Mothers Matter:

Mother's Commitment to Children's Educational Outcomes in Ghana

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Abstract

In Ghana, with rates of economic inequality increasing, the government has made numerous strides to combat the socioeconomic, gender, and locational discrepancies of educational enrollment and completion to develop into a more equal nation. This paper looks specifically at preferences of adult members within traditional Ghanaian households and how the inclusion of mothers' preferences may impact the success of their children's primary school completion. In Ghana, children traditionally begin primary schooling at age six and complete primary education by age thirteen if they remain in school and perform satisfactorily. The central question explored in this thesis is: when the traditional male dominance of school financing is challenged, and mothers contribute to school expenses, are children's educational outcomes positively impacted? This paper finds that children who report shared parent funding have higher rates of primary school completion than children who report school expenses are funded solely by their father. This finding is true for both male and female children and is particularly strong for children who reside in households of lower welfare designations.

Introduction

Education, whether formal or informal, provides skills that position an individual to be better situated for later life-course outcomes. Higher levels of education often lead to higher wages, better health, and increased decision-making power (Duflo 2012). Expanding and improving education consequently has positive impacts not only for the individual but for society as a whole. This discussion is one that has become prevalent in developing countries as they look to distribute educational opportunities to those that have historically lower rates of enrollment and completion as a means of promoting social welfare and economic growth. Although public intervention in education could solve some of these inequities, this paper looks specifically within the household to discern if differences in decision-making affects educational outcomes of children.

Specifically, this paper aims to understand the importance of female agency in a traditional Ghanaian household. Esther Duflo (2012) conducted extensive research on mothers' empowerment and found a positive relationship with various child outcomes. Additionally, Claudia Buchman (2000) found that family background and structure were strongly linked to educational outcomes in developing countries. This paper attempts to combine and contribute to this previous research using a new measure of female agency- the mother's financial contributions to her children's schooling expenses while controlling for family background. Restricting the analysis to only married women, the impact of female empowerment in a household is investigated on primary school completion rates for her children. Additionally, in the context of the developing country, this analysis will specifically focus on subpopulations of Ghana to discern if the impact of female agency could reduce persistent educational gaps for target groups including girls and children from low-resource households.

Relevance

In September 2001, Ghana joined other developing nations in committing to the United Nations' Millennium Development Goals (MDGs).[1] The eight goals aimed to help eradicate poverty and achieve developmental progress by 2015.[2] In the 15 years between the adoption of these goals and their intended completion, the country has experienced notable progress. There has been substantial population growth, along with overall rising economic trends. Notably, Ghana's performance in economic growth has been acknowledged in comparison to other sub-Saharan countries and, in 2010, was officially declared a middle-income country (Balwanz & Darvas 2013). However, this accelerated economic growth may not have benefited all areas of the population. Nationally, the Gini coefficient increased from 41.9 percent in 2005/2006, to 43.0 in 2016/2017, with much of this inequality concentrated in rural areas.[3]

This concern that rising economic growth has been accompanied by growing inequality has received attention within Ghana. Namely the second goal of achieving universal basic education, as put forth by the MDGs, has important long-term impacts in reducing worsening social and economic inequality. Additionally, equitable access to education has been found to promote economic growth, reduce poverty, improve public health, and strengthen social cohesions (OECD 2012). Consequently, focusing on this policy may indirectly aid in meeting other MDGs. In regard to universal education, the challenges Ghana faced were incorporating children into the educational sector that have traditionally been absent and remedying differences

[1] The Millennium Development Goals (MDGs) originated from an international desire to achieve peace and a decent standard of living for every individual and were endorsed by 189 member states, included Ghana. (United Nations 2015)

[2] The eight basic goals are to: (1) eradicate extreme hunger and poverty, (2) achieve universal education, (3) promote gender equality and empower women, (4) reduce child mortality, (5) improve maternal health, (6) combat HIV/AIDS, malaria and other diseases, (7) ensure environmental sustainability and (8) to develop a global partnership for development (United Nations 2015).

[3] Inequality in rural areas increased from 37.8 to 41.8 in this same 12 year period (GSS).

in educational quality. Differences in enrollment and completion arose from existing inequities that "systematically disadvantage marginalized groups, denying their right to basic education" (Balwanz & Darvas 2013). Although the implementation of Ghana's *Free and Compulsory Universal Basic Education (FCUBE) Policy* in 2008 was a positive step toward eliminating barriers to schooling, it did not necessarily limit or reduce the costs for the poorest of households (Akyeampong 2009). Although there exists no tuition cost for public schooling, households still must bear the burden of both monetary and non-monetary costs associated with schooling. These costs could include but not be limited to=-y transportation costs, uniforms, school supplies, food, lost potential wages, time away from the household etc. Consequently, to truly achieve universal primary education, policy makers must look at the barriers that still exist and avenues that may improve the inclusivity of schooling (Balwanz & Darvas 2013).

This is not to say that Ghana has not made significant progress in increasing educational enrollment. The implementation of *FCUBE* nearly doubled the number of students enrolled in basic education over a ten-year period (Balwanz & Darvas 2013). However, the children not enrolled and not completing school are still a relevant concern, especially because these children are disproportionately from low-wealth households and rural areas (Balwanz & Darvas 2013). To incorporate these children into primary education, policy makers may have to look within the household to determine why a child would or would not be enrolled in schooling.

It is with this mindset that I felt investigating the relationship between a mother's level of empowerment and children's educational outcomes had specific and present-day relevance in Ghana. The economic impact of increasing a woman's position or economic power in a household is important for the overall well-being of the country (Duflo 2012). Simultaneously, the power a woman has within her own household could have a direct impact on her children.

Former World Bank President James Wolfensohn asserted that when women have the ability to influence decision-making, the outcomes of the household may be different and would be positive (Duflo 2012). If there exists an improved educational outcome for the next generation related to female empowerment, encouraging women to be in positions of power and act accordingly may be an important policy focus.

Furthermore, if female empowerment is shown to have some relation to higher schooling outcomes for children in resource-constrained households, emphasizing policy that increases the status of women may have positive impacts for children who have lagged behind achieving universal primary education. Both increasing overall school participation and raising the position of women in decision-making positions are important as Ghana defines itself in a globalized context.

Literature Review

In Ghana, it is traditional to separate and assign social and economic roles by gender. The male is the head of the family under customary law and is often thought to be largely in charge of major family decisions (Lloyd & Gage-Brandon, 1994). However, growing economic development in the country, along with a focus on gender equality in the MDGs, has created instances in which this structure is challenged. The link between economic development and female empowerment is best thought of as mutually reinforcing (Duflo 2012). When poverty is reduced, gender inequality is reduced. When women take an active role in society, the economy improves. To say whether one or the other is responsible for the changing roles in Ghanaian households is therefore beyond the scope of this project. However, the increasing participation of

women within the household and society, along with Ghana's economic development, may together contribute to improved outcomes for future generations.

There is evidence that factors related to greater female empowerment are linked to positive outcome for their children. Doepke and Tertilt (2011) show that when income transfers are given to the females in the household, as opposed to the males, expenditures on children increase. Duflo (2012) expands upon this, identifying that these expenditures are additionally associated with child health improvements. In terms of school enrollment, the health of children is frequently related to school attendance or dropout patterns (Buchman 2000). Consequently, the relationship between female empowerment and child health could have external impacts on educational outcomes.

With associated income influencing relative power in the household, the mother likely has more say in the decision-making process and has the ability to advocate for her children. This status in the household framework can also be seen when women have higher education levels, are older, and contribute to the household income (Duflo 2012). It is important to acknowledge that households of empowered females are likely different from other households. In addition to earnings, education, and the female's age, the male may also act differently in this household structure, which in turn impacts child outcomes.

Buchman (2000) presents the prominent theory for why empowered mothers are more likely to invest in their children's well-being. In developing countries, females often rely on their children for security in old age more than males. This could lead to women having fewer, healthier, and better-educated children. Fundamentally, better educated and healthier children are better positioned as adults to assist their mothers later in life.

Decisions about children's education are expected to occur at the household level. If a woman is positioned to influence this decision, literature suggests that she will have fewer children (Duflo 2012). The decision to have fewer children consequently has important implications for the well-being of the children in the household, as the expenditure per child could be higher. Additionally, households that have fewer children may have less resource constraints, lessening the burden of education, or the need for child labor, which all relate to improved educational outcomes (Buchman 2000).

Theory

Prior to grade ten, there are no formal exams that restrict educational opportunities, allowing education to remain roughly continuous in Ghana (Glewwe & Jacoby 1994). However, as has been noted previously, many Ghanaian students are not reaching this point. Consequently, one could assume that students are not enrolling, or are leaving school early, because the associated costs appear to outweigh the potential benefits. This raises the question of the benefits, costs, and preferences of the household decision-maker on the education of their children.

The conventional economic theory regarding the total amount of education for a child can be evaluated by the consumer choice problem. Considered at the household level, a particular household has a budget constraint, determined by the price of the two goods and the financial resources of the household. In the decision regarding education, the two goods are children's education and everything else. The slope of this budget line is therefore dependent on the price of the two goods in relation to one another. The intercepts on either axis indicate the maximum amount of the good if the household decided to allocate all of its income to one good. Although

the household could in theory consume any combination of education and other good that exists

on this budget constraint, the household will choose the point which aligns with its preferences

and its perceived values of the goods in question. The household's preferences are represented

by indifference curves that provide an abstract depiction of the expected value of different

"bundles" of these two goods. Each indifference curve corresponds to bundles of these two

goods that offer the same level of utility. Consequently, the individual is indifferent between all

bundles that offer the same utility. Combining the budget constraint and indifference curve, one

can find the optimal level of education the household will consume for their child. This point is

at the tangency of the budget line and the indifference curve shown by point A on Figure 1. This

allocation of the two goods, education and other goods, is within the household's financial scope

and provides the highest possible utility.

Figure 1. Basic Consumer Choice Problem at the Equilibrium Point

Other Goods (OG)

Income/P_{OG}

A

Budge Constraint: P_{OG}/P_{CE}

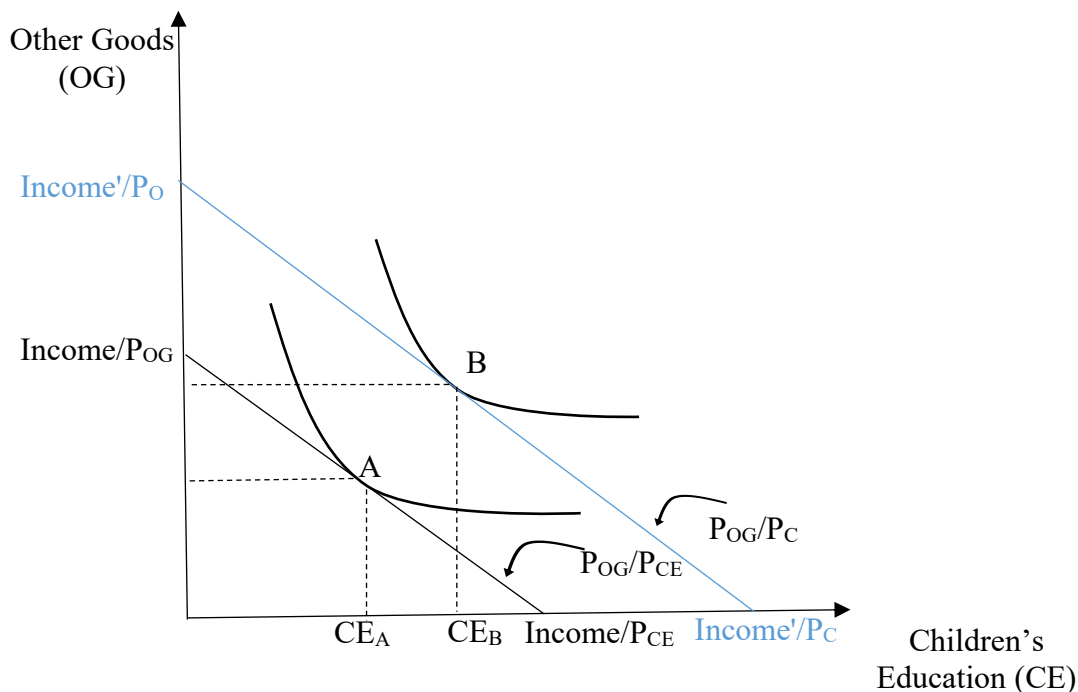Income/P_{CE} Children's Education (CE)
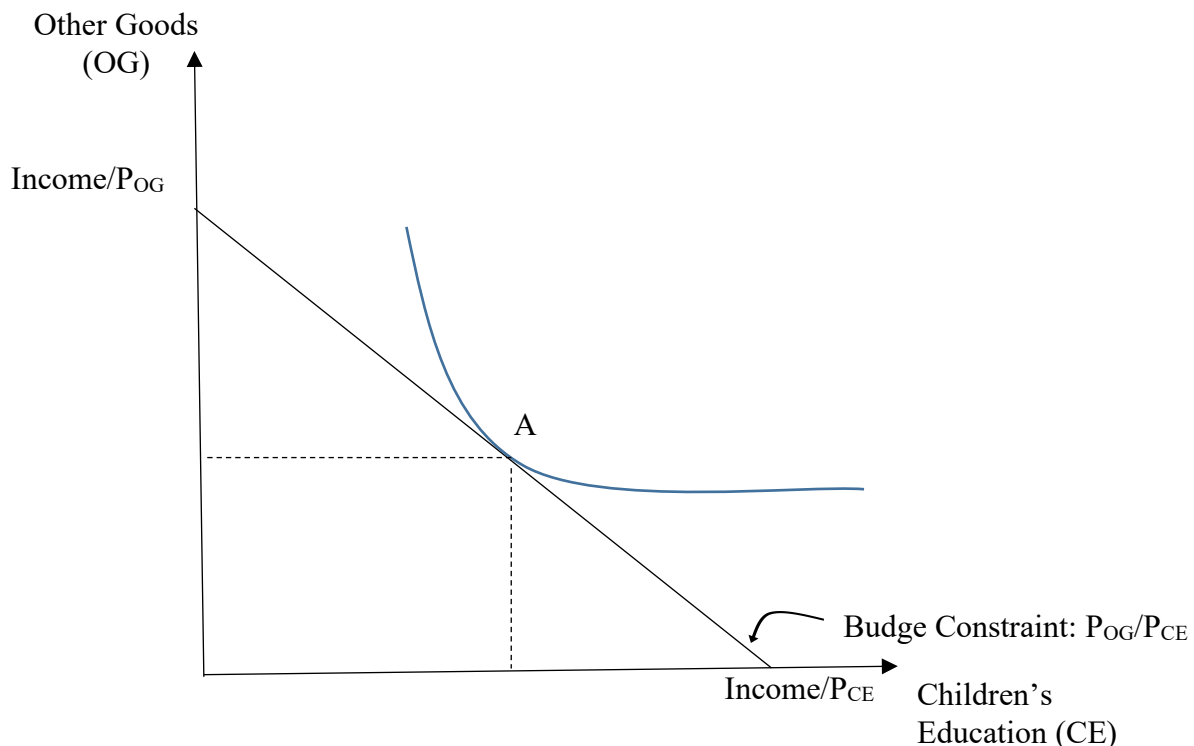
This allocation at point A is considered the equilibrium point. At this point of tangency, the slope of the budget constraint and the slope of the indifference curves are equal. Consequently, the ratio of the marginal utilities between other goods and children's education is equivalent to the ratio of the prices of other goods and children's education. Additionally, per each dollar spent, the marginal utility of children's education and other goods are also equal. At this point, all things held constant, the consumer cannot be made better off. However, it is easy to see why this model would only go so far in explaining a real-world scenario. All things cannot always be held constant, and such *ceterus paribus* violations can alter the budget constraint, the indifference curve, or both.

The first simplification of the above picture is that all households face a difference budget constraint. Consequently, varying incomes, even with the same indifference curves, would alter the final allocation of education. In Figure 2, there are two households with different income levels. Even with the same preferences, the lower income household faces a lower budget constraint and, therefore, the optimal educational consumption for their children is lower. However, because both education and other goods are normal goods, as income rises a rational consumer would desire more of both. Consequently, as the budget constraint shifts out, the household will consume more of both and obtain higher utility from this bundle. This income effect explains differences in educational consumption between households with different financial resources.

Additionally, the consumer choice theory allows for differences in tastes and preferences of decision makers to influence the optimal bundle of goods consumed. However, tastes and preferences are often considered fixed and are typically ignored in regard to their origins or how they could be altered. In this thesis I break from this convention by identifying ways in which a

household's tastes for education may vary. I begin by assuming income, or "welfare

designation," is fixed. To simplify, I only consider two separate income levels: one with the

highest welfare designation status and one with the lowest welfare designation. The assumption

is that across these two groups, the amount of children's education desired will increase as

income increases and the budget constraint shifts out. Note that Income' is greater than Income in

Figure 2 below. The question we are interested in centers around the differences in educational

outcomes *within* each of these groups. To answer this question, we must return to indifference

curves and understand how preferences may also change educational outcomes.

Figure 2. Consumer Choice Problem with Two Budget Constraints

Other Goods (OG)

$Income'/P_O$

$Income/P_{OG}$

B

A

P_{OG}/P_C

P_{OG}/P_{CE}

CE_A CE_B $Income/P_{CE}$ $Income'/P_C$

Children's Education (CE)

Before we delve into understanding how the household indifference curve could be

determined, it is critical to understand that all individuals can have different indifference curves.

This is logical when you consider how your preferences may be different from your friend, your

neighbor or even your sibling. In this context, the focus is on the value an individual places on

education, or simply, how much he or she is willing to give up spending on children's education for another good. For a Ghanaian individual, preferences regarding children's education may be influenced by religious beliefs, cultural norms toward schooling, school quality, or the potential future earnings of the child. Furthermore, for the most resource-constrained households, the costs arise in the present period, while the benefits occur in the future. This may place a higher value on other goods with a more immediate benefit. Additionally, the quality of schooling in Ghana is highly inequitable, with poor, rural areas further disadvantaged. With parents and children evaluating the perceived returns to education, low-quality education may seem less worthwhile, and consequently less worth the investment (Duflo 2012). This consideration of potential future earnings may be especially important for the only child or the first-born or if the family resides in an area that lacks a competitive wage job market (Shapiro & Tambashe 2001).

However, because we are thinking of this decision at the household level, it is critical to understand how different members of different households may have different preferences, and consequently different indifference curves. In Figure 3, both individuals have unique indifference curves. If we start at point A and look at each individual's willingness to give up a unit of education, we are able to determine what they must receive in return in order to be equally as happy. For the individual with a weak preference in education and a flatter indifference curve, he or she requires much less of the alternative good to still be equally as happy. Conversely, the one with the strong preference for education requires everything the other individual received in addition to the goods between OG_{steep} and OG_{flat} in order to forfeit an additional unit of education.
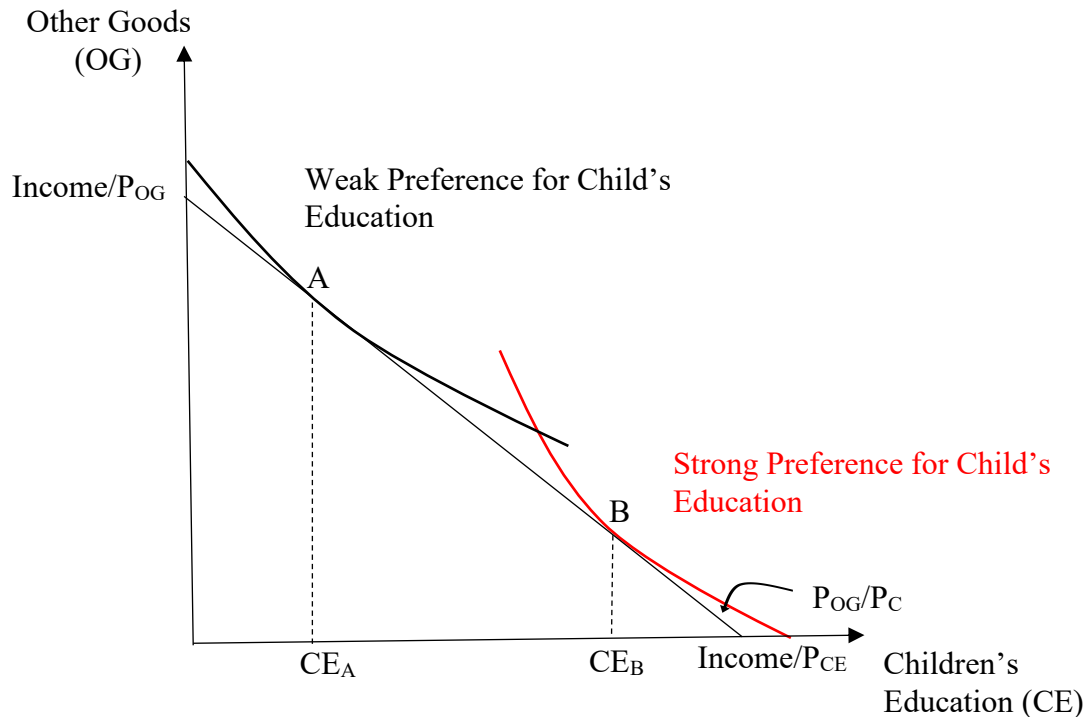
Figure 3. Preferences and Indifference Curves for Children's Education
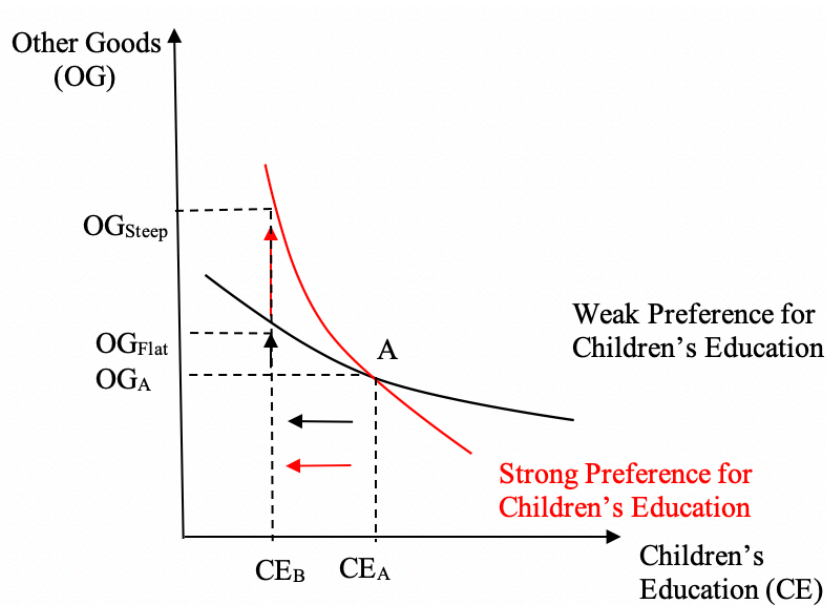
When we consider different shaped indifference curves - that represent alternative tastes and preferences for education - with one budget line, it is evident how the optimal consumption of education would differ. Using Figure 4, we can see that the equilibrium point A is the point of tangency between the indifference curve and the budget constraint for a decision maker with a weak preference for education. At this point the individual would consume the amount of education indicated by CE_A. In contrast, the individual with stronger preferences toward children's education, acting optimally, selects a bundle with more education and less of the other goods than a person with weak educational preferences. Therefore, the point of tangency for the individual with strong preferences occurs at point B and the consumption of education is shown by CE_B. By this theory, given a fixed income, those with stronger preferences for children's education will consume more education at the expense of the other good. One factor that could strongly influence this preference is the education level of parent. For example, a parent who has

completed primary education may have a steeper indifference curve (stronger preference toward

education) and, consequently, the point of tangency would align with point B on Figure 4.

Figure 4. Fixed Budget Constraint with Varying Preferences Towards Education

Because preferences are unique to every individual, within one household different

parents may have different preferences regarding a child education resulting in different

indifference curves. If the mother has a higher willingness to choose education over an

alternative good, then there is reason to believe the educational outcomes for the child would

improve. Furthermore, even among mothers, mothers that have a high education themselves may

have a heightened interest in their children's education. This higher preference would be

represented with an even steeper indifference curve and a low willingness to forfeit a unit of

education for other goods. In comparison, the father may have a slightly flatter indifference

curve and require fewer incentives to stop funding a child's education. However, if we believe

that educational decisions are truly made at the household level, then it is imperative to determine whose individual preferences influence the final decision.

The historical trend of males at the head of the household in Ghana posits the males to have greater authority in household decisions. This would initially mean that the optimal level of education would largely reflect his own preferences. Male household heads may be myopic, focusing on the sort-term, immediate needs of the family and would prefer their children engage in work in the home or for pay than attend school. Consequently, with a weak preference for children's education and a flat indifference curve, we recognize that this scenario would likely lead to less emphasis and spending on children's education. Conversely, if the scenario arose where the female had control over household decisions, the household indifference curve would be steeper as it aligns with her preferences. This theory would lead one to believe when the mother is the sole decision maker the child has a higher likelihood of being enrolled and completing primary school than if the mother is absent from this decision. However, because of the traditional nature of Ghana, this scenario of a sole mother funding is rare and may be due to other factors unobserved that could also impact the decision-making framework.

The third potential option is that both parents' preferences contribute to the indifference curve of the household. Although there is no way of discerning who has greater influence within the household, there is reason to believe, if both parents are involved in education decisions, the indifference curve may have a slope somewhere between that of the mother's and father's individual indifference curves. Consequently, I hypothesize that for a fixed income level, when the mother is able to have agency in the educational decision process, and her preferences are considered, the optimal consumption of education will be higher, and the child's educational outcomes will be better than if the decision was made solely by the father. Additionally, I

hypothesize that when the mother is highly educated and contributes to the decision-making, the indifference curve will be even steeper because of the greater value more educated mothers place on education. Lastly, if the female is the sole decision maker in a household, the optimal consumption of education for her children may be even higher, although I recognize that this scenario may be occurring for reasons that cannot be observed and may influence this decision in other ways. In the following section I describe the data I use to evaluate the viability of the hypotheses presented above.

Figure 5. Hypothesized Individual Indifference Curves for Education Given Household Budget Constraint
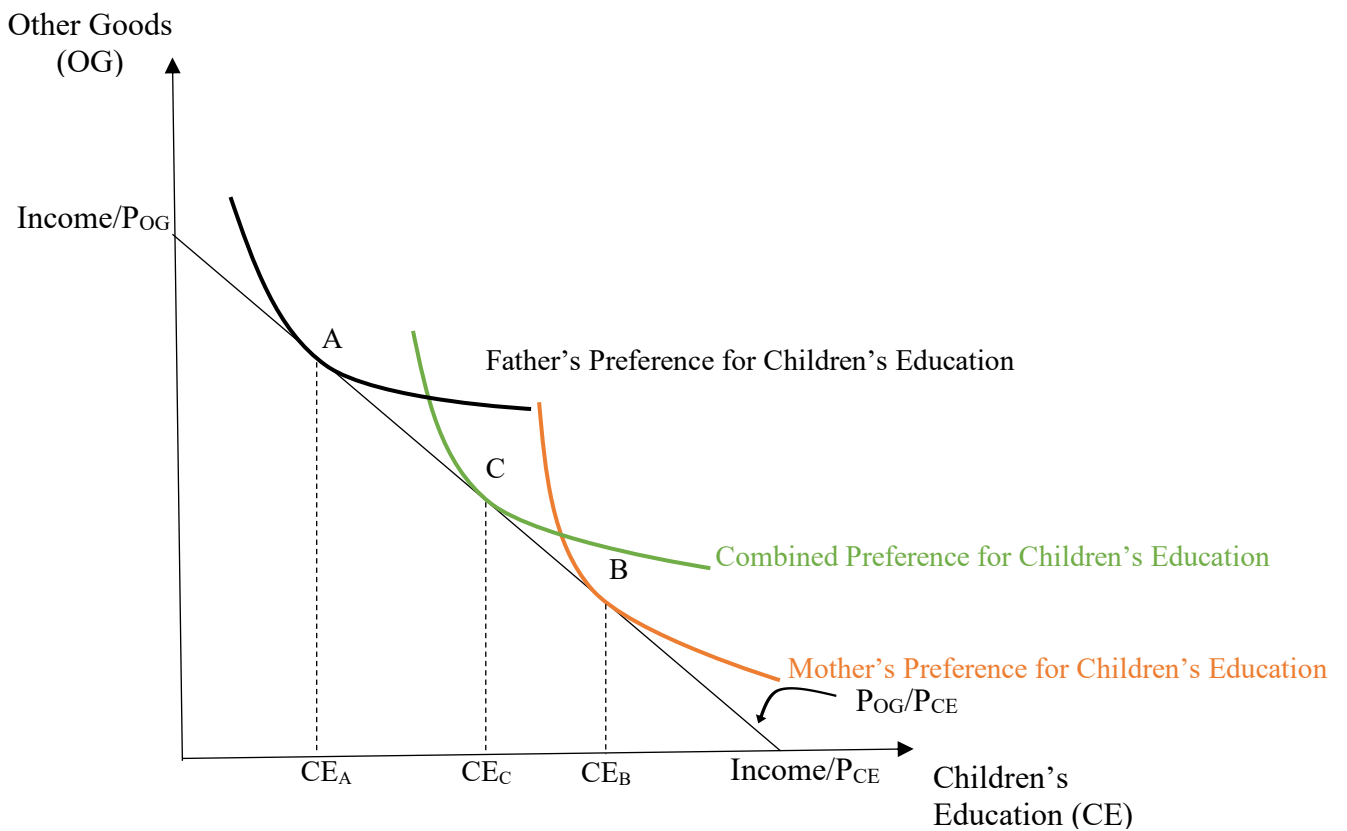
Data

The data for this project is obtained from the Ghanaian Statistical Service in the 7th wave of the Ghana Living Standard Survey conducted in 2016/2017.[4] The Ghana Living Standard Surveys have been conducted since 1987 with the aim to provide an accurate representation of the living conditions and well-being of Ghanaian residents. The Ghana Statistical Service is highly regarded for the quality of their data, with their data being used not only for internal projects, but also by The World Bank and affiliated partners.

Educational Outcomes

When investigating educational outcomes, one can examine enrollment or completion rates. The focus of this paper is on the completion of primary school. Not only is this outcome more relevant given Ghana's commitment to achieving universal basic education, completion is a better indicator than enrollment because it more accurately predicts improved later life outcomes. Additionally, given the focus upon female agency in decision-making, providing enough funding so that a child completes primary education is likely a reflection of higher commitment to education. The variable *Complete Primary* takes a value of 1 if the child has completed a primary education. If the child has not completed primary education, *Complete Primary* is set to 0.

Variables of Interest

<u>SES Designation</u>

In Ghana, income is often a poor proxy for a family's true wealth. Especially in rural areas, many individuals are involved in substance agriculture and report a low-wage income. To circumvent this issue, this analysis utilizes a measure of the National Welfare Quintile that the

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[4] The GLSS-7 is a nationwide survey, which like previous waves, includes national and regional indicators. The survey studies roughly 15,000 households in 1000 Enumeration Areas (56.1% rural; 43.9% urban) (GSS).

family occupies. Acknowledging the importance of financial constraints, this variable was transformed into two simple categories. The two categories that originate from this quintile variable are *Lower SES*, in which the child's household occupies quintiles 1 or 2, or *Upper SES*, in which the child's household is designated as one of the upper three quintiles. Although blunt, this simplistic measure will serve to control for large differences in determining a family's budget and ability to invest in education. Furthermore, those within the same quintile may face similar vulnerabilities that could affect educational decisions.

This variable for quintile also serves as one of the measures that will remedy the lack of school quality data in the sample. The most serious limitation to this data is the insufficiency of school quality data for all communities. If a school is of low quality or is far from one's residence, the household could decide the cost is not worth the benefit. A notably imperfect control, this analysis will rest on the assumption that those in the same quintile will face similar schooling options and that the school attended by children from *Upper SES* households are of higher quality. Even though there likely still exists variation within quintiles, there is reason to believe quality, type, and availability of schools are more similar for families within the same wealth designation with similar resource constraints. Additionally, the difference in school quality between urban and rural schools is a problem already recognized by Ghanaian policymakers. Therefore, urban household residence will be controlled for throughout the analysis with a binary variable set equal to 1 if the child lives in an urban area, and 0 if the child resides in a non-urban area. This analysis recognizes this shortcoming, yet still hopes to discern differences in enrollment patterns, acknowledging variant school quality and access. For future research, addressing this issue with detailed data collection on school quality and distance would be highly recommended.

School Funding Source

      Lacking a standard measure of women's empowerment, I will be utilizing a measure of "school funding" to determine the level of involvement a female has in the educational decision-making process within the household. Assuming the educational decisions for a child are a household decision, if the female contributes to the funding process, there is reason to believe she contributes to the cost/benefit analysis. Because the sample is restricted to children who have attended school, most children have an individual or individuals that contributed to school-related expenses such as fees, books, uniforms, transportation costs, and other associated costs reported. This person is hereby known as the "school funder" and remains relevant because of monetary and non-monetary costs associated with sending a child to school. For a household to enroll their children and financially support them through primary school completion, they must value the benefit of schooling more so than a household who does not make this same decision, given the same budget constraint.

      Consequently, investigating the school-funding source provides a useful avenue to observe a woman's role in the household and the impact on her children. This measure should be understood as an active indicator of female empowerment, as the female is taking an identifiable action asserting her agency. If the mother is not involved in the funding, the funding could be left to only the father (the most common alternative). For the sake of simplicity, in my empirical work, the reference category will be always be the funding scenarios in which only the father contributes. The two categories of comparison will be *shared parent funding* which equals 1 if both the father and mother contribute to financing a child's education and 0 otherwise, or *mother only funding. Mother Only Funding* is also a binary indicator, taking a value of 1 if the mother is

the sole source of educational funding for the child. All other funding scenarios are combined into a separate binary indicator which serves as a control.

There exists a limitation in this data as the school funding source is missing for some observations within households. In the interest of preserving the sample size, the school funding source is imputed for any such observations if there exists a same-gendered sibling with a school funder designation. If multiple same-gendered siblings exist in the data, the school funding source for the sibling closest in age is utilized. For those who do not have a sibling of the same gender in the household and still lack a school funder designation, the observations are dropped from the sample. This process only slightly alters the sample size and there exists no obvious selection by gender, region, urban/rural designation or welfare quintile.

Summary Statistics

The main sample used for this analysis contains children that reside with both of their biological parents. This eliminates the issue of single-parent funding due to a single parent household. The sample is further restricted to children who have attended school and therefore can report the individual or individuals who covered school fees and related expenses. This sample is restricted to 5,074 children who are between 13 and 23 years old. These children are old enough that they would be expected to have completed primary school education, but young enough that they would still be reported as a member of their parents' household.[5]

Table 1 reports the summary statistics for the sample. Inspection of the table reveals that 73.8 percent of the sample have completed primary education. For my analysis sample 63.4 percent of children are labeled *Lower SES* indicating that these children live in households that

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[5] An important consideration for the remainder of the analyses within this paper is that children who were never enrolled are now dropped from the sample. Considering that this is a group of interest for policy makers, this is a notable shortcoming of this design.

occupy the bottom two welfare quintiles, while the other 36.6 percent reside in households that occupy the upper three national welfare quintiles. For all children, ages 13 to 23, the father is responsible for school funding for 75 percent of the sample. *Shared parent funding* occurs for 17.6 percent of the observations, while *mother only funding* occurs for only 4.4 percent of the sample. These statistics provide insight into the traditional household structure of Ghana. Given how common the scenario is in which only the father funds schooling expenses, the preferences of the father may traditionally dominate the educational outcomes for the child.

These summary statistics provide notable background information on this subsample of the Ghana population as well. In this sample 31 percent of the children reside in urban areas, and 15.6 percent of this sample are members of polygamous households. Additionally, 32.6 percent of these children have a *highly educated mother* who has completed at least a primary education, while 49.2 percent have a *highly educated father*.

Table 1. Summary Statistics of the Full Sample

	Children Ages 13-23
Educational Outcomes	
Completed Primary Education	.738
	(.440)
Welfare Designation	
Lower SES	.634
	(.482)
Upper SES	.366
	(.482)
School Funding Source	
Father Only Funding (ref)	.750
	(.433)
Shared Parent Funding	.176
	(.381)
Mother Only Funding	.044
	(.204)
Self or Other Funding	.030
	(.171)
Controls	

Girl Child	.440
	(.496)
Child Age	16.718
	(2.864)
Religion of Child	4.238
	(1.618)
Birth Order of Child	1.994
	(1.116)
Child of Polygamous Household	.156
	(.363)
Household Residence- Urban	.310
	(.462)
Household Size	8.180
	(3.533)
Parental Age Difference	8.659
	(7.444)
Highly Educated Mother	.326
	(.469)
Highly Educated Father	.492
	(.500)
Observations	5,074

Table 2 reports the summary statistics for the analysis sample by school funding source. This allows us to see differences in characteristics between the subsamples, as well as notable differences in outcomes. For the subsample that is restricted to children in which only the father funds school expenses, 72 percent have completed primary education. In comparison, these outcomes are slightly improved for the subsample in which funding responsibilities are shared among parents: 80.1 percent have completed primary education. For characteristics that differ among these populations, a notable pattern emerges that reinforces the concept of female agency. As the mother takes more control over the financial decision-making regarding school, the mean household size is smaller. This aligns with previous literature that finds a decrease in child-bearing when female empowerment increases. Another notable finding is that there are more highly educated mothers and fathers in the shared parent funding group than in the groups in which a single parent funds.

Table 2. Summary Statistics by School Funding Source

	Father Only	Shared Parent	Mother Only
Educational Outcomes			
Completed Primary Education	.720	.801	.748
	(.449)	(.400)	(.435)
Welfare Designation			
Lower SES	.641	.601	.644
	(.480)	(.490)	(.480)
Upper SES	.359	.399	.356
	(.480)	(.490)	(.480)
Controls			
Girl Child	.440	.451	.441
	(.496)	(.498)	(.498)
Child Age	16.676	16.699	16.896
	(2.861)	(2.804)	(2.887)
Religion of Child	4.265	4.123	4.279
	(1.654)	(1.387)	(1.646)
Birth Order of Child	2.005	1.970	1.896
	(1.125)	(1.114)	(.995)
Child of Polygamous Household	.170	.113	.095
	(.376)	(.317)	(.293)
Household Residence- Urban	.293	.356	.410
	(.455)	(.479)	(.493)
Household Size	8.345	7.769	7.234
	(3.548)	(3.681)	(2.957)
Parental Age Difference	8.501	8.683	10.104
	(7.282)	(7.389)	(9.265)
Highly Educated Mother	.304	.445	.320
	(.460)	(.497)	(.467)
Highly Educated Father	.485	.578	.401
	(.500)	(.494)	(.491)
Observations	3822	899	222

Table 3 shows the breakdown of summary statistics across the two wealth designations. For the *Lower SES* subsample, only 66.2 percent of the sample has completed primary education, compared to 87.0 percent of the *Upper SES* group. The *Upper SES* sample has a lower number of children in polygamous households, is notably more urban, and has more children with highly educated parents.

Table 3. Summary Statistics by Wealth Designation

	Lower SES	Upper SES
Educational Outcomes		
Completed Primary Education	.662	.870
	(.473)	(.337)
School Funding Source		
Father Only Funding (ref)	.757	.738
	(.429)	(.440)
Shared Parent Funding	.167	.193
	(.373)	(.395)
Mother Only Funding	.044	.042
	(.206)	(.202)
Self or Other Funding	.032	.027
	(.176)	(.163)
Controls		
Girl Child	.413	.497
	(.493)	(.496)
Child Age	16.597	16.955
	(2.819)	(2.928)
Religion of Child	4.328	4.082
	(1.753)	(1.338)
Birth Order of Child	2.002	1.980
	(1.327)	(1.098)
Child of Polygamous Household	.210	.062
	(.408)	(.242)
Household Residence- Urban	.154	.578
	(.361)	(.494)
Household Size	8.888	6.950
	(3.824)	(2.628)
Parental Age Difference	9.331	7.493
	(7.978)	(6.245)
Highly Educated Mother	.184	.574
	(.387)	(.495)
Highly Educated Father	.352	.736
	(.478)	(.441)
Observations	3224	1863

The summary statistics revealed that children who receive educational funding from both mother and fathers have higher rates of primary school completion than children from families where only the father finances education. These unconditioned means are consistent with the expectation that mothers have stronger educational preferences (and steeper indifference curves) than fathers. In the next section, I discuss how I will test if children with *shared parent funding*

are more likely to complete primary school while controlling for other factors that are expected to impact primary school completion.

Estimation Strategy

To estimate the impact of school funding source on primary school completion, we will utilize the following model.

(1) *Complete Primary* = α_o + α_1*(shared parent funding)* + α_2 *(mother only funding)* + α_3 *(upper SES)* + α_4 *(highly educated mother)* + α_5 *(girl)* + $\alpha_6 X$ + ϵ

Recall that the outcome variable, *Complete Primary*, takes a value of one if the child has completed a primary education and a value of zero otherwise. *Shared parent funding* and *mother only funding* are indicators for scenarios alternative to that in which only the father funds, while *highly educated mother* indicates the child's mother has completed at least a primary education. These indicators are important because they will likely impact the tastes and preferences toward education. Consequently, we expect the signs on α_1 and α_4 to be positive and significant. Given the unusual and rare nature of mother-only funding in theory, we expect α_2 to be positive, while acknowledging this situation may indicate unobserved differences in the household and may alter educational outcomes in either direction. *Upper SES* is an indicator for the child residing in an *Upper SES* household and is intended to control for the income effect. Because households with more resources have a larger budget constraint, it is predicted they will consume more education. Therefore, we also hypothesize that α_3 will be positive and significant.

If one were to consider household income as endogenous within this model there would be concern that the estimates may suffer from endogeneity bias. To address this concern a reduced form model was run without the *Upper SES* indicator. These results, located in the

Appendix, are reassuring that the estimates obtained from Model 1 do not suffer from extensive endogeneity bias.

X is a vector which controls for other factors that may impact child educational outcomes. In addition to including a control for the scenario in which school is funded by one's self or other, X includes child level controls (age of child, religion of child, birth order of child), household level controls (polygamous household indicator, household size, urban residence), and parental controls (age difference between father and mother, indicator for highly educated father). These variables are included in X because they are expected to impact either the tastes and preferences for education, the budget constraint, or both. Additionally, ϵ is included as an error term.

It is possible that mother's preferences for education are conditional on the gender of the child, with the mother having even stronger preferences for her female offspring than her male offspring. If this is the case, *shared parent funding* relative to *father only funding* would lead to an even greater increase in the likelihood of primary school completion for girls. To test this hypothesis, I estimate Model 2 which interacts the binary indicator *shared parent funding* and if the child is a girl.

(2) *Complete Primary* $= \alpha_o + \alpha_1$*(shared parent funding)* $+ \alpha_2$ *(mother only funding)* $+ \alpha_3$ *(upper SES)* $+ \alpha_4$ *(highly educated mother)* $+ \alpha_5$*(girl)* $+ \alpha_6$ *(shared parent funding*girl)* $+ \alpha_7$ *(mother only funding*girl)* $+ \alpha_8 X + \epsilon$

Model 2 uses the same controls and sample as the first model, so we expect all signs previously discussed to remain the same.[6] In developed countries, women have been found more likely to advocate for their daughters, which would lead to an expectation of positive signs on

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[6] An additional interaction term between self or other funding and girl child will also be included as a control for this model.

these interaction terms. However, in developing countries, women may support all their children equally because of the potential for future security or advocate most strongly for the oldest child without following a clear, gendered path (Duflo 2012). In this scenario we would expect α_6 and α_7 to be insignificant.

Because there is reason to believe that the school funder may have differential effects among welfare groups, we will re-estimate Model 1 and stratify the data by *Lower SES* and *Upper SES*. This potential differential effect is captured in this stratified model as we allow the tastes and preferences toward education to be different for parents in separate SES designations. The preference toward education may be stronger for all school funding scenarios in *Upper SES* households due to their network and the greater returns to education. Alternatively, mothers in *Lower SES* households may have stronger preferences toward education because they have a strong desire for their children to have opportunities that may require improved educational levels. Furthermore, these households may be structured differently, which allows for the mother's preferences to have greater influence in the shared parent-funding scenario. Although stratification will reduce the sample size for each of the subsamples, we still expect the signs of the coefficients on s*hared parent funding* to remain positive and significant.

All the models estimated will be weighted at the individual level using a weighting variable provided by the Ghana Statistical Service. Additionally, the standard errors are clustered by Enumeration Areas. These are small geographical groups intentionally selected to create a regional representative sample. This method of clustering the standard errors attempts to avoid the issues of identical correlation due to similarities among Enumeration Areas.

Results

The above models all utilize a maximum likelihood estimation given a probit distribution to discern the impact of school funding source, welfare, and other factors on the probability of positive childhood educational outcomes. The reference group for these models is the most common school funding scenario Ghana in which the child's father is the only individual funding school expenses. In the core model, we have pooled the sample and controlled for welfare designation. In the secondary specifications, we will look at the same model separately for *Lower* and *Upper SES* households.

When analyzing the probit coefficients, there are two main points of discussion. First, do the signs of the coefficients take the expected sign, indicating the hypothesized direction of the relationship and secondly, is the relationship statistically significant? The discussion will focus on these questions for the key variables of interest - school funding source, welfare designation, and parent education. I believe these all have the potential to positively influence tastes and preferences or shift the budget constraint out and consequently, be associated with a higher probability of improved educational outcomes for the child.

Table 4 presents the probit coefficient estimates for the impact of school funding source, welfare designation, and parent education on primary school completion of a child. The coefficient on *shared parent funding* is positive and significant at the 10 percent level. Children with both parents contributing to school expenses are 16.1 percent more likely to complete primary education than children who have only their father contributing to school expenses while holding household SES status constant.[7] This finding reaffirms the notion that mothers have

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[7] The coefficient on mother-only funding is neither positive nor significant. However, given the circumstances that could surround this occurrence, this is not a particularly concerning result, especially when combined with the low observation count.

stronger preferences for children's education than fathers. The coefficient estimate for *Upper SES* households is positive and significant at the 1 percent level. This finding reveals that children from households with more resources are more likely to complete primary education than children from poorer household as previously expected. Additionally, we find a statistically significant positive relationship between parental education for both mothers and fathers and their children's primary school completion. This result is consistent with the idea that as the education levels of mothers and fathers rise, they value their child's education more, leading to a steeper indifference curve.

In regard to the previous concern of endogeneity bias, the estimates from the reduced form model (included in the Appendix) are similar to those presented in our core model. In the reduced form model the estimate on *shared parent funding* becomes slightly smaller and less significant, while the estimate for *highly educated mother* becomes more significant and more positive. Overall, the findings of the core model are largely robust to the reduced form model specification, which proves reassurance that the results do not suffer from extensive bias.

The second column in Table 4 provides the probit coefficients for the second model specification. This model includes an interaction term between the gender of the child and the school funding source. Although none of the coefficients on the interactions term are positive or significant, the coefficients on *shared parent funding* and the *girl child* individually both became more positive and more significant. Because of the developing nature of Ghana, and the previous achievement of gender parity at low levels of education this is not a particularly surprising result. However, this result shows that a mother's preference toward education applies to all children, not just her female children.

Table 4. Probit Estimates for Impact of School Funding Source and Other Factors on Children's Primary School Completion

VARIABLES	(1) Core Model	(2) Child Gender Interaction Model
Shared Parent Funding	0.161*	0.268**
	(0.0961)	(0.125)
Mother Only Funding	-0.136	-0.134
	(0.158)	(0.215)
Self or Other Funding	0.102	0.224
	(0.220)	(0.288)
Upper SES Household	0.353***	0.357***
	(0.0716)	(0.0718)
Girl Child	0.0716	0.124*
	(0.0618)	(0.0653)
Shared Parent Funding x Girl Child		-0.237
		(0.149)
Mother Only Funding x Girl Child		-0.00208
		(0.344)
Self or Other Funding x Girl Child		-0.295
		(0.370)
Highly Educated Mother	0.365***	0.365***
	(0.0873)	(0.0870)
Highly Educated Father	0.410***	0.410***
	(0.0762)	(0.0756)
Constant	-5.113***	-5.156***
	(0.348)	(0.344)
Observations	5,074	5,074

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: Controls included for gender, age, religion, and birth order of child, as well as size, urban residence, parental age difference and polygamous status of the household.

We further test this model above by stratifying the data into two subsamples by welfare designation. This reduces the sample size from 5,074 observations in the pooled sample to 3,217 observations in the *Lower SES* subsample and 1,857 observations in the *Upper SES* subsample. Table 5 displays these coefficient estimates for both subsamples. Inspection of Column 1 shows a large and statistically significant impact of shared-parent funding on children's primary school

completion, compared to father-only funding. Notably, this relationship does not hold in size or direction for the *Upper SES* subsample shown in Column 2. One interpretation of this finding is that parent preferences in *Upper SES* households are more similar and the mother's opinion does not have a large effect on the child's educational outcomes. However, in *Lower SES* households the mothers have much stronger preferences for education than the fathers. Consequently, when mothers are able to contribute to funding with fathers, there is a 29.8 percent increase in primary school completion compared to *Lower SES* households in which only the father funds.

The coefficient on *highly educated mother* is positive and significant for both subsamples. For the *Lower SES* children, a child with a *highly educated mother* is 38.9 percent more likely to complete primary than a child without a *highly educated mother*. Within the *Upper SES* households, a *highly educated mother* is associated with a 30.8 percentage point increase in the probability that a child finishes primary school. In regard to father's education, a strong and positive relationship holds for the *Lower SES* subsample, increasing the likelihood of primary school completion by 52.8 percentage points compared to a child without a *highly educated father*. Although the coefficient is positive for the *Upper SES* group, the coefzient is not statistically significant.

Table 5. Probit Estimates for Impact of School Funding Source and Other Factors on Children's Primary School Completion Stratified by SES Designation

VARIABLES	(1) Lower SES	(2) Upper SES
Shared Parent Funding	0.298***	-0.0476
	(0.109)	(0.145)
Mother Only Funding	-0.0496	-0.426
	(0.166)	(0.276)
Self or Other Funding	0.311	-0.191
	(0.293)	(0.257)
Girl Child	0.0544	0.0893

	(0.0767)	(0.111)
Highly Educated Mother	0.389***	0.308**
	(0.112)	(0.136)
Highly Educated Father	0.528***	0.191
	(0.0923)	(0.139)
Constant	-4.923***	-5.887***
	(0.345)	(0.803)
Observations	3,217	1,857

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: Controls included for gender, age, religion, and birth order of child, as well as size, urban residence, parental age difference and polygamous status of the household.

Discussion

The results from these models are important in identifying some of the nuances in school completion patterns related to the tastes and preferences of the household. Notably, this analysis was useful in highlighting the recurrent negative impact on positive school outcomes due to low family wealth. Children in *Lower SES* households are 35.3 percent less likely to complete primary school than children of *Upper SES* households (See Table 4 Core Model). This finding is consistent with previous research and is not a surprising result. However, among Low SES households, the most pressing question is whether this disadvantage can be countered by female agency in the household. I found that *shared parent funding* substantially offset the wealth effect by increasing the likelihood of primary school completion by 29.8 percent for children in these low wealth households (see Table 5 Column 1). Thus, mothers are tremendously influential in regard to their children's education, especially in poor households.

It is interesting to consider why this relationship may not hold separately for the higher SES group. There is potential that the father in *Upper SES* households already has a steep indifference curve regarding education and, consequently, the mother's involvement in the

decision-making does not significantly alter the preferences toward education as they are already quite strong. Comparatively in *Lower SES* households, fathers that are funding school individually may place minimal value on education. Additional female contributions toward child school funding may shift the household preferences more drastically toward education in these scenarios.

This analysis was also important in identifying other factors outside of wealth and school funding that could impact child primary completion rates. Gender of the child does not seem to impact the preferences of the individual who chooses to support schooling, although girls in this sample appear to have higher rates of primary school completion. Along with the large positive effect of wealth, the education level of parents is related to the future education of their child. This finding is important when one considers the current inequalities in primary school completion and how this could contribute to the rising inequality within the country. However, if Ghana remains committed to universal education, this result is promising when considering long-term effects. Not only will these children receive more education in the short-term, but increasing tastes and preferences toward education may have positive effects for future generations.

Because of the relationship between female empowerment and economic development, this policy has potential to cause indirect improvements in educational outcomes. As Ghana looks toward the Sustainable Development Goals for 2030, the country should be commended for its notable focus on expanding educational outcomes across the country. Although there is still work to be done in improving equity and access, the country has made notable gains since the beginning of the 21st century. Conversely, the high prevalence of father-funding scenarios within this data indicates that female empowerment and equality in the household still remain

relevant discussions for policymakers. This has been noted by the new Sustainable Development

Goals as they recognize "there are still complex issues concerning male dominance and

patriarchy that need to be addressed."[8] Consequently, future research on female empowerment

may become an even larger focus for Ghana as the country continues to develop. However, what

remains evident is that for all children, and especially for those in resource constrained

households, when deciding upon children's education- mothers matter!

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[8] Put forth in a publication by the United Nations regarding advocacy messages for the new SDGs in Ghana. (UNDP 2017)

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Appendix

Table A.1 Probit Estimates for the Reduced Form Model compared to Estimates from the Core Model Specification

VARIABLES	(1) Reduced Form Model	(2) Core Model
Shared Parent Funding	0.146	0.161*
	(0.0907)	(0.0961)
Mother Only Funding	-0.111	-0.136
	(0.161)	(0.158)
Self or Other Funding	0.0735	0.102
	(0.212)	(0.220)
Upper SES Household		0.353***
		(0.0716)
Girl Child	0.0866	0.0716
	(0.0618)	(0.0618)
Highly Educated Mother	0.427***	0.365***
	(0.0870)	(0.0873)
Highly Educated Father	0.434***	0.410***
	(0.0770)	(0.0762)
Age of Child	0.321***	0.322***
	(0.0172)	(0.0174)
Religion of Child		
Catholic	0.426**	0.418**
	(0.173)	(0.174)
Protestant	0.446**	0.389**
	(0.176)	(0.177)
Pentecostal/Charismatic	0.449***	0.396**
	(0.162)	(0.165)
Other Christian	0.412**	0.350**
	(0.177)	(0.178)
Islam	0.269	0.250
	(0.171)	(0.172)
Traditionalist	-0.212	-0.226
	(0.240)	(0.240)
Birth Order of Child	0.0585**	0.0519*
	(0.0285)	(0.0288)
Child of Polygamous Household	-0.103	-0.126
	(0.123)	(0.125)
Household Residence- Urban	0.449***	0.350***
	(0.0900)	(0.0925)
Household Size	-0.0378***	-0.0287**
	(0.0126)	(0.0124)

Parental Age Difference	-0.000419	-0.00124
	(0.00443)	(0.00418)
Constant	-5.018***	-5.113***
	(0.338)	(0.348)
Observations	5,074	5,074

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