic as household wealth is not evenly distributed among members of the household. Secondly, most studies in Ghana use cross-sectional data, thereby being unable to uncover dynamic relationships between key variables (Hsiao, 2007). This study, therefore, uses the Ghana Socioeconomic panel to compute child poverty in Ghana. Using multidimensional child poverty as the main variable of interest, the study examines the impact of child poverty on a child's academic performance. Another factor likely to affect the academic performance of the child is school conditions. Although the condition of the school influences the academic performance of the child, parents also have a role to play in how children perform academically. The presence of parents in the household influences the

performance of the child. Thus parents are able to monitor, supervise, and provide guidance to children. The study, therefore, controls for the presence of parents in the household.

According to the reviewed literature the child characteristics such as sex (Considine and Zapalà, 2002; Kingdon et al., 2017; Ge & Wang, 2019), innate ability (Alloway & Alloway, 2010; Lamas, 2015; Parrales et al., 2020), place of residence (Considine and Zapalà, 2002; Duc, 2011; Fang et al., 2018), level of deprivation (Ge & Wang, 2019; Hair et al., 2015; Shanks, 2007), and school conditions such as type of school attended (Hochchild, 2003; Windrick, Walela and Sande 2015), presence of more than one teacher and access to textbooks (Opoku-Amankwa, 2010; Hampden-Thompson, 2013) are likely to affect the academic performance of the child. The Educational background of the parents (Khan, 2015; Mare & Maralani, 2006) and the presence of the parents (Hampden-Thompson, 2013) also influence the performance of the child. As a contribution to the literature, this chapter examines the impact of multidimensional child poverty on the academic performance of Ghanaian children.

This chapter is organized into four sub-sections. The next sub-section after this introductory section presents the methodology for this chapter. This is followed by a sub-section on the discussion of results and the concluding sub-section. The concluding sub-section of this study presents a summary of the chapter as well as some recommendations for this study.

5.2 Methodology

5.2.1 The Educational Production Model

The study employs the educational production model to analyze the connection between child poverty, school inputs and school outputs such as achievement scores. The outcome variable in

this analysis is the academic performance of the child. As a product of the learning process (Lamas, 2015) it is usually expressed through school grades. Academic performance is usually expressed or shown through grades or test scores. These scores are used to assess if a child passed or failed a test (Lamas, 2015). The test scores reveal the extent to which an educational objective has been attained by a student, teacher, or school in general.

The educational production function is defined as

$$A = f(X_a, X_b, X_c) \quad (5.1)$$

Where

A = School output (English and Math Test Scores)

X_a = A vector of variables representing the school environment (number of teachers per class, type of school (public or private))

X_b = A vector of variables measuring child-specific characteristics (MCP, Cognitive Development, Sex)

X_c = A vector of variables measuring the environmental influence (Presence of the parents in the household, household size, parental education)

5.2.2 Data

This study uses data from the three waves of the Ghana Socioeconomic Panel Survey for the estimation.

5.2.3 Estimation technique

Panel data models capture both time-series and cross-section variations in the variables under observations. This offers more information on both the dependent and independent variables and reduces collinearity among explanatory variables thereby increasing efficiency (Plasmans, 2006). It also provides information on the inter-temporal dynamics of variables (Hsiao, 2007) and it accounts for individual heterogeneity (Wei and Lui, 2001). In addition, panel data models are able to measure the relevant unobserved effects in addition to the observable effects of the independent variables on the dependent variables. The use of a random effect model (RE) or a fixed effect model (FE) determines how the unobserved variables are incorporated into the model.

Due to the censored nature of the dependent variable, a Tobit model (Tobin, 1958) is adopted for this analysis. Specifically, the random effect Tobit model is used in this analysis. The random effect Tobit model is an extension of the Tobit model that includes random effects. The dependent variable is both left and right censored. A left censored score implies the absence of observation or reporting of results of some children's scores that fall below a certain threshold. It also means that the results fall short of a certain threshold that is not recorded. The right censored dependent variable means that some children scored above the maximum threshold and those high scores are not observed. In the case of this study, the upper limit for both English and Math test scores is pegged at 7 points.

The model takes the form,

$$Y_1^* = \beta_1 X_{it} + \beta_2 Z_{it} + \beta_3 V_{it} + \varepsilon_i \quad i = 1, 2, \dots, N \quad t=1, 2, 3 \quad (5.2)$$

$$Y_i = 0 \quad \text{if } Y_i^* \leq 0 \quad (5.3)$$

$$Y_i = Y_{it}^* \quad \text{if } 0 \leq Y_{it}^* \leq 7 \quad (5.4)$$

$$Y_i = 7 \text{ if } Y_{it}^* \leq 7 \quad (5.5)$$

where

Y_i^* is the latent variable which is observed only when positive.

N is the total number of children,

Y_i is the test scores for each child i ,

β is the vector of parameters to be estimated

X_{it} is the vector of child characteristics

Z_{it} is the vector of school conditions and

V_{it} is the vector of household characteristics

ε_i is the error term.

In the traditional Tobit model, it is assumed that the parameters of the independent variables are fixed across observations. This is not the case in this study since the effect of the explanatory variables on test scores vary across the children captured in this data. The traditional Tobit model may not be able to capture the unobserved heterogeneity effect. Therefore, the Random Effect Tobit model is adopted to account for the heterogeneity effect of unobserved characteristics of the observations. The Random Effect Tobit Model on test scores is presented as:

$$Y_{ij}^* = \beta_0^* + \beta_1^* X_{it} + \beta_2^* Z_{it} + \beta_3^* V_{it} + b_i + \varepsilon_{ij} \quad (5.6)$$

where β_0^* is the intercept, β_1^* , β_2^* and β_3^* are the coefficients of X_{it} , Z_{it} and V_{it} . Following the educational production model, X_{it} is the measure of child characteristics, Z_{it} is the measure of

School conditions and V_{it} is the measure of household characteristics. i is the observation (child) in time t

5.2.4 Measures

Outcome variable

The main outcome variables are Math and English Test Scores. The possible minimum score is a zero (0) and the maximum is eight (8). From the questionnaire, these tests were conducted for members of the household between the ages of 9 to 26 years. As mentioned in the previous chapter, a child is defined as a person below the age of 18 years. This study is therefore limited to children between the ages of 9 and 15 years. The analysis is conducted for children between the ages of 9 to 11 years and 12 to 15 years. Separate analyses are conducted for these categories of children because of the differences in their level of maturity and knowledge. Within the educational system of Ghana, the normal school-going age of the child reveals that children between the ages of 9 to 11 years are in primary school while children between the ages of 12 to 15 years are in Junior High School (JHS).

Variables of Interest

The main variable of interest is multidimensional child poverty (MCP). This variable is calculated in Chapter Three of this study. It measures the multidimensional poverty status of the child. A child who is considered to be multidimensionally poor is coded as 1 while a child who is not poor is coded as 0.

The study controls for the cognitive development of the child. The Digit Span Test (DST) which measures the memory function of the child is used as a proxy for the innate ability of the child

(Ostrosky-Solís & Lozano, 2006). The DST is a test conducted for children between the ages of 5 and 15. The test is conducted in two forms, thus DST Forward and DST Backward. In the DST Forward, the child is asked to repeat digits in a forward order while in the DST Backward, the child is asked to repeat some digits in reverse or backward order. The Forward Digit Span Test captures the verbal, working memory, and attention span of the child while the Backward Digit Span Test examines the child's cognitive control and executive function.

There are eight sessions in DST Forward while DST Backward has seven sessions. Each session has three questions. The first two questions ask the child to repeat a couple of digits in a specific order. To conform to DST Backward, only the first 7 sessions of the DST Forward are considered in this study. Aside from the first session in the DST Forward which asks the question in a particular pattern, the remaining sessions do not follow any particular pattern. It is interesting to note that the child is only able to move on to the next session after answering at least one question in a session correctly. For this analysis, answering at least one session correctly is coded as 1 and 0 if the child is unable to repeat the two sets of numbers correctly. The child scores 7 if he or she can repeat at least one set of digits correctly in all sessions in the Backward DST and the first 7 sessions in the Forward DST. The minimum and maximum scores for both tests are 0 and 7 respectively. Score1 is the test results for DST Forward and Score2 is the test results for DST Backward. The test was conducted for children between the ages of 5 and 15. From Table 4.5, the *a priori* expectation of the DST which is proxied to the innate ability of the child is expected to have a positive impact on the academic performance of the child (Alloway & Alloway, 2010; Best et al., 2011; Mulder et al., 2017; Vandenbroucke et al., 2017; Quílez-Robres et al., 2021).

Also of interest to this study is the household family structure such as the presence of a father or mother in the house, and household size. The *a priori* expectation (Table 5.1) of this study is that

the presence of both parents in the household will improve the academic performance of the child (Hampden-Thompson, 2013; Nguyen & Vu, 2022). The study also controls for the educational level of the parents and is expected that higher levels of parental education will have a positive influence on the test scores of the child (Schultz, 1963; Mare & Maralani, 2006; Khan et. al 2015). This is because highly educated parents show interest and care in the education of their children (Khan et a., 2015). The study controls for the type of school the child is attending (private or public school). The participation of the private sector in the provision of basic education in Ghana is increasing (Effah and Senadza, 2008). The type of school the child attends is coded as 1 if public and 0 if private. It is expected that children who attend private schools will perform better than those who attend public schools (Choy, 1997; Windrick, Walela and Sande, 2015). This is because some private schools are well resourced compared to public schools and children in private schools usually take advanced courses compared to their counterparts in the public schools (Choy, 1997). Likewise, children who have more than one class teacher are expected to perform better than those who have only one class teacher. To avoid the dummy variable trap, there is an omitted category in each of these groups. The presence of a dummy in each category will create perfect collinearity in the regression model.

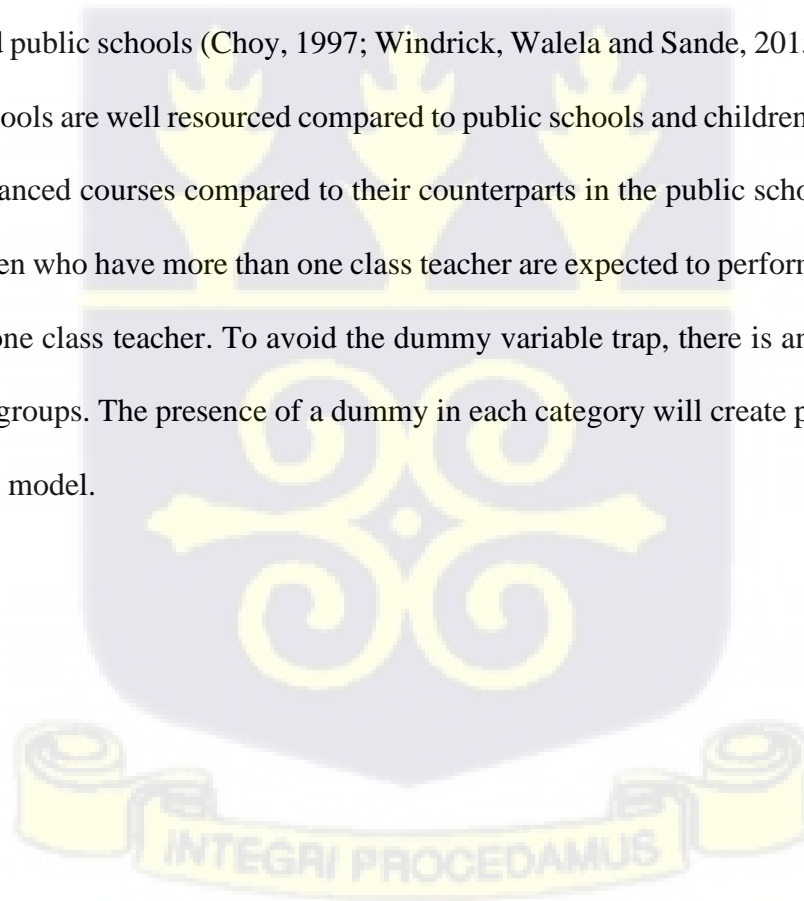


Table 5. 1: A Prior Expectations

Variable	Operationalization	Expected Sign	Reference
Child poverty	Deprived = 1 Not Deprived = 0	-	(Hair et al., 2015; Ge & Wang 2019)
Gender	Male = 1 Female = 0	-	(Lee & Kushner, 2008; Kingdon et al., 2017; Ge & Wang (2019)
Innate ability	Digit Span Test (DST)	+	(Alloway & Alloway, 2010; Best et al., 2011; Mulder et al., 2017; Vandenbroucke et al., 2017; Quílez-Robres et al., 2021)
Parent's Education Completed	None (Reference) Primary Secondary Tertiary	+	(Schultz, 1963; Mare & Maralani, 2006; Khan 2015)
Presence of both parents in the home	Yes = 1 No = 0	+/-	(Hampden-Thompson, 2013; Nguyen & Vu, 2022)
Location	Rural (Reference) Urban	-	(Duc, 2011; Fang et al., 2018)
One teacher	Yes = 1 No = 0	+/-	(Mupa, P., & Chinooneka, T. I. (2015); Sarfo & Adisei (2015); Mabeya, Gikuhi & Anyona, (2019)
Textbook	Has all = 1 Has some = 2 Has none = 3	+/-	(Opoku-Amankwa, 2010; Glewwe et al. 2009)
Type of School	Private school = 0 Public school = 1	-	(Choy, 1997; Windrick, Walela and Sande, 2015)

5.3 Descriptive statistics

The descriptive statistics of test scores for children between the ages of 9 and 11 years (Primary) and those between 12 and 15 years (JHS) are presented in this section. In addition, the descriptive statistics of the covariates are also presented. Generally, children between the ages of 12 and 15 years have higher average scores in both English and Math, compared to their counterparts between the ages of 9 and 11 years. The average test scores for children at the Primary level across regions are presented in Table 5.2. The descriptive results reveal that in Wave 1, children between the ages of 9 and 11 years in the Northern Region of Ghana recorded the highest average score in the Math Test while those in the Upper East Region recorded the highest average test score in English. In Wave 2, children in the Greater Accra Region have the highest average score in Math and English. Results from Wave 3 reveal that children in the Greater Accra Region have the highest score in English. However, in the Math test, children from the Upper East, Upper West, Northern Region, and Greater Accra Region have the highest test score in Math. This reveals an improvement in the performance of children in the northern part of Ghana over the years. Table 5.2 also reports the χ^2 for Bartlett's test for equal variances. The test is conducted against the null hypothesis that the batch variances are all equal. A low p-value, usually less than 0.05 gives cause to reject the null hypothesis. Thereby, suggesting that there are significant differences in the variances across the various groups. According to Table 5.2, there are statistical differences in the variance across the regions of Ghana except for the English test score in Wave 1, the DST score in Wave 2, and the Math test score in Wave 3.

Table 5. 2: Average of test scores by Region for children in Primary Level (9-11years) across the three waves

Wave	Region	Math	English	DST Forward	DST Backward
1	Western	5	4	5	1
	Central	4	3	4	1
	Greater Accra	5	5	5	2
	Volta	4	3	4	1
	Eastern	4	4	3	2
	Ashanti	4	4	4	1
	Brong Ahafo	4	3	3	1
	Northern	6	4	4	1
	Upper East	5	6	5	2
	Upper West	4	.	4	2
	<i>Chi²</i>	3.78*	7.26	13.85***	52.88***
<i>Observation</i>	338	338	338	338	
2	Western	4	3	4	2
	Central	4	3	4	2
	Greater Accra	6	6	5	2
	Volta	3	3	4	1
	Eastern	4	3	4	2
	Ashanti	5	4	5	2
	Brong Ahafo	4	2	4	2
	Northern	5	5	5	3
	Upper East	5	4	5	2
	Upper West	3	4	6	5
	<i>Chi²</i>	6***	17.24***	7.47	45.51***
<i>Observation</i>	667	667	667	667	
3	Western	4	3	4	2
	Central	4	4	4	2
	Greater Accra	5	6	4	2
	Volta	4	5	4	2
	Eastern	4	5	4	2
	Ashanti	4	5	3	1
	Brong Ahafo	4	4	4	1
	Northern	5	5	3	2
	Upper East	5	5	4	2
	Upper West	5	5	3	2
	<i>Chi²</i>	13.6	8.64***	13.17*	32.06
<i>Observation</i>	329	329	329	329	

Source: Author's calculations. Averages are presented. Chi^2 from Bartlett's test for equal variance significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*) are also presented

Table 5.3 presents the average of test scores by Gender among primary children (9-12years) across the three waves. Generally, the average test scores from Wave 3 are slightly higher than the average test scores recorded in Wave 1. The descriptive results show that there are no differences in the variances between males and females across the waves.

Table 5. 3: Average of test scores by Gender among primary children (9-11years) across the three waves

Wave	Gender	Math	English	DST Forward	DST Backward
1	Female	4	4	4	2
	Male	4	4	4	2
	<i>Chi</i> ²	0.3	0.13	0.03	0.23
	<i>Observation</i>	338	338	338	338
2	Female	4	3	2	2
	Male	5	4	2	2
	<i>Chi</i> ²	0.17	0.36	0.35	0.0003
	<i>Observation</i>	667	667	667	667
3	Female	5	5	4	2
	Male	4	4	4	2
	<i>Chi</i> ²	1.89	0.23	0.82	0.31
	<i>Observation</i>	329	329	329	329

Source: Author’s calculations. Averages are presented. *Chi*² from Bartlett's test for equal variance significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*) are also presented

The average test scores by location for children in the primary level (9-12 years) across the waves are presented in Table 5.4. The results from the descriptive statistics reveal that the average test scores are higher for children in the urban areas compared to the average test scores for children

in the rural areas. With the exception of the DST Backward in Wave 1 and the DST Forward and DST Backward in Wave 3, the Bartlett's test for equal variances implies that there are significant differences in the variance between the performances of children in the urban and rural communities of Ghana

Table 5. 4: Average test scores by Location among primary children (9-11years) across the waves

Wave	Location	Math	English	DST Forward	DST Backward
1	Rural	4	3	3	2
	Urban	5	5	4	2
	<i>Chi</i> ²	2.48***	1.15***	0.03*	0.29
	<i>Observation</i>	338	338	338	338
2	Rural	4	2	4	2
	Urban	5	5	5	2
	<i>Chi</i> ²	0.002**	0.03***	0.18***	0.55***
	<i>Observation</i>	667	667	667	667
3	Rural	4	4	4	2
	Urban	5	5	4	2
	<i>Chi</i> ²	4.7***	1.66**	0.68	0.06
	<i>Observation</i>	329	329	329	329

Source: Author's calculations. Averages are presented. *Chi*² from Bartlett's test for equal variance significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*) are also presented

Regarding the multidimensional poverty status of children in the Primary level, thus children between the ages of 9 and 11, the results from Table 5.5 reveal that multidimensionally poor children perform worse than their counterparts who are not poor across all three waves.

Table 5. 5: Average test scores by MCP among primary child (9-12years) across the waves

Wave	MPI	Math	English	DST Forward	DST Backward
1	No	5	4	4	2
	Yes	4	3	4	1
	<i>Chi</i> ²	0.45***	0.06***	1.63***	5.2*
	<i>Observation</i>	338	338	338	338
2	No	5	4	5	2
	Yes	3	2	4	1
	<i>Chi</i> ²	0.05***	2.9***	0.92***	0.01***
	<i>Observation</i>	667	667	667	667
3	No	5	5	4	2
	Yes	3	3	4	1
	<i>Chi</i> ²	0.08***	0.33***	1.81***	6.38*
	<i>Observation</i>	329	329	329	329

Source: Author's calculations. Averages are presented. *Chi*² from Bartlett's test for equal variance significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*) are also presented

Specifically, the average test scores for Math, English, and DST Backward are higher among children who are not multidimensionally poor compared to their poor counterparts. With the

exception of Wave 2, where the average test scores for DST Forward are higher among children who are non-poor, compared to poor children, in Wave 1 and Wave 3, the average test scores for DST Forward remain the same for both poor and non-poor children. According to the Bartlett's test for equal variances, there are significant differences in the variance between the performances of children who are multidimensionally poor and their contemporaries who are not multidimensionally poor.

The average test scores for children in JHS, thus between the ages of 12 and 15 are presented in Tables 5.6 to Table 5.9. According to Table 5.6, in Wave 1, children in the Northern Region of Ghana have the highest score in Math. For the English test, children in the Northern Region and Greater Accra Region recorded the highest score. In Wave 2, the highest test scores in Math were recorded among children in the Greater Accra Region and the Upper East Region. With respect to the English test, children in the Northern Region and Greater Accra Region have the highest scores. The results of both Math and English tests generally improve in Wave 3. Children in the Ashanti Region, Northern Region, and Upper East record the highest score in Math while children in the Volta Region, Ashanti Region, Northern Region and Upper East Region record the highest score in English. Per the Bartlett's test for equal variances, all the test scores are significantly different in the variance across the waves and regions with the exception of the scores from the Math test in Wave 1, scores from the DST Forward in Wave 2 and scores from the English test scores in Wave 3.

Test scores by gender among children between the ages of 12 and 15 years reveal that there are no differences in the test scores between boys and girls (Table 5.7). The only difference is seen in the English test in Wave 3. The Bartlett's test for equal variances however shows that this difference is not significant.

Table 5.6: Average of test scores by Region among JHS child (12- 15 years) across the three waves

Wave	Region	Math	English	DST Forward	DST Backward
1	Western	6	5	5	2
	Central	6	5	5	2
	Greater Accra	6	6	5	3
	Volta	6	5	5	3
	Eastern	6	5	4	2
	Ashanti	6	5	4	2
	Brong Ahafo	5	4	4	2
	Northern	7	6	6	3
	Upper East	6	6	6	2
	Upper West	5	0	5	1
		<i>Chi²</i>	8.9	19.8***	18.83***
	<i>Observation</i>	411	411	411	411
2	Western	5	4	4	2
	Central	5	5	5	2
	Greater Accra	6	6	5	4
	Volta	5	5	5	2
	Eastern	5	4	5	2
	Ashanti	5	5	5	2
	Brong Ahafo	5	4	4	2
	Northern	5	6	6	2
	Upper East	6	5	4	3
	Upper West				
		<i>Chi²</i>	7.37	17.18***	2.08
	<i>Observation</i>	423	423	423	423
3	Western	5	5	4	2
	Central	5	6	5	2
	Greater Accra	5	5	4	2
	Volta	5	6	5	3
	Eastern	5	5	4	2
	Ashanti	6	6	4	2
	Brong Ahafo	5	5	4	2
	Northern	6	6	3	2
	Upper East	6	6	4	2
	Upper West	5	4	3	2
		<i>Chi²</i>	15.7*	7.81	16.87*
	<i>Observation</i>	386	386	386	386

Source: Author's calculations. Averages are presented. Chi² from Bartlett's test for equal variance significant at p<0.01 (***), p<0.05 (**), p<0.1 (*) are also presented

Table 5.7: Average of test scores by Gender among JHS child (12 – 15 years) across the three waves

Wave	Gender	Math	English	DST Forward	DST Backward
1	Female	6	5	5	2
	Male	6	5	5	2
	<i>Chi²</i>	<i>2.1</i>	<i>0.61</i>	<i>1.48</i>	<i>8.38***</i>
	<i>Observation</i>	<i>411</i>	<i>411</i>	<i>411</i>	<i>411</i>
2	Female	5	5	5	2
	Male	5	5	5	2
	<i>Chi²</i>	<i>0.52</i>	<i>0.97</i>	<i>0.63</i>	<i>0.28</i>
	<i>Observation</i>	<i>423</i>	<i>423</i>	<i>423</i>	<i>423</i>
3	Female	5	6	4	2
	Male	5	5	4	2
	<i>Chi²</i>	<i>0.16</i>	<i>1.12</i>	<i>0.06</i>	<i>0.03</i>
	<i>Observation</i>	<i>386</i>	<i>386</i>	<i>386</i>	<i>386</i>

Source: Author's calculations. Averages are presented. χ^2 from Bartlett's test for equal variance significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*) are also presented

Similar to results among children in the primary level, among children in JHS, those in urban areas have higher average test scores than those in the rural areas. It is worth noting that the test scores for Math in Wave 2 and Wave 3 are not significantly different between rural and urban dwellers. In addition, DST Forward scores in Wave 1, 2 and 3 as well as DST Backward scores in Wave 1 and 3 are not statistically different between rural and rural dweller.

Table 5. 8: Average test scores by Location among JHS child (12-15 years) across the waves

Wave	Location	Math	English	DST Forward	DST Backward
1	Rural	5	5	5	2
	Urban	6	6	4	3
	<i>Chi²</i>	29.73***	14.02***	0.29	1.29
	<i>Observation</i>	411	411	411	411
2	Rural	5	4	5	2
	Urban	6	6	5	3
	<i>Chi²</i>	1.39	18.3***	0.003	34.6***
	<i>Observation</i>	423	423	423	423
3	Rural	5	5	4	2
	Urban	6	6	4	2
	<i>Chi²</i>	0.49	7.05***	0.41	0.31
	<i>Observation</i>	386	386	386	386

Source: Author's calculations. Averages are presented. χ^2 from Bartlett's test for equal variance significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*) are also presented

The descriptive statistics for the average test scores by MCP among JHS children (12 -15 years) reveal that children who are not multidimensionally poor have higher scores than children who are multidimensionally poor (Table 5.9). With the exception of Wave 1 (all test scores), and in Wave 2, the DST Forward, where there are no differences in all the recorded test scores, all other test scores according to the Bartlett's test for equal variances are statistically significant. Thus, these test scores are significantly different in the variance across the waves and between poor and non-poor children.

Table 5. 9: Average test scores by MCP among JHS children (12-15 years) across the waves

Wave	MPI	Math	English	DST Forward	DST Backward
1	No	6	5	5	2
	Yes	4	3	5	2
	<i>Chi²</i>	<i>1.77</i>	<i>0.77</i>	<i>0.13</i>	<i>0.64</i>
	<i>observation</i>	<i>411</i>	<i>411</i>	<i>411</i>	<i>411</i>
2	No	6	5	5	2
	Yes	5	3	4	2
	<i>Chi²</i>	<i>1.02</i>	<i>8.37***</i>	<i>0.02</i>	<i>19.***</i>
	<i>Observation</i>	<i>423</i>	<i>423</i>	<i>423</i>	<i>423</i>
3	No	5	5	4	2
	Yes	3	3	4	1
	<i>Chi²</i>	<i>0.08***</i>	<i>0.33***</i>	<i>1.81***</i>	<i>6.38*</i>
	<i>Observation</i>	<i>386</i>	<i>386</i>	<i>386</i>	<i>386</i>

Source: Author's calculations. Averages are presented. Chi² from Bartlett's test for equal variance significant at p<0.01 (***), p<0.05 (**), p<0.1 (*) are also presented

In all the selected categories, children perform better in the forward digit span text than in the backward digit span test. The study, therefore, uses the forward digit span test as a proxy for the innate ability of the child.



5.4 Results and Discussion

5.4.1 Children at Primary Level (9 to 11 years)

Table 5.10 presents results for children at the Primary level (9-11 years). The *xttobit* command is used to generate the coefficients. The first two columns (A and B) examine the impact of the child's conditions, household conditions and school conditions on the performance in Math scores while columns C and D examine the child's performance in English tests. Columns A and C are the base models for Math and English. Columns B and D present results on how children perform when we control for the presence of both parents in the household. In models B and D, both the father's educational level and the mother's education are dropped as we control for the presence of both parents in the household. This is to eliminate the issue of multicollinearity in the model.

Regarding the post-estimation diagnostic test, the Wald tests in Table 5.10 confirm that the null hypothesis which states that the regression coefficient is equal to zero ought to be rejected since the Wald test results in Columns A, B, C and D are large and the p-values are small. The Prob > chi2 is 0.00 across all four regressions indicating that the p-value is less than 0.0001, hence showing strong evidence for the rejection of the null hypothesis. The Wald chi² in parenthesis are the degrees of freedom associated with the Wald test. From columns A and B, 854 of the observations are uncensored, thus 854 of them fall within the range where the dependent variable thus the test scores is observed and not censored. On the other hand, 49 and 171 are left and right censored respectively. This implies that 49 observations were at the lower bound while 171 observations were at the upper bound of the observation. In columns C and D, the 508 observations were uncensored while 217 and 283 observations were left and right censored respectively. Thus, 217 observations were at the lower bound while 283 observations were at the upper bound.

Table 5. 10: The impact of Child, household and School conditions on Math and English Tests – Primary Level (9 -11 years)

VARIABLES	(A)	(B)	(C)	(D)
	Math	Math	English	English
	<i>Coefficients</i>	<i>Coefficients</i>	<i>Coefficients</i>	<i>Coefficients</i>
Innate Ability	0.43*** (0.04)	0.43 *** (0.04)	0.74*** (0.09)	0.73*** (0.09)
MPI	-0.70*** (0.18)	-0.79*** (0.12)	-1.78*** (0.40)	-2.13*** (0.40)
Male	0.12 (0.13)	0.13 (0.13)	-0.18 (0.28)	-0.15 (0.29)
Urban	0.58*** (0.14)	0.74*** (0.14)	1.52*** (0.31)	1.86*** (0.31)
Father's Education (Ref: None)				
Primary	-0.06 (0.20)		0.13 (0.42)	
Secondary	-0.09 (0.18)		0.04 (0.39)	
Tertiary	0.36 (0.29)		0.99 (0.62)	
Other	0.25 (0.69)		-0.70 (1.46)	
Mother's Education (Ref: None)				
Primary	0.90*** (0.19)		1.59*** (0.41)	
Secondary	0.51*** (0.16)		1.89*** (0.34)	
Tertiary	1.34** (0.54)		1.69 (1.13)	
Other	-0.10 (1.08)		1.43 (2.31)	
Father in HH	0.07 (0.15)		0.39 (0.33)	
Number of children	0.04 (0.05)	0.01 (0.05)	-0.01 (0.10)	-0.07 (0.11)
One Teacher	-0.44*** (0.17)	-0.44*** (0.17)	-1.56*** (0.37)	-1.62*** (0.28)
Public School	-0.62*** (0.15)	-0.66*** (0.15)	-1.13*** (0.31)	-1.39*** (0.32)
Both Parents in HH		0.10 (0.15)		0.47 (0.32)
Constant	2.76*** (0.36)	3.12*** (0.33)	1.52** (0.77)	2.92*** (0.70)
Observations	1,074	1074	1,008	1,008
Uncensored	854	854	508	508
Left censored	49	49	217	217
Right censored	171	171	283	283
Wald chi ²	(16) 321.51	(8) 281.36	(16) 291.61	(8) 252.54
Prob > chi ²	0.00	0.00	0.00	0.00
Log likelihood	-2066.54	-2083.79	-1860.23	-1881.62

Source: Author's calculations. Estimated coefficients are presented and Robust Standard Errors in parentheses. Standard errors are robust to heteroscedasticity. Betas are significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*)

The results show that multidimensionally poor children (MPI) perform worse in both Math and English tests than children who are not multidimensionally poor. From columns A and C, it can be observed that the expected Math and English scores of children who have multiple deprivations are 0.70 and 1.78 respectively lower than children who are not experiencing multiple deprivations. This implies that child poverty has a negative impact on child academic performance for children at the Primary level. It is worth noting the impact of poverty on academic performance among primary schools is dire in English than in Math. Intuitively, children stricken by poverty may have low or limited exposure to resources or a language-rich environment to enhance their literacy skills. A language-rich environment is a learning environment that enhances the development of a child's language skills. Such language-rich environments support children to interact and build up good vocabulary. Another intuition accounting for the results is that children are likely to acquire Math skills even before school entry. Regarding English proficiency, children from non-English backgrounds like in most Ghanaian communities are likely to perform worse in English than in Math as English is not their mother tongue. The innate ability (proxied by the Forward Digit Span test), which measures the cognitive ability of the child has a positive and significant impact on the performance of children. The results show that children who are able to recall are more likely to perform well in both Math and English tests at the Primary level. Thus if the innate ability of the child increases by one point, the expected score of the child would increase by 0.43 points in the Math test and 0.74 points in the English test. The results also reveal that the mother's level of education has a positive impact on the performance of the child in Primary school. Thus, children whose mothers had primary and secondary levels of education performed better than children whose mothers had no education; the performance is increasing in the level of education even though not monotonically. From column A, the expected Math test score of children whose

mothers have tertiary education is 1.34 higher than children whose mothers have no education. Those whose mothers have secondary education score 0.51 points higher than children whose mothers have no education while those whose mothers have primary education score 0.9 higher than those whose mothers have no education. With respect to the English test, it is observed from column C that the expected score of children whose mothers have secondary education is 1.89 points higher than children whose mothers have no education and for those whose mothers have primary education, their expected English score is 1.59 points higher than those whose mothers have no education. The Father's level of education has no significant impact on the performance of children at the Primary level. The presence of the father or both parents in the household has no significant impact on the child's academic performance. As expected, children who live in urban communities perform better than children who reside in rural areas. The expected Math and English score for children who live in urban localities are respectively, 0.58 points and 1.86 points higher than the scores of children who live in rural localities. The gender of the child as well as the number of children in the household also has no effect on the performance of the child.

The results also show that school conditions have a significant impact on child performance. According to Table 5.10, children from private schools perform better than children who attend public schools. Thus for children who attend public schools, their expected score in Math and English is respectively 0.62 points and 1.13 points lower than the children who attend private schools (column A and column C). Concerning the number of class teachers, children who have more than one class teacher performed better than children who have only one teacher. From column A and column C, it can be observed that children who have only one class teacher score 0.44 points and 1.56 points lower respectively in the Math and English tests than children who have access to more than one class teacher.

Column B, where the presence of both parents in the household is controlled in the Math model, reveals that the coefficients of the covariant remain the same for innate ability and in situations where the child has one class teacher. The impact of poverty on Math scores declines by 0.09, while the performance among urban dwellers increases by 0.16. The presence of both parents in the household is not significant. The results are quite similar in Column D (English test). Thus the presence of both parents in the household is not significant. With the exception of the location (urban) where the coefficient increases by 0.34, the coefficients of all other covariates decline. Thus, the coefficient of innate ability and MPI declines by 0.01 and 0.34 respectively. Similarly, the coefficients of access to one teacher and the type of school (public school) declined by 0.06 and 0.26 respectively.

5.4.2 Children at JHS Level (12 to 15 Years)

The results with regard to children in JHS are presented in Table 5.11. The structure of Table 5.11 is similar to Table 5.10. The first two columns (A and B) examine the impact of the child's conditions, household conditions and school conditions on the performance of the Math scores while the last two columns (C and D) examine the child's performance in English tests. Columns A and C are the original models. Columns B and D present results on how children perform when they have both parents in the household. Thus in these two models, we control for the presence of both parents in the household.

The post-estimation diagnostic test, thus the Wald tests in Table 5.11 confirm that the null hypothesis which states that the regression coefficient is equal to zero ought to be rejected since the Wald test results in Columns A, B, C and D are large and the p-values are small. The Prob > chi2 is 0.00 across all four regressions indicating that the p-value is less than 0.0001, hence

showing strong evidence for the rejection of the null hypothesis. The Wald χ^2 in parenthesis are the degrees of freedom associated with the Wald test. From columns A and B, 763 of the observations are uncensored, thus 763 of them fall within the range where the dependent variable thus the test scores is observed and not censored. On the other hand, 32 and 425 are left and right censored respectively. This implies that 32 observations were at the lower bound while 425 observations were at the upper bound of the observation. In columns C and D, the 578 observations were uncensored while 106 and 507 observations were left and right censored respectively. Thus, 106 observations were at the lower bound while 507 observations were at the upper bound.

The study covers children between the ages of 12 and 15 years. These children are likely to be in JHS. The results show that *ceteris paribus*, children in JHS who are multidimensionally poor are likely to score 0.94 less in English tests than children who do not suffer from multiple deprivations. Unlike the child in primary school whose deprivation status has an impact on his or her Math score, for children in JHS (between the ages of 12 and 15), their deprivation status does not affect their Math score. As expected the innate ability of this category of children has a positive and highly significant impact on the performance of the child. Thus, if the innate ability of the child increases by one point, his or her expected Math score should increase by 0.47 points. Similarly, if the innate ability of the child in JHS increases by one point, his or her expected English test score will increase by 0.67 points. Though the father's level of education has no impact on the performance of the child, the mother's education is highly significant in influencing the Math score of the child. From column A, it is observed that for children whose mothers have tertiary education their expected Math score would be 2.86 points higher than children whose mothers had no education and for those whose mothers had secondary and primary education, their expected Math score is likely to be 0.28 and 0.52 points respectively higher than children whose mothers had no education.

Table 5.11: The impact of Child, household and School conditions on Math and English Test – JSS (12-15 years)

VARIABLES	(A) Math	(B) Math	(C) English	(D) English
	<i>Coefficients</i>	<i>Coefficients</i>	<i>Coefficients</i>	<i>Coefficients</i>
Innate Ability	0.47*** (0.04)	0.47*** (0.04)	0.67*** (0.07)	0.66*** (0.07)
MPI	-0.16 (0.18)	-0.21 (0.17)	-0.94*** (0.28)	-1.13*** (0.28)
Male	-0.05 (0.14)	-0.04 (0.14)	-0.31 (0.22)	-0.30 (0.23)
Urban	0.66*** (0.15)	0.73*** (0.15)	0.93*** (0.24)	1.07*** (0.24)
Father's Education (Ref: None)				
Primary	-0.13 (0.19)		0.50 (0.32)	
Secondary	0.05 (0.19)		0.37 (0.31)	
Tertiary	-0.40 (0.30)		0.55 (0.50)	
Other	0.45 (0.69)		0.55 (1.12)	
Mother's Education (Ref: None)				
Primary	0.52*** (0.19)		0.32 (0.30)	
Secondary	0.28* (0.17)		0.98*** (0.28)	
Tertiary	2.86*** (0.76)		1.00 (0.99)	
Other	-1.29 (1.08)		-2.71 (1.66)	
Father in HH	-0.01 (0.16)		0.32 (0.25)	
Number of kids	-0.09 (0.05)	0.11** (0.05)	-0.05 (0.08)	0.07 (0.08)
One Teacher	-0.99*** (0.14)	-1.05*** (0.14)	-2.08*** (0.24)	-2.23*** (0.24)
Public School	-0.37** (0.16)	-0.41** (0.16)	-0.63** (0.27)	-0.77*** (0.27)
Both Parents in HH		0.03 (0.15)		0.34 (0.24)
Constant	4.31*** (0.38)	4.57*** (0.34)	3.67*** (0.62)	4.58*** (0.55)
Observations	1,220	1,220	1,191	1,191
Uncensored	763	763	578	578
Left censored	32	32	106	106
Right censored	425	425	507	507
Wald chi ²	(16) 339.85	(8) 320.34	(16) 346.65	(8) 328.54
Prob > chi ²	0.00	0.00	0.00	0.00
Log likelihood	-2053.11	-2066.78	-1987.03	-1997.25

Source: Author's calculations. Estimated coefficients are presented and Robust Standard Errors in parentheses. Standard errors are robust to heteroscedasticity. Betas are significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*)

Thus, children whose mothers have tertiary education are likely to perform better in Math tests than children whose mothers had primary or secondary education. The education of the mother only influences the English score of the child if the mother has secondary education. Thus from column C, it can be observed that for children whose mothers have secondary education, their expected English score is 0.98 points higher than children whose mothers have no education. The presence of fathers in the household has no impact on the performance of the child. With regards to child characteristics, although the gender of the child has no impact on his or her performance in both Math and English tests, their location influences their performance. Children who reside in urban communities are likely to perform 0.66 and 0.93 points better in Math and English respectively than their rural counterparts.

Interestingly, the school conditions of the child have an impact on the performance of the child. Children with more than one class teacher are more likely to perform better than those with just one teacher. From columns A and C, it can be observed that the child's expected score in Math and English is likely to be 0.99 and 2.08 lower respectively than a child who has more than one class teacher. The type of school the child attends influences the performance of the child. From the studies, children who attend public schools perform worse than children who attend private schools. Thus, it can be observed from columns A and C that the expected score of children in Math and English score is 0.33 points and 0.63 points lower for children who attend public school compared to children who attend private schools. The study reveals from columns B and D that the presence of both parents in the household has no impact on the academic performance of the child.

5.4.3 Robustness checks – Household wealth

For robustness checks, the study replaces MPI with the household wealth variable and access to textbooks in columns A and C. Access to textbook is not used as an explanatory variable in the model where MPI is used. In the models where the study include access to textbooks, the study compute a wealth index that replaces MPI. In Columns B and C, we control for the interaction between the poverty status of the child and the type of school the child attends. The purpose of this interactive term is to examine whether the relationship between child poverty is different between children who attend private schools and those who attend public schools. This is to examine if the text result of children who are multidimensionally poor would change based on the type of school the child attends. Table 5.12 presents the robustness checks for the Primary level analysis while Table 5.13 presents the robustness checks for the JHS level analysis. The household wealth index is calculated using the Principal Component Analysis (PCA). Details of the PCA are presented in Appendix 3.

The calculation of the wealth index is based on the availability of some assets in the household. An asset is a store of wealth and has the ability to generate income and facilitate access to credit. Access to assets by the household enables the household to diversify its income and ease liquidity constraints. Accumulating productive wealth can enable households to move out of poverty (Doss, Deere, Oduro & Swaminathan, 2011).

All 15 indicators used in the computation are presented in Appendix 3. They include Access to household assets (such as radio, television, stove, fridge, bicycle, motorcycle, mobile phone, and iron) source of water, source of lighting, crowding, housing materials, and toilet material. All variables are categorized as binary. The frequencies of all these variables are between 5% and

95%, hence can be included in the analysis. The frequency of all the variables used in the PCA is presented in Appendix 4. Participants who make up this data set are from both the urban and rural areas of Ghana. This study, therefore, takes into account the differences in the household wealth index that may accrue due to the location of the participant. Because assets commonly owned by rural households are different from urban households, the wealth index for both urban and rural households is computed separately. The urban and rural wealth index scores are therefore computed with their scale hence there is no need to assign weights to them. The two variables, urban and rural wealth index scores are then merged to derive a composite wealth index score. (Hjelm et al., 2017) The wealth index score is then categorized into wealth quintiles for easy interpretation, the higher the index, the wealthier the household. For easy interpretation, the household wealth index is presented as quintiles ranging from 1 to 5 where Q5 represents the richest household, Q4 represents the rich households, Q3 represents the middle-class household, Q2 represents poor households and Q1 represents the poorest households.

The results show that except for the richest households, the household wealth index has no significant impact on the performance of the child at the Primary level in Columns A and C (Table 5.12). Thus children from the richest households perform 0.9 (significant at 0.01) and 1.50 (significant at 0.05) points better in Math and English respectively than children in the poorest households.

The narrative among the older children (12-15 years) however changes slightly. While household wealth has no impact on the Math scores of children, it has a positive impact on the English scores of children in JHS (Table 5.13) across all categories of household wealth. From column C of Table 5.13, the expected English score of children who live in households that belong to the richest

quintile is 1.99 points higher than children who live in households that belong to the poorest quintile.

Table 5.12: Robustness Checks: The Impact of Child, Household and School Conditions on Math and English Test -- Primary School (9-11 years)

VARIABLES	(A) Math	(B) Math	(C) English	(D) English
Innate Ability	0.43*** (0.04)	0.65* (0.38)	0.76*** (0.09)	0.73*** (0.09)
MPI		-0.65* (0.38)		1.92** (0.78)
Wealth Index (ref: poorest)				
Poor	0.22 (0.33)		-0.08 (0.67)	
Middle income	-0.14 (0.31)		-0.22 (0.64)	
Rich	0.17 (0.31)		0.85 (0.62)	
Richest	0.90*** (0.33)		1.50** (0.68)	
Male	0.09 (0.14)	0.10 (0.14)	-0.22 (0.28)	-0.16 (0.29)
Urban	0.55*** (0.16)	0.77*** (0.15)	1.34*** (0.33)	1.87*** (0.31)
Father's Education				
Primary	-0.16 (0.21)		0.09 (0.43)	
Secondary	-0.19 (0.19)		0.02 (0.40)	
Tertiary	0.18 (0.30)		0.88 (0.63)	
Other	0.12 (0.74)		-0.27 (1.45)	
Mother's Education				
Primary	0.96*** (0.20)		1.62*** (0.35)	
Secondary	0.46*** (0.17)		1.81*** (0.35)	
Tertiary	1.18** (0.56)		1.54 (1.15)	

Other	0.26 (1.09)		1.51 (2.32)	
Father in HH	0.07 (0.16)		0.35 (0.33)	
Number of kids	0.03 (0.05)	0.01 (0.05)	-0.04 (0.10)	-0.08 (0.11)
One Teacher	-0.51*** (0.17)	-0.48*** (0.18)	-1.72*** (0.37)	-1.63*** (0.38)
Public School		-0.60*** (0.16)		-1.34*** (0.34)
Sch*MPI		-0.21 (0.43)		-0.28 (0.89)
Textbook (ref: Has all)				
Has some	-0.45*** (0.15)		-1.20*** (0.30)	
Has None	-0.75** (0.32)		-1.74* (0.67)	
Illness	0.05 (0.24)		0.27 (0.50)	
Both Parents in HH		0.16 (0.15)		0.38 (0.32)
Constant	2.25*** (0.44)	3.11*** (0.34)	0.71 (0.90)	2.91*** (0.71)
Observations	1,007	1,007	1,007	1,007
Number of PID	1,003	1,003	1003	1,866
Uncensored	795	795	507	507
Left censored	43	43	217	217
Right censored	169	169	283	283
Wald chi ²	(22)309.25	(13) 273.98	(22)306.88	(13) 275.02
Prob > chi ²	0.00	0.00	0.00	0.00
Log likelihood	-2057.92	-1943.33	-1849.51	-1866.91

Source: Author's calculations. Estimated coefficients are presented and Robust Standard Errors in parentheses. Standard errors are robust to heteroscedasticity. Betas are significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*)

For children who live in rich, middle-income, and poor households, their English text scores were 1.30, 1.06, and 1.03 respectively higher than those children who lived in the poorest quantile.

Access to textbooks is controlled for in the robustness analysis. This is because studies have shown that access to textbooks plays a critical role in the performance of children (Opoku-Amankwa,

2010; Glewwe et al. 2009). The results reveal that not having all textbooks have a negative impact on a child's academic performance at the Primary level. From Columns A and C, the results reveal that the expected score in the Math test for children in Primary school who do not have all textbooks is 0.45 points lower than the children who had all textbooks (Table 12). While those who have no textbooks perform 0.75 points lower than those who have all textbooks (Column A). Similarly, in Column C, for children who do not have all textbooks, their expected score for English tests is 1.20 points lower than that of children who have all textbooks while for those who have no textbooks, their performance in English is 1.74 lower than children who have all textbooks (Table 5.12, Column C). In Column D, the result reveals that multidimensionally poor children perform better in English than their counterparts who are not poor. This is counterintuitive and could be attributed to good school conditions such as adequate teachers.

Surprisingly children in JSS who have no textbooks perform better in the English test than children who have all textbooks (Table 5.13, Column C). This could be due to the fact that children who have all the textbooks may not be reading them or making maximum use of them. On the other hand, the availability of textbooks has no impact on the Math score of children in JSS.

To examine the performance of multidimensionally poor children in public schools, an interaction is conducted between the type of school the child attends and the deprivation status of the child thus, Sch*MPI. The results show that in Columns B and C of both Tables 5.12 and Table 5.13, where we control for the interaction between child poverty and the type of school the child attends we observe that the interaction term (Sch*MPI) is not significant.

Table 5.13: Robustness Checks: The Impact of Child, Household and School Conditions on Math and English Test –JSS (12-15 years)

VARIABLES	(A) Math	(B) Math	(C) English	(D) English
Innate Ability	0.48*** (0.04)	0.48*** (0.04)	0.68*** (0.07)	0.67*** (0.07)
MPI		0.20 (0.41)		-1.11* (0.64)
Wealth Index (ref: Poorest)				
Poor	-0.06 (0.33)		1.03* (0.52)	
Middle income	0.10 (0.30)		1.06* (0.49)	
Rich	0.29 (0.30)		1.30*** (0.48)	
Richest	0.49 (0.33)		1.99*** (0.53)	
Male	-0.03 (0.14)	-0.04 (0.14)	-0.27 (0.22)	-0.30 (0.22)
Urban	0.56*** (0.16)	0.74*** (0.15)	0.78*** (0.26)	1.08*** (0.24)
Father's Education				
Primary	-0.11 (0.20)		0.47 (0.32)	
Secondary	0.05 (0.19)		0.36 (0.31)	
Tertiary	0.41 (0.31)		0.55 (0.50)	
Other	0.34 (0.71)		0.07 (1.11)	
Mother's Education				
Primary	0.48** (0.19)		0.23 (0.31)	
Secondary	0.27		0.89***	

	(0.18)		(0.29)	
Tertiary	2.82***		0.80	
	(0.76)		(0.99)	
Other	-1.23		-2.47	
	(1.07)		(1.65)	
Father in HH	0.06		0.24	
	(0.16)		(0.26)	
Number of kids	-0.10**	-0.12**	-0.06	-0.06
	(0.05)	(0.05)	(0.08)	(0.08)
One Teacher	-0.93***	-1.03***	-2.01***	-2.21***
	(0.15)	(0.14)	(0.24)	(0.24)
Public School		0.33*		0.77***
		(0.17)		(0.29)
Sch*MPI		-0.50		0.05
		(0.45)		(0.71)
Textbook (ref: Has all)				
Has some	-0.12		-0.06	
	(0.15)		(0.24)	
Has None	-0.08		1.11*	
	(0.36)		(0.60)	
Illness	0.12		-0.66	
	(0.27)		(0.42)	
Both Parents in HH		0.04		-0.01
		(0.15)		(0.18)
Constant	3.85***	4.49***	1.83***	4.55***
	(0.39)	(0.34)	(0.68)	(0.56)
Observations	1,190	1,190	1,190	1,190
Uncensored	738	738	578	578
Left censored	32	32	106	106
Right censored	420	420	506	506
Wald chi ²	(21) 331.55	(9) 311.08	(21) 350.46	(9) 329.70
Prob > chi2	0.00	0.00	0.00	0.00
Log likelihood	-1884.67	-2008.68	-1983.78	-1995.82

Source: Author's calculations. Estimated coefficients are presented and Robust Standard Errors in parentheses. Standard errors are robust to heteroscedasticity. Betas are significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*)

5.5 Chapter Summary

This chapter emphasized the impact of child, school, and household conditions on the performance of a child. The results revealed that child poverty has a negative impact on the performance of a child. Thus, children who suffer from multiple deprivations are likely to perform worse than their counterparts who are not multidimensionally poor. The study also found that having access to more than one class teacher positively influences the academic performance of the child. Similarly, having access to all textbooks is likely to enhance the child's performance, especially at the Primary level. Although the presence of the parents has no significant impact on the academic performance of the child, the education of the mother significantly influences the academic performance of the child. Thus, children whose mothers had higher levels of education performed better than children whose mothers had no education. The type of school the child attends also affects the academic performance of the child. Children who attended private schools performed better than children who attended public schools. The situation is likely to worsen if the child who attends a public school is also multidimensionally poor. This implies that inequalities within private and public schools contribute to the poor academic performance of some children.

Results from the study also reveal that although household wealth has no significant impact on the Math score of children at the JHS level, child poverty has a huge impact on the performance of the child at that level. This implies that household wealth is an inadequate measure of child poverty. Thus the right measure of child poverty is important in the child-related poverty study.

CHAPTER SIX

DRIVERS OF STUNTING AMONG CHILDREN IN GHANA

6.1 Introduction

The economic and demographic conditions within which a child is born affect the health status of the child (Chowdhury et al., 2020). Children are likely to suffer from malnutrition in an environment where there is inadequate nutrition. As stated in the introductory chapter, the fourth objective of the thesis is to examine the factors contributing to stunting among children under five years. The empirical analysis is conducted at the household level. The data used for the fourth objective of the thesis is derived from the Ghana Socioeconomic Panel Survey (GSPS). The survey is conducted every four years, hence over time some children may outgrow the sample criteria of less than five years. The study, therefore, focuses on the presence of stunted children in the household. The data is an unbalanced panel.

According to Da Vanzo & Gertler (1990), the household may be considered the unit of analysis. The decision about the health of other household members is made by key decision-makers in the household. For instance, the decision on a child's health is made by the parent. Furthermore, due to the limited resources available to the household, the household is forced to make choices and allocate consumption goods (including health) to its members. Lastly, the health of one member

of the household may have implications for or may affect other members of the household. The household therefore plays an important role in examining child health.

This chapter is organized as follows. The next section (6.2) describes the methodology, followed by the presentation and discussion of the results in section 6.3. Section 6.4 concludes with a summary of the chapter.

6.2 Methodology

6.2.1 Model Specification

The response variable is dichotomous, hence a binary logistic regression model is used.

The model to be estimated is presented as

$$\ln \left(\frac{P(Y_{ij} = 1 | x_{ij}, u_j)}{P(Y_{ij} = 0 | x_{ij}, u_j)} \right) = \alpha_1 + \sum_{k=1}^K \beta_k x_{kij} + u_j \quad (6.1)$$

$$u_j \sim N(0, \sigma^2) \quad j = 1, 2, 3 \quad i = 1, 2, \dots, n$$

Where Y_{ij}

is the dichotomous stunted status ($Y_{ij} = 1$ if stunted and $Y_{ij} = 0$ if not stunted) of the i^{th} child in the j^{th} wave.

x_{ij} represent the covariates while α_1 is the intercept. β_k is the k^{th} regression coefficient which measures the effect of changing the covariates by one unit on the log odds ratio. The study assumes that u_j follows a normal distribution with mean = 0 and variance = σ^2 .

Considering the binary nature of the dependent variable, the estimation strategy used in the chapter is the logistic regression where the random effect is applied. The standard errors are adjusted in the regressions to account for possible intra-cluster correlations that may result from the sampling design.

6.2.2 Description and Measurement of Variables

The outcome variable stunting is dichotomized as category 1 being stunted and 0 if otherwise. The study first examines what influences the presence of a stunted child in the household. Stunting, a measure of undernutrition also known as height-for-age (stunting) score is calculated using the *zscore06* command in Stata. The anthropometrical data of the child records the height of the child in centimeters.

The definition of stunting is based on the WHO which defines stunting as a child whose height-for-age z-score (HAZ) is below two standard deviations ($HAZ < -2SD$). HAZ is calculated by subtracting an age- and sex-appropriate median value from a standard population and dividing by the SD of the standard population. This is based on the WHO recommended 2006 growth standards. There is an established difference between stunting and linear growth retardation. Linear growth retardation is the inability of a child to reach his or her linear growth potential (Leroy & Frongillo, 2019). This means that within a population of children, those who are too short for their age may be experiencing linear growth retardation and not stunting necessarily. Stunting is, therefore, a subset of linear growth retardation, since the number of children within a given population suffering from linear growth retardation is much higher than those who are stunted (Leroy & Frongillo, 2019).

Maternal depression is used as a proxy for maternal health status. Depression is measured using the Kessler 10 Survey as presented in the GSPS questionnaire. This is an international standard set of questions that asks 10 questions about the psychological distress of the respondents. The scores are summed up and interpreted as 10-19, likely to be well; 20-24, likely to have *mild depression*; 25-29, likely to have *moderate depression* and 30-50, likely to have *severe depression*. This is categorized as *well* if the total distress score of the mother is 10-19, *mild depression* if the total distress score is 20-24, and *moderate* and *severe depression* if the mother's total distress score is 25-29 and 30-50 respectively.

Household characteristics controlled for include household wealth, source of water and the type of toilet facility in the household, while maternal characteristics controlled for include the education of the mother, the health of the mother and the presence of the mother in the house. The education of the mother is measured using the highest level of education. In a sensitivity analysis, we control for the presence of both parents in the household.

In this study, we examine what accounts for the presence of a stunted child in the household. The response variable or the outcome variable is therefore dichotomous. A binary logistic regression model is therefore used in the analysis. The independent variables used in this case include the wealth index, the level of depression of the mother, which is a proxy for maternal health, maternal education, and the presence of both parents in the house. The study controls for the location and presence of either the father or mother in the house.

Measuring child welfare can be challenging especially when not all costs associated with child welfare can be measured directly. The study controls for the share of total household expenditure on children. Intuitively the proportion of total household expenditure on children depicts how

much of the household wealth goes directly to the benefit of the child, especially in a situation where the household wealth is not evenly distributed.

The a priori expectations for this study are presented in Table 6.3. Based on the reviewed literature, it is expected that household wealth will reduce the likelihood of stunting in the household (Boah et al., 2019; Christian et. al, 2020; Darteh, et. al, 2014). Poor sanitation (Modern, Sauli, & Mpolya, 2020), the presence of both parents in the household (Ntshebe et al. 2019) as well as living in an urban area (Wemakor & Mensah, 2016; Andersen et al., 2016; Chowdhury et al., 2020) are likely to reduce the odds of stunting in the household. Households with more children are likely to have stunted children compared with households with fewer children (Bogale et al., 2018; Darteh et al., 2014).

Stata 15 is used for the analysis. Results for a panel of descriptive statistics are presented in Table 6.1. The results for the logistic regression are reported with their odds ratio. The significant level is set at $p < 0.05$. The *vce robust* is applied to give a robust standard error that caters for any traces of heteroscedasticity and serial correlation.

6.3. Results

6.3.1 Descriptive statistics

The descriptive statistics presented in Table 6.1 covers a sample of 1876 households. From the descriptive statistics (Table 6.1), 34 percent of these households have stunted children. The overall standard deviation of having a stunted child in the household is 0.47. The between variation of stunting is 0.42 while the within variation of stunting is 0.27. The maximum number of stunted children in the household recorded was 5. Some households do not have stunted children.

Approximately, 34 percent of these households are poor and 29 percent of these households live in urban communities. About half of the children in the households are girls. Overall, 77 percent of these children have their parents (both mother and father) in the household. The average number of children under five in the household is 2. These households could have as many as 7 children in the household. Regarding the status of sanitation in these households, 80 percent have access to good water while 19 percent have access to improved toilets. On average, 11 percent of total household expenditure is spent on children. The percentages associated with these variables across the three waves are presented in Appendix 6. In Wave 1, Wave 1 and Wave 3, 63 percent, 69 percent, and 63 percent of mothers respectively are well and not depressed. Regarding those with mild depression, 25 percent, 21 percent, and 22 percent of these mothers suffer depression in Wave 1, Wave 2, and Wave 3 respectively. Maternal level of education has generally improved across

Table 6. 1: Descriptive Statistics of Households with children under 5 years

Variable		Mean	Std. Dev.	Min	Max	Observations
Stunting	overall	0.34	0.47	0	1	N = 2865
	between		0.42	0	1	n = 1876
	Within		0.27	-0.32	1.01	1.52719
No. of Stunted Children	overall	0.40	0.61	0	5	N = 2865
	between		0.54	0	3	n = 1876
	Within		0.35	-1.1	1.9	1.52719
Location	overall	0.29	0.45	0	1	N = 2865
	between		0.46	0	1	n = 1876
	Within		0.00	0.29	0.29	1.52719
Poverty Status	overall	0.34	0.47	0	1	N = 2865
	between		0.42	0	1	n = 1876
	Within		0.25	-0.33	1.00	1.52719
proportion of girls	overall	0.49	0.43	0	1	N = 2865
	between		0.39	0	1	n = 1876
	Within		0.23	-0.18	1.15	1.52719
Maternal depression	overall	1.51	0.79	1	4	N = 2865
	between		0.70	1	4	n = 1876
	Within		0.45	-0.49	3.51	1.53
Both Parents are in the HH	overall	0.77	0.42	0	1	N = 2865
	between		0.42	0	1	n = 1876

Number of children under 5	Within		0.12	0.10	1.44	1.53
	overall	1.62	0.78	1	7	N = 2865
share of exp. on children	between		0.71	1	6	n =n 1876
	Within		0.39	-1.38	4.62	1.53
Maternal education	overall	11.18	13.15	0	99.4	N = 2865
	between		9.44	0	82.62	n = 1876
Improved toilet	Within		9.21	-31.50	71.18	1.53
	overall	2.03	1.01	1	5	N = 1769
Source of water	between		0.98	1	5	n = 1269
	Within		0.29	0.03	4.03	1.39
Wealth index	overall	0.19	0.39	0	1	N = 2857
	between		0.37	0	1	n = 1873
Source of water	Within		0.19	-0.48	0.85	1.53
	overall	0.80	0.40	0	1	N = 2864
Wealth index	between		0.37	0	1	n = 1876
	Within		0.17	0.13	1.46	1.53
Improved toilet	overall	2.91	1.40	1	5	N = 2826
	between		1.36	1	5	n = 1854
Source of water	Within		0.41	1.24	4.58	1.52

Source: Authors computation from the GSPS (n= number of households)

the waves. For instance, the proportion of mothers with secondary education increased from 38 percent in Wave 1 to 50 percent in Wave 3 (Appendix 6).

Table 6. 2: Prevalence of Stunting among children (number of children and percentages) according to Waves

Wave	Stunting		
	Non-Stunted	Stunted	Total
1	1,774	958	2,732
	64.93%	35.07%	100
2	1,493	416	1,909
	78.21%	21.79%	100

3	1,499	489	1,988
	75.4%	24.6%	100
Total	4,766	1,863	6,629
	71.9%	28.1%	100

Pearson chi2(2) = 115.3 Pr = 0.000

A breakdown of stunting according to the three waves is presented in Table 6.2. This is the breakdown of the number and percentages of stunted children in Wave 1, 2 and 3. The prevalence of stunting among children decreased from 35.1 percent in Wave 1 to 21.8 percent in Wave 2. The decline was short-lived as the country recorded an increase in the prevalence of stunting. Thus stunting later increased to 24.6 in Wave 3. Descriptive statistics in percentages presenting households with children under 5 are presented in Appendix 6.

Table 6. 3: A Prior Expectations

Variable	Operationalization	Expected Sign	Reference
Location	Rural (Reference)	-	Wemakor & Mensah, 2016; Andersen et al., 2016; Chowdhury et al., 2020
	Urban		
Wealth Index	Poorest (Quintile 1: Ref)	-	Boah et al., 2019; Christian et. al, 2020; Darteh, et. al, 2014)
	Poor (Quintile 2)		
	Middle income (Quintile 3)		
	Rich (Quintile 4)		
	Richest (Quintile 5)		
Maternal Health	Depressed Mother	+	Wemakor & Mensah, 2016;
	Well		

	Mild		Addo et al., 2015; Black et al., 2013; Fookan & Vo, 2021
	Moderate		
	Severe		
Both Parents in the household	Yes = 1	-	Ntshebe et al. 2019
	No =		
Maternal Education	None (Reference)	-/+	Semali et al., 2015; Chowdhury et al., 2020; Eshete et al., 2020; Hanson et al., 2018
	Primary		
	Secondary		
	Tertiary		
Sanitation	Improved toilet	-	Modern, Sauli, & Mpolya (2020),
	Improved source of water		
Number of children		+	Bogale et al., 2018; Darteh et al., 2014

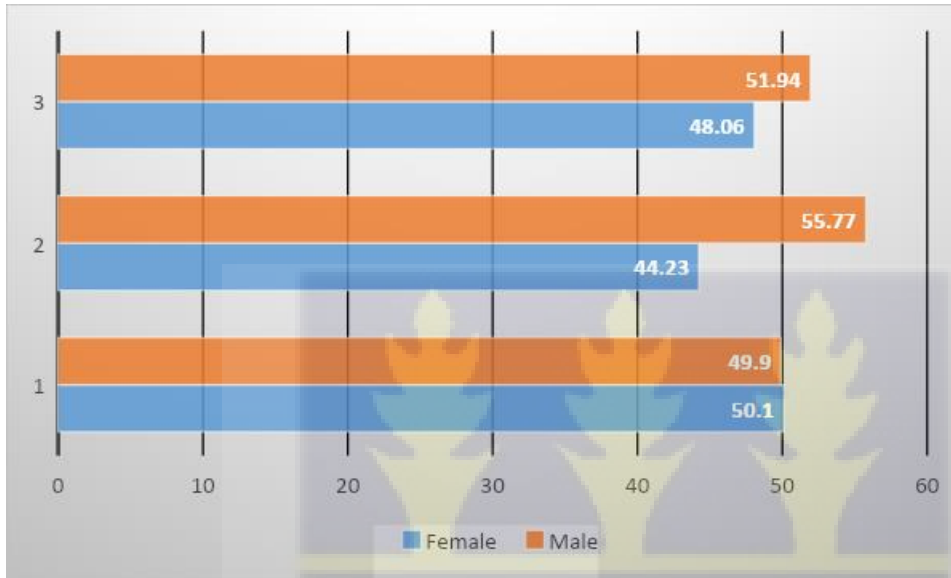
6.3.2 Discussion of Results

6.3.2.1 Determinants of Stunting in the Household

Although the analysis is at the household level, we first describe the nature of the data at the child level. Descriptive statistics of children in the full sample are presented in Figure 8 to Figure 10. Except for Wave 1 where the prevalence of stunting was found to be higher among females, in Wave 2 and 3, the prevalence of stunting was higher among males. Stunting has been consistently higher in rural areas. However, in 2013/14, the gap between stunting in rural areas and urban areas was reduced (rural: 57% and urban: 43%). The gap however increased in Wave 3 as stunting in rural communities increased to 62 percent. Stunting prevalence by wealth quintile shows that the

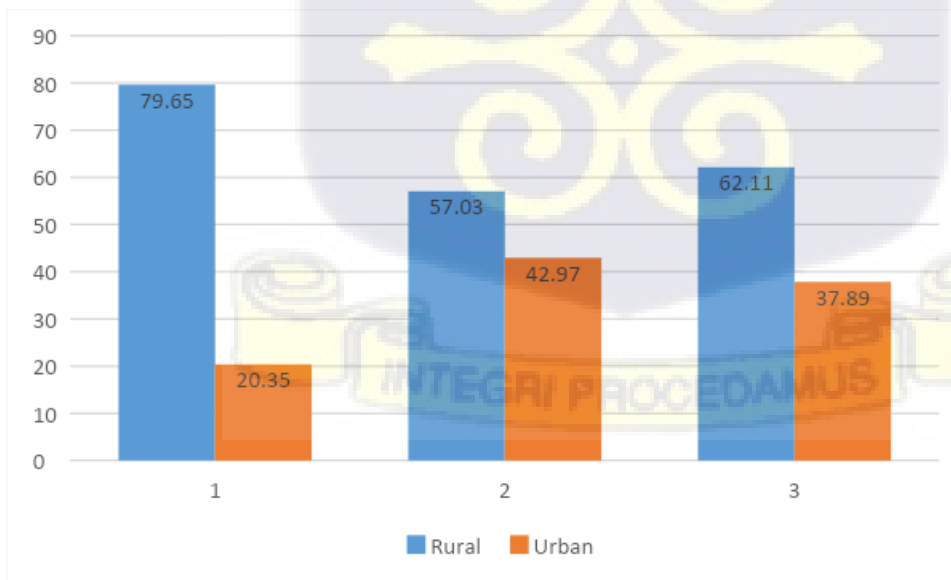
gap between the richest household and the poorest households reduced in 2018/19 (Wave 3), compared to 2009/2010 (Wave 1). Overall the prevalence of stunting in Ghana reduced in 2013/2014 (Wave 2). The decline was short-lived as in 2017/2018, the prevalence of stunting in Ghana is on ascension.

Figure 8: Stunting among children by Gender and Wave



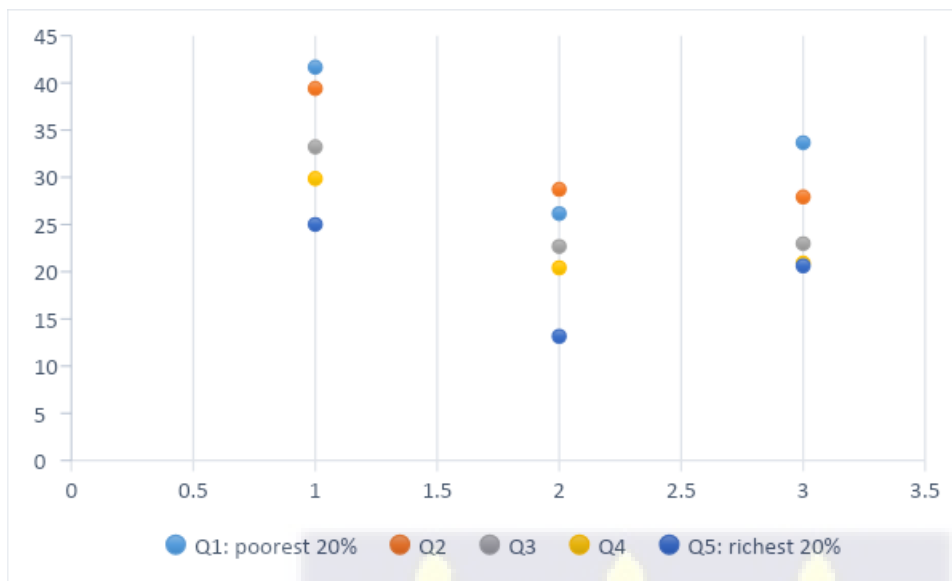
Source: Author's computation based on data from the Ghana Socioeconomic Panel Survey

Figure 9: Prevalence of Stunting among children by Location and Wave



Source: Author's computation based on data from the Ghana Socioeconomic Panel Survey

Figure 10: Stunting Prevalence by wealth quintiles across waves



Source: Author's computation based on data from the Ghana Socioeconomic Panel Survey

Table 6. 4: Effect of Poverty on Stunting in the household

VARIABLES	(A) odds ratio	© odds ratio
Poor HH	1.60*** (0.12)	1.33*** (0.10)
Urban		0.71*** (0.06)
Number of children		1.12*** (0.02)
Constant	0.42*** (0.02)	0.35*** (0.03)

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

As stated earlier, the unit of analysis is the household, the presence of a stunted child in the household is the dependent variable. Table 6.4 presents results for examining the impact of household welfare on whether or not a household has a stunted child or not. The robust standard errors are in parentheses. The result shows that poor households are more likely to have stunted children than non-poor households. The poverty status used in this analysis follows from the estimates in session 3.5 (Chapter 3) According to the results, the odds of a household having a stunted child increase by 60 percent among poor households. This implies that the likelihood of a household having a stunted child increases as the household becomes poor, the study controls for the location of the household and the number of children in the household. The results reveal that households located in urban areas are less likely to have stunted children. Similarly, households with a higher number of children are likely to have stunted children compared with households with fewer children. Thus, a unit increase in the number of children in the household increases the odds of a household having a stunted child by 12 percent.

The study goes further to examine the effect of changes in the welfare of the household on the child. Household welfare in this study is measured by the poverty status of the household. Over the period under investigation, some households may have become non-poor, others may have become poor, some households may have remained poor while others may have remained non-poor. Table 6.5 shows the effect of changes in household welfare on stunting in the household. Table 5.6 reports results from the effect of changes in household welfare on stunting in the household. Columns 1 and 2 present the results full data set where column 1 presents the odd ratio for the logit results and column 2 presents their corresponding marginal effects. The model is then separated into two groups by location. The focus in columns 3 and 4 is on the urban population

while results from the rural population are presented in columns 5 and 6. Columns 3 and 4 are the respective odds ratio and marginal effects results for the urban group. Columns 5 and 6 are the respective odds ratio and marginal effects results for the urban group.

The results show that changes in household welfare have an effect on the likelihood of having a stunted child in the household. In urban households, those that became non-poor are less likely to have stunted children in the household while in rural households, households that became poor are more likely to have stunted children. Specifically, for households in rural areas, compared to households that remained poor, households that become poor are 8 percent points more likely to have stunted children in their households, while households in urban areas that became non-poor are 16 percent points less likely to have stunted children in the household. The number of children under 5 years in the household is significant at 10 percent. Specifically, the likelihood of having a stunted child in the household increases as the number of children under 5 increases across all three models. The share of household expenditure on children is only significant among urban dwellers.

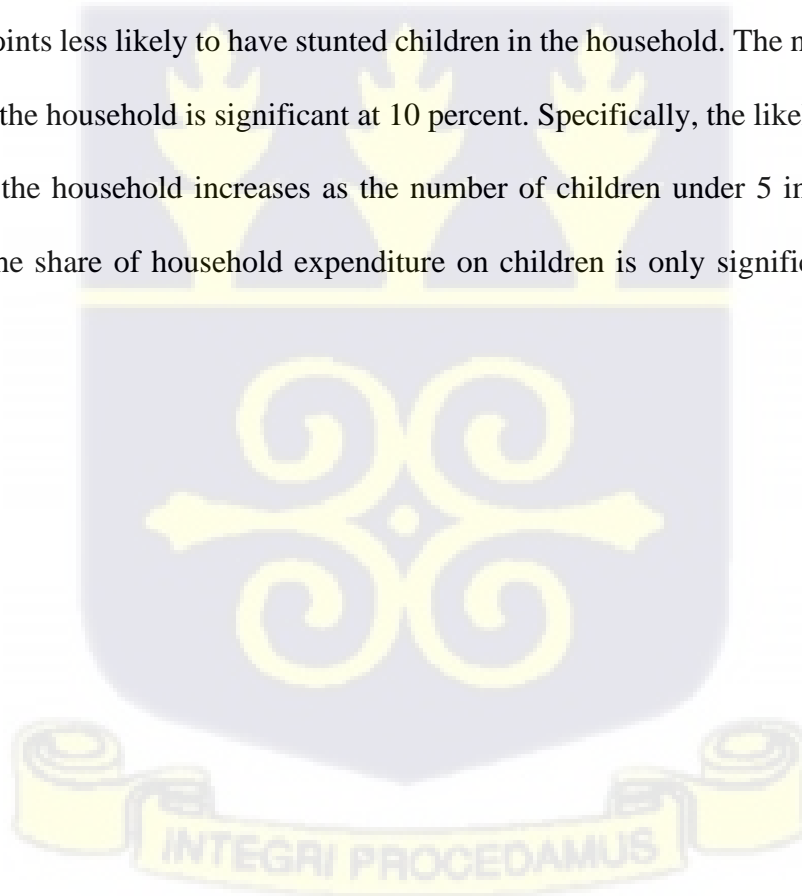


Table 5.6: Effect of Changes in Household Welfare on Stunting

VARIABLES	ALL		Urban		Rural	
	Odds ration	Marginal Effect	odds ratio	Marginal Effect	odds ratio	Marginal Effect
Location (ref: Rural)						
Urban	0.72** (0.12)	-0.06** (0.03)				
Change_in Welfare (ref: Remain Poor)						
Became Poor	1.51* (0.35)	0.08* (0.04)	1.26 (1.09)	0.04 (0.14)	1.57* (0.39)	0.08* (0.05)
Became Non Poor	0.94 (0.23)	-0.01 (0.04)	0.21* (0.17)	-0.16* (0.11)	1.03 (0.27)	0.01 (0.05)
Remain Non Poor	1.01 (0.22)	0.002 (0.04)	0.89 (0.69)	-0.02 (0.13)	0.97 (0.22)	-0.01 (0.04)
Proportion_girls	0.80 (0.12)	-0.04 (0.03)	1.10 (0.33)	0.01 (0.04)	0.72* (0.13)	-0.06* (0.03)
Maternal depression (ref: well)						
Mild	1.30 (0.21)	0.05 (0.03)	1.25 (0.43)	0.03 (0.06)	1.36 (0.26)	0.06 (0.04)
Moderate	1.32 (0.31)	0.05 (0.04)	1.04 (0.50)	0.01 (0.07)	1.38 (0.38)	0.06 (0.05)
Severe	1.21 (0.43)	0.03 (0.06)	0.67 (0.54)	-0.05 (0.09)	1.45 (0.60)	0.07 (0.08)
Children under5	1.56*** (0.14)	0.08*** (0.01)	1.36* (0.24)	0.05* (0.03)	1.63*** (0.17)	0.09*** (0.02)
Share_HHexp_cld	1.00 (0.00)	0.00 (0.00)	1.02* (0.01)	0.003* (0.001)	1.00 (0.00)	0.00 (0.00)
Constant	0.15*** (0.04)		0.12** (0.11)		0.15*** (0.05)	
No. of households	1,116		340		776	
Wald chi2	40.94		14.13		29.43	
Degree of Freedom	10		9		9	
Prob > chi ²	0.00		0.12		0.00	
Log pseudolikelihood	-768.9		-202.969		-560.97	

Source: Author's calculations. Estimated coefficients are presented and Robust Standard Errors in parentheses. Standard errors are robust to heteroscedasticity. Betas are significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*)

Table 6.6 shows the results of the logistic regression for the factors associated with the presence of a stunted child in the household. The results are expressed as the exponential coefficients or odds ratio associated with stunting. There are five columns representing 5 different regressions. Column A is the original logistic regression where the study controls for location, the poverty status of the household (based on computations from Chapter Three of this study), the number of children under 5 years in the household, the proportion of girls under 5 years in the household, maternal depression and the presence of both parents in the household. In the second column, thus Column B, the study controls for location, maternal education, and the share of household expenditure on children. Sanitation plays a critical role in the health of children. The study, therefore, controls for the nature of the toilet facility in the household and the source of drinking water. Non-poor households are more likely to improve sanitation compared to poor households. To avoid multicollinearity, a separate regression is estimated in Column C. In Column C, the study also controls for the presence of both parents in the household while in Column D, the study interacts the presence of both parents with location to examine the impact of having both parents in the urban location on stunting in a household. In Column E, the studies does a robust check by controlling for the economic status of the household, using the wealth index. Similar to the previous chapter, the Wald tests presented in Table 6.6 are large and the $\text{Prob} > \chi^2$ are extremely low (0.0001) implying strong evidence for the rejection of the null hypothesis.

The results are expressed as the exponential coefficients or odds ratio associated with stunting. The results in Table 6.6 show that stunted children are likely to be found in households where mothers have mild depression compared with households where there are no depressed mothers. There are higher odds of finding stunted children in households where mothers have mild depression. Although mothers with moderate and severe depression are not significant, the impact

of mild depression has serious implications for the overall well-being of the household and has to be eradicated. Maternal health is critical for the well-being of all the members of the household, especially children. It has the potential to affect the quality of caregiving. The results of this study are in line with results from studies by Wemakor & Mensah (2016) who found that depression among women increases the likelihood of stunting among children. The study associated the high level of stunting in the Northern Region to the high level of depression among women.

The results also showed that household poverty status influences the presence of a stunted child in the household (Column A). Compared to non-poor households, poor households are more likely to have stunted children than non-poor households. Households in the urban regions have lower odds of having stunted children in their household, compared to households which are found in rural communities. From Column A, households in urban areas are likely to have a reduction of 26 percent odds of having stunted children than households in rural areas. The study also found that the odds of having a stunted child in the household increased as the number of children under five years in the household increased. Thus, the odds of having a stunted child in the household increase by 53 percent as the number of children under 5 years in the household increases.

Surprisingly, the presence of both parents in the household increases the odds of having a stunted child in the household. Nevertheless, interacting location and the presence of both parents in the household showed that there is no significant impact on stunting (Column D).

As indicated earlier, the study controls for the share of household expenditure on children in the household. There is a decrease in the odds of having a stunted child in the household as the share of expenditure on children increases. Although the share of household expenditure on children may not be directly related to the nutrition of the child in the household, it provides an alternative

lens for measuring the economic status of the household. It also reveals the level of priority the household places on the well-being of the child.

The study also revealed that good sanitation is important to the health of the child. Thus, having an improved toilet and an improved source of water reduces the odds of the household having a stunted child (Column C). In Column E, the study conducts a robustness checks by controlling for the wealth index as a measure of the economic status of the household. The study found that compared to households in the poorest quintile, the odds of a richer household having a stunted child decreases in non-poor households. For instance, the richest households experience a reduction of 33 percent in the odds of having a stunted child in the household, while households that fall in the fourth quintile, thus rich households are likely to have a reduction of 34 percent in the odds of having a stunted child. In the same vein, households that are categorized as middle-income experience a reduction of 21 percent odds of having a stunted child. The poor household quintile is not significant. It is interesting to note that the reduction in odds of stunting increases as the household migrates from Quintile 2 (middle income) to quintile 5. The results from the study reveal that both maternal education and the proportion of girls in the household are not significant. The household poverty status is suspected to be endogenous. There is however a limitation in identifying valid instruments for household poverty. The introduction of share of improved sanitation and share of household expenditure on children in the model (Column B and C) serve as robustness checks.



Table 6. 6: Drivers of the presence of a stunted child in the household

VARIABLES	(A) odds ratio	(B) odds ratio	(C) odds ratio	(D) odds ratio	(E) odds ratio
Location					
Urban	0.74*** (0.07)	0.77** (0.09)	0.70*** (0.07)	0.72* (0.14)	0.80** (0.09)
Poverty Status					
Poor	1.41*** (0.13)			1.50*** (0.14)	
Proportion girls	0.88 (0.09)	0.82 (0.10)	0.88 (0.08)	0.88 (0.08)	0.89 (0.09)
Depressed Mother (Ref: Well)					
Mild	1.25** (0.13)		1.27** (0.13)	1.28** (0.13)	1.22* (0.12)
Moderate	1.16 (0.17)		1.22 (0.17)	1.22 (0.17)	1.15 (0.16)
Severe	1.27 (0.28)		1.32 (0.30)	1.31 (0.30)	1.22 (0.27)
Both Parents in household					
Yes	1.26** (0.13)		1.39*** (0.14)	1.41*** (0.17)	1.28** (0.13)
Number of children under 5	1.53*** (0.08)	1.53*** (0.11)			1.50*** (0.08)
Share of HH expenditure on children		0.99** (0.00)			
Maternal Education (Ref: None)					
Primary		1.00 (0.19)			
Secondary		0.92 (0.10)			
Tertiary		1.04 (0.33)			
Other		0.30 (0.24)			
Toilet					
Improved toilet			0.76** (0.09)		
Source of Water					
Improved Source			0.83* (0.09)		
Both Parents*Location				0.97 (0.22)	
Wealth Index (Ref: Q 1 poorest)					

Poor					0.96 (0.12)
Middle income					0.72*** (0.09)
Rich					0.66*** (0.09)
Richest					0.67** (0.11)
Constant	0.20*** (0.03)	0.30*** (0.05)	0.51*** (0.07)	0.36*** (0.05)	0.28*** (0.05)
Number of households	1,876	1,269	1,873	1,876	1,854
Wald chi2	116.18	47.14	55.38	64.66	118.28
Degree of Freedom	8	8	8	8	11
Prob > chi ²	0.000	0.000	0.000	0.000	0.000
Log pseudolikelihood	-1769.16	-1049.62	-1801.33	-1802.175	-1742.58

Source: Author's calculations. Estimated coefficients are presented and Robust Standard Errors in parentheses. Standard errors are robust to heteroscedasticity. Betas are significant at $p < 0.01$ (***), $p < 0.05$ (**), $p < 0.1$ (*)

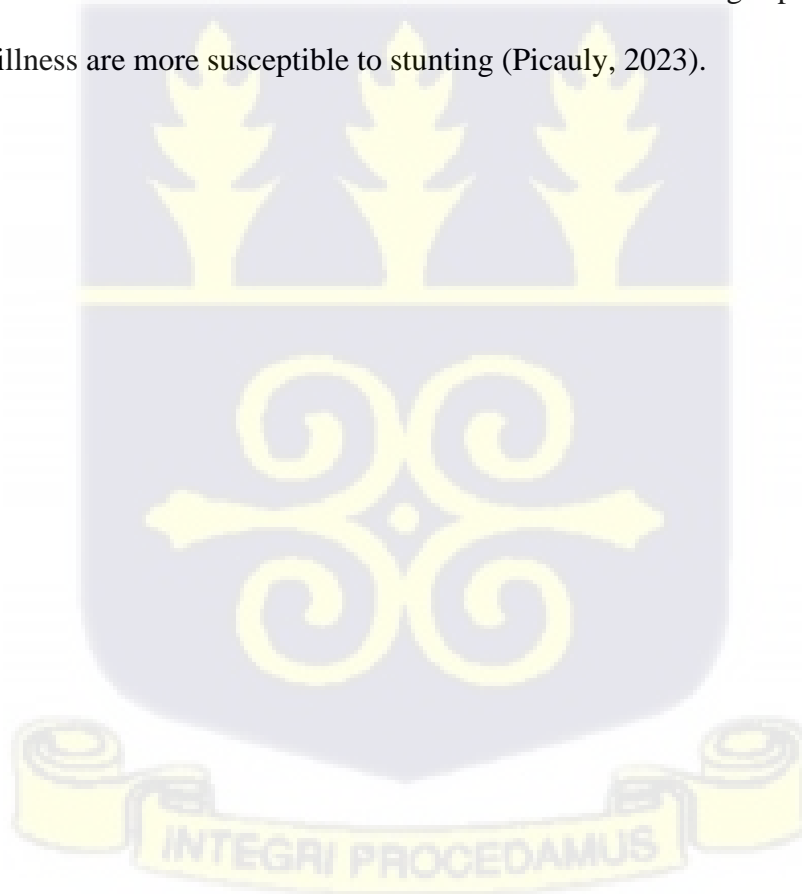


6.4 Chapter Summary

This chapter examined the factors that contribute to stunting among children under six years. The study is conducted at the household level, where it examines factors that contribute to the likelihood of having a stunted child in the household. The study reveals that non-poor households are less likely to have stunted children. Likewise, households are less likely to have stunted children as their welfare improves. The study also confirms that good sanitation reduces the likelihood of having a stunted child in the household. Thus, having improved toilet facilities as well as good sources of water in the household also reduces the odds of a child being stunted in the household. The health of mothers has an impact on the health of the child. Households are likely to have stunted children if mothers in those households suffer from mild depression. This implies that unwell mothers may not be in the right frame of mind to provide good nourishment to their children. Maternal education and the proportion of girls in the household are not significant. Surprisingly, the presence of both parents in the household increases the odds of a child being stunted. Agreeably, when both parents are in the household, they may pay more attention to the feeding of their children compared to having caregivers to cater for their children. However, in a situation where both parents are in the household but are stricken by poverty, they may not have the resources to cater for their children. This may account for the results exhibited in the analysis. The study also found that the likelihood of stunting reduces as the share of household expenditure on children increases. The share of household expenditure on children may not have a direct relation with the nutrition of the child. It is however an indication of how the well-being of the child is prioritized. Thus households which prioritize the well-being of children are likely to spend more on the nutrition of the children in the household. This, therefore, implies that the likelihood

of having stunted children in the household is likely to reduce as the welfare of the child is prioritized.

Stunting and child poverty are intertwined, thus while child poverty may lead to stunting, stunting on the other hand leads to child poverty. The measuring of child poverty includes a health dimension, which in this study includes indicators such as child mortality, and illness. Studies have shown that these indicators are associated with stunting. According to Wright et al., (2021), stunting is highly associated with mortality. Thus, stunted children are at high risk of dying. Addressing stunting is therefore important for tackling child mortality (Hirwa, 2024). Furthermore, illness, another indicator of health dimension has an influence on stunting. Specifically, children who experience illness are more susceptible to stunting (Picauly, 2023).



CHAPTER SEVEN

WHO SHOULD GO TO SCHOOL? DETERMINANTS OF SON PREFERENCE

7.1 Introduction

In line with the fifth objective of this study, this chapter seeks to examine factors that influence the household's preference for a male child. This is an exploratory research on son preference in Ghana. Son preference has a negative impact on children and has the potential of worsening child poverty. An exploratory study on son preference is timely as no in-depth study has been conducted on son preference in Ghana. The impact of son preference on child poverty is complicated and manifold. Son preference is the situation whereby there is a bias in favour of having a male child over a female child. This bias could be founded on cultural or societal norms.

Son preference has several implications for child poverty. Intuitively, it has the tendency to lead to unequal resource allocation. The theory of household decision making entails negotiating how household resources will be allocated. Members of the household with strong bargaining power are likely to influence the allocation of household resources. Households with strong son preference are likely to allocate more resources such as education, inheritance, nutrition and healthcare to sons at the detriment of their daughters. This could lead to unequal distribution of resources. Furthermore, this could increase the disparity between male children and female children in terms of health, education and general well-being, thereby leading to child poverty among female children.

Secondly, households characterized by son preference are likely to place priority on the education of their sons while their female children are given lower quality education or worse case are deprived of education. Girls who receive limited educational opportunities are likely to have

limited future earnings. Unequal educational opportunities for girls have the potential of perpetuating the poverty cycle.

Son preference could lead to healthcare neglect among female children. Female children in households with strong son preference may not get the needed attention with regard to their health as compared to their male counterparts. Thus, the health of male children is likely to be prioritized compared to their female children in the household. This makes female children more vulnerable to diseases as they potentially experience poorer health outcomes. The vulnerability of female children to diseases makes them susceptible to child poverty.

Finally, son preference has the potential to amplify gender inequality. Thus, policies and programs targeted at eliminating gender inequality must consider tackling or addressing son preference and its effect on child poverty as son preference usually stems from discriminatory cultural and social norms. Studies on son preference are important because policy makers, and generally the government whose object is to alleviate child poverty, especially in regions where son preference is prevalent need to promote gender equality and target issues of gender bias.

The study juxtaposes the household preference for a male child to the respondent's view on whether it is better to school a son than it is to school a daughter. The organization of this section is as follows; section 7.2 discusses the methodology where the data, variables estimation technique, as well as the prior expectation of the result, are presented. Section 7.3 discusses the results and section 7.4 presents the summary of the chapter.

7.2 Methodology

7.2.1 Data

The Ghana Socioeconomic Panel Data was used for this study. It is a nationally represented survey conducted by the ISSER, in collaboration with Yale University. Three waves of data are used in this study. This survey provides the most recent data on Ghana's socioeconomic conditions among households. Households were selected as the survey sample using a two-stage stratified cluster sampling approach. The data was collected using structured questionnaires. Data was collected between 2009/10, 2013/14 and 2018/19 for waves I, II and III respectively.

7.2.2 Variables

Son preference, the dependent variable is measured by the responses both females and males above the age of twelve years in the household give to the statement 'it is better to send a son to school than it is to send a daughter'. Respondents who agree to the statement are coded 1 while those who disagree are coded 0. Different estimations are run for male and female respondents. This is because the survey granted separate interviews for both males and females in the household. Household decisions are usually made by adults in the household. The study, therefore, focuses on respondents who are 20 years and above. Respondents for this section of the survey were 12 years and above. However, for this study, since household decisions are made by adults in the household, the study focuses on respondents above the age of 19.

The main variables of interest are household wealth status and the educational level of the individual. This is to verify if indeed the modernization effect has an influence on the decision of the household (Gu et al., 2022; Rossi & Rouanet, 2015). The study also controls for the age, marital

status, parental education, location and religion of the respondents. The age of the respondents is categorized as “20 to 35”, “36 to 50”, “51 to 65” and above 66 years for easy interpretation. With regards to the marital status of the respondents, respondents in a marital or consensual union are categorized as “married” while those who are divorced, separated, betrothed, never married and widowed are categorized as “not married”. Religion is categorized as Christian, Moslem, Traditional and Others. Here, “Others” include those who have no religious affiliation, are Buddhists or Rastafarians. The study also controls for the lineage of the respondent. In other words, the study controls for whether the respondent is from a matrilinear lineage or a patrilinear lineage. Lineage in this context is the mode of inheritance.

The principal component analysis is used to compute the household wealth index which in this study is used as a proxy for the economic status of the household. The household wealth is used as a proxy for the long-term standard of living of the household. It is computed based on the household’s ownership of assets (such as radio, TV, kerosene or electric stove, fridge, bicycle, motorcycle, mobile phone and iron); the source of drinking water, type of building material and type of toilet facility, lighting system and other household characteristics that relate to the socioeconomic status of the household such as wealth index. Participants who make up this data set are from both the urban and rural areas of Ghana. This study, therefore, takes into account the differences in the household wealth index that may accrue due to the location of the participant. The two variables, urban and rural wealth index scores are then merged to derive a composite wealth index score. The wealth index score is then categorized into wealth quantile for easy interpretation, the higher the index, the wealthier the household. For easy interpretation, the household wealth index is presented as quintiles ranging from 1 to 5 where Q1 represents the poorest household, Q2 represents the poor households, Q3 represents the middle-class household,

Q4 represents rich households and Q5 represents the richest households. The study controls for modernization. Access to television is used as a proxy for modernization in this study.

The *a priori* expectation of the study is presented in Table 6.1. From the literature reviewed, it is expected that household wealth (Rahman, 2019), modernization, education (Asadullah et al.,2021; Björkman-Nyqvist, 2013; Davison, 1993), and urbanization (Gu et al, 2022; Davison, 1993) will water down the preference for sons.

7.2.3 Estimation technique

A binary logistic model is used because the response variable, ‘it is better to send a son to school than to send a daughter’ is dichotomous.

$$\ln \left(\frac{P(Y_{ij}) = 1 | x_{ij}, u_j}{P(Y_{ij}) = 0 | x_{ij}, u_j} \right) = \alpha_1 + \sum_{k=1}^K \beta_k x_{kij} + u_j \quad (7.1)$$

$$u_j \sim N(0, \sigma^2) \quad j = 1, 2, 3 \quad i = 1, 2, \dots, n$$

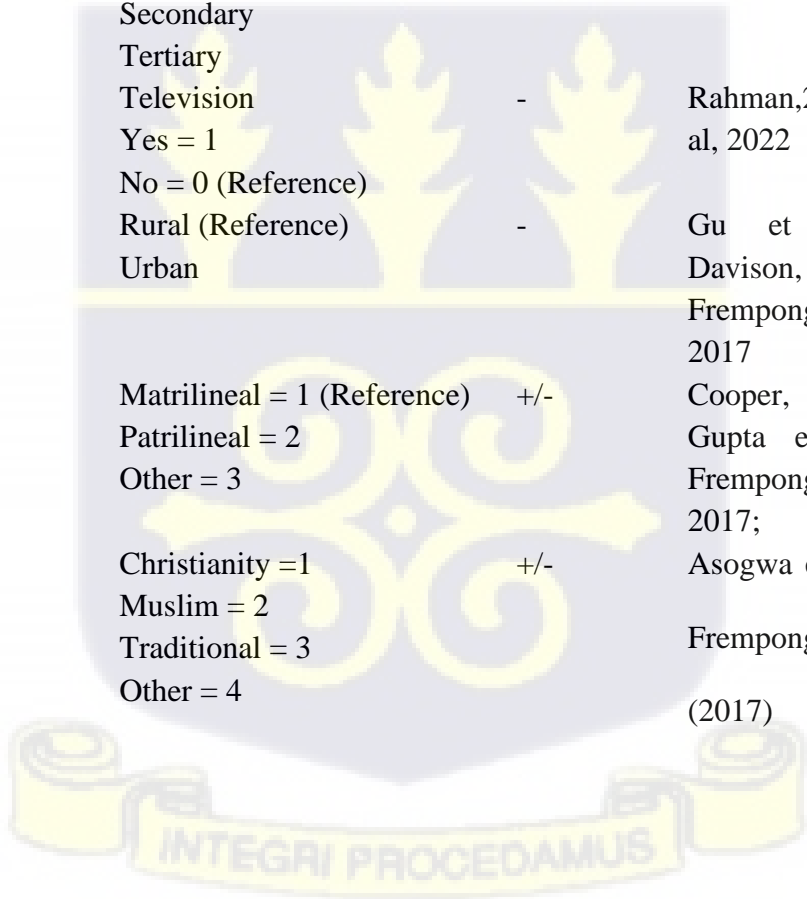
Where Y_{ij}

1. is the dichotomous response ($Y_{ij} = 1$ if Agreed and $Y_{ij} = 0$ if Disagreed) of the i^{th} male household member above the age of 19 in the j^{th} Wave.
2. is the dichotomous response ($Y_{ij} = 1$ if Agreed and $Y_{ij} = 0$ if Disagreed) of the i^{th} female household member above the age of 19, in the j^{th} Wave.

x_{ij} represent the covariates while α_1 is the intercept. β_k is the k^{th} regression coefficient which measures the effect of increasing the covariates by one unit on the log odds ratio.

Table 7.1: *A Priori* Expectations

Variable	Operationalization	Expected Sign	Reference
Wealth Index	Poorest (Quintile 1: Ref)	-	Björkman-Nyqvist, 2013; Rahman, 2019
	Poor (Quintile 2)		
	Middle income (Quintile 3)		
	Rich (Quintile 4)		
	Richest (Quintile 5)		
Education	None (Reference)	+/-	Asadullah et al.,2021; Björkman-Nyqvist, 2013; Davison, 1993; Frempong & Codjoe, 2017),
	Lower Primary		
	Upper Primary		
	JHS/SHS		
Parental Education	Tertiary	-	Gu et al, 2022
	None (Reference)		
	Primary		
	Secondary		
Modernization	Tertiary	-	Rahman,2019; Gu et al, 2022
	Television		
Location	Yes = 1	-	Gu et al, 2022; Davison, 1993; Frempong & Codjoe, 2017
	No = 0 (Reference)		
	Rural (Reference)		
Lineage	Urban	-	Gu et al, 2022; Davison, 1993; Frempong & Codjoe, 2017
	Matrilineal = 1 (Reference)		
Religion	Patrilineal = 2	+/-	Cooper, 2011; Das Gupta et al., 2003 Frempong & Codjoe, 2017;
	Other = 3		
	Christianity =1		
	Muslim = 2		
Religion	Traditional = 3	+/-	Asogwa et al., (2020) Frempong & Codjoe, (2017)
	Other = 4		



7.3 Discussion of Results

7.3.1 Descriptive Statistics

The study does a panel analysis because it makes room for more information. The descriptive statistics for male respondents are presented in Table 7.2 while that of female respondents are presented in Table 7.3. According to Table 7.2, 13 percent of the male respondents agree that it is better to school a boy than a girl. The overall standard deviation of men who think it is better to school sons than daughters is 0.34. The variation among men is 0.26. This is relatively higher than the variations within men over time. This implies that there is little change in the perception of men towards schooling sons than daughters over time. Regarding their poverty status, 30 percent of the male respondents are poor. The results are quite similar for the female respondents. The overall mean of the wealth index is approximately three (3rd Quintile). This implies that the average household in this study belongs to a middle-income household. The between and within standard deviation for the wealth index is almost the same, thus 1.3 and 0.5 respectively. This implies that the variation in household wealth across households is greater than the variations observed within households over time. The average household size is 4. The largest household has 20 people. The average age group of the respondents is between 36 to 50. Regarding the marital status of the respondents, 83 percent of the male respondents are married and 36 percent of them live in urban communities. On average, the male respondents belong to the patrilineal lineage. The average maternal education and paternal education are none and primary respectively.

Table 7.2: Descriptive Statistics for Male Respondents

	Variable	Mean	Std. Dev.	Min	Max	Observations
Male respondents	overall	0.13	0.34	0	1	N = 7947
	between		0.26	0	1	n = 3999
	within		0.23	-0.54	0.80	T-bar = 1.98
Wealth Index	overall	3.15	1.43	1	5	N = 7947
	between		1.35	1	5	n = 3999
	within		0.48	0.82	5.49	T-bar = 1.98
Poverty status	overall	0.30	0.46	0	1	N = 7947
	between		0.38	0	1	n = 3999
	within		0.29	0.37	0.97	T-bar = 1.98
Household size	overall	4.29	2.5	1	20	N = 7947
	between		2.3	1	17.5	n = 3999
	within		1.05	-6.71	11.28	T-bar = 1.98
Age Group	overall	2.3	1.01	1	4	N = 7947
	Between		1.00	1	4	n = 3999
	within		0.31	0.3	0.3	T-bar = 1.98
Marital Status	overall	0.83	0.38	0	1	N = 7947
	between		0.40	0	1	n = 3999
	within		0.15	0.16	1.5	T-bar = 1.98
Location	overall	0.36	0.48	0	1	N = 7947
	between		0.49	0	1	n = 3999
	within		0	0.36	0.36	T-bar = 1.98
Mother's Edu	overall	1.33	0.75	1	4	N = 7947
	between		0.73	1	4	n = 3999
	within		0.33	0.67	3.99	T-bar = 1.98
Father's Ed.	overall	1.65	1.04	1	4	N = 7947
	between		1.00	1	4	n = 3999
	within		0.43	-1.02	4.32	T-bar = 1.98
Religion	overall	1.64	0.96	1	4	N = 7947
	between		0.86	1	4	n = 3999
	within		0.48	-0.36	3.64	T-bar = 1.98

Table 7.2: Descriptive Statistics for Male Respondents Cont'd

	Variable	Mean	Std. Dev.	Min	Max	Observations
Region	overall	5.4	2.51	1	10	N = 7947
	between		2.49	1	10	n = 3999
	within		0.06	0	5.4	T-bar = 1.98
Lineage	overall	1.65	0.59	1	3	N = 7947
	between		0.56	1	3	n = 3999
	within		0.18	0.32	2.98	T-bar = 1.98

Table 7.3 presents descriptive statistics for female respondents. The results reveal that 11 percent of female respondents agree to the statement that it is better to school a boy than a girl. The average size of their households is 5 and the largest household is made up of 20 people. On the average, these respondents belong to the middle-income category and their average age is between 36 to 50 years. Most of these women are married, specifically, 73 percent of the female respondents are married women. Regarding their location, 36 percent live in urban communities, and 33 percent of them are poor. The average maternal education and paternal education are none and primary respectively. On the average, the female respondents belong to the patrilineal lineage

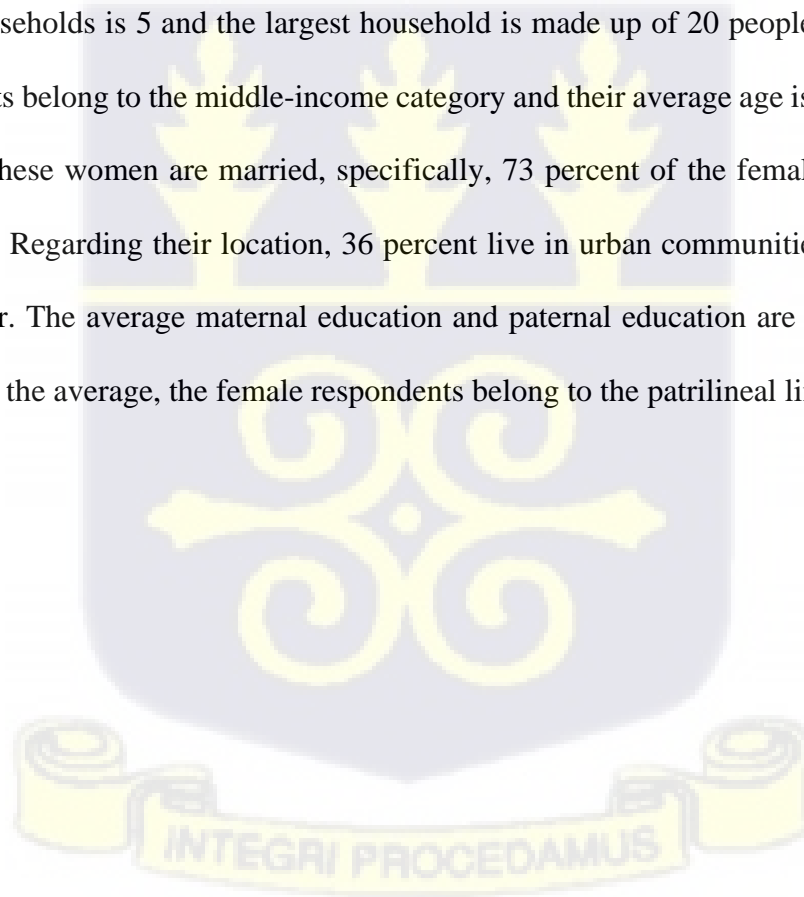


Table 7.3 Descriptive Statistics- Female Respondents

	Variable	Mean	Std. Dev.	Min	Max	Observations
Female respondents	overall	0.11	0.31	0	1	N = 10421
	between		0.25	0	1	n = 5644
	within		0.21	-0.56	0.78	T-bar = 1.84
Wealth Index	overall	3.1	1.41	1	5	N = 10421
	between		1.34	1	5	n = 5644
	within		0.47	0.72	5.39	T-bar = 1.84
Poverty status	overall	0.33	0.47	0	1	N = 10421
	between		0.40	0	1	n = 5644
	within		0.29	0.34	0.99	T-bar = 1.84
Household size	overall	4.70	2.66	1	20	N = 10421
	between		2.51	1	17.5	n = 5644
	within		0.95	-6.3	11.70	T-bar = 1.84
Age Group	overall	2.1	1.01	1	4	N = 10421
	Between		1.00	1	4	n = 5644
	within		0.30	0.1	3.43	T-bar = 1.84
Marital Status	overall	0.73	0.44	0	1	N = 10421
	between		0.45	0	1	n = 5644
	within		0.14	0.06	1.4	T-bar = 1.84
Location	overall	0.36	0.48	0	1	N = 10421
	between		0.48	0	1	n = 5644
	within		0	0.36	0.36	T-bar = 1.84
Mother's Education	overall	1.31	0.74	1	5	N = 7947
	between		0.71	1	5	N = 3999
	within		0.34	-0.67	3.99	T-bar = 1.98
Father's Education	overall	1.66	1.04	1	5	N = 10421
	between		1.00	1	5	n = 5644
	within		0.46	-0.69	4.32	T-bar = 1.84
Religion	overall	1.49	0.81	1	4	N = 10421
	between		0.75	1	4	n = 5644
	within		0.36	-0.51	3.49	T-bar = 1.84

Table 7.3 Descriptive Statistics- Female Respondents Cont'd

	Variable	Mean	Std. Dev.	Min	Max	Observations
Region	overall	5.6	2.55	1	10	N = 10421
	between		2.5	1	10	n = 5644
	within		0.0	5.57	5.57	T-bar = 1.84
Lineage	overall	1.63	0.59	1	3	N = 10421
	between		0.56	1	3	n = 5644
	within		0.18	0.30	2.97	T-bar = 1.84

7.3.2 Empirical Results

Table 7.4 presents results for panel logit results and reports the odds ratio. The Stata command *xtlogit* is used. The binary dependent variable is coded 1 if the respondents agree to the statement that it is better to school a boy than a girl and 0 if otherwise. The results are presented in six columns. Columns A, AA and B, show the results for male respondents, while results for female respondents are presented in columns C, CC and D. The study replaces wealth index with household poverty status in Columns AA and CC. The household poverty status follows from the computation of household poverty status in Chapter Three. In Columns B and D, the study controls for the lineage, educational level of the respondent as well as the ownership of a television set. Lineage is coded 1 if the respondent has a matrilineal lineage and 2 and 3 if from a patrilineal lineage and others respectively. The educational level of the respondent is measured by the highest grade the individual completed. This is categorized as none (the reference group), pre-school, lower primary, upper primary, JHS/SHS, tertiary and others. As explained earlier, the principal component is used to compute the wealth index of the household. The Wald test presented in Table 7.4 are large and the Prob > χ^2 are extremely low (0.0001) implying strong evidence for the rejection of the null hypothesis which state that the parameters are statistically equal to zero.

As expected, the wealth index of the individual has a decreasing odds of agreeing to the statement. The results showed that compared to the poorest household, (the reference group) both men and women in rich households have lower odds of agreeing to the statement. The odds of agreeing to the statement decrease from the poor to the richest group. The wealth index is significant at 1 percent. This confirms the findings of Gu et al. (2022) in that the preference for a specific gender diminishes as people get wealthier. The poverty status of the household has no significant impact on the preference of both men and women in the household (Column AA and CC).

As the household size increases, the males in the household are 0.03 points more likely to agree with the fact that it is better to educate sons than daughters. Intuitively, this could be because resource constraints within the household may force the household to concentrate on providing education for the boys. An increase in the household size increases the odds of males in the household agreeing to the statement by 3%. This implies that people who live in larger households are likely to have a preference for the male son. Contrary to the findings of this study, Jayachandran (2015) found that son preference is higher among households with smaller sizes while Rossi and Rouanet (2015), found that in Africa, smaller families have a preference for either boys or girls.

Marital status was significant for both males and females in the household. Compared to the unmarried men, there is a lower odd of 27% of married men agreeing with the statement. This means that married men are less likely to agree with the statement compared to their unmarried



Table 7.4 Logistic Regression for Son Preference

VARIABLES	(A)	(AA)	(B)	(C)	(CC)	(D)
	odds ratio	odds ratio	odds ratio	odds ratio	odds ratio	odds ratio
	Male	Male	Male	Female	Female	Female
Wealth Index (ref: poorest)						
Poor	0.76*** (0.08)			0.84** (0.07)		
Medium	0.65*** (0.07)			0.66*** (0.07)		
Rich	0.58*** (0.07)			0.55*** (0.06)		
Richest	0.35*** (0.06)			0.26*** (0.05)		
Poverty Status		1.12 (0.09)			1.08 (0.08)	
Household size	1.03* (0.02)	1.02 (0.02)	1.05*** (0.01)	1.0 (0.01)	1.00 (0.01)	1.06*** (0.01)
Age group (ref: 20-35 years)						
36 - 50 years	0.94 (0.10)	1.01 (0.10)	0.95 (0.09)	0.79*** (0.06)	0.79*** (0.06)	0.67*** (0.06)
51 - 65 years	0.77** (0.09)	0.79** (0.09)	0.70*** (0.09)	0.79** (0.08)	0.78** (0.08)	0.65*** (0.07)
66 and above	0.86 (0.11)	0.87 (0.11)	0.71** (0.10)	0.97 (0.11)	0.96 (0.12)	0.78* (0.11)
Marital Status (ref: Not married)						
Married	0.73*** (0.08)	0.70*** (0.08)	0.77*** (0.08)	1.23** (0.12)	1.17 (0.11)	1.38*** (0.14)
Location (ref: Rural)						
Urban	0.63*** (0.07)	0.46*** (0.05)	0.52*** (0.06)	0.74*** (0.08)	0.51*** (0.05)	0.59*** (0.06)
Father's Education (ref: None)						
Primary	1.16 (0.23)	1.09 (0.21)		0.92 (0.20)	0.92 (0.19)	
Secondary	1.03 (0.13)	0.96 (0.12)		1.00 (0.12)	0.89 (0.11)	

Table 7.4 Logistic Regression for Son Preference Cont'd

VARIABLES	(A) odds ratio	(AA) odds ratio	(B) odds ratio	(C) odds ratio	(CC) odds ratio	(D) odds ratio
	Male	Male	Male	Female	Female	Female
Tertiary	0.69 (0.22)	0.58* (0.17)		0.51** (0.17)	0.40*** (0.14)	
Other	1.18 (0.41)	1.11 (0.39)		0.60* (0.17)	0.57* (0.17)	
Mother's Education (ref: None)						
Primary	0.93 (0.18)	0.92 (0.18)		1.08 (0.21)	1.03 (0.19)	
Secondary	1.32* (0.22)	1.23 (0.19)		1.26 (0.20)	1.08 (0.17)	
Tertiary	0.43 (0.33)	0.37 (0.27)		1.63 (1.07)	1.19 (0.74)	
Other	0.76 (0.48)	0.69 (0.45)		1.02 (0.53)	0.90 (0.49)	
Religion (Ref: Christian)						
Muslim	1.00 (0.11)	1.03 (0.12)	1.25* (0.15)	1.02 (0.09)	0.97 (0.09)	1.49*** (0.16)
Traditional	1.40*** (0.18)	1.61*** (0.21)	1.60*** (0.22)	1.35*** (0.14)	1.51*** (0.16)	2.01*** (0.25)
Others	1.41*** (0.18)	1.56*** (0.20)	1.19 (0.17)	1.40** (0.21)	1.52*** (0.24)	1.43* (0.27)
Region (Ref: Western Region)						
Central Region	1.90*** (0.37)	2.04*** (0.38)		1.52* (0.31)	1.70*** (0.33)	
Greater Accra Region	0.46*** (0.11)	0.46*** (0.12)		0.62* (0.16)	0.59** (0.15)	
Volta Region	0.43*** (0.09)	0.44*** (0.10)		0.91 (0.18)	0.94 (0.19)	
Eastern Region	1.17 (0.21)	1.29 (0.23)		1.37* (0.25)	1.53** (0.28)	
Ashanti Region	1.39* (0.22)	1.48** (0.24)		1.17 (0.21)	1.22 (0.21)	

Table 7.4 Logistic Regression for Son Preference Cont'd

VARIABLES	(A) odds ratio	(AA) odds ratio	(B) odds ratio	(C) odds ratio	(CC) odds ratio	(D) odds ratio
	Male	Male	Male	Female	Female	Female
Brong Ahafo Region	0.94 (0.18)	1.05 (0.20)		1.21 (0.24)	1.40* (0.26)	
Northern Region	2.23*** (0.39)	2.78*** (0.48)		3.05*** (0.47)	3.97*** (0.69)	
Upper East Region	1.35 (0.29)	1.53** (0.32)		1.59*** (0.31)	1.88*** (0.36)	
Upper West Region	1.94*** (0.41)	2.46*** (0.52)		2.23*** (0.44)	2.94*** (0.58)	
Wave (ref: Wave 1)						
Wave 2	0.56*** (0.05)	0.57*** (0.05)	0.94 (0.10)	0.47*** (0.04)	0.46*** (0.04)	0.97 (0.12)
Wave 3	1.03 (0.09)	1.04 (0.09)	1.18** (0.10)	0.82** (0.07)	0.85* (0.07)	0.99 (0.09)
Television			0.70*** (0.07)			0.64*** (0.06)
Highest Education (ref: None)						
Pre-School			1.18 (0.82)			1.01 (0.55)
Lower Primary			0.65*** (0.12)			0.56*** (0.11)
Upper Primary			0.47*** (0.07)			0.53*** (0.08)
JHS/SHS			0.39*** (0.04)			0.39*** (0.05)
Tertiary			0.09*** (0.04)			0.06*** (0.06)
Other			0.13*** (0.04)			0.14*** (0.09)
Lineage (Ref: Matrilineal)						
Patrilineal			0.81** (0.08)			1.20* (0.11)
Other			0.96			1.02

Constant	0.26*** (0.05)	0.15*** (0.03)	(0.16) 0.39*** (0.07)	0.15*** (0.02)	0.10*** (0.02)	(0.11) 0.12*** (0.02)
Observation	7,854	7,947	7,142	10,282	10,421	8,654
Wald chi2	402.38	378.99	352.79	557.53	540.73	422.55
Degree of Freedom	32	29	20	32	29	20
Prob > chi ²	0.00	0.00	0.00	0.00	0.00	0.00
Log pseudolikelihood	-2755.80	-2795.88	-2543.87	-3176.84	-3246.3	-2745.11

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1



counterparts. Thus son preference is lower among married men, compared to unmarried men. Intuitively this could be because married men came to the realization that they have no control over the gender of the children they conceive. The story is different among married women. Compared to unmarried women, married women are more likely to have a son preference. From Column C, married women have 23% more odds of agreeing to the statement that it is better to school a son than a daughter. The preference of these women for a son may be due to some economic considerations. In communities where sons are expected to provide financial support to their parents in their old age, some married women may express their preference for sons based on economic reasons.

The lineage of the individual is also significant. Compared to those who belonged to the matrilineal lineage, male respondents who belonged to the patrilineal had lower odds for son preference. Thus from Column B, they had a 19 percent decrease in the odds for son preference. On the contrary, female respondents who belonged to the patrilineal lineage had higher odds of having son preference (Column D). The results confirm findings from Frempong & Codjoe (2017) that households from patrilineal backgrounds are more likely to have son preference. The preference for the son among the patrilineal household could be because of family name or heritage flow along the male lineage (Das Gupta et al., 2003; Cooper, 2011) The regional background of the respondents has a significant influence on their son preference. Compared to respondents from the Western Region, those from the Ashanti Region, Central Region, Northern Region, Upper East Region and Upper West Region have greater odds for son preference. While those located in the Greater Accra Region and Volta Region have lower odds for son preference.

For both male and female respondents, there are lower odds of an urban dweller agreeing to the statement than rural dwellers. The educational level of both male and female respondents have

highly significant impact on whether or not they have a son preference. From Columns B and D, it is observed that both male and female respondents have lower odds for son preference as their level of education increases. Thus, as their educational level increases, their desire for son preference reduces. Thus, for respondents with tertiary education, there is a 91 percent decrease in the odds of a male respondent having a son preference and 94 percent decrease in the odds of a female respondent having a son preference. For respondents who have secondary education, there is a 61 percent decrease in the odds of a male respondent having a son preference and a 61 percent decrease in the odds of a female respondent having a son preference. Compared with those with no education, for respondents who have education up to the lower primary level, there is a 35 percent decrease in the odds of a male respondent having a son preference and a 44 percent decrease in the odds of a female respondent having a son preference. These findings are in line with findings from studies by Frempong & Codjoe (2017) who used the 2014 Ghana Demographic and Health Survey. This prior evidence suggests that higher education reduces gender preference. In addition, older respondents have lower odds for son preference.

Unlike other studies, this study controls for the parental education of the respondents. Interestingly, the father's educational level is significant at 1 percent for the female respondent, but the mother's educational level has no significant impact on the female respondent. For female respondents whose fathers had tertiary education, they are less likely to have son preference compared with respondents whose fathers have no education (Columns C and CC). Specifically, at 1 percent significant level, the odd for son preference reduces by 60 percent among females whose fathers have tertiary education compared to their counterparts whose fathers had no education (Column CC). From Column AA, it is observed that fathers' education reduces the odds for son preference among the males in the household. Thus at 10 percent significant level, the odds for son preferences

among males in the household reduces by 42 percent if their father has had a tertiary education, compared to their counterparts whose fathers had no education. Male respondents whose mothers have had secondary education are 32 percent more likely of having a son preference compared with those whose mothers have no education (Column A).

The religious status of the individual has a significant influence on the son preference of the individual. Compared to respondents who belong to the Christian fraternity, respondents who belonged to the Traditional had greater odds for a son preference. This finding is consistent with findings by (Asogwa et al., 2020) who confirmed that son preference is high among the African Traditional Religion. From Column D, it is seen that Muslim women have greater odds for son preference. *Others* is also significant at 1 percent for male respondents and 5 percent for female respondents. Respondents who belonged to *Other* religions had higher odds for son preference. Other religion here includes Buddhism, Rastafarianism and those who have no religion.

The study controls for access to television as a proxy for modernization. The control for television is run in different regressions as depicted in column B and D. As expected, respondents who owned television had lower odds for son preference. The odds are lower for son preference among males and females who have access to television by 30 percent and 36 percent respectively. The findings suggest that access to television, a proxy for modernization and an indicator of household wealth has the potential, to expose people to new lifestyles and hence influence their behaviour (Rahman,2019; Gu et al, 2022).

The findings from this study are in line with other studies (Rossi & Rouanet, 2015; Frempong & Codjoe, 2017), Tafuro & Guilmoto, 2020; Gu, Hua, McKenzie, & Zheng, 2022;), that education and urbanization reduce the preference for sons. This is because education and urbanization change people's perceptions and desires. According to Rossi & Rouanet (2015) this is referred to as the

equalizing effect of modernization. Thus, parental value for the son is neutralized through economic development. The behaviour and perception of people change as they get educated, worthy and informed.

7.4 Chapter Summary

The main objective of this chapter was to examine the factors likely to influence household son preference. The study proxies the response that it is better to school a male than a female as a preference for a male. The study used the three waves of the Ghana Socioeconomic Panel Survey. This chapter establishes that household wealth influences the son preference of the household. Specifically, the study found that respondents from richer households have lower odds of agreeing to the statement it is better to school a son than a daughter and by extension respondents from richer households have lower odds for a son preference. This finding conforms with the conclusions by Rahman (2019) thus ownership of household assets reduces household's desire for son preference. In line with findings by Asadullah et al., 2021, this study also found that higher education reduces the odds of son preference. In addition, parental education, as well as urbanization reduces the odds of son preference (Gu et al. 2022). The study also found that modernization, proxied by access to television, has a higher probability of reducing son preference. That is the odds are lower for son preference among males and females who have access to television by 31 percent and 37 percent respectively. Television, according to Rahman (2019) can expose people to modern lifestyles. The study also found that individuals from a patrilineal lineage have lower odds for preference son.

The study therefore concludes that exposure to education, modernization, urbanization and wealth change people's perceptions and desires. Hence these factors reduce the odds of son preference through the equalizing effect (Rossi & Rouanet, 2015)



CHAPTER EIGHT

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

8.1 Introduction

This chapter concludes the entire study with a summary and policy recommendations. The study sought to examine child poverty in Ghana. Specifically, it focused on five main aspects of child poverty. First, the measure of child poverty and the analysis of the trends and dynamics of child poverty in Ghana. Second, determinants of child poverty. Third, the impact of child poverty on child academic performance. Fourth, an examination of factors which contribute to stunting in the household. Last but not least, examined factors likely to influence son preference in the household. The study used data from the Ghana Socioeconomic Panel Survey in all five empirical chapters.

8.2 Summary of key findings

8.2.1 Measuring Child Poverty in Ghana

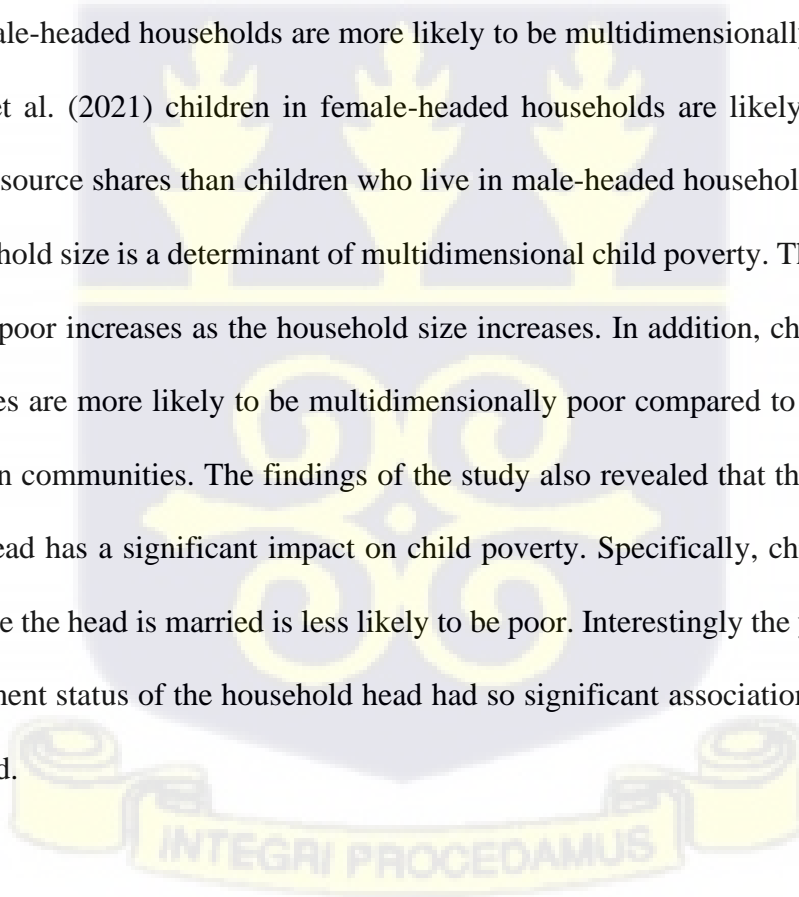
The first empirical chapter of this thesis measures child poverty in Ghana using the multidimensional poverty approach and the household poverty status approach. In the household poverty approach, the poverty status of the household is conferred on the child. Thus, a child from a poor household is considered to be poor while a child from a non-poor household is identified as non-poor. Though this method is relatively crude, it gives room to explore the prospect of a child in a non-poor household being multidimensionally poor and a child in a poor household being multidimensionally non-poor.

This study follows the Alkire and Foster (2011) measure of overlapping multidimensional poverty to measure multidimensional child poverty. The three main dimensions used in this measure are health, education & child protection and standard of living. Equal weights are assigned to each dimension of child deprivation. Indicators are chosen for each dimension, thus health (access to health insurance; disease & sickness and child mortality); Education and Child Protection (access to textbooks; lateness in schooling and violence) and Standard of living (access to safe water; improved toilet; source of main light; overcrowding and housing). The study found that there has been a decline in the level of deprivation of some indicators from 2010 (Wave 1) to 2018 (Wave 3). For instance, there has been a decline in the deprivation of housing conditions, overcrowding, access to health insurance and violence in their households or neighbourhood from Wave 1 to Wave 3. The proportion of children who were deprived in terms of access to electricity, and textbooks, lateness to school and child mortality, increased from Wave 1 to Wave 2 but later declined in Wave 3. The study found that the deprivation in the standard of living of children is the major contributor to multidimensional child poverty in Ghana. This is followed by the health dimension. Education and child protection is the least contributor to child poverty in Ghana. This could be attributed to the frantic effort by the government of Ghana and non-governmental organizations to improve education in Ghana. In terms of the decomposition of multidimensional poverty at the regional level, the study found that there is a decline of multidimensional child poverty in all the regions except for Western, Central and Upper East Regions. Much attention and resources, therefore, need to be channeled to these regions. The study also used a transition matrix to examine the transition in poverty from 2010 to 2018 and found that 85 percent of the children remained multidimensionally non-poor while 44 percent of children remained poor. On the other hand, of children who experienced a transition, 15 percent became poor while 56 percent became

non-poor. In comparing multidimensionally poor children and child poverty based on household poverty status. The study found that children who live in poor households may not necessarily be multidimensionally poor. This could be attributed to some level of improvement in the Ghanaian education and health sectors.

8.2.2 Determinants of child poverty

The second objective of this study was to examine the determinants of child poverty in Ghana with specific emphasis on the characteristics of the household head. The dependent variable, multidimensional child poverty status was computed in Chapter Three. The study found that children from male-headed households are more likely to be multidimensionally poor. According to Bose-Duker et al. (2021) children in female-headed households are likely to receive larger proportions of resource shares than children who live in male-headed households. The study also found that household size is a determinant of multidimensional child poverty. Thus, the likelihood of a child being poor increases as the household size increases. In addition, children who live in rural communities are more likely to be multidimensionally poor compared to their counterparts who live in urban communities. The findings of the study also revealed that the marital status of the household head has a significant impact on child poverty. Specifically, children who live in households where the head is married is less likely to be poor. Interestingly the years of schooling and the employment status of the household head had so significant association with the poverty status of the child.



8.2.3 Examining the Nexus of Child Poverty and Child Academic Performance

Following the educational production model, the study examines the connection between child poverty and child academic performance and controls for school conditions. The child's performance is measured by the child's test scores for English and Math. The Random Effect Tobit is used for the empirical analysis of children at the primary level (9 -11 years) and those at the JHS (12-15 years). The results reveal that multidimensionally poor children perform worse in both Math and English tests. Interestingly the robustness checks reveal that the household wealth index has no significant impact on the academic performance of children. This implies that the household wealth index does not present a true reflection of the deprivation status of the child. Thus, the right measure of child poverty is important in the study regarding children. In addition, children who had higher innate ability had better performance in both Math and English tests. The study also revealed that the maternal educational level has a positive effect on the performance of the child. The parental presence had no impact on the performance of the child. The study also revealed that school conditions have an impact on the performance of the child. Thus inadequate textbooks have a negative impact on the academic performance of the child at the primary level. On the other hand at the JSS level, children who have no textbooks perform better in English text compared to those who have access to all textbooks. The reason for this unusual result is that these children who have access to textbooks may not be reading. Secondly, some level of sharing could be going on among the students. Hence those who do not have textbooks make maximum use of them when they get the opportunity to borrow from their colleagues. The study also found that at both the Primary and JSS level, children who have access to more than one class teacher perform better than those who have only one class teacher. The type of school the child attends is found to be crucial. Thus a child who attends private school at the primary and JSS levels performed better than children who

attends public school. Children who are multidimensionally poor and also attend public schools have worse performance.

8.2.3 Drivers of Stunting in the Household.

The results from the study reveal that the health condition of the child improves as the household welfare improves. Thus children are likely to benefit from the improvement in household welfare. In addition, households in rural communities are more likely to have stunted children than those in urban communities. In addition, maternal health has an impact on the health of children in the household. Thus a household is likely to have stunted children if that household has an unwell mother, who specifically suffers from mild depression.. The study also reveals that stunting is likely to be lower in households with a higher value of food consumed and higher expenditure on child clothing household. A bivariate analysis reveals that there are lower odds of stunting in households where mothers have secondary education compared to households where mothers have no education. The study also revealed that households with improved toilet and water facilities have lower odds of having stunting in the household.

8.2.4 Who should go to School: A Son Preference Analysis

The fourth empirical chapter examined the determinants of son preference. The results revealed that one's desire for son preference reduced as their education level increased. The study also found that, compared with rural dwellers, urban dwellers are less likely to have a preference for sons. In addition, the study revealed that lineage influences the probability of a person having a preference for a son. Thus individuals from patrilineal are less likely to have son preference compared with those from the matrilineal lineage. The study also revealed that individuals from

richer households are less likely to have son preference. With regards to household size, individuals from larger households are more likely to have son preference. Access to television, a proxy for modernization reduces the likelihood for son preference.

8.3 Contributions to Knowledge

The adverse effect of poverty can be long-lasting on children and is capable of denting efforts to develop the human capital of the nation. There is limited study on child poverty in Ghana. Most studies on child poverty in Ghana limit their analysis to the measure of child poverty. This study however goes a step further to examine the impact of child poverty on child academic performance. The study measures child poverty with a multidimensional approach. Secondly, unlike other studies which examine the determinants of child poverty using household poverty status, this study examines the determinants of child poverty using the multidimensional child poverty. Thirdly, the study confirms that using household wealth as a yardstick to measure child well-being is inadequate since household resources are not equally distributed. Hence studies relating to the well-being of children should focus on the multidimensional poverty of the child.

It is worth noting that most studies on child health in Ghana have only relied on cross-sectional data. This thesis however does a panel analysis on the health of children, measured by stunting in the Ghanaian household. Another novelty of this study is that this study examines the effect of changes in household welfare on stunting. Findings reveal that households are less likely to have stunted children as the welfare of the household improves. The study also examines whether the presence of parents in the household impacts stunting.

Son preference tends to cause households to prioritize the needs of sons over daughters. Thus in households where sons are preferred to daughters, sons are likely to receive better education,

nutrition, and health while daughters are neglected. This could perpetuate poverty among girls as the gap in education, nutrition, and health widens between boys and girls. This study contributes to the limited studies of son preference in Ghana by highlighting that modernization, education, and urbanization reduce the preference for sons in Ghana. The novelty in this chapter is the question that was used as a proxy for son preference, thus it is better to send a son to school than to send a daughter. Finally, this study takes advantage of the Ghana Socioeconomic Panel Data, which is relatively new.

8.4 Policy recommendations

Key among all, this study recommends that poverty reduction policies and programs factor in the welfare of children as well as eliminate factors that are likely to place children in a disadvantaged position.

The findings of this study call for improvement within the educational sector. Quality education is critical for the economic growth of the nation. Implementing policies which enforce the education of children is inadequate. Early interventions among children may reduce the gap in achievement during schooling. This is because early inequalities tend to increase accumulated disadvantages which tend to affect the performance of the child (Kingdon et al., 2017).

As children move along the educational ladder, low levels of initial school performance could have an adverse effect on subsequent educational activities. It is therefore important to invest in a child's education at the lower levels. Compared to girls, boys are likely to improve from low educational performance as they progress into formal school. Girls are therefore at risk of maintaining poor academic performances along their educational trajectory (Carter, E., Rose, P., Sabates, R., & Akyeampong, K., 2020).

The findings of the study reveal that multidimensionally poor children perform worse than those who are not multidimensionally poor. Worthy of note is that the household wealth index has no significant impact on the academic performance of the child. This implies that how poverty is measured has implications for studies regarding children. The measure and analysis of child poverty are critical in poverty reduction studies. This study recommends a tailor-made approach be adopted by analysts and policymakers to identify poor children and unveil their characteristics as well as their worse forms of deprivation which need much attention.

The study also confirms that improvement in household welfare benefits the child by improving the health status of the child. Results from the thesis confirm households with improved toilet and water facilities have lower odds of having a stunted child in the household. In addition, healthy mothers have higher odds of raising healthy children. Thus, there are lower odds of having a stunted child in the household when the mother in the household is healthy. This study, therefore, recommends that poverty strategies aimed at improving the welfare of children should aim at improving the conditions of the household and the mothers since the household and mothers are the first point of contact for the child. The study also confirms that parents have a role to play in the holistic upbringing of their children. The presence of the parents in the household, especially the mother, is critical for child development.

The findings of this study have birthed the following policy recommendations to improve education at the basic level.

First, the study found that access to more than one class teacher has a positive impact on the academic performance of the child. This study, therefore, recommends that teacher training schools should be empowered with adequate resources to produce enough teachers. Subject-specific teachers should be recruited to teach both at the basic level and the Junior High level.

Teachers who teach multiple subjects are less effective (Sarfo & Adisei, 2015). As the study confirmed, having access to more than one class teacher will improve the quality of teaching and learning. Subject teachers will have the time to research and bring in some level of innovation during their subject periods. The study also found that there exist an inequality gap exists between basic schools located in rural and those located the urban communities. The government must make a conscious effort to put measures in place to narrow the gap between schools located in rural and urban communities. The use of transfers to redistribute funds may not readily address the problem of inequality between rural and urban schools. Providing the infrastructure such as electricity, well-furbished classrooms, access to good sanitation and good drinking water will go a long way to bridge the gap between rural and urban schools. Furthermore, teachers posted to rural communities must be provided with special packages such as free housing facilities and special allowances. This will not only serve as motivation for these rural teachers, but it will also serve as an incentive to attract others to accept postings to such remote communities. Though access to textbooks is important for quality education, however, this is not enough for quality education. Good utilization is important. Hence both teachers and parents must encourage and supervise children in their studies

Parents also have a role to play in ensuring the holistic well-being of the child. Absent parenting has a negative effect on children, especially among urban dwellers. The presence of the parent in the household is not important for its own sake but the presence of parents in the household would provide the platform for parents to guide their children. The Ghana Education Service through the Teacher Parents Association must sensitize parents about the importance of their presence in the household. Parents, therefore, have to make a conscious effect to be with their children. Discussions during Parent-Teacher Associations in schools should focus on the role parents have

to play in the overall well-being of their children, especially in the prioritization of child nutrition. As the study indicated, improved toilet reduces the risk of stunting in the household. It is therefore recommended that houses are built with improved toilet facilities like flush toilets/ water closets. Town and Council Planning must engage stakeholders to ensure that houses constructed have their private toilets and as well as quality water.

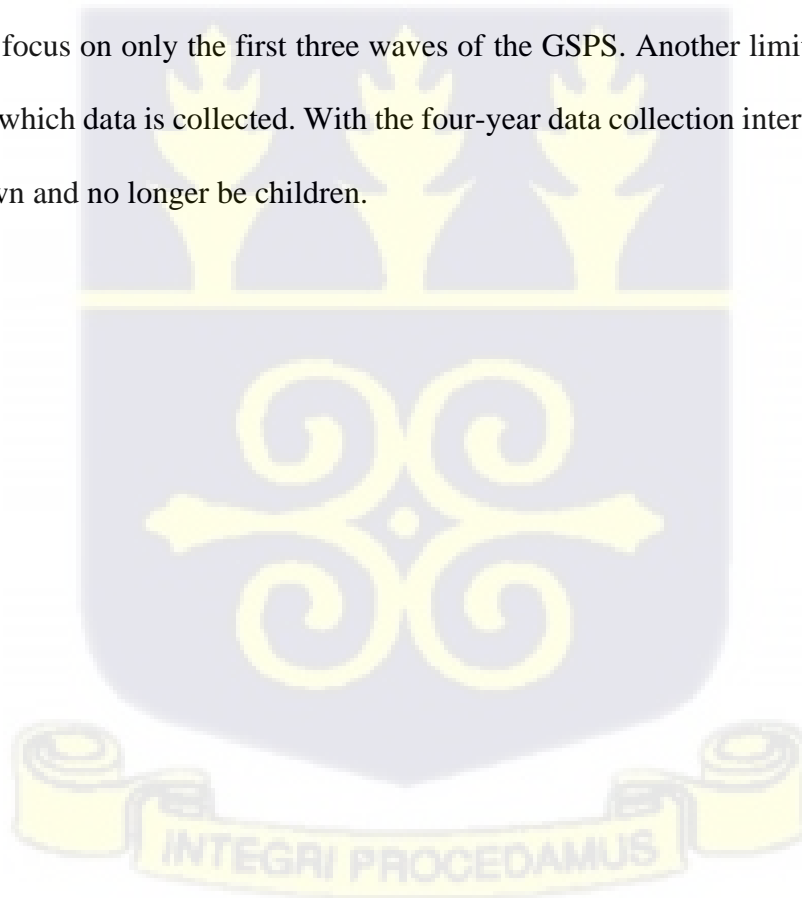
In line with the fifth empirical chapter, the study recommends policies geared toward bridging the gender inequality gaps in Ghana. Son preference is usually motivated by the disparity in wages and control of assets between men and women. Some parents therefore think it is economically viable to have boys to girls and by extension, to school a boy than a girl. They think their educational investment will be lost when girls marry and get pregnant (Davison, 1993). Bridging the gender wage inequality gap will allay the fears of parents since there is equal economic value for both boys and girls. The study also recommends that all stakeholders such as the Ghana Education Service, the Ministry of Gender, Children, and Social Protection and parents place priority on ensuring that educational opportunities are fairly distributed among both boys and girls in the household and that nothing becomes a barrier in preventing both boys and girls from benefiting from educational investments.

A good understanding of households' decisions on children's education based on gender bias is important for designing sustainable policies which aim at stimulating gender equality. Even in the era of free compulsory education, parents still decide who goes to school and how long a child can stay in school. It is therefore up to the education stakeholders to ensure that no child is left behind. Thus, the Ministry of Gender, Children, and Social Protection ensure that every Ghanaian child has access to quality education irrespective of gender. Stakeholders should therefore employ the use of social media to sensitize Ghanaians about the equal worth both sons and daughters bring to

the table at the workplace and in the realms of leadership. This, in the long run, will neutralize the value for sons and reduce gender preference or preferably eradicate it.

8.5 Limitations of the study and suggestions for future studies (or) Area for further research

One main limitation of the study is the timing of the release of the data from the survey. The timely release of the fourth wave could have enriched the studies. Nonetheless, due to time constraints, the study had to focus on only the first three waves of the GSPS. Another limitation of the study is the interval at which data is collected. With the four-year data collection interval, some children would have grown and no longer be children.



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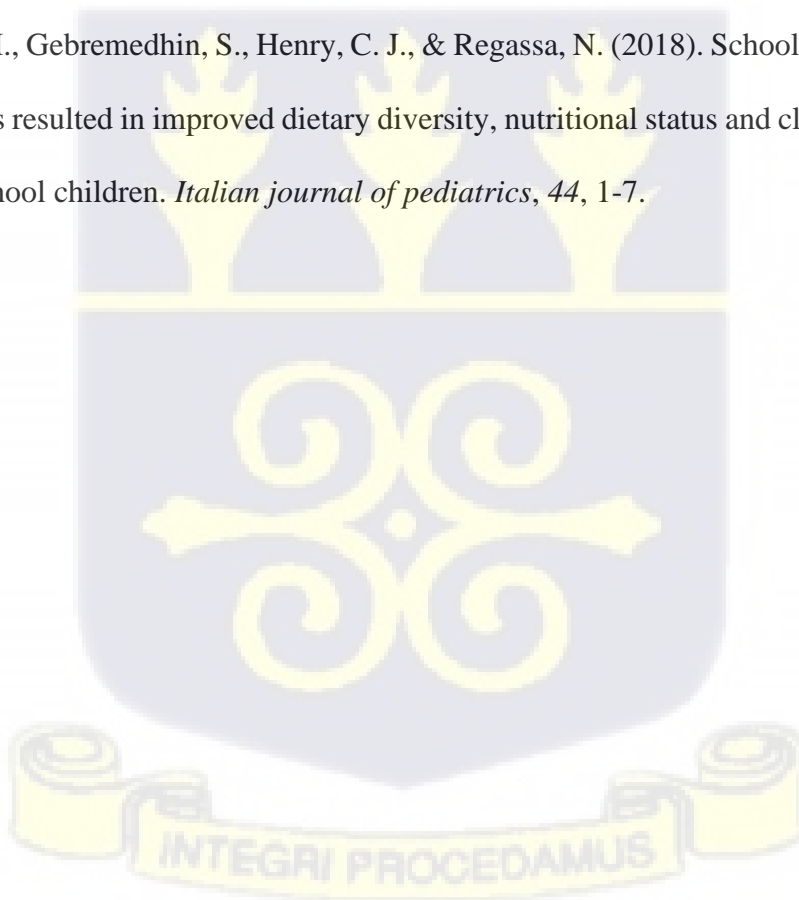
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APPENDIX

Appendix 3: PCA Variables used to Compute Wealth Index

CODE = 1 (Wealthier)

CODE = 0 (Poorer)

Toilet facility

Non-poor = 1

Poor = 0

Flush

Pit/Pan/bucket

KVIP

Public/Toilet in another house

Bush/ Beach

Wall Material

Non-poor= 1

Poor = 0

Wood/Bamboo

Mud/Mud bricks

Stone

Metal sheet/Slate/Asbestos

Burned bricks

Thatch

Cement/Sandcrete blocks

Cardboard

Landcrete

Mud bricks with cement plastering (Wave2)

Floor Material

Non-poor= 1

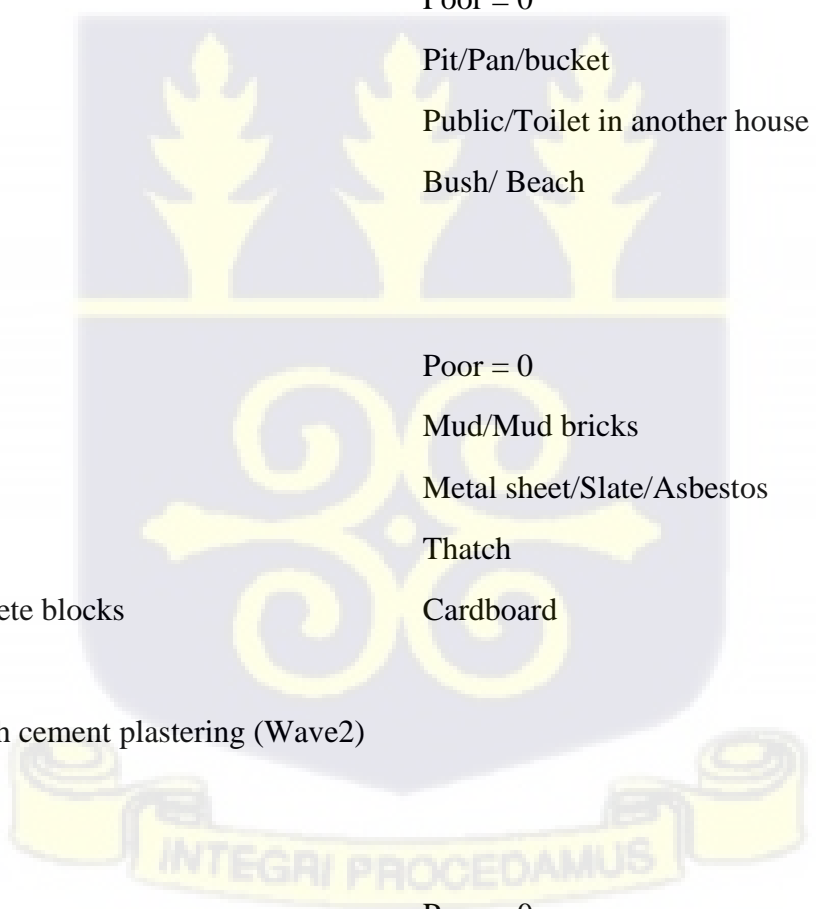
Poor = 0

Stone

Earth/Mud/Mud bricks

Cement/Concrete

Wood



Burnt Bricks

Vinyl tiles

Ceramic/Marble Tiles

Vinyl tiles

Terrazo

Roof Material

Non-poor= 1

Poor = 0

Corrugate iron sheets

Palm leaves/Raffia/Thatch

Cement/Concrete

Wood

Roofing tiles

Mud bricks /Earth

Bamboo

Asbestos/Slate

Crowding

3 or fewer people per bedroom = 1

More than 3 people per bedroom = 0

Lighting

Electricity/gas/gen/Solar/kerosene = 1

Candles/Torches/nolight = 0

Source of water

Non-poor= 1

Poorr = 0

Indoor plumbing

Unprotected well

inside standpipe

River/Stream

Water truck/tanker service

Rain water/spring

Water vendor

Dugout/pond/lake/dam

Pipe in neighbouring household

Private outside standpipe/tap

Public Standpipe

Sachet/bottled water

Borehole

Protected well

Household Assets

Yes = 1

No = 0

Radio (Radio Cassette Player, Record Player,
3-in-1 radio system, Video Player or
VCD/DVD Player)

TV

Stove (kerosene/electric/gas)

Fridge

Bicycle

Motorcycle

Mobile phone

Iron



Appendix 4: Frequencies of Variables used to compute Wealth Index

	Code = 0	Code = 1
Improved Toilet		
	No Flush	Flush/VIP
Wave 1	84.69	15.31
Wave 2	77.76	22.24
Wave 3	76.82	23.18
Total	80.21	19.79

Wall Material

	Poorer Materials	Wealthier
Wave 1	56.18	43.82
Wave 2	47.29	52.71
Wave 3	41.09	58.91
Total	48.87	51.13

Floor Material

	Poorer Materials	Wealthier
Wave 1	27.12	72.88
Wave 2	14.46	85.54
Wave 3	13.03	86.97
Total	18.99	81.01

Roof Material

	Poorer Materials	Wealthier
Wave 1	26.99	73.01
Wave 2	17.01	82.99
Wave 3	12.85	87.15
Total	19.65	80.35

Crowding

	Crowded	Not crowded
Wave 1	49.98	50.02
Wave 2	44.73	55.27
Wave 3	40	60
Total	45.37	54.63

Lighting

	No Electricity	Electricity
Wave 1	31.07	68.93
Wave 2	38.11	61.89
Wave 3	28.15	71.85
Total	32.26	67.74

Water Source

	Not improved	Improved
Wave 1	22.66	77.34
Wave 2	21.74	78.26
Wave 3	16.54	83.46
Total	20.5	79.5

Radio/Player

	No	Yes
Wave 1	25.61	74.39
Wave 2	32.01	67.99
Wave 3	45.12	54.88
Total	33.51	66.49

Television

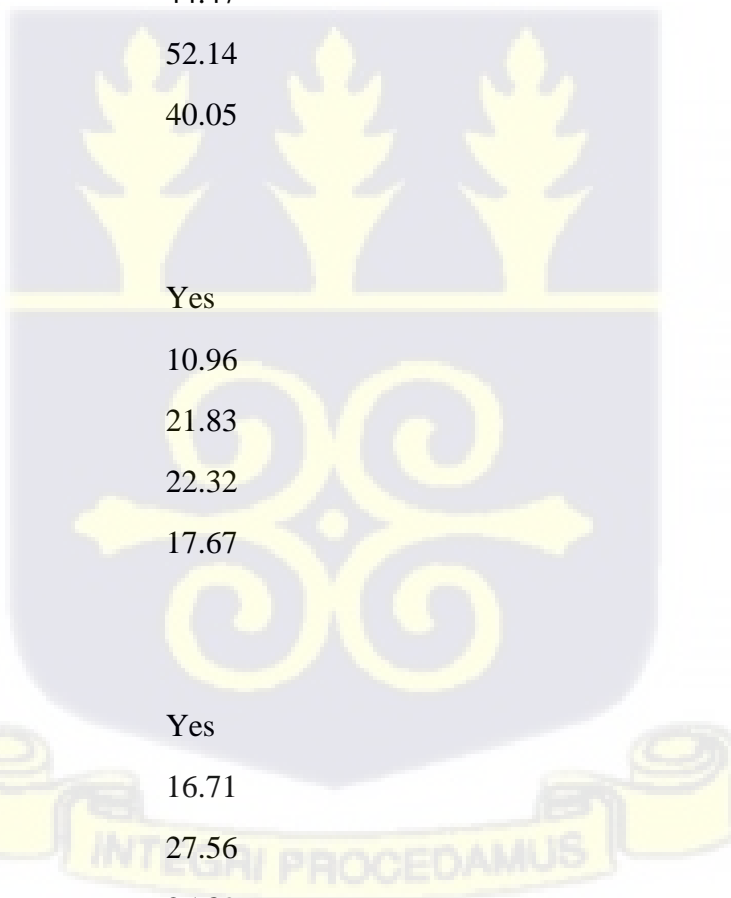
	No	Yes
Wave 1	72.63	27.37
Wave 2	55.53	44.47
Wave 3	47.86	52.14
Total	59.95	40.05

Stove

	No	Yes
Wave 1	89.04	10.96
Wave 2	78.17	21.83
Wave 3	77.68	22.32
Total	82.33	17.67

Fridge

	No	Yes
Wave 1	83.29	16.71
Wave 2	72.44	27.56
Wave 3	74.11	25.89
Total	77.26	22.74



Bicycle

	No	Yes
Wave 1	57.14	42.86
Wave 2	62.3	37.7
Wave 3	67.83	32.17
Total	61.95	38.05

Motorcycle

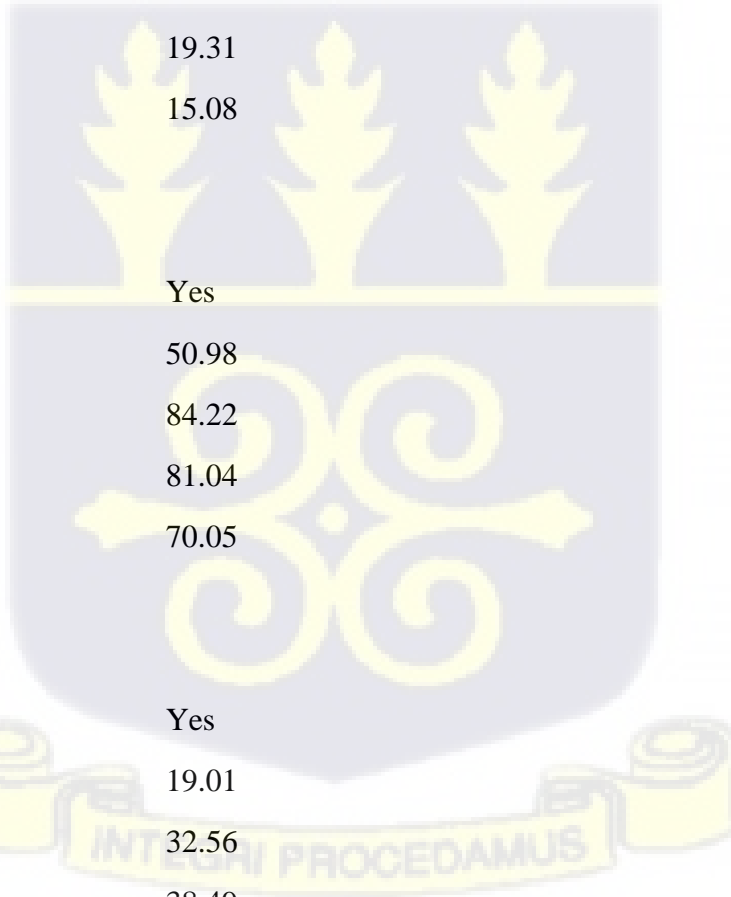
	No	Yes
Wave 1	89.61	10.39
Wave 2	83.04	16.96
Wave 3	80.69	19.31
Total	84.92	15.08

Mobile Phone

	No	Yes
Wave 1	49.02	50.98
Wave 2	15.78	84.22
Wave 3	18.96	81.04
Total	29.95	70.05

Iron

	No	Yes
Wave 1	80.99	19.01
Wave 2	67.44	32.56
Wave 3	61.51	38.49
Total	70.99	29.01



Appendix 5: Endogeneity test for test score and multidimensional poverty

VARIABLES	MCP	MCP
Math Score	-0.37 (0.75)	
English		-0.39 (0.65)
Score1	-0.19 (0.43)	-0.18 (0.34)
Male	0.68 (1.49)	0.77 (1.46)
Urban	-1.03 (2.06)	-1.37 (2.33)
Father's Education (ref: No Education)		
Primary	-1.20 (2.54)	-1.03 (2.13)
Secondary	-1.11 (2.32)	-1.04 (2.14)
Tertiary	-3.26 (6.48)	-3.07 (5.53)
Other	-1.25 (3.34)	-0.90 (3.11)
Mother's Education (ref: No Education)		
Primary	0.06 (0.68)	0.05 (0.63)
Secondary	-1.04 (2.08)	-0.88 (1.65)
Tertiary	-	
Other	-	
Father in HH	0.58 (1.19)	0.68 (1.19)
Number of kids	0.39 (0.83)	0.39 (0.75)
One Teacher	1.80 (3.41)	1.82 (3.28)
Public School	0.43 (0.89)	0.44 (0.86)

Constant	-3.57 (7.46)	-4.34 (8.66)
Observations	1,050	984
R-squared	0.23	
Wald chi ²	0.50	0.66
Degree of Freedom	14	14
Prob > chi2	1.00	1.00
Log likelihood	-418.68	-378.32

Model A: Std. Err. adjusted for 1,043 clusters in groups ; Model B:Std. Err. adjusted for 980 clusters in groups

Appendix 6.1: Descriptive statistics of households with children under 5 years

		Wave 1	Wave 2	Wave 3
Stunting	Yes	44%	24%	28%
	No	56%	76%	72%
	Chi ²	116.25		
	p-value	0.000		
	Observations	1,876		
Poverty	Poor	38%	25%	35%
	Non-poor	62%	75%	65%
	Chi ²	42.39		
	p-value	0.00		
	Observations	1,876		
Location	Urban	27%	29%	32%
	Rural	73%	71%	68%
	Chi ²	6.34		
	p-value	0.04		
	Observation	1,876		
Wealth Index	Poorest	24%	21%	18%
	Poor	19%	21%	20%
	Middle-income	22%	20%	21%
	Rich	20%	19%	19%
	Richest	15%	19%	22%
	Chi ²	22.43		
	p-value	0.00		
Observations	1,854			
Maternal Depression	Well	63%	69%	63%
	Mild	25%	21%	22%
	Moderate	9%	8%	11%

	Severe	3%	2%	4%
	Chi ²	18		
	p-value	0.02		
	Observations	1,876		
Maternal Education	None	45%	48%	42%
	Primary	14%	5%	3%
	Secondary	38%	44%	50%
	Tertiary	3%	2%	4%
	Other	0%	1%	1%
	Chi ²	67.49		
	p-value	0.00		
	Observation	1,269		
Both parents in the HH	Yes	78%	74%	78%
	No	22%	26%	22%
	Chi ²	5.93		
	p-value	0.05		
	Observations	1,876		
Improved toilet	Not improved	84%	80%	77%
	Improved	16%	20%	23%
	Chi ²	15.64		
	p-value	0.00		
	Observation	2,857		
Source of Water	Not improved	21%	21%	17%
	Improved	79%	79%	83%
	Chi ²	5.95		
	p-value	0.05		
	Observations	1,873		
Proportion of Children under 6 years	Mean	0.50	0.47	0.49
	Observations	1,876		
Number of children under 6 years	Mean	2	2	1
	Maximum	7	6	5
	Minimum	1	1	1
	Observations	1,876		

Observations is the number of households

