The Relationship between Household Economic Resources and Youth Academic Performance in Ghana: A Multilevel Structural Equation Modeling

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The Relationship between Household Economic Resources and Youth Academic Performance in Ghana: A Multilevel Structural Equation Modeling

by

David Ansong

A dissertation presented to the Graduate School of Arts and Sciences of Washington University in partial fulfillment of the requirements for the degree of Doctor of Philosophy

December 2013
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List of Abbreviations

BCS  British Cohort Study
BECE Basic Education Certificate Examination
BHPS British Household Panel Study
CCT  Conditional Cash Transfer
CFA  Confirmatory Factor Analysis
CFI  Comparative Fit Index
CI   Confidence Interval
CGAP Consultative Group to Assist the Poor
CSD  Center for Social Development
FCUBE Free Compulsory Universal Basic Education
GES Ghana Education Service
GHC Ghana Cedi
GNA Ghana News Agency
GoG  Government of Ghana
GPA Grade Point Average
GSS Ghana Statistical Service
JHS Junior High School
LEAP Livelihood Empowerment against Poverty
MSEM Multi-group Structural Equation Modeling
NAF New America Foundation
NLSY National Longitudinal Survey of Youth
NYPG National Youth Policy of Ghana
OECD Organization for Economic Co-operation and Development
PIH Permanent Income Hypothesis
PSID Panel Study of Income Dynamics
PTA Parent-Teacher Association
RMSEA Root Mean Square Error of Approximation
ROSCA Rotating Savings and Credit Association
SACMEQ Southern and East African Consortium for Monitoring Education Quality
SCT Social Cognitive Theory
SE  Standard Errors
SEM Structural Equation Modeling
SHS Senior High School
SSA Sub-Saharan Africa
TRA Theory of Reasoned Action
UNESCO United Nations Educational, Scientific and Cultural Organization
UNICEF United Nations Children's Fund
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ABSTRACT OF THE DISSERTATION

The Relationship between Household Economic Resources and Youth Academic Performance in Ghana: A Multilevel Structural Equation Modeling

by

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Professor Michael Sherraden, Chair

The Government of Ghana recognizes the importance of education for improving the socioeconomic well-being of young Ghanaians and the development of the nation. Education currently accounts for the largest share (31%) of Ghana’s national budget (GNA, 2012). Educational reforms and investments have had remarkable success in improving access to education up to the Junior High School (JHS) level, but progression beyond JHS remains a challenge. More than half of JHS graduates do not gain admission into Senior High School (SHS) because of poor academic performance and the inability of those who qualify to afford the drastic increase in educational costs.

Stakeholders have focused on different ways to address these educational challenges. Researchers who study the developmental effects of owning assets (e.g., savings, home, land, livestock, etc.) in particular have begun paying attention to ways in which personal (e.g., savings) and household (e.g., assets) economic resources can improve young people’s educational outcomes. This emerging area of work is guided by the asset-effects framework, which posits that economic resources may influence educational outcomes directly through being able to pay for tuition and school supplies and indirectly through their influence on cognitive
processes (e.g., academic self-efficacy and expectations). Empirical evidence from around the world suggests potential connections, but there are significant research gaps on how specific types of economic resources affect educational outcomes. For instance, while most studies that link income and educational outcomes find strong relationships between income and children’s academic performance, others find mixed or contradictory results. The mixed results suggest the need for further conceptualization and empirical research to clarify the nature of the relationships between different types of economic resources and academic performance.

To help address the research gaps, this study uses nested cross-sectional data from an ongoing youth savings experiment to examine potential direct and indirect associations between two types of economic resources—parents’ income and household assets—and math and English scores of middle school-age youth in Ghana. In addition, the study assesses the possibility that gender moderates the relationships between the aforementioned types of economic resources and math and English scores.

Using multilevel structural equation modeling techniques, the study does not find strong evidence to support the hypothesized direct relationship between economic resources and educational outcomes. However, the study finds strong evidence that parents’ income and household assets indirectly affect math and English scores through young people’s academic self-efficacy and expectations. These findings suggest that psychological factors such as academic self-efficacy and expectation are more predictive of youth academic performance than economic resources. Subgroup analyses also show that gender moderates the indirect relationships between economic resources and English scores but not math scores. This finding concerning possible gender differences could inform policymakers about economic resources that may promote parallel outcomes for boys and girls.
Chapter 1: Introduction

Background of the Study

Formal education is the principal institutional route by which people are equipped with the knowledge and skills they need to become economically productive and competitive (Baffour-Awuah, 2011; Maliyamkono & Ogbo, 1999; Oduro, 2000). Like most young people around the world, school-age youth in Ghana need formal education to acquire knowledge, skills, and competencies to participate in an increasingly knowledge-driven society. Emerging empirical evidence from sub-Saharan Africa (SSA) suggests that having economic resources is associated with educational success (Chowa, Ansong, & Rainier, 2010). However, such research does not explain how different types of economic resources—such as accumulated savings and income—might have varying associations with specific types of educational outcomes (e.g., academic performance) or how these relationships may vary by gender. Thus, this dissertation examines:

(1) how two types of economic resources—income and assets—are associated with academic performance\(^1\) of Junior High School (JHS) students in Ghana,

(2) whether students’ psychological factors—academic self-efficacy and academic expectations—mediate the relationships between economic resources and academic performance, and

(3) whether the nature of the relationships between economic resources and academic performance depends on the child’s gender.

Because formal education is critical to economic growth and human development through human capital, especially in developing countries (Barro, 2006; Oduro, 2000), the

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\(^1\) For the purposes of this study, academic performance refers to how well students are doing with respect to grades and standardized tests.
Government of Ghana (GoG), public and private organizations, and other education stakeholders have made and continue to make significant investments in the country’s educational system. For the individual, formal education has both monetary and nonmonetary benefits, as it boosts:

- earning potential, economic well-being, and social mobility (Baum & Payea, 2005; Haveman & Wolfe, 1994; Keeley, 2007; Loke & Sacco, 2011);

- social skills, including the ability to engage in peer relationships, self-control, compliance with laws and social codes, and assertiveness (Gesthuizen, Van der Meer, & Scheepers, 2008); and

- cultural capital through their acquisition and/or reinforcement of norms and values (e.g., tolerance, hard work, civility, and respect) (National Research Council, 2005).

**Statement of Problem**

Given that there are more returns on attaining higher levels of education, the youth in Ghana must pursue educational advancement beyond the basic education level to benefit fully. In Ghana and many developing countries, the youth with higher education have comparative advantage over those who have only basic education. This is because those without higher education often have to direct their job search toward the lower-tier and informal sector jobs that are mostly casual and temporary, but the youth with higher education can be competitive in both the formal and informal job market (El Badaoui & Rebiere, 2012). For instance, the 2007 job tracking survey by the Ghana Statistical Service (GSS) revealed that more than 80% of job openings in the formal employment sector were available only to individuals with no less than Senior High School (SHS) education (Amankrah, 2007). Thus, there are better job prospects in the formal sector for individuals who are able to enroll in formal education beyond the JHS level. However, there are enormous challenges to the smooth transition from JHS to SHS in Ghana,
two of which are low academic performance and high cost of higher education (Ministry of Education, Science, and Sports, 2007).

**Low Academic Performance**

Admission to SHS in Ghana is partly merit-based. That means successful transition from JHS to SHS partially hinges on good grades. Yet, many JHS students have poor academic performance and therefore they cannot gain admission to SHS (Ajayi, 2012). For example, between 1992 and 1997, less than one fifth of JHS students reached mastery level\(^2\) in English language and math subjects (Mereku, 2003). From 2006 to 2008, 38% of JHS students who sat for the Basic Education Certificate Examination (BECE)\(^3\) did not qualify for SHS because of poor performance (Daily Graphic, 2008). In 2008 and 2010, students from 34 schools had a 0% pass rate on the BECE and therefore did not qualify for SHS (Okyerefo, Fiaveh, & Lamptey, 2011). Several inter-country studies also have corroborated the observation that academic performance in Ghana is comparatively low. For instance, Ghana placed last among other African countries, including South Africa, Morocco, Botswana, and Egypt in the Trends in International Math and Science Study (TMISS) in 2003 (Abukari, 2010). A repetition of the TMISS study in 2007 and 2011 revealed that academic performance in Ghana continues to trail other countries with similar income levels (Etsey et. al., 2009; National Center for Education Statistics, n.d.).

Poor academic performance in Ghana has been attributed to inadequate infrastructure, lack of educational materials, and inadequate training and motivation of teachers (Ghana News Agency, 2010; Norviewu-Mortty, 2012). Nevertheless, individual- and family-owned economic

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\(^2\) As of 2003, the Ghana Education Service’s (GES) cutoff for mastery in a subject was 60% (i.e., Average) for English language and 55% for math (Mereku, 2003). The GES uses the following 9-scale grading system: Excellent (80%-100%), Very Good (75%-79%), Good (70%-74%), High Average (65%-69%), Average (60%-64%), Low Average (55%-59%), Low (50%-54%), Lower (45%-49%), and Lowest (below 40%).

\(^3\) The BECE is the national standardized examination offered at the time of completion of JHS (i.e., Ninth grade).
resources might help improve academic performance through investment in educational
resources and needs. While empirical research has not shed adequate light on this possibility in
Ghana, evidence from Elliott’s (2011, 2013) research on the effects of economic instability on
children’s educational outcomes in the US suggests that economic resources provide families
with an advantage. Families with accumulated assets are able to access educational resources—
such as textbooks and writing materials—that are proven to affect academic performance

The GoG has made efforts to address many of the challenges facing the educational
system. However, most of these efforts have been geared toward achieving universal primary
education by 2015—Millennium Development Goal 2—and less about improving academic
performance. The GoG’s efforts to increase enrollment at the JHS level have had little or no
impact on academic performance (Atta-Quayson, 2007), one of the major barriers to successful
transition from JHS to SHS. Enrollment rates at the JHS level have increased steadily since the
1980s, while academic performance has decreased over the same period (Akyeampong, 2009;
DANIDA, EFW, & The World Bank, 2011; Okyerefo, Fiaveh, & Lamptey, 2011; The World
Bank, 2010). See Appendix A for enrollment trends of public and private JHS from 2001 to
2010. Using econometric estimation models, Osei and others (2009) find that government tuition
subsidies do not have a significant impacts on BECE pass rates. Thus, ensuring access through
an increased focus on enrollment does not guarantee other important educational outcomes, such
as regular attendance, active engagement in schoolwork, and good academic grades. Without
efforts to improve academic performance, many JHS students will not obtain passing grades in
the BECE to qualify for admission into SHS.
High Cost of Transition

Apart from low academic performance, the significant increase in educational expenses is another major barrier to successful transition to SHS. Basic education (primary and JHS) has been made mostly free through GoG programs that subsidize educational costs by providing School Capitation Grants (free tuition), a School Feeding Program (free school lunch), school uniforms, and textbooks (Osei, et. al., 2009). The GoG provides these subsidies at the basic education level partly because the Constitution of the Republic of Ghana\(^4\) stipulates that basic education is a fundamental human right for all Ghanaian children, and must be free to all regardless of social or economic background (Akyeampong, 2011). However, government subsidies drop substantially at the SHS level as the Constitution recommends but does not require the GoG to guarantee or fund second cycle institutions. For instance, in the 2011/2012 academic year, SHS students paid an equivalent of about USD 500 in annual tuition (Public Agenda, 2011) and almost USD 100 in direct costs of school charges and materials (Innovation for Poverty, n.d.). Clearly, as one transitions from JHS to SHS, the number of school-related supplies\(^5\) increases and the cost of education rises to more than 50% of many families’ annual incomes (Ghana Health and Education Initiative, n.d.). The drastic increase in educational expense may account for the high dropout rate (70%), which is higher during the transition from JHS to SHS than the dropout rate during JHS (22%). This may be an indication that many families cannot bear the cost of SHS education. See Appendix B for illustration of the rates of transition from primary school through SHS.

\(^4\) Chapter 5 of the 1992 Constitution of the Republic of Ghana stipulates that (a) basic education shall be free, compulsory, and available to all; (b) secondary education in its different forms, including technical and vocational education, shall be made generally available and accessible to all by every appropriate means, and in particular, by the progressive introduction of free education.

\(^5\) Common school-related supplies at the SHS level include school uniforms, school bags, exercise books, textbooks, and other stationeries.
School-related expenses create enormous challenges for individuals and households, especially those who fall within low-income brackets. Data from the Ghana 2003 Core Welfare Indicators Questionnaire (CWIQ) survey reveal that persons from households in the highest wealth quintile in Ghana are nearly three times likely to have completed middle school than persons in the lowest wealth quintile (Oduro, 2008). This gap could be due to poor households’ inability to afford school expenses. Like many developing countries, Ghana’s economy is growing, and there are competing demands on meager public funds available for social programs like education. Conventional mitigating measures—such as scholarships and fellowship opportunities—at the SHS level are scarce, thus individuals and families have to find ways to pay for educational expenses.

As Ghana moves toward a model of more cost sharing in education at the SHS and higher levels, individual- and family-owned economic resources—income and assets—may become an even more important factor in determining whether or not one can afford schooling. Knowing that they are able to pay for current and future educational expenses enables students to concentrate on their academic performance. It is becoming increasingly clear that provision of free access to school, particularly beyond the primary school level, is unlikely because of the continued rise in population, high levels of inflation, low economic growth rates, and competing demands on limited government funds (Maliyamkono & Ogbu, 1999). Lewin (2008) predicts that the already low SHS enrollment level will continue to plunge unless the GoG allocates at least 5% of Ghana’s gross domestic product (GDP) to education. In terms of percentage of total education expenditure, public expenditure dropped from 19% to 18% for JHS and from 19% to 12% for SHS from 2004 to 2008 (DANIDA, EFW, & The World Bank, 2011). Taking the

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6 In 2011, 8.1% of GDP was spent on education, which was 24.4% of the total government (UNESCO Institute for Statistics, 2013).
current trends in education funding into account, cost sharing will continue to be a key part of government policies at higher levels of education.

In principle, the Free Compulsory Universal Basic Education (FCUBE) program initiated in 1996 to increase access and ensure that parents pay only limited non-tuition fees has not completely removed the financial burden on parents (UN Girl’s Education Initiative [UNGEI], n.d.). There are over 70 different types of fees ranging from UDS 0.33 to UDS 13.13 that parents must pay in addition to stationery, transportation, and 10% of the cost of required textbooks (The World Bank & UNICEF, 2009). These costs have resulted in 11% of children working while in school and 3% dropping out entirely (The World Bank & UNICEF, 2009). Despite the current share of education expenses already borne by students and parents, some government officials are calling for increment in the amount of fees and levies they are required to pay (Caillaud et al., 2009; Lewin, 2008). Thus, government subsidies for education are not likely to increase enough to absorb costs, a situation that raises the questions: Does the lack or limited availability of economic resources affect students’ educational expectations? How does this, in turn, affect effort and performance in school?

This dissertation will examine whether access to economic resources can lead to a strong sense of self-efficacy and positive educational expectations, which may motivate students to focus on their academic work in order to perform well in school.

**Significance of the Study**

Much of what we know about the impacts of economic resources on educational outcomes is derived from studies in developed countries and other African countries. Findings suggest that economic resources—owned mostly by parents—are positively associated with children’s school-related behaviors (e.g., regular school attendance) (Zhan & Sherraden, 2011;
Elliot & Beverly, 2010) and educational outcomes (e.g., graduation, better grades, and progression) (Elliot & Beverly, 2010; Kim, 2010; Loke & Sacco, 2011). While these results may suggest that there is a relationship between economic resources and education in Ghana, there are knowledge gaps. For instance, the mediating mechanisms through which economic resources affect academic performance have not been fully understood (Elliott, Choi, Destin, & Kim, 2011). Knowing such mediation mechanisms will clarify the processes that underlie the nature of the relationship between economic resources and academic performance.

Also, the educational effects of economic resources—particularly of those owned by youth in SSA—are not well documented (Deshpande & Zimmerman, 2010), and the few empirical studies in developing countries have been limited to small sample sizes or specific countries (Deshpande & Zimmerman, 2010). There are nuances such as different measures and important covariates that empirical research does not yet account for (Chowa, Ansong, & Masa, 2010).

In addition, economic, social, and political differences exist between Ghana and developed or even fellow SSA countries (Green, 2013; Pasquali & Aridas, 2013). Therefore, results from different settings may not be generalizable to the Ghanaian context (Fentiman, Hall, & Bundy, 1999), and the mechanisms by which economic resources are associated with academic performance are less clear.

By helping address these gaps, this study seeks to inform practitioners and policymakers on how economic empowerment opportunities may create educational advantage for Ghanaian youth and their households. Findings from this study and others can guide efforts to reverse the lagging academic performance at the JHS level, one of the major barriers to educational progression.
Purpose of the Study

Further research is needed to shed light on the relationships between economic resources—income and assets—and academic performance in Ghana. Thus far, empirical evidence from around the world suggests potential connections, but there are significant research gaps on how specific types of economic resources (e.g., household income versus assets) affect academic performance. In the SSA context, it is not clear whether other factors fully or partially mediate the relationships between different types of economic resources and academic performance, and whether these possible direct and indirect relationships differ for girls and boys. This dissertation uses data from a random sample of Ghanaian youth and parents participating in the YouthSave Ghana Experiment to provide clarity on the relationship between economic resources (income and assets) and academic performance (math and English language subject scores). Specifically, this dissertation aims to examine:

1. the kinds of household economic resources associated with youth’s academic performance,
2. the mediating role of academic self-efficacy and expectations in the relationship between economic resources and academic performance,
3. whether the unmediated (i.e., direct) and mediated (i.e., indirect) relationships between economic resources and academic performance vary by gender.

History and Structure of the Ghana Education System

A brief review of its history and current structure is necessary to put the Ghanaian educational system into perspective. I divide the educational history of Ghana into three epochs—precolonial, colonial, and postcolonial. Prior to the introduction of Western literacy to Ghana in the 1530s by the Dutch and Danish (Education Encyclopedia, n.d.), young people
developed knowledge and skills through indigenous education in the form of social or apprenticeship training. This training covered practical, social, spiritual, and intellectual needs appropriate for the environment and community (Egbo, 2000). Artisans and professionals taught crafts, trades, and other professions through apprenticeships (Obide, 1995). Males and females received instructions in different activities.

Indigenous education was overshadowed and dwarfed by western educational policies in the colonial era. Beginning in the 1830s, missionaries introduced Western literacy as a means of spreading Christianity (Education Encyclopedia, n.d.; Ghana Education Service [GES], 2004; Graham, 1971, 1976). Later, colonialists trained some older youth in Western literacy so they could assist in running the colonies. The colonial administration gradually introduced formal education and later built infrastructure for schools (Obide, 1995). By the end of the colonial era in the late 1950s, Ghana had moved toward mass formal education and a Western educational system. Later in 1961, the country passed the Education Act (Act 87), which pushed for the construction of more schools and adoption of the concept of universal primary education (GES, 2004; Oduro, 2000).

The postcolonial era has seen a gradual move from an agricultural-based economy—with 24.65% of the country’s GDP in this sector—to an industrial- and service-based economy (Kolavalli, et. al., 2012), which has resulted in an increasing demand for workers who have mastered numeracy and literacy skills. These structural shifts refocused the approach to education and employment. The formal educational system has formalized the acquisition of knowledge and skills. Youth who wish to develop their capabilities for future employment and boost their earnings prospects may have to go through some form of formal education. This is recognized generally as the most suitable means of acquiring literacy and numeracy skills and
acquiring broader knowledge, reasoning, and problem-solving skills essential for being successful in the changing economy (National Research Council, 2005).

The educational structure in Ghana has undergone many reforms since the country gained independence. The most recent and significant changes were the result of the 1987 educational reforms, which shortened pre-university education from 17 years to 12 years (Tonah, 2009). Currently, Ghana has the 6-3-3-4 educational structure. Students begin formal education at age six and spend six years in primary school, three years in JHS, three years in SHS, and four years in the university. Basic education is universal and covers the first nine years of schooling (primary school and JHS). The goal of universal education is to expose children to a wide variety of ideas and skills to (a) build their capabilities to fit into society, (b) stimulate their interests in specific areas for future training, and career development. Students are taught eight to nine subjects: mathematics, English language, integrated science, social studies, Ghanaian language and culture, basic design and technology, information and communication technology, religious and moral education, and the French language (optional). A school year at the primary and JHS level lasts 40 weeks. At the end of the third year in JHS, students are tested using scores from an internal continuous assessment and Basic Education Certificate Examination (BECE) which is a national standardized examination.

By law, basic education in Ghana is compulsory, universal, and tuition-free. According to the last population and housing census conducted in 2010, most Ghanaians (53.7%) have had at least basic education (Ghana Statistical Service, 2012). The current gross enrollment ratio at JHS is 79.5%, but the completion rate is only 66% (Global Partnership for Education & Ghana Development Partner Group, 2012). Students are not obliged to continue their education beyond JHS, but doing so is a goal of many students because in SHS they begin to acquire advanced
knowledge, specialized skills, and competencies that increase their higher education opportunities, enhance their employment prospects and access to most formal jobs. The SHS curriculum covers core subjects—English language, mathematics, integrated science, and social studies—and elective subjects in one of five program areas—agriculture, general arts/sciences, business, vocational, and technical studies.

The current gross enrollment ratio at SHS is 40% (UNESCO Institute for Statistics, 2013). Results of the 2010 census show that among the entire population of Ghana, 23.4% have no formal education, 33.4% have a primary level education, 26.7% have a JHS education or its equivalent, 10.9% have an SHS education or its equivalent, and 4.1% have a post-SHS education (Ghana Statistical Service, 2012). This means more than four in five Ghanaians have never progressed from JHS to SHS even though an SHS education equips young people with the knowledge and skills that broaden their chances of future educational prospects, economic well-being, and social mobility. Contrasted with previous generations, more Ghanaian youth are transitioning from JHS to SHS today (Fatusi & Hindin, 2010), but a large pool of youth still do not progress because of poor performance in JHS and the inability to pay for SHS education.

**Definition of Concepts**

**Youth**

In this study, *youth* are defined as 12- to 18-year-olds enrolled in JHS or SHS. While there is no universally accepted definition of *youth* in Ghana, for practical and policy purposes, the National Youth Policy of Ghana (NYPG) defines it as persons from ages 15 to 35 years (Ministry of Youth and Sport, 2010). The United Nations’ definition of youth as those aged 15 to 24 years serves as the basis for the NYPG age range. This study limits the definition of youth to
12- to 18-year-olds because it is consistent with the age range of typical JHS and SHS students, the target population of this study.

Other youth characteristics considered in this study are based on socially defined activities (e.g., school and work) that youth typically are involved in (Jacobo, n.d.). Youth in Ghana can be categorized in four ways: (1) in school but not working, (2) in school and working, (3) working only, and (4) neither working nor in school. Given that one of the primary phenomena of interest in this study is academic performance, the current study focuses on youth enrolled in the formal educational system, including those who also work. This study uses the terms youth, young people, and JHS students interchangeably.

**Formal Education and Educational Outcomes**

Education includes the knowledge, skills, and attitudes that people cultivate to prepare for future occupations, responsible citizenship, and leisure activities. Formal and informal education represents acquired human capital and the process of acquiring it, but the focus of this study is on formal education. Unlike informal education, formal education is more systematic, has a predefined curriculum and minimum attendance requirements (Dib, 1988).

Typical measures of formal educational outcomes fall under two categories: academic performance and educational attainment (Kim, 2010). Some of the measures of academic performance are test scores and subject grades (Elliott, Kim, Jungi, & Zhan, 2010; Huang, Guo, Kim, & Sherraden, 2010; Jutte et al., 2010; Reynolds & Temple, 1998; Watkins, 1997).

Educational attainment, on the other hand, encompasses achievement of milestones such as school completion, graduation, and transition to higher levels of education (Elliott & Beverly, 2010; Reynolds, Temple, & Ou, 2010). Other studies have focused on school behaviors, including school attendance (Nam & Huang, 2009; Elliott & Beverly, 2010), school engagement,
and establishing networks and bonding in school (Buhs, 2005; Iyer, Kochenderfer-Ladd, Eisenberg, & Thompson, 2010) or psychological measures, including academic self-efficacy and expectations (Kim, 2010; Zhan & Sherraden, 2003).

Different studies model these education-related measures differently as outcomes, predictors, mediators, and correlates. In this study, educational outcomes are limited to academic performance as demonstrated by math and English language subject scores. Given that the literature on educational outcomes has used academic performance and achievement interchangeably, the current study will use both academic performance and achievement to refer to educational outcomes, especially when discussing extant literature.

Economic Resources

In this study, the term economic resources has a broad meaning, encompassing both income and assets. Although these two concepts are connected, they are distinct and therefore should be treated as separate concepts (Oliver & Shapiro, 1997; Sherraden, 1991; Wolff, 1995; Zhan, 2006). Income denotes the inflow of financial resources (Sherraden, 1991) and becomes an asset only if saved for future use (Oliver & Shapiro, 2006). Assets refer to accumulated resources, including deferred income. Assets can be abstract (i.e., intangible) or concrete (i.e., tangible) (Sherraden, 1991; Sparr & Moser, 2007), but a broad definition of assets, though useful in some cases, “runs the risk of blurring a great many meanings of assets and may not serve very well in thinking about social issues related to government policies” (Nam, Huang, & Sherraden, 2008, p. 2).

This study focuses on tangible assets (e.g., wealth and physical property), which are the most relevant for educational outcomes in Ghana. Measuring tangible assets is a more focused way to gauge/measure economic resources, and studying their impact on educational outcomes
ensures that this study draws on the theoretical perspective that assets are a tool for socioeconomic development of young people (see Nam, Huang, & Sherraden, 2008). Specific examples of tangible assets include but are not limited to (1) financial savings; (2) stocks, bonds, and other financial securities; (3) real property; (4) hard assets other than real estate (e.g., automobiles); (5) machines, equipment, tools, and other tangible components of production; (6) durable household goods; and (7) livestock (Nam, Huang, & Sherraden, 2008).

In this study, the term economic resources refers to income and assets, unless specified otherwise. As necessary, ownership of an economic resource—by student, parent, or household—will be clarified.

Conclusion

For many in Ghana, progressing beyond JHS is critical to future socioeconomic well-being. There are several infrastructural and personnel inadequacies that may contribute to the problem, but two of the major barriers to progression are low academic performance and inability to afford fees and school-related expenses. However, individual and household economic resources might help fund students’ education, which could affect their academic performance at the JHS level. Emerging theoretical and empirical work on asset effects—especially in developed countries and some SSA countries (e.g., Uganda)—are the basis for this reasoning (Chowa, Ansong, & Masa, 2010). However, empirical research has not yet shown the effects of economic resources on academic performance in Ghana. It is not clear what type of economic resources or whose economic resources matter most in improving academic performance. We know little about how the direction and magnitude of the relationship may change when individual, classroom, and school factors are considered. We do not know whether economic resources directly influence academic performance or whether behavioral and personal
psychological factors mediate these relationships. This study contributes to the knowledge base by examining these questions and shedding light on how findings may confirm or deviate from what we know empirically about the relationship between economic resources and academic performance in other contexts.
Chapter 2: Theoretical Framework

Overview

Using the human capital development framework, I address the sources of and motivations for individual and household investment in formal education. I also explore the direct and indirect effects of income and assets on educational outcomes.

Human Capital Development

Understanding the relationships between economic resources and educational outcomes requires a focus on the broader question of what motivates educational investment. Why and how do others, especially parents and relatives, get involved in education of youth? Why does it matter to invest in youth education beyond basic school? The human capital development perspective provides a framework for understanding important aspects of investment in youth education.

In their seminal work in the early 1960s, Theodore Schultz, Gary Becker, and Jacob Mincer set the stage for debate on what constitutes human capital and how human capital relates to future well-being, productive activities, and earnings (Beaulieu & Mulkey, 1995; Hayami, 2009; Nureev, 2010). Human capital is an individual’s stock of skills, specialized knowledge, experience, and acquired abilities that result from formal and informal education. In this study, I will focus on the benefits of formal education without discounting apprenticeships, on-the-job training, and other avenues for human capital accumulation.

A key argument in favor of human capital investment is that knowledge and skills bring returns to individuals and communities, organizations, and civil society (Hayami, 2009; Kwon, 2009). The human capital development framework is grounded in the assumption that people are rational and weigh the benefits and costs of their investment in human capital (Becker, 1996;
Schultz, 2003). Economists view education as capital good because individuals’ knowledge and skills affect productivity levels and lead to economic growth through spending of earnings (Beaulieu & Mulkey, 1995; Ng & Feldman, 2010; Olaniyan & Okemakinde, 2008). In addition to these economic returns of human capital investment, there are social benefits of self-respect and honor (Acemoglu & Angrist, 1999; Moretti, 2004). As people acquire more education, they acquire more competencies that boost their self-worth, and they may become more useful to others who may need their help.

One underlying assumption of the human capital development perspective is that capital acquisition is multileveled with individual, family, community, and national levels influencing knowledge and skills acquisition (Hayami, 2009; Kwon, 2009). At the individual-level, personality traits that influence human capital accumulation include genetic makeup, physical and mental qualities, strength, and intelligence (Nureev, 2010). Family- and household-level characteristics that constrain or facilitate investment in children’s human capital include parents’ education, interests, decision-making power dynamics, and economic status (Akresh, Bagby, de Walque, & Kazianga, 2012a). Communities and countries contribute to the development of human capital through education by devoting resources to educational infrastructure.

Human capital development is not always a personal decision (Olaniyan & Okemakinde, 2008), especially for children and youth who depend on parents’, relatives’, and guardians’ investments in their knowledge and skills acquisition. Also, if parents’ resources are limited, their ability to spend money and time on children’s education will be affected. The type of investment also depends on “…financial capabilities in the families [and] the prospective utilization of the capital which is being accumulated” (Mincer & Polachek, 1974, p. S77). Parents’ financial resources and their knowledge of options, returns, and costs influence
investment in their children’s education. Many parents and families may make deliberate financial sacrifices hoping for future benefits (Hayami, 2009). For example, a Ghanaian parent might sell or use property as collateral to raise money to support a child’s education in the hope of better returns in the future.

Similarly, governments’ and other entities’ investments through policies—such as compulsory school attendance—hinge on the premise of financial capacity and prospects of future benefits to individuals and society. When the government makes an educational investment, youth seldom have a say in how it happens. Even when children have resources and are aware of available human capital investment options, they may not have enough information about those options or may lack maturity to make informed and rational choices. As Fischhoff (1992) explains, youth who lack information often do not make the best decisions. Even when they have adequate information, “…they often do a poor job of understanding the probabilities of consequences… [and] they are more likely to rely on personal experiences” (Fischhoff, Crowell, & Kipke, 1999, p. 3). Some youth may not have had the personal experiences that are pivotal in making informed decisions about educational investments.

Human capital is developed through accumulation over time (Cisternas, 2011; Tamura, 2004). Within the context of formal education, the human capital accumulation process starts from preschool and builds progressively through higher education and beyond. This means it is important that individuals go beyond the basic school level if they want to acquire advanced knowledge and skills to be competitive in the future. More human capital investments (e.g., more years of education and training) often yield greater returns. In Ghana, for instance, individuals who acquire formal education up to the basic education level may not be as marketable as those who attend school beyond JHS (Sackey, 2008). The higher the levels of education attained, the
greater the returns. Two individuals with the same job titles but different levels of education might earn different salaries, even if they are similar in productivity (College Board, 2005; Day & Newburger, 2002). Research on youth earnings in Harare, Zimbabwe, finds that individuals with higher education earn about 21% more than those with a GCE O-level (SHS) certificate (Zhou, 2002). Individuals who have O-level certificates earn 25% more than those without it.

Although more years of education and higher credentials may not always translate into better performance, having them positively influences the chances of employment and earnings. These differential returns on human capital investment can motivate parents and youth to strive for more education or training beyond the basic level to reap more benefits.

Gender also affects the allocation of investments in human capital (Mincer & Polachek, 1974), partly because in many societies, returns on education differ by gender. In developed and developing countries, occupational differences still exist between men and women. Even when the labor force has a high representation of women, they frequently are employed in low-earning activities (Heintz, 2005). In the US for instance, the average salary of female researchers in the medical field is lower than that of men in the same field, regardless of specialty, rank, leadership positions, and number of publications (Jagsi et al, 2012).

If the theoretical argument holds that human capital investment depends on expected returns, investment in girls’ education is lower than investment in boys’ in many societies (Jensen, 2010). For some families, the idea that most girls will join their husbands’ families after marriage means that the return on any human capital investment may not always have direct benefits to their parents (Foster & Rosenzweig, 2009), which could be a disincentive (Jensen, 2010). Thus, it is important that studies such as this one take into account gender dynamics that
influence how people make human capital investment decisions, which may lead to different outcomes.

The foregoing review of the human capital development perspective focused on motivations for, sources of, and gender dynamics in human capital investment. Next, I discuss the theoretical frameworks which explain how income and assets affect academic success.

**Effects of Income on Educational Outcomes**

Income is an important economic resource that enables people to afford educational resources and services. The relevance of income to education lies mostly in its ability to fund important educational expenses, such as daily school lunch, stationery, school supplies, and tuition. Because of the importance of income for education, governments often step in to provide income support to families (Mayer, 2010). Indeed, the increase in income-maintenance strategies—including conditional cash transfer (CCT) programs in Ghana and other SSA countries—is due to the impact they are having on school enrollment and school attendance (Garcia & More, 2012).

While the presence of income boosts educational investment, which results in better educational outcomes, the absence of income has negative effects on educational investments. When the steady flow of income is interrupted by job loss or other events, investment in education also may diminish. Some families in developing countries such as Ghana respond to these income shocks by increasing children’s labor to supplement household income (Chowa, Ansong, & Masa, 2011; Beegle, Dehejia, & Gatti, 2003; World Bank & UNICEF, 2009).

There are also situations where changes in flow of income compels some parents and guardians to frequently change jobs and housing locations, which leads to school changes (Ross & Roberts, 1999). Continuous residential and school mobility is associated with lower math
scores, more grade failures, and school behavior problems (McDonnell, Crook, & Chellman, 2012; Ross & Roberts, 1999). Frequent changes of school make it difficult for students to feel connected to a school and build important alliances and friendships, which are important for staying on course in school.

Friedman’s permanent income hypothesis (PIH) is a cornerstone of the theorized connection between income and educational expenditures. His hypothesis is that an individual’s ability to forecast future income determines how they spend or invest current income (Wang 2006). Someone convinced that human capital will result in more future income is more inclined to spend current income on its development. Proponents of the PIH expect in-school youths’ future incomes to be higher than their current incomes because they will obtain higher paying jobs that require superior knowledge and skills. In other words, those who expect education to result in higher future incomes may be motivated to spend on education now. Studies in Ghana suggest that the economic motivation to invest in education is boosted further when the household size is small and the head has formal education (Alhassan, 2010; Donkoh & Amikuzuno, 2011).

Income is important for human capital development, but relying solely on it may not result in long-term educational well-being (Sherraden, 1991; Boshara, 2009). When it comes to education, long-term and short-term investments are both important. Uncertainties about continuous income may lead to doubts that resources will be available to pay for future educational costs, especially for students who plan to progress to higher education levels.

Another challenge with the income perspective is that young people in particular may not have income. As the neoclassical lifecycle theory asserts, income does not flow throughout all stages of the lifecycle. School-age youth are likely to have limited or no income, which means
most depend on employed parents and adult relatives to assist with their educational investments. However, parents’ and relatives’ incomes often are susceptible to inconsistent flow because of job loss, death, or illness (Ansong, Chowa, Grinstein-Weiss, 2013; Sherraden, 1991). When these unexpected events happen, a young person may have no choice but to drop out of school, unless there are other economic resources to draw on.

In essence, income is important for short-term educational expenditure but may not be the most reliable means of funding long-term human capital development. For income to have a significant effect on future educational well-being, it has to create a storehouse of future consumption through asset accumulation. Thus, in addition to needing income for short-term educational expenses, the youth and their families also need assets to serve as insurance against future reductions or losses of income. According to Shapiro and Wolff (2005, p. 12), “wealth (assets) signifies a command over financial resources that, when combined with income, can produce the opportunity to secure ‘good life’ in whatever form is needed or desired – education, training…” With this distinction between income and assets, how distinct are the impacts of income and assets on educational outcomes? One would expect variations in the magnitude and nature of the associations because of the inherent differences in these types of resources. A discussion of the relationship between assets and educational outcomes follows.

**Effects of Assets on Educational Outcomes**

If income is important but sometimes insufficient for supporting long-term educational outcomes, can assets fill the gap? The asset-effect perspective asserts that assets can have short-term, long-term, direct, and indirect impacts on educational outcomes. Michael Sherraden (1991) hypothesized that beyond consumption effects, assets have important effects on several domains of individuals’ and families’ economic, psychological, social, and educational outcomes. If
assets influence young people’s educational outcomes, by what mechanisms does this happen in the Ghanaian context? Next, I discuss how the asset-effect framework theorizes the direct and indirect mechanisms by which assets affect educational outcomes.

**Direct Effects of Economic Resources on Educational Outcomes**

One may hypothesize a direct link from assets to educational outcomes (Elliott, Kim, Jung, & Zhan, 2010), because people often rely on wealth and fungible resources to pay for school-related expenses. As in other SSA countries, Ghanaian children often are denied access to education because their families cannot afford fees (Agbewode, 2009). Even though basic school is supposed to be free because of government policies and programs, some schools charge additional fees and levies that lead some families to tap into their economic resources. Some pupils cannot go to school because they have not paid their fees (Siziya, Muula, & Rudatsikira, 2007).

Education is high-priority expenditure for many families in Ghana and many African countries, and some individuals and families accumulate savings from their jobs and other productive assets for the specific purpose of paying school tuition and expenses for their children (Bouman, 1995). Those with limited or no financial resources may sell off personal or family properties, and some use assets as collateral to secure loans (Lerman & McKernan, 2008) to finance educational investments. Student loan programs in Ghana have formidable problems (Woodhall, 1992), and obtaining educational loans is a challenge for most individuals, especially at the SHS level. Basic-level education is subsidized, and student loan programs are readily available for tertiary-level (i.e., college) students. That leaves SHS-level students with limited options for funding their education. For those who cannot easily access student loans or the
limited scholarships, one option is to use non-moveable personal or family assets (e.g., houses and land) as collateral for commercial loans.

The direct effects of assets on educational access are more evident in countries such as Ghana where most individuals cannot depend on the limited number of scholarships available, which often do not cover living expenses or school-related needs (OECD and The World Bank, 2007). Even students who receive scholarships must bear school-related expenses in the course of their education, which makes having personal and family assets critical. Kimuyu (1999) explains that some households in rural East Africa participate in savings schemes such as RoSCAs to accumulate enough savings to pay school fees. Students who do not have sufficient financial assets or other forms of economic resources may have to forego school until resources become available.

**Indirect Effects of Economic Resources on Educational Outcomes**

Some asset researchers have built on the original conceptualization of direct asset effects by suggesting that assets also have indirect effects on educational outcomes (Ansong, Chowa, & Grinstein, 2013; Shobe & Page-Adams, 2001). The indirect asset-effect framework suggests that assets may change people’s thinking and behavior, which in turn, may affect how students perform in school. Two pathways—academic self-efficacy and academic expectations—explain how this happens for JHS students.

**Academic self-efficacy pathway:** Defined as a belief in one’s ability to accomplish a particular task successfully, self-efficacy often depends on whether one has the opportunity to participate in knowledge and skills acquisition through formal education. The sense of control obtained by accumulating, managing, and spending economic resources also improves self-efficacy (Bynner & Paxton, 2001). This is consistent with the vicarious learning perspective,
which suggests that observational learning (i.e., modeling) is a key determinant of self-efficacy (Bandura, 1997; Gist & Mitchell, 1992; Law & Hall, 2009).

External social and economic factors, including the presence or absence of income and assets, influence the development of self-efficacy. When these economic resources are available, people react to them in varying ways that may affect their beliefs and how they feel about their capabilities (Pajares & Schunk, 2001; Shobe & Page-Adams, 2001). Byunner and Paxton (2001, p.5) suggest that “having an asset allows a household to be more confident looking to the future and will enable people to take more active control of their lives.”

As economic resources influence self-efficacy, self-efficacy may in turn affect educational outcomes (Bean & Sidora-Arcoleo, 2012; Chow, Masa, Wretman, & Ansong, 2013; Page-Adams & Sherraden, 1996; Sherraden, 1991). Since the 1980s, motivation researchers and educational psychologists have focused considerable attention on the relationship between self-efficacy and positive educational outcomes. So far, studies have shown that academic self-efficacy predicts college grades (Bong, 2001; Zajacova, Lynch, & Espenshade, 2005), hours spent on schoolwork (Torres & Solberg, 2001), and the propensity to stay in school (Zhang & RiCharde, 1998). Young people’s beliefs about their capabilities influence their task choices and the effort they put into their schoolwork (Bandura, 1997; Schunk, 1995; Schunk & Pajares, 2002). Students who feel capable tend to work harder and seldom give up when faced with obstacles (Schunk & Pajares, 2002). Bandura’s social cognitive theory posits that when students believe in their self-efficacy, they are motivated to use acquired knowledge and skills to tackle academic challenges, which eventually result in better academic outcomes (Zajacova, Lynch, & Espenshade, 2005). Confident young people tend to view difficult school assignments as challenges and work hard to address them (Pajares & Schunk, 2001).
In Bandura’s view, students’ feelings of self-efficacy determine how they set personal academic goals and behave in school. Research on academic self-efficacy of students suggests that perceived self-efficacy influences the setting of academic goals and final academic performance (Bandura, Barbaranelli, Gian, & Pastoreili, 1996; Grabowski, Call, & Mortimer, 2001; Zimmerman, Bandura, & Martinez-Pons, 1992). The more students believe in their abilities, the more they would exercise control over how they think, feel, and behave in school.

Concerns about limitations or a lack of economic resources to pay for educational expenses can arouse academic stress or doubts, which may disrupt learning abilities (NIH News, 2012; Yousefi, et al., 2010). In the absence of such anxieties and self-doubts, students are motivated to concentrate on schoolwork, increase their study hours, and seek help from teachers and/or colleagues, all of which are important for performing well in school (see Oyserman, Bybee, & Terry, 2006). Even students with superior academic skills may need motivation to use their academic prowess. In other words, competent and brilliant students need some level of belief in their own capabilities to excel in school. The availability of sufficient economic resources to pay for school expenses allows students to be confident and proactively use their skills. Bandura (1986) explains that, “judgments of efficacy …determine how much effort people will expend and how long they will persist in the face of obstacles or aversive experiences. The stronger their perceived self-efficacy, the more vigorous and persistent are their efforts” (p. 394). In short, the presence of economic resources may influence students’ beliefs about what they can accomplish. Confidence in one’s capabilities may in turn affect amount of effort and academic performance.

*Academic expectations pathway:* Economic resources also affect educational outcomes indirectly through academic expectations. Most people, including young students, have hopes,
goals, and plans for the future. Those who have positive expectations anticipate better opportunities in the future, which form the basis for goal setting, planning, and behaving in ways to optimize goal attainment (Christy-McMullin, Shobe, & Wills, 2009; Hideg & Novaky, 2002; Seginer, 2009).

Motivation for positive expectations often is stimulated by individuals’ interactions with their physical and social environments (Seginer, 2009). When parents invest substantial economic resources into their children’s education, they expect their children to perform well because they have provided for their school needs. Some parents may not only have high academic expectations of their children but will also get involved in their children’s schooling to make sure their educational investments are not wasted. Children who are aware of their parents’ educational expectations may be motivated to work harder in school in order not to disappoint their parents. On the other hand, those who feel overly pressured to perform may be inclined to rebel against what they perceive as unrealistic expectations and incessant pressure; such rebellion could negatively affect their academic performance (Akhtar & Aziz, 2011; Peixoto, 2011).

Some theorists suggest that an active process of interconnection and coexistence occurs between people and their physical environments (i.e., the environment influences people’s thoughts and behaviors just as people manage and shape their environments) (Werner & Altman, 2000; Werner, Brown, & Altman, 2002). Stimulation to think and behave in certain ways also comes from children’s physical environments. The ongoing interconnections and interactions with the physical environment include the processes of accumulating resources and managing those already accumulated. Managing personal economic resources might prompt people to think about future possibilities. Young people who assist their parents manage a productive asset (e.g., rental properties such as a commercial vehicle or house) may think about what they can do to
accumulate similar assets or achieve even greater success in the future. Conversely, youth from families with fewer or no assets may not even consider attaining higher education level because they lack the financial resources to sustain the process. It is possible that some people with few resources may also be even further motivated because of their desire to experience better life situations that will be different from the difficult experiences of their parents. Notwithstanding, their perception of what might be feasible, in terms of being able to pay for higher education, may become an obstacle. In order for students from poor households to intensify and sustain their hard work toward higher education (i.e. future identity), they must first be convinced that resources are available to help pay for future tuition and other school related expenses (Elliott, Chowa, & Loke, 2011).

Stimuli that influence thoughts and behaviors vary in intensity, frequency, duration, number of sources, and type (Hutchison, 2008; Sundstrom, Bell, Busby, & Asmus, 1996). This means that different levels, sources, and types of economic resources or expectations could have varying effects on behavior. Hutchison (2008) explains that an overload or deprivation of environmental stimuli (i.e., physical and social) can have negative influences on human behavior. That means overly high parental expectation or lack of any form of parental expectation could hinder academic achievement.

Young people have sophisticated cognitive abilities that allow them to respond to stimuli from available economic resources. They can reconstruct past and current events and imagine likely future outcomes of their actions (Taylor & Pham, 1996). This cognitive stimulation is reflected in their expectations for and worries about the future. Depending on how young people’s experiences and social contexts influence their thoughts, they may develop fears or hopes that affect how they behave and plan for the future. For instance, the fear of not
transitioning from JHS to SHS because of associated costs might lead a young person to give up on schooling altogether. Conversely, a young person who has financial security because of their personal or family income and assets may be more optimistic about the future and would think about how they can take advantage of available resources.

Once people have pondered and decided how they would wish their future to look, they engage in behaviors that are consistent with their thoughts and expectations. The theory of reasoned action (TRA), developed by Fishbein and Ajzen in the mid-1970s, explains the relationship between cognitive processes and actions. The TRA holds that beliefs and intention (i.e., cognitive representation) are immediate antecedent of behavior (Fishbein & Ajzen, 1975; Rutter & Bunce, 1989). In other words, individuals’ assessment of future consequences plays a critical role in deciding how to behave. After evaluating likely outcomes, people may engage in exploratory behaviors, such as seeking advice and gathering information about available options. Behaviors also could be direct commitments to a specific option (Seginer, 2009), such as engaging more seriously in academic work and studies (Horstmanshof & Zimitat, 2007).

The Asset Experience

Related to the idea that assets have indirect effects on educational outcomes is the idea of asset experience. Bynner and Paxton (2001) expanded the original concept of asset effects by suggesting that one should understand asset effects in terms of not only psychological, social, and economic outcomes but also benefits acquired during asset accumulation, management, and spending. This process—termed the asset experience—could serve as a learning opportunity for many young people in Ghana. Some parents and guardians involve their children in asset accumulation efforts to impart entrepreneurial and money management skills. Many communities in Ghana historically have had community norms and traditional institutional
structures that foster occupational socialization of younger members of the household (Apt, 2005; Apt, Blavo, & Opoku, 1992; Centre for Social Policy Studies [CSPS], 2001). As Mbebeb (2009) explains:

In the African traditional setting, occupations and vocational training of the youth were tied to family or kinsman. The primary obligation of the family was to niche the child for a comprehensive task in the family and society. Socialization of family members and kinsmen into economic roles became a cultural value in respect of the old age utilitarian education practice. Learning most occurred through imitation, observation and apprenticeship where learners were socialized into life skills in a life space. Learning in a real life situation had direct impact on vocational awareness, entrepreneurial drive and employability. (p. 26)

Young people who participate in accumulation and management of economic resources gain knowledge and develop their human capital, both of which are valuable to their future careers and endeavors. In many communities and cultures, youth have responsibilities in a family business—a type of asset—which teaches them how, where, and when to accumulate economic resources. Young people still in school may bring their resource accumulation and management experience to the classroom, which may influence academic performance. Like internships, the asset experience might offer helpful practical experiences and opportunities to apply theories taught in the classroom. This is consistent with the participatory action research approach, an effective framework for helping youth take meaning from what they learn in school (Engelman & Hazel, 2010). In fact, young people who participate in internships, job shadowing, and SHS-based businesses gain early occupational experience and vocational exploration (Shanahan, Mortimer, & Kruger, 2002).
Benefits of resource accumulation and management might be more evident at the SHS level where students start specializing in specific areas and courses of study. For example, a student specializing in business studies or economics might be able to relate theoretical knowledge to their work during weekends and long vacations during which students typically help their families manage businesses.

However, involvement of school-age youth in asset-generating activities can be problematic because it could get in the way of school work. In a systematic review of studies on assets and child wellbeing, Chowa, Ansong, and Masa (2010) found that certain types of asset accumulation might interfere with young people’s schooling and other developmental outcomes in developing countries. Nevertheless, there is a learning component of asset accumulation. Building and managing assets may teach youth what to repeat or avoid, and these valuable life lessons can be applied to coursework and future choices.

**Summary**

This chapter reviewed the human capital development perspective that attempts to explain motivations for investing in education. Also discussed are the effects that income and assets may have on educational outcomes. The nature and amount of assets that people own play a significant role in their ability to access educational resources and services for personal development. Similarly, the chapter draws on the asset-effects framework combined with the social cognitive theory (SCT) and theory of reasoned action (TRA) to explain how the management and use of assets and interactions with them can change people’s behaviors. Direct and indirect effects of assets are critical if they are to have a significant impact on young people’s education. The forgoing discussions on theoretical perspectives of income and asset ownership offer logical ways through which economic resources can influence educational
outcomes. The key question is whether there is enough evidence to support the theoretical explanations. The next chapter reviews empirical studies on the nature of the relationship between economic resources and educational outcomes.
Chapter 3: Empirical Evidence

Overview

This chapter presents empirical evidence of the connection between economic resources and educational outcomes in developed and developing countries. Although existing studies examine a wider range of ages than the current work, results suggest that there are positive relationships between economic resources and educational outcomes for youth of all ages. Studies included here have found positive, negative, and mixed effects, and some test moderated and mediated effects of economic resources. Because other factors affect educational outcomes, I conclude with a review of literature on individual, classroom, and school covariates that might mediate, suppress, or confound the relationship between economic resources and educational outcomes.

Evidence from Developed Countries

Empirical studies in developed countries—mostly the US and Europe—suggest that income and assets have direct and indirect positive impacts on several educational outcomes, including school grades, enrollment and graduation (Corwyn & Bradley, 2002; Destin & Oyserman, 2009; Nam & Huang, 2009; Williams Shanks, Kim, Loke, & Destin, 2010).

Effects of Income on Educational Outcomes

Most studies that investigate the relationship between income and educational outcomes find significant positive associations (Nam & Huang, 2009). A study by Acemoglu and Pischke (2001) that uses data from three longitudinal surveys of high school graduates in the US finds that a 10% increase in family income is associated with 1.4% increase in the likelihood of enrolling in college. Brooks-Gunn, Klebanov and Duncan (1996) follow children from birth to
age 5 and find that parents’ income during a child’s first three years has a strong effect on the child’s intelligence test scores, regardless of family structure and mother’s education and age. Using National Longitudinal Survey data, Dahl and Lochner (2012) find that a $1,000 increase in income improves children’s academic test scores by 6%.

Other studies investigate the relationship between income and other types of educational outcomes. One of the few studies that have investigated the relationship between income and school behavior finds that higher family income is associated with lower risk of school dropout among ninth graders in US urban schools (Randolph, Fraser, & Orthner, 2006). The study also finds differences in dropout by race but not gender. Another study by Hilger (2012) finds causal effects of parental income on college enrollment in the US and that females have slightly higher—but not statistically significant—enrollment rates than males. Belley and Lochner (2007) also find that higher family income is strongly positively associated with educational attainment, which is consistent with the hypothesized association between income and educational outcomes in Chapter 2.

The evidence of positive relationships between income and educational outcomes in the US is consistent with findings from European studies. In Norway, Loken (2010) uses longitudinal data from 1967 to 1969 to examine the causal effects of permanent family income on children’s educational attainment and finds a positive relationship. Using data from the British Cohort Study (BCS) and the British Household Panel Study (BHPS), Blanden and Gregg (2004) find that family income has a causal relationship with educational attainment.

While most studies that link income and educational outcomes find strong positive relationships between income and children’s academic performance, others find mixed or contradictory results. In a national survey of families in the US, Corwyn and Bradley (2002) find
no statistically significant effect of household income on European American children but a small effect on children in minority groups, including African Americans and Hispanics. Using data from the Panel Study of Income Dynamics (PSID), Shea (2000) finds a negligible impact of parents’ permanent income on children’s years of schooling, especially when fathers have more years of education. Shea also finds that results are more robust for boys, possibly because fathers tend to bequeath more resources to sons than daughters. Another study by Chevalier, Harmon, O’Sullivan, and Walker (2005), finds that controlling for parental education, permanent income does not significantly explain whether or not a student will drop out of school by age 16.

Though most income-related studies examine the direct relationship between income and educational outcomes, few have specified and tested the mediating role of parental expectations. For example, Davis-Kean (2005) uses a structural equation modeling approach to show that parents’ income indirectly affects academic performance through their expectations and behavior and that girls perform slightly better than boys on reading tests. Using data from Baltimore fourth-grade students and their parents, Alexander, Entwisle, and Bedinger (1994) find that parental expectations directly affect test scores and school behavior and also mediate the influence of income and home environment on educational outcomes. The current study examines similar relationships by assessing whether income is directly associated with academic performance in Ghana or indirectly through youth academic expectations, and whether this varies by gender.

**Effects of Assets on Educational Outcomes**

In developed countries, different types of assets are connected to different educational outcomes. Using data from the 1979 National Longitudinal Survey of Youth (NLSY79) Orr (2003) finds that U.S. households’ income-producing assets (i.e., estates, farm, stocks, and
bonds) were significantly associated with standardized math scores, regardless of children’s
gender. Destin and Oyserman (2009) also used datasets from Chicago and Detroit to investigate
the impact of financial assets on adolescents’ planned academic effort and expectations for
higher grades. The study reveals that when students believe financial assets are available to pay
for school, they tend to have higher expectations of their grades and plan to put more effort into
their school work. Destin and Oyserman (2009) also find no significant variation by gender.

Some studies investigate the effect of family homeownership and consistently find
positive impacts on children’s educational outcomes. In one such study, Zhan and Sherraden
(2003) find that mothers’ homeownership is associated with children’s higher grade point
averages (GPAs), but results are estimated to be significantly higher for girls than for boys. Other
studies find that homeownership is associated with improved math and reading test scores
(Essen, Fogelman, & Head, 1978), and school attendance (Aaronson, 2000; Green & White,
1997). Lovenheim (2011) finds that college enrollment increases by 5.7% when housing value
increases by $10,000 in the US. What is not clear is the relationship between homeownership
and educational outcomes is whether the positive impacts of homeownership are due to the
stability of residence, neighbor characteristics or the homeownership itself.

Youth-owned assets, such as savings in a bank or money kept at home, may also have
implications for several educational outcomes. Using data from the US PSID and its Child
Development Supplement, Elliott (2008) documents a positive relationship between youth-
owned economic resources and academic outcomes. Elliott finds that young people aged 18 and
younger who have savings designated for school score higher in math than those who do not
have such savings. The study also controls for gender and finds that while boys score 3.71 points
higher on math tests than girls, girls are 31% more likely to expect to attend college.
Another dimension of the conceptual connection between assets and educational outcomes is the mediational role of other factors, including parents’ and youth’s expectations and future orientation. Sherraden (1991) explains that assets boost self-efficacy and create a sense of orientation toward the future. Evidence—mostly from the US—supports this hypothesis that assets may lead to psychological outcomes (e.g., expectations, self-efficacy, and future orientation). A study by Elliott, Kim, Jung, and Zhan (2010) finds that parents’ asset ownership affects their expectations, which indirectly affects their children’s math scores. This is congruent with Zhan and Sherraden’s (2003) finding that mothers’ expectations of children’s educational success act as a mediator in the relationship between assets (e.g., home ownership and savings) and educational achievement. Using data from the NLSY79, Zhan (2006) finds that parents’ future expectations mediate the association between parental assets and educational outcomes. Kim (2010) similarly finds that children’s educational expectations partially explain the positive impact of net worth and financial assets on school dropout rates.

Findings from the studies discussed above are consistent with the theorized relationships—direct and indirect—between economic resources and educational outcomes, but there are nuances in the directions and mechanisms of the relationships. Economic resources (e.g., income and assets) and educational outcomes are not always positively associated, and the relationships between them are not always statistically significant. For example, an individual could become overly confident about educational outcomes, which could result in complacency of effort. Children from advantaged families might not work hard in school because their parents’ economic resources assure a secure future.

Some studies have found no statistically significant association between assets and educational outcomes. Elliott, Kim, Jung, and Zhan (2010) find a positive relationship between
wealth (net worth, homeownership, and children’s savings for school) and children’s math scores among Caucasian parents but not among African American parents, and Kim (2010) finds that income is associated with other educational outcomes (high school completion, college attendance, and college degree attainment) but not high school dropout rates. Similarly, a study by Orr (2003) in the United States finds that income-generating assets are statistically significantly associated with math scores but non-income-generating assets are not associated with math scores. Variation in type and measurement of educational outcomes, ownership structure of economic resources (i.e., whether the resources are owned by youth, parent, or household), and other socio-demographic factors (e.g., gender) could impact results. Some variation could be attributed to methodological issues and dataset limitations. For instance, studies use varying approaches to account for differences in outcomes by gender, including splitting samples by gender, modeling interaction term between gender and other variables, or entering gender as a control variable in regression models. This study will help fill some of the research gaps by examining how gender and asset ownership may affect academic performance as measured by math and English subject grades.

Evidence from Sub-Saharan Africa

Given the evidence of mixed but mostly positive direct and indirect associations between economic resources and educational outcomes in developed countries, can we expect similar results from Ghana and other SSA countries? Research is lacking, but rigorous empirical research is emerging in Ghana (Chowa, Masa, Wretman, & Ansong, 2013). Until recently, studies on economic resources and education in Ghana have focused on resources owned by parents and other family members and have had inconsistent results. Empirical evidence discussed in this section suggests that the relationship could be positive, negative, or both.
Effects of Income on Educational Outcomes

Empirical research on the independent effects of income on educational outcomes in Sub-Saharan Africa (SSA) is limited, and most studies examine income effects in the larger context of household socioeconomic status (SES). Tansel (1997) conducts one of the few empirical studies on the independent effect of income on educational outcomes and finds that household income in Ghana and Côte d’Ivoire is the most significant predictor that families will invest in children’s education and that children will advance beyond basic education. Acheampong (2007) also finds that Ghanaian children in households with limited income are less likely to attend JHS or transition from JHS to SHS than children from more advantaged families. Conversely, Cockburn and Dostie (2007) report that household income in Ethiopia negatively affects school attendance because students’ work time competes with school hours. This finding is consistent with other studies in Ethiopia by Rose and Al-Samarrai (1997), and Weir (1997) that find that income opportunities such as child work are associated with low school enrollment. This means some children miss school because they are engaged in income generating activities.

Some studies in SSA investigate how cultural beliefs and practices related to gender roles influence the relationship between income and educational outcomes. Using data from Mozambique’s Household Survey of 2002/2003, Bilale (2007) finds that household income is significantly associated with enrollment and academic performance and that, boys in primary school perform better than girls. Handa, Simler, and Harrower (2004) use data from Mozambique’s Household Survey of 1996/1997 and find that household income is strongly associated with primary school enrollment, with boys in rural areas recording significantly higher enrollment rate than girls. In a study of 1,725 households in Guinea, Glick and Sahn
(2000) find that increases in household income have a significantly greater influence on girls’ enrollment than boys’.

The few studies in SSA that have disentangled the effects of income from other economic resources and socio-economic status indicators have mostly ignored the potential mediational role of psychological factors (e.g., self-efficacy and expectations). Empirical research—such as what is presented in the current study—is needed to test the hypothesized indirect pathway from economic resources (e.g., income) to educational outcomes.

**Effects of Assets on Educational Outcomes**

Other studies on economic resources and educational outcomes in SSA have focused on household assets and generally reveal a positive association between asset ownership and school enrollment, attendance, and completion (Filmer and Pritchett, 2001; Montgomery, Grant, Mensch & Roushdy, 2005; Montgomery & Hewett, 2005). Filmer and Pritchett (1999) use survey data from 35 developing countries, including Ghana, to examine how household wealth affects educational attainment of 15- to 19-year old youth. Using an asset index as a measure for household wealth, the authors find that wealth is positively associated with basic school enrollment. According to the study, in regions like Central Africa, many children from low-income households never enroll in school, possibly because such low-income households lack resources to pay for school-related expenses. Cockburn and Dostie (2007) also find that a family’s ownership of assets—in the form of ploughs and sickles—increases school attendance. Perhaps the amount of time youth are required to work on the farm is reduced—and subsequently the amount of time youth are able to spend in school is increased—if the family owns assets such as farm equipment. Clearly, more rigorous research is needed to investigate these asset ownership mechanisms.
Just as there is limited mediational studies on the relationship between income and education in SSA, few empirical studies investigate assets’ influence on educational outcomes in SSA. One of such few studies is the 2005 study by Ssewamala and Curley who find that Ugandan students with access to a savings account have positive plans and become more confident about them. Although the authors did not specifically test mediational roles of these psychological factors, they suggest that they are important antecedents to changes in school behavior and improvement in academic performance.

A number of studies in SSA examine the differences in how assets’ influence educational outcomes for rural and urban youth as well as for girls and boys. Studies by Jensen and Nielson (1997) and Buchmann (2000) find that although land ownership has a negative effect on school attendance, the negative relationship tends to be stronger in rural areas. Because of their proximity to owned land, families in rural areas may expect children to work on farmlands and they may perceive it as the best future career for the children as opposed to formal education, whereas children in urban areas likely live too far from the land for farm work to be feasible. Using data from the 2000 Multiple Indicator Cluster Survey in Senegal, Montgomery and Hewett (2005) find that children from households in the lowest wealth quintile are less likely than those in higher wealth quintiles to ever attend school or complete at least primary education. The authors also reveal that the absence of assets exerts a stronger negative influence in rural areas. Montgomery and Hewett believe this rural–urban difference can be explained by urban families’ relatively easier access to educational infrastructure. This suggests that rural–urban differences in infrastructure might moderate the relationship between parent and household economic resources and educational outcomes.
One might argue that those living in rural areas—regardless of their economic resources—would have comparatively low educational outcomes because school infrastructure is lacking. This may be true for some but not all rural dwellers. In rural areas with poor academic performance and low attendance, family resource constraints might worsen the already poor educational experience of students. For example, the Resource-Dilution perspective explains that when resources cannot support the education of all children in the household, parents might ask some children, particularly younger ones, to stay home. If resources become available, out-of-school children in the household may then go to school.

Unlike the consistent results in the rural–urban variation, studies show mixed results for the moderational effect of gender in the relationship between assets and educational outcomes. For instance, Lincove (2009) examines the association between household wealth and school attendance in Nigeria and finds significant relationship with girls’ schooling but not boys’. Similarly, Ssewamala, Karimli, Han and Ismayilova (2010) find that children’s savings accounts in Uganda have a significantly larger positive influence on adolescent girls’ educational plans than boys’. In contrast, Curley, Ssewamala, and Han (2010) do not find gender variations in the relationship between children’s savings accounts and better educational outcomes in Uganda. While studies in Ghana reveal that educational attainment does vary by gender (Abukari, 2010; Dunne & Leach, 2007; Mensch & Lloyd, 1998), research has not yet sufficiently explained the role of gender dynamics. Thus, this study will test the moderation effect of young people’s gender in the relationship between economic resources and their academic performance.

Generally, assets positively influence education outcomes directly (e.g., by financing educational needs) or through psychological factors (e.g., self-efficacy and expectations). However, is it possible for some kinds of assets to influence educational outcomes negatively?
Assets that require a significant amount of time to manage or maintain may negatively influence school attendance. Cockburn and Dostie (2007) show that the ownership of permanent crops decreases school attendance for boys and that maintenance of household farms requires a great deal of time and effort by all family members, including children, which may take students’ time away from schoolwork. Empirical evidence from Ghana, Kenya, and Ethiopia also shows that some types of assets negatively affect school attendance. Using data from Ethiopia, Admassie (2002) finds an inverse relationship between household ownership of cattle and school attendance. A family’s ownership of cattle or other large livestock may increase the probability that youth must herd animals during school hours and attend school when work permits. Youth who work may not perform well in school because of the stress associated with combining the two activities (Chowa, Ansong, & Masa, 2010). Also, youth who work before or after school may not have time to do homework or may have difficulty concentrating in class because of fatigue. In a study of Kenyan youth aged 17 years and younger, Moyi (2007) finds that family ownership of arable land is associated with a child’s propensity to combine farm-work with schooling. Similarly, a study by Bhalotra and Heady (2003) shows that, an increase in family farmland ownership negatively affects girls’ school attendance and participation. These negative effects are consistent with Lerman and McKernan’s (2008; p.198) admission in their in-depth discussion of asset-effects that, “…problems can arise in the process of building and managing assets.”

Some studies show that economic resources have both positive and negative impacts on educational outcomes. For example, Jensen and Nielson (1997) use data from Zambia’s Priority Survey II and find that savings and assets, such as bicycle, refrigerator, and plough, have positive effects on school attendance, while land ownership has negative effects. Using data from 596
households in Kenya to examine individual, family, and contextual factors that affect school enrollment, Buchmann (2000) finds that children in households with more financial resources are more likely to enroll. However, the study also finds that children whose families own land are more likely to work rather than attend primary and secondary schools. According to these two studies, land ownership has a negative effect on schooling. Because of the appreciation most Ghanaians have for land ownership—partly because of its association with wealth and power (Gilman, 1984)—it is possible that land ownership in Ghana also has profound effects on children’s educational well-being.

As mentioned earlier, studies on occupational socialization of children suggest that many youth assist their parents to manage assets such as shops and businesses (Kisselburgh, Berkelaar, & Buzzanell, 2009; Lucas, 2006). Some young people must herd livestock daily as part of their household responsibilities. Combining this type of work with school or doing such work during school hours impedes educational attainment (Chowa, Ansong, & Masa, 2010).

The mixed results suggests the need for further conceptual and empirical research of the contextual effects (e.g., student age, income level, and number of parents in the household) in the relationships between assets and educational outcomes in developing countries. Younger children who are unable to manage assets may not benefit from the asset experience (Bynner & Paxton, 2001), but they may then have more time to focus on schoolwork and fewer worries about economic resources.

**Additional Correlates and Predictors of Educational Outcomes**

Correlates and predictors of educational outcomes, which may have implications for the effects of economic resources, fall into three major categories: individual, household/family, and school/community.
**Individual-Level Correlates**

Individual-level factors that affect educational outcomes include biological and psychological well-being. A study by Johnson, Wolke, Hennessy, and Marlow (2011) finds that children born prematurely have relatively lower levels of academic attainment and a higher prevalence of learning difficulties. The study also finds that neonatal factors (e.g., breech delivery and abnormal cerebral ultrasound) independently predict educational outcomes by age 11. Fentiman et al., (1999) also find that the age at which a child is first enrolled in school is strongly associated with dropout rates.

How students think about schooling is a predictor of performance. A student’s self-concept, self-efficacy, attitudes, and motivations positively affect academic performance (Ajayi, 2012; Bandura et al., 1996; Jegede et al., 1997; Kiamanesh, 2005). In Nigeria, self-concept and academic motivation are significant predictors of students’ attitudes towards math, personality traits such as agreeableness and extraversion are associated with student educational aspirations, and academic performance are associated with educational aspirations of students (Ajayi, 2012; Jegede et al., 1997).

Around the globe, behaviors that reflect students’ perceptions and experiences have an influence on academic performance. In Italy, one study shows that students who believe in their academic self-efficacy and have educational aspirations not only have high achievement but also exhibit positive social behaviors, have low behavioral and emotional problems, and are accepted by their peers (Bandura et al., 1996). In addition, school attachment and commitment positively influence academic performance (Stewart, 2007).
Household- and Family-Level Correlates

Household and family factors (e.g., parents’ educational level, involvement, and expectations) affect youth educational outcomes. Research suggests that parents’ educational level is positively associated with children’s educational outcomes. Perhaps it is easier for educated parents to help their children with homework because they have literacy and numeracy skills. In addition, educated parents may show more interest in their child’s school performance and may follow up regularly on how they perform in school, which could influence children’s perceptions and subsequent behaviors. Although parents’ educational level generally is associated with children’s educational outcomes, the magnitude of the relationship may vary by geographical and cultural contexts. For instance, empirical evidence shows that fathers’ educational level has a stronger positive effect on children’s educational performance in Ghana and Cote d’Ivoire (Tansel, 1997) and in Uganda, Kenya, Tanzania, Malawi, Mozambique, and Zambia (Smith & Barrett, 2010). Mothers’ educational level, on the other hand, has a stronger influence on children’s educational outcomes in Guinea (Glick & Sahn, 2000), Botswana, Namibia, Lesotho, and Swaziland (Smith & Barrett, 2010).

Similarly, parental expectations seem to affect children’s educational performance (Zhan, 2006). Most empirical studies show that children perform better in school when parents are involved (Fantuzzo, McWayne, Perry, & Childs, 2004; Muller & Roberts, 2000; Nyarko & Vorgelegt, 2007; Topor, Keane, Shelton, & Calkins, 2010), but a few show that parental involvement may be associated negatively with children’s educational performance (Izzo & colleagues, 1999). Could this be that parents become involved only after problems have arisen? Some parents actively become involved in their children’s education outside school hours, and others help in the management and running of the school. For instance, many parents participate
in school governance through parent-teacher associations (PTA). The nature of parental expectations and the way such expectation are communicated to children could encourage them to work hard and perform well in school.

School- and Community-Level Correlates

School and community factors—in the form of human and physical resources—also affect children’s educational outcomes. The qualification of teachers and the student–teacher ratio may make a difference in the quality of education that students receive. Huebler (2008) cites data from UNESCO to show that SSA’s average student–teacher ratio (40.7:1) is the highest contrasted with other regions, including Southern Asia (37.8:1), Southeast Asia (26.5:1), and the world (24.6:1). Indeed, more than 90% of countries in SSA have a student–teacher ratio higher than 40:1, with Mozambique (67.4:1), Rwanda (65.9:1), and Chad (63.2:1) being the highest (Huebler, 2008). Ghana has a comparatively lower student-teacher ratio of 30:1 (DANIDA, EFW, The World Bank, 2011).

When large numbers of students are enrolled in a school or the school day is divided into shifts (i.e., with teachers being responsible for teaching a day’s worth of lessons in back-to-back groups of students to serve more children in one facility), student performance and teacher satisfaction suffers (Lee et al., 2005; Michaelowa & Wittmann, 2007). Using data from South Africa’s Third International Mathematics and Science Study, Howie (2005) finds that heavier teacher workload is associated with poor performance on math tests. Lee, Zuze, and Ross (2005) use data from 42,000 students in 23,000 schools in 14 SSA countries to show that students tend to have low reading test scores in schools in which teachers have large numbers of students. However, not all empirical studies find negative or significant impacts of high pupil–teacher ratios, heavy teacher workloads, and large class sizes on educational outcomes. A study in
Ethiopia by Abraha, et al., (1991) finds no statistically significant relationship between class size and girls’ performance. These non-significant and mixed results suggest that variation in other factors such as asset ownership may have effects.

Teachers’ commitment, qualifications, and experience also affect educational outcomes. Using 2003 World Bank data on Indonesia, Suryadarma et al., (2006) finds that a lack of teacher commitment—as measured by teacher absenteeism—negatively affects students’ performance on math tests. Another study of fifth graders from Burkina Faso, Cameroon, Cote d’Ivoire, Madagascar, and Senegal shows that teacher absenteeism has a statistically significant negative effect on students’ performance on standardized tests (Michaelowa, 2001).

Teachers with better training and experience may be able to use their expertise to enhance students’ learning. Nyagura and Riddel (1993) present evidence that seventh graders in Zimbabwe are more likely to do well on math and English tests when taught by trained teachers. A study by Michaelowa (2001) also finds that the qualification of teachers—through initial education—and regular training are associated with higher standardized test scores of fifth graders. Similarly, Lee, Zuze, and Ross (2005) find a strong direct relationship between the quality of teachers and sixth graders’ reading comprehension abilities in Botswana, Mozambique, Namibia, and Seychelles.

Other physical resources such as classrooms, furniture, and textbooks also influence educational outcomes. For instance, the availability of textbooks is positively associated with math performance in Zimbabwe (Nyagura & Riddel, 1993) and higher standardized test scores in Francophone SSA countries (Michaelowa, 2001). Many schools in SSA do not have instructional materials (e.g., textbooks, blackboards, libraries, and laboratory equipment) or other basic needs (e.g., running water and electricity), which affects the quality of teaching and learning (Bilale,
When some of these missing resources are available in students’ homes, students do better in school. Using second-wave data from the Southern and East African Consortium for Monitoring Education Quality (SACMEQ), Smith and Barrett (2010) find that when books, artificial lighting, and reading tables (i.e., desks) are available to engage and support learning in the home, students perform better in school.

**Conclusion**

In conclusion, the extant literature shows that economic resources—whether income or assets—are associated with different educational outcomes in varied ways. What is unclear in the case of Ghana is the relative importance and independent effects of (a) income and (b) assets on academic performance. What we know thus far are inferences from studies conducted in other SSA countries and—most often—developed countries that are economically, socially, and politically different from Ghana. The key question is whether these mixed findings are applicable to the Ghanaian context. This dissertation will help clarify how the two broad types of economic resources—income and assets—are associated with academic performance in Ghana.

Also clear from the empirical evidence reviewed in this chapter is that income and assets are not the only possible determinants of educational outcomes. Several individual, household, classroom, school, and community characteristics are associated with educational outcomes, regardless of the presence or absence of economic resources (Chowa, Masa, Wretman, & Ansong, 2013). This means that a rigorous test of the relationship between economic resources and educational outcomes cannot ignore these contextual factors. Another important question that needs attention is whether the direction and magnitude of the relationships between economic resources and academic performance is significantly different for boys and girls in Ghana, which is addressed by a multi-group modeling approach in this study.
Chapter 4: Methodology

Overview

This chapter describes the proposed conceptual framework and study methodology for addressing the main research questions of this study. Then the chapter presents research hypotheses, description of variables in the models, and multilevel structural equation modeling (MSEM) strategies used.

Conceptual Framework

Theoretical perspectives and empirical evidence discussed in Chapters 2 and 3 suggest a positive relationship between economic resources and academic performance, but the process by which this occurs is unclear. The current study offers three potential pathways—direct effects of economic resources, indirect effects through academic expectations, and indirect effects through academic self-efficacy—to explain the link between economic resources and academic performance (Figure 1). The relatively few studies on this subject in SSA conceptualize and examine this connection as a direct relationship (Curley, Ssewamala, & Han, 2010; Ssewamala et al., 2008).

Direct Effects of Household Economic Resources

Figure 1 shows a direct pathway (Path c) from economic resources (i.e., parents’ income, and household assets) to academic performance, as measured by English and math scores. This direct pathway captures the idea that asset accumulation leads to educational advantage by increasing individuals’ control over educational resources (Bouman, 1995; Elliott, 2011). For instance, students can use household savings to pay for tuition, extra classes or lessons, examination fees, and transportation to school, all of which have direct influence on students’ school performance (Kimuyu, 1999).
Indirect Effects of Economic Resources through Self-Efficacy and Expectations

Elliott et al. (2011) observe that the indirect “linking mechanisms” connecting economic resources to educational outcomes are missing from most studies. Based on prior theorization and empirical studies, this study suggests that two indirect pathways exist. First is the path from economic resources to academic performance through academic self-efficacy (Path $a_1$ and Path $b_1$). Second is the path from economic resources to academic performance through academic expectations (Path $a_2$ and Path $b_2$). This study suggests that parents’ incomes and household assets will result in young people’s higher academic expectations and feelings of self-efficacy,
which in turn will motivate them to be serious about their education and behave in ways that improve their performance in school.

It is important to note that these hypothesized relationships exist in a multilevel framework because individual students grow up and interact within dual contexts: their households and schools. This means that, besides the influence of individual preferences and dispositions on their educational outcomes, other factors at the household and school levels exert influence on their expectations, self-efficacy, and ultimately academic performance. Therefore, the direct and indirect associations between economic resources and academic performance should be conceptualized from a multilevel perspective.

Before these hypothesized multilevel relationships can inform policy, practice, and future research in Ghana and SSA, it is important to test them because of several unknowns. First, if the theorized indirect pathways hold in the SSA context, it is not clear whether the hypothesized mediators fully or partially mediate the relationships between all types of economic resources (i.e., parents’ income and household assets) and academic performance in English and math subjects. Second, it is unclear whether the type of economic resource (i.e., income or asset) has different effects on outcomes. Third, it is unclear if these possible direct and indirect relationships affect girls and boys differently.

**Research Questions**

The study proposes six research questions and corresponding hypotheses based on the above conceptual model and the gaps in existing research. They are categorized into three relationships: direct, indirect, and moderated.

**Direct Relationships**

**Research question 1**: Do economic resources directly affect academic performance?
*Hypothesis 1a:* Parents’ income is positively associated with young people’s English scores.

*Hypothesis 1b:* Household assets are positively associated with young people’s English scores.

*Hypothesis 1c:* Parents’ incomes are positively associated with young people’s math scores.

*Hypothesis 1d:* Household assets are positively associated with young people’s math scores.

**Indirect Relationships**

**Research question 2:** Do economic resources indirectly affect academic performance by increasing young people’s academic self-efficacy?

*Hypothesis 2a:* Academic self-efficacy mediates the association between parents’ income and young people’s English scores.

*Hypothesis 2b:* Academic self-efficacy mediates the association between household assets and young people’s English scores.

*Hypothesis 2c:* Academic self-efficacy mediates the association between parents’ incomes and young people’s math scores.

*Hypothesis 2d:* Academic self-efficacy mediates the association between household assets and young people’s math scores.

**Research question 3:** Do economic resources indirectly affect academic performance by increasing young people’s academic expectations?

*Hypothesis 3a:* Academic expectations mediate the association between parents’ income and young people’s English scores.
Hypothesis 3b: Academic expectations mediate the association between household assets and young people’s English scores.

Hypothesis 3c: Academic expectations mediate the association between parents’ income and young people’s math scores.

Hypothesis 3d: Academic expectations mediate the association between household assets and young people’s math scores.

Moderated Relationships

Research question 4: Are the direct effects of economic resources on academic performance different for boys and girls?

Hypothesis 4a: Gender moderates the direct association between parents’ income and young people’s English scores.

Hypothesis 4b: Gender moderates the direct association between household assets and young people’s English scores.

Hypothesis 4c: Gender moderates the direct association between parents’ incomes and young people’s math scores.

Hypothesis 4d: Gender moderates the direct association between household assets and young people’s math scores.

Research question 5: Are the indirect effects of economic resources on academic performance through academic self-efficacy different for boys and girls?

Hypothesis 5a: Gender moderates the indirect association between parents’ incomes and young people’s English scores through academic self-efficacy.

Hypothesis 5b: Gender moderates the indirect association between household assets and young people’s English scores through academic self-efficacy.
Hypothesis 5c: Gender moderates the indirect association between parents’ incomes and young people’s math scores through academic self-efficacy.

Hypothesis 5d: Gender moderates the indirect association between household assets and young people’s math scores through academic self-efficacy.

Research question 6: Are the indirect effects of economic resources on academic performance through academic expectation different for boys and girls?

Hypothesis 6a: Gender moderates the indirect association between parents’ income and young people’s English scores through academic expectations.

Hypothesis 6b: Gender moderates the indirect association between household assets and young people’s English scores through academic expectations.

Hypothesis 6c: Gender moderates the indirect association between parents’ income and young people’s math scores through academic expectations.

Hypothesis 6d: Gender moderates the indirect association between household assets and young people’s math scores through academic expectations.

Research Design and Setting

This study uses a cross-sectional, multilevel research design to establish the existence of correlational relationships between economic resources and academic performance (Kumar, 2011). The cross-sectional data are from a baseline survey taken in the ongoing YouthSave Ghana Experiment, one of the largest social experiments in the developing world to test the long-term impacts of youth savings accounts on educational, psychosocial, health, and financial capability outcomes and household financial well-being. YouthSave is a consortium project and is funded by the MasterCard Foundation. Save the Children implements the project in partnership with the Center for Social Development (CSD) at Washington University in St.
Louis, the New America Foundation (NAF), and the Consultative Group to Assist the Poor (CGAP). CSD is leading the research agenda for the project.

As part of the YouthSave project, HFC Bank in Ghana is offering savings accounts to JHS students in randomly assigned experimental schools. HFC Bank is a leading universal banking institution in Ghana that offers diversified financial services, including commercial, investment and mortgage banking and micro financing. The YouthSave Consortium selected HFC Bank from a pool of interested financial institutions because it was the best fit for the project.

The intervention includes intensive marketing of a tailored youth savings product called *Enidaso Account* (which literally means *Hope Account* in the Akan language) to 50 experimental schools and offers financial education and in-school banking to half of the experimental schools. Youth who open accounts receive a photo ATM card that they can use only to check their balance. There are no charges for checking account balance. Withdrawals are not allowed for the first three months after account opening. Parents must accompany youth to withdraw from the account, but the youth can make deposits by themselves. Deposits are branch-based for half of the experimental group and both branch- and school-based for the other half.

As mentioned earlier, the current study focuses on only the baseline data of the YouthSave experiment and therefore this study does not compare the experimental group with the control group. See Appendix C for an illustration of how the current study fits into the larger YouthSave project.

**Sampling**

Because YouthSave is an experiment, YouthSave research team used probability sampling to select junior high schools as the primary sampling unit and students as the secondary
unit in the project. Specifically, the sampling frame included all public JHSs in eight of the ten administrative regions of Ghana. Two regions—Upper East and Upper West—were excluded because HFC Bank, the financial institution partner of the YouthSave project in Ghana, does not operate in those regions. After creating the sampling frame, the YouthSave research team used a simple random sampling approach to choose 100 JHSs to be included in the study. Again, because the larger YouthSave project is an experiment, the 100 schools were assigned randomly into 50 experimental schools and 50 control schools. However, the present study does not attempt to establish causality and so it uses the baseline sample as a single observational sample without comparing the experimental to the control schools (Hofler, 2005).

In obtaining the individual-level sample, the research team selected 60 students from each school using the “random sampling with replacement”\(^7\) approach to ensure that each student had an equal and independent probability of being selected (Kumar, 2011). To allow for attrition, participants were oversampled (Rootman, 2001) with a final sample size of 6,252 JHS students. Researchers interviewed parents of youth participants, successfully surveying 73\% (4,576) in person, which resulted in a youth sample of 6,252 and a parent sample of 4,576. Because household and parents’ characteristics (e.g., parents’ income and household assets) are central to the current study, youth whose parents were not interviewed at baseline are excluded from the current study.

**Data Collection**

This randomly sampled observational study merges three types of data sets for statistical modeling. The first are baseline survey data obtained by 40 interviewers from 4,576 JHS

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\(^7\) With the sampling with replacement approach, elements randomly selected from the sampling frame are put back into the sampling frame before another element is selected from the pool. This approach ensures that each subject has an equal and independent chance of being selected.
students in schools and their parents at homes and workplaces. YouthSave researchers from CSD, the University of North Carolina, and the Institute of Statistical, Social and Economic Research (ISSER) at the University of Ghana trained interviewers to collect survey data. To ensure quality and rigorous data collection, interviewers were required to have prior data collection experience with ISSER and a bachelor’s degree. The second type of data comes from copies of youths’ report cards kept by the schools. Interviewers worked with headmasters of the selected schools to transfer the youths’ data—including math and English language scores and school attendance—onto a data abstraction form (Appendix D). The third type of data come from one-page self-administered surveys of headmasters and include school characteristics of infrastructure, personnel/staff, classroom conditions, and programs organized by the school (e.g., excursions and free school feeding programs).

The institutional review boards of the University of Ghana, Washington University in St. Louis, and the University of North Carolina approved all data collection methods.

**Instruments**

Researchers carefully developed and tested all four data collection instruments—the youth questionnaire, parent questionnaire, school record data abstraction form, and headmaster questionnaire—and adapted questions from established scales to ensure relevance to youth in Ghana. Based on suggested best practices, researchers used a multi-method pretesting protocol (Miller, 2003; Schneider et al., 2009; Willis, 2005), and a panel with expertise in measurement theory and educational, health, and financial capability outcomes reviewed the instruments to identify potential problems. Next, the researcher team pilot tested the instruments in one private and three public JHSs to validate the applicability and appropriateness of the questions and scales. Pilot testing involved 55 interviewer-administered face-to-face surveys, 20 cognitive
interviews, and 6 in-depth qualitative interviews. The final data collection instruments are proprietary and will be available upon completion of the YouthSave project.

**Measures**

**Dependent variables**

The two dependent variables are youth’s overall math scores and English scores during an academic term. Students’ performances in math and English language or reading subjects have been used consistently as proxies for overall academic performance in other studies in Ghana (Chowa et al., 2013; Etsey, 2005; Osafo-Acquah & Asamoah-Gyimah, 2009) and in other countries (Loke & Sacco, 2011; Williams Shanks, 2007; Yeung & Conley, 2008; Zhan, 2006). Using math and English subject scores as proxies for academic performance is based on the reasoning that developing literacy and numeracy skills is fundamental for success in a range of developmental areas, including social, economic, technical, and scientific training (Department of Education and Skills, 2011).

Each outcome variable includes continuous assessment and final examination scores. Continuous assessment scores reflect student performance on learning activities—including paper-and-pencil tests, in-class and take-home assignments, and oral presentations in class—completed throughout the academic term and are supposed to be a formative measure of students’ learning. The Ghana Education Service (GES) adopted the continuous assessment program during the 1987 education reforms with the goal to improve teachers’ assessments of students’ ability (Amuah, 1996).

The study uses a ratio of 70:30 as weights for the final examination and continuous assessment scores, respectively. This weighting criterion is consistent with the GES weighting
system at the time of baseline data collection (Dery & Addy-Lamptey, 2010; Keteku, 1999). These outcome variables are continuous variables ranging from zero to 100.

**Independent Variables**

The two independent variables—parents’ income and household assets—are types of household economic resources.

**Parents’ income.** Parents’ income is a continuous variable that measures all sources of parents’ income in a typical month. Because incomes in developing countries like Ghana fluctuate from month to month and season to season, interviewers emphasized during data collection that parents should report the typical monthly income during the last 12 months. This best practice was adapted from the household questionnaire of the Ghana Living Standards Survey Round Four (GLSS4, n.d.), and researchers expected respondents to report average income. Parents self-reported income from full-time jobs, part-time jobs, income from rental properties, pensions, remittances, and other sources, all in Ghana Cedis (GHC).

**Household asset ownership.** This is a continuous variable measured by an asset index constructed using an approach recommended by Filmer and Pritchett (2001) and Filmer and Scott (2008). The survey asked youth about family ownership of 19 asset items in three broad categories: nine household possessions (e.g., radio, electric or gas stove, kerosene stove, electric iron, box iron, refrigerator, television, cellular phone, and landline phone), six types of livestock (e.g., cattle, goats, sheep, donkeys, pigs, and chickens), and four transportation-related property (e.g., bicycle, motorcycle, canoe or boat, and car or truck). Moser and Felton’s (2007) suggestions for constructing asset index informed the types of assets included in this study. The study used principal component analysis to determine the weight of each asset item. Using the equation, $A_i = (b_1a_{1i}) + (b_2a_{2i}) + \ldots + (b_{k}a_{ki})$, where $A_i$ is the asset index for the “$i$” household, $a_{1i}$,
\(a_1, \ldots, a_k\) are the \(k\) indicators of the 19 asset items, and \(b_1, b_2, \ldots, b_k\) are weights used to aggregate the indicators into an index. A positive index value indicates a high level of asset ownership and a negative value indicates low level of assets. The use of a composite asset variable is a standard practice in asset-related studies (Ansong, Chowa, & Grinstein-Weiss, 2013; Chowa, 2008; Elliott, Kim, et al., 2010; Huang, Guo, Kim, & Sherraden, 2010).

**Hypothesized Mediators**

This study models two variables as potential mediators in the relationship between economic resources and educational performance: academic self-efficacy and youth’s academic expectations.

**Academic self-efficacy.** Academic self-efficacy is measured by an 8-item subscale that determines “perceived capability to manage one’s own learning behavior, to master academic subjects, and to fulfill academic expectations” (Muris, 2001, p.146). Muris’ original 5-point scale was expanded to an 11-point scale for YouthSave, which is consistent with Bandura’s guidelines for constructing self-efficacy scales (Bandura, 2006). Respondents answered questions about how easily they can perform certain tasks (e.g., study for a test, pass a test, pass all subjects, finish homework, pay attention in class, satisfy parents with schoolwork, focus on their studies, and get teachers to help with schoolwork). This study uses confirmatory factor analysis (CFA) to reduce the academic self-efficacy items into one self-efficacy index. A positive index value indicates a strong sense of self-efficacy and a negative value indicates a weak sense of self-efficacy. The data analysis section of this chapter explains this data reduction process.

**Academic expectation.** Academic expectation is a continuous variable that measures scores students expect to receive at the end of the academic term in math and English language subjects. This is a self-reported score ranging from zero to 100 percentage points. Math
expectations are included in all math models, and English expectations are in all English models. The academic expectation questions were adapted from studies conducted in Chicago and Detroit by Destin and Oyserman (2009) and the “I Can Save” project survey initiated by CSD (Sherraden et al., 2007).

**Covariates**

Evidence presented in Chapters 2 and 3 indicate that personal, household, school, and community characteristics might affect educational outcomes by suppressing or confounding the effects of economic resources. To understand the independent effects of economic resources on educational outcomes, these additional factors—described below except community characteristics—are controlled for in all statistical models. Community characteristics are not controlled for because community level data were not collected as part of the YouthSave project.

**Individual-level characteristics.** The study controls for youth’s age and school attendance. Age is a continuous variable measured in years. Many education-related studies typically account for age (Chowa, et. al., 2013; Elliott, Chowa, & Loke, 2011). School attendance is a continuous variable measured as the number of days that a study participant attended school in the last academic term. The attendance records were obtained from the attendance registers of schools in the study.

The study also controls for students’ commitment to school and planned effort. Commitment to school is a continuous variable measured using a nine-item, 11-point Likert-type scale ranging from 0 (*strongly disagree*) to 10 (*strongly agree*). The commitment to school scale is an adapted version of the Rochester Youth Development Study (Thornberry, Lizotte, Krohn, Farnworth, & Jang, 1991). Youth were asked to describe their attitudes toward school, doing homework, and getting good grades. A high value indicates high level of commitment to school.
This study uses confirmatory factor analysis (CFA) to reduce the commitment to school scale into one index. The data analysis section of this chapter explains the data reduction process.

Planned effort is a continuous variable measured in hours per week. The planned effort question was adapted from Destin and Oyserman (2009). Youth were asked, on average, how many hours a week they spend on school work outside of school. A high value indicates higher level of planned effort.

**Household-level characteristic.** Household size is included in all multilevel structural models as a household-level control variable. It is a continuous variable measured by the number of people who are economically dependent (i.e., rely for food, shelter, clothing, and other basic needs) on the head of household. Studies control for household size because of its influence on determinants of academic performance (Bachman, 2002; Chowa, et al., 2013; Marks, 2006). Parent’s expectation was excluded from the final models because it was highly collinear with household size.

**School-level characteristics.** Two school-level characteristics known to influence academic performance (i.e., student-to-teacher ratio and teacher qualification) are controlled in all structural models. The student-to-teacher ratio for each school is a continuous variable. Research in SSA shows that the number of students relative to number of teachers in a class affects math performance (Nyagura & Riddel, 1993), standardized test scores (Michaelowa, 2001), and quality of teaching and learning (Bilale, 2007; Howie, 2005; Smith & Barrett, 2010).

Teacher qualification is a continuous variable that measures the number of teachers without postsecondary certification in each school in this study. This variable was included because other studies from Ghana show that the quality of teaching and learning in the classroom
partly depends on academic and professional qualifications of the teacher (Agyemang, 1993; Etsey, 2005).

**Data Analysis Plan**

This study employs multilevel structural equation modeling (MSEM) approach to address the research questions. The multilevel approach ensures that hierarchical clustering of youth in schools is accounted for. Multilevel analysis is recommended when the intraclass correlation (ICC), a measure of the proportion of variance in academic performance that is accounted for by between schools variation, is greater than 10% (Lee, 2000). In this study, ICC was found to be .4578 for math and .4023 for English (See Equations 1). These high ICCs are an indication that variation between schools account for 45.78% of the variability in math performance and 40.23% in English performance (See Equation 1 below).

*Equation 1*

\[
\text{ICC} = \frac{\sigma^2_w}{(\sigma^2_w + \sigma^2_r)}
\]

where \( \sigma^2_w \) is the estimate of school-level variance, and \( \sigma^2_r \) is the estimate of individual-level variance.

Math performance ICC = \( \frac{128.07}{(128.07 + 151.67)} \) = 0.4578 (i.e., 45.78%)

English performance ICC = \( \frac{114.53}{(114.53 + 170.14)} \) = 0.4023 (i.e., 40.23%)

Structural equation modeling (SEM) approach is combined with the multilevel approach because it allows researchers to test mediation effects efficiently in one model rather than separate models in multiple steps as in conventional regression analysis (Bowen & Guo, 2011; Miranda & Russell, 2011; Nasser & Hagtvet, 2006; Zwig, Yahner, & Rossman, 2012). In all multilevel structural models, the independent variables and covariates are assessed at Levels 1
and 2, and the mediators and dependent variables at Level 1 (i.e., 2-1-1 design). A two-step MSEM process was used (Kline, 2005; Schumacker & Lomax, 1996). The study assesses the fit between all theorized (latent) constructs and their corresponding indicators before assessing the hypothesized direct and indirect relationships between economic resources and educational outcomes. The two-step method removes the possibility that the structure of individual latent factors could be the source of misfit when testing the structural model (Regambal & Alden, 2009).

The study also conducts subsample analyses to examine measurement and structural differences across gender, which tests whether the set of observed variables measure the same relationships in the male group as in the female group. Differences in results would indicate that gender moderates the relationship between economic resources and academic performance, regardless of other control variables. I used the student version of LISREL 9.1 statistical software program to conduct all analyses.

Recognizing the current debate on misuse of SEM significance testing (Glaser, 1999; Hu & Bentler, 1999; Kline, 2005), this study based its assessment of model fit on a number of generally recommended indices: a nonsignificant chi-square statistic ($\chi^2$) and a root mean square error of approximation (RMSEA) $\leq .05$ with an upper bound $\leq 0.08$ for its 90% confidence interval. Chi-square values and their degrees of freedom were reported as customary, but chi-square values were not used to judge model fit because of their sensitivity to this study’s large sample size (Thompson, 2004; Warne, 2011). However, chi-squares are used in situations in which chi-square difference tests are needed to help identify the best fit among a series of models.
Missing data—assumed to be missing at random—in all indicators accounted no more than 10% of the total sample. Thus, the study uses the model-based regression imputation to replace the missing data and analyzed all measurement and structural models with the maximum likelihood estimation method. Response scales of all observed variables in the models were wide enough to qualify as continuous variables. Maximum likelihood works well under the assumption that all data are multivariate normal. The study assessed the skewness and kurtosis statistics of all indicators for possible violations of multivariate assumptions. Skewed variables were log-transformed. All variables included in the measurement and structural models had skewness statistics ranging from -1.38 to 1.05 and kurtosis statistics from -1.39 to 2.40. These ranges fall within the acceptable departures from normality (i.e., skewness values of ±1.5 and kurtosis values of ±3.5), which maximum likelihood is robust enough to handle (Hau & Marsh, 2004). All MSEM analyses were based on covariance matrices because they produce more stable test statistics and parameter estimates (Chowa, 2008; Cudeck, 1989).

**Measurement Models**

The study used data reduction techniques to create indices for the multidimensional measures of academic self-efficacy and commitment to school. First, I used confirmatory factor analysis (CFA) to specify the factor structure of these constructs. In conducting the CFA, all eight self-efficacy indicators and ten commitments to school indicators were specified priori to loading onto the latent constructs. To improve the model fit, I dropped indicators with factor loadings below 35. I also allowed errors between some indicators to correlate using theory and meaningful modification indices as a guide (Hong, 1998; Whittaker, 2012). I standardized all latent variables in the measurement models by fixing the factor loading of one indicator for each latent variable to equal 1.0 (Kline, 2005, Ledermann & Macho, 2009).
After confirming the factor structures of both constructs, I transformed the self-efficacy and commitment to school items into separate indices (DiStefano, Zhu, & Mindrila, 2009). I used the factor scores of the two latent variables as weights to produce composite factors for self-efficacy and commitment to school. Treating the nine indicators as “causal indicators” was necessary for two reasons. First, this approach is more parsimonious than the more complex structural model that includes all nine self-efficacy and commitment indicators (Zajacova, Lynch, & Espenshade, 2005). Moreover, because of limitations on the number of variables that can be included in a structural model in the student version of LISREL 9.1, including nine indicators in the measurement model would limit the number of covariates allowed in the main structural models.

**Multilevel Structural Models**

**Multilevel Mediation Analyses**

The study tested three types of associations (i.e., direct effect, partial mediation, and complete mediation) simultaneously to assess all hypothesized pathways between economic resources and educational outcomes.

To find support for the *direct relationship hypothesis*, the model should be a good fit, and the direct path from economic resources to educational outcomes at the individual-level (*Path_{wc} in Figure 2*) must be significant. The *complete mediation hypothesis* will hold if the direct relationship between economic resources and educational outcomes is not statistically significant when controlling for other covariates (Kenny, 2012). Thus, there will be complete mediation if *Path_{wc} in Figure 2* is zero or not statistically significantly different from zero. To retain the *partial mediation hypothesis*, the overall model should fit the data well, and the parameter estimate of the direct relationship between economic resources and educational outcomes at the
individual-level must be significant (i.e., Path\textsubscript{w} c must be significantly different from zero) when controlling for expectations, self-efficacy, and other variables in the model (Kenny, 2012). Lastly, the paths from economic resources through the mediator to educational outcomes at the individual-level (Path\textsubscript{w} a and Path\textsubscript{w} b) should be statistically significant. If the conditions for partial mediation are met but the direct relationship (Path\textsubscript{w} c) and indirect relationship (the product of Path\textsubscript{w} a and Path\textsubscript{w} b) are in opposite directions (i.e., + and –), it would be considered suppression (MacKinnon, Krull, & Lockwood, 2000; Shrout & Bolger, 2002).

Figure 2. Two-level path diagram for the direct and indirect relationships between economic resources and academic performance. Path\textsubscript{w} = relationships at the individual level (i.e., within schools); Path\textsubscript{B} = relationships at the school level.

All multilevel structural models account for the mediation effect of academic self-efficacy and expectations—the two main mediators—simultaneously, which has the advantage of establishing whether the effect of each mediator is independent of the effects of the other mediator (Kenny, 2012). Kenny (2012) recommends this approach as long as the two mediators are not too highly correlated: (r\textsubscript{efficacy and math expectation} = .32; r \text{efficacy and English expectation}= .35; p<.05).
I modeled youths’ math expectations as a mediator in all math models and English expectations as a mediator in all English models. The study included the following covariates in all multilevel structural models: four individual-level covariates (i.e., youth’s age, youth’s school attendance record, commitment to school, planned effort), one household-level covariate (i.e., household size), and two school-level covariates (i.e., student-to-teacher ratio and teacher qualification).

**Moderation Test**

In addition to accounting for seven covariates in the structural models, the study used the multi-group approach to assess gender moderation of the relationships between economic resources and educational outcomes. First, the study analyzed structural models with the full sample to establish and confirm the best multilevel structural relationships between the main variables. Next, the models were replicated with separate female and male samples. If the models showed satisfactory fit, I compared the male-only and female-only models with the full-sample. To reject the hypotheses that gender moderates the relationship between economic resources and academic performance, both models being compared have to be statistically significant and should have similar effect size.

In total, I tested three English models: Model 1a is the English model for the full sample, Model 1b is the English model for the female-only sample, and Model 1c is the English model for the male-only sample. Similarly, I tested three math models: Model 2a is the math model for the full sample, Model 2b is the math model for the female-only sample, and Model 2c is the math model for the male-only sample.
Chapter 5: Results

Overview

This chapter presents descriptive characteristics of the study sample and results of the structural equation modeling. In addition, the study compares the characteristics of males and females because one of the main questions addressed in this study was whether gender moderates the potential relationships between economic resources and educational outcomes. Exceptions include school-level control variables (e.g., student-to-teacher ratio and teacher qualification), which were not measured at the individual level. There is less emphasis on interpretation of parameter estimates because the overarching goal of this study was to test the overall trends in the relationship between economic resources and academic performance, and also to assess self-efficacy and expectations as possible mediating pathways. The magnitude of parameter estimates are only interpreted whenever possible.

Descriptive Results

Table 1 presents the descriptive statistics of all dependent and independent variables, the two mediators, and control variables for the full, male-only and female-only youth samples.

Individual- and Household-Level Characteristics

Fifty-two percent of the sample are female. The average age of the entire youth sample is 15.30 years, which is more than a year older than the expected JHS-level upper age of 14 years. Males (M = 15.49, SD = 2.07) are slightly but statistically significantly older than females (M = 15.12, SD = 1.88) (t = 6.55, p < .01). The youngest female in the youth sample is 10 years old, the youngest male is aged 9, and the oldest male and female are aged 26.
### Table 1. Descriptive characteristics of the full, female-only, and male-only samples

<table>
<thead>
<tr>
<th></th>
<th>Full Sample (N=4452)</th>
<th>Female (n=2314)</th>
<th>Male (n=2138)</th>
<th>p-value‡</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M(SD)</td>
<td>Range</td>
<td>M(SD)</td>
<td>Range</td>
</tr>
<tr>
<td><strong>Dependent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English score</td>
<td>50.88(17.25)</td>
<td>8.20↔100</td>
<td>50.02(17.08)</td>
<td>10↔98.60</td>
</tr>
<tr>
<td>Math score</td>
<td>50.20(16.92)</td>
<td>4.51↔100</td>
<td>48.60(16.08)</td>
<td>9.20-100</td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents’ income (log)</td>
<td>13.60(0.09)</td>
<td>-0.10↔0.55</td>
<td>1.05(0.01)</td>
<td>-0.10↔0.55</td>
</tr>
<tr>
<td>Household assets index</td>
<td>2.37(1.79)</td>
<td>-6.33↔13.03</td>
<td>2.29(1.77)</td>
<td>-6.33↔13.03</td>
</tr>
<tr>
<td><strong>Mediators</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy index</td>
<td>0.02(0.89)</td>
<td>-5.56↔1.65</td>
<td>-0.01(0.87)</td>
<td>-4.49↔1.65</td>
</tr>
<tr>
<td>English expectations</td>
<td>66.54(16.11)</td>
<td>5↔100</td>
<td>67.18(16.34)</td>
<td>0↔100</td>
</tr>
<tr>
<td>Math expectations</td>
<td>67.36(15.99)</td>
<td>0↔100</td>
<td>65.16(16.49)</td>
<td>8↔100</td>
</tr>
<tr>
<td><strong>Individual-level covariates</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>15.30(1.98)</td>
<td>9↔26</td>
<td>15.12(1.88)</td>
<td>10↔26</td>
</tr>
<tr>
<td>Attendance (days)</td>
<td>54.32(7.79)</td>
<td>4↔68</td>
<td>54.90(7.49)</td>
<td>4↔68</td>
</tr>
<tr>
<td>Planned effort (hours)</td>
<td>7.53(4.81)</td>
<td>0↔40</td>
<td>7.70(4.90)</td>
<td>0↔40</td>
</tr>
<tr>
<td>Commitment to school</td>
<td>77.39(9.32)</td>
<td>36↔90</td>
<td>77.01(9.35)</td>
<td>36↔90</td>
</tr>
<tr>
<td><strong>Household-level covariates</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household size</td>
<td>10.14(7.49)</td>
<td>0↔28</td>
<td>10.18(7.41)</td>
<td>0↔28</td>
</tr>
<tr>
<td><strong>School-level covariates</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student-teacher ratio</td>
<td>25.01(12.36)</td>
<td>6↔69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers without postsecondary certificate</td>
<td>1.47(2.54)</td>
<td>0↔14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

‡ Probability values indicating whether females and males are statistically significantly different on each of the variables in the models; M = Mean; SD = Standard deviation
Young people in the study come from relatively large households. The median and most frequent household size (i.e., mode) is 4, but the typical household includes almost 5 (M = 4.67, SD = 2.74) dependents. Statistically, male and female youth in the study live in households that are not significantly different in size (t = 1.44, p = .15). Female-headed households (M = 4.61, SD = 2.85) are a bit larger than male-headed households (M = 4.73, SD = 2.62).

Generally, young people are committed to school. The mean commitment to school index is 77.39 with a possible range 0 to 90. The least committed student scored 36 and the most committed scored 90 on the commitment to school scale. Statistically, male students (M = 77.77, SD = 9.28) are slightly more committed to school than female children (M = 77.01, SD = 9.32) (t = 2.89, p < .05).

With regard to the number of hours students spend on school work after normal school hours, students spend nearly eight hours on average (M=7.53, SD=4.81) on their school work every week. Female students spend more hours per week on their school work (M = 7.70, SD = 4.90) than male students (M = 7.36, SD = 4.72) (t = 2.48, p < .05). This difference of less than one hour of school work is statistically significant.

Overall, school attendance rate is high with the typical student attending school about 54 days (M = 54.32, SD = 7.79) in an academic term. Female students (M = 54.90, SD = 7.49) attend school about one day more than male students (M = 53.70, SD = 8.07), which is statistically significant (t = 7.14, p < .001).

**School-Level Characteristics**

The average student-to-teacher ratio is about 25 (M=25.01, SD=12.36). About 20 of the 100 schools in the sample have student-to-teacher ratio as low as 15, and others have as high as

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8 The total number of school days varied from school to school, ranging from 50 to 68 days.
In nearly half of the schools (49%), all teachers have post-secondary certification, but other schools have as many as 14 teachers without post-secondary certificate.\(^9\)

**Dependent Variables**

Overall, students’ performance was slightly better in English than math. The average English score for the full sample was 50.88 (SD = 17.25). Females scored a little lower (M = 50.02; SD = 17.08) than males (M = 51.82; SD = 17.38), which is statistically significant (t = 3.49, \(p < .001\)). Females’ English scores range from 10 to 98.60, while males’ scores range from 8.20 to 100. The best and lowest scoring students in English is are males.

In math, the average score for the full sample was 50.20% (SD = 16.92). As in English, males did better in math subject. Males scored statistically significantly higher (M = 51.92, SD = 17.08) than their female counterparts (M = 48.60, SD = 16.08) in math (t = 6.55, \(p < .001\)). However, the worst male student scored 4.51 in math, while the worst female student scored 9.20.

**Independent Variables**

The mean of household asset index for the full sample is 2.37 (SD = 1.59) with a range from -6.33 to 13.03. It is important to note that for this scale, negative values do not mean negative assets or lack of assets. A negative value means fewer household assets and a positive value indicates more household assets. Likewise, a value of zero does not mean the household does not own assets, but rather the median value. Statistically, male youths’ households have significantly more household assets (M = 2.46, SD = 1.81) than female youths’ households (M = 2.29, SD = 1.77) (t = 3.32, \(p < .01\)). The average monthly income for parents (log-transformed)\(^9\)

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\(^9\)A 2009 report by the Ghana Education Campaign Coalition (GNECC) shows that 24% of JHS teachers nationwide are untrained and as high as 38% of JHS teachers from rural areas.
is 13.60 (SD = 0.09). There is no statistically significant difference in the income earned by parents of males and the parents of females ($t = -0.32, p = .74$).

**Mediators (Academic Self-Efficacy and Expectations)**

The mean of academic self-efficacy index for the full sample is 0.02 (SD = 0.89) with a range from -5.56 to 1.65. A negative value indicates a weaker sense of self-efficacy and a positive value indicate a stronger sense of self-efficacy. Statistically, males participants (M = 0.02, SD = 0.92) rate their self-efficacy higher than females (M = -0.01, SD = 0.87) ($t = 3.32, p < .05$). The typical youth expects to score above average (i.e., 50%) in both English and math, but they have slightly higher expectations for math scores (67.36%) than English scores (66.54%). Statistically, there is no considerable gender difference in expected English scores ($t = 0.79, p = .43$), but there is a statistically significant gender difference in expected math scores ($t = 6.07, p < .01$). Male students expect to score 0.38 higher than female students in math.

**Results of Multilevel Measurement Models**

The hypothesized multilevel two-factor (e.g., self-efficacy and commitment to school) structure did not fit the data well: $x^2 = 2191.41 (df = 155)$, RMSEA = .08 (90% CI: .08, .09). Respecification of the model with correlated errors resulted in a good model fit: $x^2 = 189.96 (df = 48)$, RMSEA = .04 (90% CI: .03, .05). See Table 2 for summaries of model fit indices. In the final measurement model, within-schools (i.e., individual-level) factor loadings of both latent constructs are above the recommended cutoff of .35, which further indicates a good two-factor structure (Warne, 2011). The factor loadings for academic self-efficacy range from .50 to .67, and the loadings for commitment to school range from .36 to .60. Figure 3 shows the within- and between-schools factor structure and loadings of the academic self-efficacy and commitment to school.
For the purposes of multilevel structural equation modeling, the factor scores of the two latent variables were used as weights to produce two separate composite factors for self-efficacy and commitment to school. The Cronbach’s alphas for academic self-efficacy (full sample: $\alpha = .74$; males: $\alpha = .74$; females: $\alpha = .75$) and commitment to school (full sample: $\alpha = .70$; males: $\alpha = .70$; females: $\alpha = .71$) had adequate internal consistency reliabilities based on the widely accepted .70 cutoff (Lance, Butts, & Michels, 2009; Spector et al., 2002).

Table 2. Summary of model fit statistics for measurement and structural models

<table>
<thead>
<tr>
<th>Model</th>
<th>RMSEA (90% CI)</th>
<th>$x^2(df)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement Model</td>
<td>.04(.03; .05)</td>
<td>189.96(48)</td>
</tr>
<tr>
<td>English Models</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full sample (N = 4452)</td>
<td>.03(.03; .04)</td>
<td>112.82(33)</td>
</tr>
<tr>
<td>Male sample (n = 2138)</td>
<td>.05(.03; .07)</td>
<td>40.57(10)</td>
</tr>
<tr>
<td>Female sample (n = 2314)</td>
<td>.04(.03; .05)</td>
<td>66.63(21)</td>
</tr>
<tr>
<td>Math Models</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full sample (N = 4452)</td>
<td>.03(.02; .04)</td>
<td>91.58(33)</td>
</tr>
<tr>
<td>Male sample (n = 2138)</td>
<td>.06(.04; .07)</td>
<td>49.38(10)</td>
</tr>
<tr>
<td>Female sample (n = 2314)</td>
<td>.04(.02; .05)</td>
<td>55.53(21)</td>
</tr>
</tbody>
</table>

*RMSEA = Root Mean Square Error of Approximation; 90% CI = Lower and upper bounds of a 90% confidence interval*
Figure 3. Multilevel exploratory factor analysis for academic self-efficacy and commitment to school scales at the within- and between-school levels

Within schools

Self-efficacy

Commitment

Between schools

* $p < .05$, ** $p < .01$, *** $p < .001$
Results of Direct Relationships between Economic Resources and Academic Performance

Direct Relationship between Economic Resources and English Scores

Direct effects of two types of economic resources—household assets and parents’ income—on each dependent variable were tested simultaneously. The overall English model showed satisfactory fit with the data ($x^2 = 112.82, df = 33, \text{RMSEA} = .04$). Table 3 presents path coefficients ($b$) and standard errors ($SE$) of the independent variables and mediators for the within- and between-school models for English scores. Results at the individual level show that at a 95% confidence interval, household assets ($b = -0.01, p > .05$) and parents’ income ($b = -0.08, p > .05$) were not directly associated with English scores, controlling for other covariates in the full sample English model. Likewise, these direct relationships were not statistically significant at the school level (i.e., household assets: $b = -0.87, p > .05$; parents’ income: $b = -1.65, p > .05$). Results for the hypothesized direct relationships between economic resources and English performance for the full sample at the within- and between-school levels are illustrated in Figures 4 and 5.

Results for males and females are reported separately from the full sample to highlight possible gender differences. As the moderation test results show, there is no evidence of significant gender difference in the English model with respect to direct relationship between economic resources and English performance. In the female English model, household assets ($b = -0.39, p > .05$), and parents’ income ($b = -0.05, p > .05$) were not directly or significantly related to English scores at a .05 significance level. Similarly, in the male English model, household assets ($b = 0.17, p > .05$), and parents’ income ($b = -0.18, p > .05$) were not directly or significantly related to English scores. Evidence from all three English models—full, female, and male—show that the data do not support the hypotheses ($1a–1d$) that parents’ income and
household assets directly affect English scores. In other words, the amount of parents’ income and household’s ownership of assets does not directly predict how well young females and males will perform in English.

Figure 4. Estimated unstandardized path coefficients for direct and indirect association between parents’ income and English grade for the full sample at the within- and between-school levels.

*\( p < .05 \), **\( p < .01 \), ***\( p < .001 \); ✗: means path coefficient is not statistically significant
Although the independent variables of interest—household assets and parents’ income—are not directly associated with English scores, several covariates are statistically significantly associated with them. Table 4 presents path coefficients ($b$) and standard errors ($SE$) of the control variables for the within- and between-school English models. In the full sample, two
youth characteristics—commitment to school and school attendance—are directly and significantly related to English performance. Student’s commitment to school is directly associated with English scores ($b = 0.13, p < .05$), which means that for every one unit increase in students’ commitment to school, English scores increase by 0.13 percentage points. There is gender difference in the magnitude but not the direction of the relationship. In the female-only sample, youths’ performance in English decrease by .19 percentage points for every one unit increase in commitment to school ($b = 0.19, p < .05$). For males, English scores increase by .14 percentage points for every one unit increase in commitment to school ($b = 0.14, p < .05$).

Like the positive relationship between commitment to school and academic performance, young people’s school attendance rates are positively and significantly associated with English scores ($b = 0.22, p < .05$). Each additional day of attendance results in a 0.22 percentage-point increase in English scores. The direction of the relationship is the same in the female- and male-only samples, except that the extent of the positive association is stronger in the male group. Males’ English scores increase by 0.25% when they increase their school attendance by one day ($b = 0.25, p < .05$). For females, English scores increase by only 0.21% for every one additional day that they attend school ($b = 0.21, p < .05$).

Student-to-teacher ratio, one of the two school-level covariates, is not statistically significantly associated with English scores in the full ($b = -0.002, p > .05$), female ($b = 0.01, p > .05$), and male models ($b = -0.001, p > .05$). Results also show that teacher qualification is not significantly associated with English scores in all three samples (full sample: $b = -0.17, p > .10$; female-only sample: $b = -0.08, p > .01$; and male-only sample: $b = 0.34$).
Direct Relationship between Economic Resources and Math Scores

A separate SEM test was conducted to test the hypotheses that household assets and parents’ income are directly related to youths’ performance in math (1c-1d). Table 5 presents path coefficients (b) and standard errors (SE) of the two independent variables of interest and mediators for the within- and between-school models for math scores. Statistically, household assets (b = -0.30, p > .05) and parents’ income (b = 0.15, p > .05) are not directly associated with math scores. Similarly, results at the school level show a statistically nonsignificant direct relationship between economic resources and math performance. Therefore, the data do not support the hypotheses that household assets (1c) and parents’ income (1d) are directly, positively associated with math scores. The within- and between-school results for the hypothesized direct relationships between economic resources and math performance for the full sample are illustrated in Figures 6 and 7.

This study also finds that these results of nonsignificant direct relationships are similar for males and females. Therefore, the data failed to support the moderation hypotheses (4c-4d) that results of the direct relationships between household assets and math scores (females: b = -0.37, p > .05; males: b = 0.13, p > .05) and between parents’ income and math scores (females: b = 0.08, p > .05; males: b = 0.29, p > .05) vary by gender.
Figure 6. Estimated unstandardized path coefficients for direct and indirect association between parents’ income and math grade for the full sample at within- and between-school levels.

- *p < .05, **p < .01, ***p < .001;
- ❌ means path coefficient is not statistically significant
Figure 7. Estimated unstandardized path coefficients for direct and indirect association between household assets and math grade for the full sample at within- and between-school levels.

* $p < .05$, ** $p < .01$, *** $p < .001$; $\times$: means path coefficient is not statistically significant
Table 6 presents path coefficients ($b$) and standard errors ($SE$) of the control variables for the within- and between-school models for math scores. Unlike household assets and parents’ income, some control variables are significantly associated with total math scores, including school attendance ($b = 0.27, p < .01$) and commitment to school ($b = 0.08, p < .05$). For each additional day of attendance, math scores increase slightly by 0.27%. Contrary to results from the English model, there is a weak but statistically significantly relationship between teacher qualifications and math performance ($b = 0.39, p < .10$). Although this relationship is significant, the results are not compelling because the relationship is only significant at the .10 significance level.

Overall, the nature, magnitude, and number of significant variables in both the English and math models are very similar. However, while neither parents’ income nor household assets are directly, significantly related to English scores, commitment to school and attendance are directly, significantly associated with English and math scores at the .05 significance level. Also, teacher qualification is positively associated with math scores but only at the .10 significance level.
Table 3. Path coefficients of independent variables and mediators in the English models

<table>
<thead>
<tr>
<th>Relationships</th>
<th>Within Schools</th>
<th>Between schools</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1_w</td>
<td>Model 2_w</td>
</tr>
<tr>
<td></td>
<td>Full sample</td>
<td>Females b(SE)</td>
</tr>
<tr>
<td><strong>Direct effects of economic resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household assets → English score</td>
<td>-0.01(0.41)</td>
<td>-0.39(0.57)</td>
</tr>
<tr>
<td>Parents’ income → English score</td>
<td>-0.08(0.19)</td>
<td>-0.05(0.27)</td>
</tr>
<tr>
<td><strong>Indirect effects of academic self-efficacy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficacy → English score</td>
<td>0.12(0.03)**</td>
<td>0.11(0.05)*</td>
</tr>
<tr>
<td>Household assets → Efficacy</td>
<td>49.81(23.68)*</td>
<td>-4.00(1.29)**</td>
</tr>
<tr>
<td>Parents’ income → Efficacy</td>
<td>-5.18(5.61)</td>
<td>0.47(0.56)</td>
</tr>
<tr>
<td><strong>Indirect effects of academic expectations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expectations → English score</td>
<td>0.21(0.02)***</td>
<td>0.22(0.03)***</td>
</tr>
<tr>
<td>Household assets → Expectations</td>
<td>-0.58(1.55)</td>
<td>16.61</td>
</tr>
<tr>
<td>Parents’ income → Expectations</td>
<td>-1.98(0.75)*</td>
<td>10.84(8.94)</td>
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</table>

+p < .10, *p < .05, **p < .01, ***p < .001; b=Path Coefficients (equivalent to regression weights); SE=Standard Errors
Table 4. Path coefficients of covariates in the English models

<table>
<thead>
<tr>
<th>Relationships</th>
<th>Within schools</th>
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<th>Between schools</th>
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<tbody>
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<td></td>
<td>Model 1w</td>
<td>Model 2w</td>
<td>Model 3w</td>
<td>Model 1B</td>
</tr>
<tr>
<td></td>
<td>Full sample</td>
<td>Females</td>
<td>Males</td>
<td>Full sample</td>
</tr>
<tr>
<td></td>
<td>$b(\text{SE})$</td>
<td>$b(\text{SE})$</td>
<td>$b(\text{SE})$</td>
<td>$b(\text{SE})$</td>
</tr>
<tr>
<td>Expectation $\rightarrow$ Efficacy</td>
<td>-23.61(9.57)*</td>
<td>1.79(0.16)***</td>
<td>-14.25(0.29)***</td>
<td>-131.49(25.67)*</td>
</tr>
<tr>
<td>Efficacy $\rightarrow$ Expectation</td>
<td>6.29(0.41)***</td>
<td>-48.61(13.01)*</td>
<td>5.37(0.41)***</td>
<td>19.15(2.67)**</td>
</tr>
<tr>
<td>Age $\rightarrow$ Efficacy</td>
<td>-23.69(9.92)*</td>
<td>1.79(0.41)*</td>
<td>-11.26(2.92)*</td>
<td>413.04(146.25)*</td>
</tr>
<tr>
<td>Age $\rightarrow$ Expectations</td>
<td>-0.36(-0.48)</td>
<td>-7.72(5.97)</td>
<td>-0.61(0.61)</td>
<td>34.91</td>
</tr>
<tr>
<td>Commitment $\rightarrow$ Efficacy</td>
<td>10.22(4.02)*</td>
<td>-0.12(0.12)</td>
<td>6.34(0.89)***</td>
<td>33.33(17.19)+</td>
</tr>
<tr>
<td>Commitment $\rightarrow$ English score</td>
<td>0.13(0.04)*</td>
<td>0.19(0.06)*</td>
<td>0.14(0.06)*</td>
<td>0.19(0.24)</td>
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<tr>
<td>Commitment $\rightarrow$ Expectation</td>
<td>-2.79(0.25)**</td>
<td>24.35(6.93)*</td>
<td>-2.22(0.27)***</td>
<td>-7.41(1.36)*</td>
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<tr>
<td>Household size $\rightarrow$ assets</td>
<td>0.03(0.004)**</td>
<td>0.03(0.01)**</td>
<td>0.02(0.007)*</td>
<td>0.03(0.32)</td>
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<tr>
<td>Household size $\rightarrow$ Expectations</td>
<td>-0.36(0.36)</td>
<td>1.29(4.23)</td>
<td>0.38(0.47)</td>
<td>-32.12(8.93)*</td>
</tr>
<tr>
<td>Attendance $\rightarrow$ English score</td>
<td>0.22(0.02)**</td>
<td>0.21(0.04)**</td>
<td>0.25(0.03)****</td>
<td>0.24(0.21)</td>
</tr>
<tr>
<td>Parental income $\rightarrow$ assets</td>
<td>0.05(0.01)*</td>
<td>0.03(0.01)*</td>
<td>0.06(0.02)*</td>
<td>-0.04(0.07)</td>
</tr>
<tr>
<td>Planned effort $\rightarrow$ Efficacy</td>
<td>8.69(3.96)*</td>
<td>-0.67(0.16)*</td>
<td>3.62(1.30)*</td>
<td>282.28</td>
</tr>
<tr>
<td>Planned effort $\rightarrow$ English score</td>
<td>-0.05(0.05)</td>
<td>-0.02(0.07)</td>
<td>-0.09(0.08)</td>
<td>-0.65(1.39)</td>
</tr>
<tr>
<td>Planned effort $\rightarrow$ Expectation</td>
<td>-0.93(0.21)</td>
<td>9.60(3.27)*</td>
<td>-1.05(0.27)**</td>
<td>-24.18(7.23)*</td>
</tr>
<tr>
<td>Class ratio $\rightarrow$ English scores</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-0.002(0.5)</td>
</tr>
<tr>
<td>Teachers without postsecondary certificate $\rightarrow$ English scores</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.17(0.22)</td>
</tr>
</tbody>
</table>

*p < .10, *p < .05, **p < .01, ***p < .001; $b$= Path Coefficients (equivalent to regression weights); SE=Standard Errors
Table 5. Path coefficients of independent variables and mediators in the math models

<table>
<thead>
<tr>
<th>Relationships</th>
<th>Within Schools</th>
<th>Between schools</th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 4w</td>
<td>Model 5w</td>
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<td>Full sample</td>
<td>Females b(SE)</td>
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<tr>
<td>Direct effects of economic resources</td>
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</tr>
<tr>
<td>Household assets → Math score</td>
<td>-0.30(0.39)</td>
<td>-0.37(0.56)</td>
<td>0.13(0.65)</td>
<td>0.54</td>
<td>12.99(30.41)</td>
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<tr>
<td>Parents’ income → Math score</td>
<td>0.15(0.19)</td>
<td>0.08(0.25)</td>
<td>0.29(0.32)</td>
<td>-2.89(3.01)</td>
<td>-3.93</td>
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<tr>
<td>Indirect effects of academic efficacy</td>
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<tr>
<td>Efficacy → Math score</td>
<td>0.09(0.03)*</td>
<td>-1.38(0.07)***</td>
<td>-5.18(0.13)***</td>
<td>-0.33(0.37)</td>
<td>-1.15(0.89)</td>
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<td>Household assets → Efficacy</td>
<td>-0.36(0.28)</td>
<td>-0.24(0.41)</td>
<td>-1.60(0.64)*</td>
<td>-8.68(5.83)</td>
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<td>Parents’ income → Efficacy</td>
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<td>0.21(0.19)</td>
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<td>-7.86(4.77)</td>
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<td>Indirect effects of youth’s academic expectations</td>
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<tr>
<td>Expectations → Math score</td>
<td>0.14(0.02)**</td>
<td>0.12(0.02)**</td>
<td>0.13(0.03)*</td>
<td>0.18(0.27)</td>
<td>-0.88(1.07)</td>
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<tr>
<td>Household assets → Expectations</td>
<td>2.39(0.65)*</td>
<td>2.08(0.97)*</td>
<td>5.46(2.32)*</td>
<td>-13.12</td>
<td>-15.57</td>
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<tr>
<td>Parents’ income → Expectations</td>
<td>0.15(0.31)</td>
<td>0.31(0.45)</td>
<td>1.83(1.23)</td>
<td>30.24(9.74)*</td>
<td>26.43</td>
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*p < .10, *p < .05, **p < .01, ***p < .001; b= Path Coefficients (equivalent to regression weights); SE=Standard Errors
Table 6. Path coefficients of covariates in the math models

<table>
<thead>
<tr>
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<th>Within schools</th>
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<tbody>
<tr>
<td></td>
<td>Model 4w</td>
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<td>Model 4B</td>
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<td>Males</td>
<td>Full sample</td>
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<tr>
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<td>b(SE)</td>
<td>b(SE)</td>
<td>b(SE)</td>
<td>b(SE)</td>
</tr>
<tr>
<td>Expectation → Efficacy</td>
<td>0.38(0.02)**</td>
<td>0.41(0.2)**</td>
<td>0.92(0.05)*****</td>
<td>2.33(0.39)**</td>
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<tr>
<td>Efficacy → Expectation</td>
<td>-1.14(0.05)***</td>
<td>-1.38(0.07)**</td>
<td>-5.18(0.13)*****</td>
<td>-7.03(0.86)**</td>
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<tr>
<td>Age → Efficacy</td>
<td>0.28(0.09)*</td>
<td>0.34(0.14)*</td>
<td>0.87(0.19)*</td>
<td>-7.65(3.48)*</td>
</tr>
<tr>
<td>Age → Expectations</td>
<td>-1.14(0.19)**</td>
<td>-1.38(0.32)*</td>
<td>-1.15(0.71)</td>
<td>-8.57</td>
</tr>
<tr>
<td>Commitment → Efficacy</td>
<td>0.38(0.02)**</td>
<td>0.35(0.04)**</td>
<td>0.29(0.33)</td>
<td>0.03(0.23)</td>
</tr>
<tr>
<td>Commitment → Math score</td>
<td>0.08(0.04)*</td>
<td>0.14(0.05)*</td>
<td>0.29(0.32)</td>
<td>0.36(0.20)</td>
</tr>
<tr>
<td>Commitment → Expectation</td>
<td>0.94(0.06)****</td>
<td>0.98(0.09)**</td>
<td>1.86(1.23)</td>
<td>3.05(0.50)**</td>
</tr>
<tr>
<td>Household size → assets</td>
<td>0.03(0.004)**</td>
<td>0.03(0.01)**</td>
<td>0.02(0.01)*</td>
<td>-0.03(0.03)</td>
</tr>
<tr>
<td>Household size → Expectations</td>
<td>-0.02(0.15)</td>
<td>0.29(0.22)</td>
<td>-0.81(0.54)</td>
<td>-0.04(0.06)</td>
</tr>
<tr>
<td>Attendance → Math score</td>
<td>0.27(0.02)**</td>
<td>0.31(0.04)**</td>
<td>0.29(0.03)****</td>
<td>0.55(0.20)*</td>
</tr>
<tr>
<td>Parental income → assets</td>
<td>0.05(0.01)**</td>
<td>0.03(0.01)*</td>
<td>0.08(0.06)</td>
<td>-0.03(0.06)</td>
</tr>
<tr>
<td>Planned effort → Efficacy</td>
<td>0.05(0.04)</td>
<td>0.001(0.05)</td>
<td>-0.07(0.09)</td>
<td>-2.55(1.25)+</td>
</tr>
<tr>
<td>Planned effort → Math score</td>
<td>0.07(0.05)</td>
<td>0.10(0.07)</td>
<td>0.04(0.08)</td>
<td>-0.83(1.14)</td>
</tr>
<tr>
<td>Planned effort → Expectation</td>
<td>0.66(0.08)**</td>
<td>0.71(0.12)**</td>
<td>1.54(0.31)****</td>
<td>10.57(2.75)**</td>
</tr>
<tr>
<td>Class ratio → Math scores</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-0.06(0.05)</td>
</tr>
<tr>
<td>Teachers without postsecondary certificate → Math scores</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.39(0.22)+</td>
</tr>
</tbody>
</table>

*p < .10, **p < .05, ***p < .001; b= Path Coefficients (equivalent to regression weights); SE=Standard Errors
Results of Indirect Relationships between Economic Resource and Academic Performance

To test the potential mediational role of academic self-efficacy and youth expectations, I assessed four major components of the mediation model: overall model fit, direct pathway ($Path_w c$ in Figure 2), and indirect pathways ($Path_w a$ and $Path_w b$ in Figure 2). If results of the overall model suggested the presence of statistically significant mediation (i.e., indirect pathways), the results were compared to results of the direct pathway to establish complete or partial mediation. Statistically significant direct and indirect relationships suggest partial mediation. Statistical significance of the indirect relationship only suggested complete (i.e., full) mediation. When an indirect relationship was confirmed, the magnitude of the indirect effect was calculated using the product-of-coefficients strategy (Kenny, 2012; Preacher & Hayes, 2008) by multiplying the path coefficient from the independent variable to the mediator ($Path_w a$) by the path from the mediator to the dependent variable ($Path_w b$).

Results of Self-Efficacy Pathway

**Mediating role of academic self-efficacy in English score outcomes.** To assess academic self-efficacy as a potential mediator, I examined the overall model for acceptable fit. The fit indices of the overall mediation model showed good model fit ($x^2 = 112.82$, df = 33, RMSEA = .04). Results show that the direct path from academic self-efficacy to English scores is statistically significant for the full sample ($b = 49.81$, $p < .05$), the female-only sample ($b = -4.00$, $p < .01$), and the male-only sample ($b = 32.52$, $p < .05$). Because of the statistically significant relationship between self-efficacy and English scores, any significant association between economic resources and self-efficacy would indicate the presence of a mediational effect.
Results show that the direct path from household assets to academic self-efficacy is statistically significant (i.e., household assets $\rightarrow$ academic self-efficacy: $b = 49.81, p < .05$), which means that there is a statistically significant indirect pathway from household assets to English scores via youths’ academic self-efficacy. The extent of the indirect relationship is 5.98 (i.e., household assets $\rightarrow$ academic self-efficacy $\rightarrow$ English scores: $49.81 \times 0.25 = 5.98$). The results support the hypothesis that a young person’s academic self-efficacy mediates the association between household assets and English scores ($2b$). The mediational effect is complete (i.e., full mediation) because direct association between the independent variable (household assets) and the outcome (English scores) is not statistically significant. Thus, household assets are related to English scores but only through students’ self-efficacy. For every one additional unit increase in household assets, English scores improve by 5.96 points through the intervening effect of academic self-efficacy.

Next, I examined whether the mediational effect is consistent across the two gender groups. First, there are statistically significant relationships between academic self-efficacy—the mediator—and English scores for females (i.e., academic self-efficacy $\rightarrow$ English scores: $b = 11.00, p < .05$) and males (i.e., academic self-efficacy $\rightarrow$ English scores: $b = 0.13, p < .05$). With these significant results, any significant relationship between economic resources and academic self-efficacy across the gender groups would indicate an indirect relationship between economic resources and English scores through the intervening effect of academic self-efficacy.

Results show that academic self-efficacy mediates the relationship between household assets and English scores for females (i.e., household assets $\rightarrow$ academic self-efficacy: $b = -4.00, p < .01$) and for males (i.e., household assets $\rightarrow$ academic self-efficacy: $b = 32.52, p < .05$), but at different significance levels, magnitudes, and directions. Therefore, the data support the
hypothesis that gender moderates the indirect association between household assets and young people’s English scores through academic self-efficacy (5b). The magnitude of the indirect relationship for females is small and negative (i.e., $-4.00 \times 0.11 = -0.44$) because there is an inverse relationship between household assets and academic self-efficacy of females ($b = -4.00$, $p < .01$). Conversely, the magnitude of the indirect relationship for males is positive and bigger (i.e., household assets $\rightarrow$ academic self-efficacy $\rightarrow$ English scores: $32.52 \times 0.13 = 4.23$) because the statistically significant path from household assets and academic self-efficacy is positive and bigger for the male sample ($b = 32.52$, $p < .05$). The extent of the indirect relationship in the male sample is closer to that of the full sample.

The study also assessed whether academic self-efficacy mediates the association between parents’ income and English scores. Upon examining the paths for the full sample and the two gender samples, none of the samples has a statistically significant path from parents’ income to self-efficacy (full sample: $b = -5.18$, $p > .10$; female sample: $b = 0.47$, $p > .10$; male: $b = 0.45$, $p > .10$). Evidence from the data does not support the hypothesis (2a) that self-efficacy mediates the association between parents’ income and English performance. Likewise, because the path from parents’ income to self-efficacy is not statistically significant for females and males, the data do not support Hypotheses 5a, which posits that gender moderates the indirect association between parents’ incomes and young people’s English scores through academic self-efficacy.

Mediating role of academic self-efficacy in math score outcomes. To assess the potential mediational role of academic self-efficacy in the math models, I first reviewed the overall model for adequate model fit, which was good ($\chi^2 = 91.58$, df = 33, RMSEA = .03). To establish a mediational effect, the direct path from academic self-efficacy—the potential mediator—to math scores must be statistically significant for the full sample model. The results
show that academic self-efficacy statistically explains math scores for the full \( (b = 0.09, p < .05)\), the female-only \( (b = -1.38, p < .001)\), and the male-only \( (b = -5.18, p < .001)\) samples. Because the academic self-efficacy pathway is significantly associated with math scores, any significant association between economic resources and self-efficacy would indicate the presence of a mediational effect.

Results show that the direct path from household assets to self-efficacy is not statistically significant \( (b = -0.36, p > .10)\), which means that there is no statistically significant indirect pathway from household assets via youths’ academic self-efficacy to math scores for the full sample. The results do not support the hypothesis that a young person’s academic self-efficacy mediates the association between their household assets and math scores \( (2d)\). However, gender moderates the mediational role of self-efficacy in the relationship between household assets and math scores. That is, the indirect relationship between household assets and math scores via self-efficacy is significant for males \( (b = -1.60, p < .05)\) but not females \( (b = -0.24, p > .10)\). Thus, household assets are related to math scores through students’ self-efficacy but only for males. The extent of the indirect relationship is 8.29 \( (i.e., -1.60 \times -5.18 = 8.29)\). The data supports the hypothesis \( (5d)\) that gender moderates the mediational role of academic self-efficacy in the relationship between household assets and math scores.

Results show that the direct paths from parents’ income to self-efficacy is significant for the full sample \( (b = 0.33, p < .05)\), but not the female-only \( (b = 0.21, p > .10)\), and the male-only samples \( (b = 0.29, p < .10)\). This means, for the full sample, there is a statistically significant indirect pathway from parents’ income to math scores via youths’ academic self-efficacy. The data supports the hypothesis \( (2c)\) that there is an indirect relationship between parents’ income and math scores through academic self-efficacy. However, the data do not support the
hypotheses ($5c$) that gender moderates the indirect association between parents’ incomes and young people’s math scores through academic self-efficacy.

**Results of Academic Expectation Pathway**

*Mediating role of youths’ academic expectations in English score outcomes.* Before assessing whether an indirect relationship exists between economic resources and English scores via youths’ expectations, the overall model for the full sample was assessed and was deemed a good fit ($x^2 = 112.82$, df = 33, RMSEA = .04). The female and male samples have sufficient overall model fit (female: $x^2 = 66.63$, df = 21, RMSEA = .04; male: $x^2 = 40.57$, df = 10, RMSEA = .05), suggesting there is support for the moderation hypotheses for the English model.

The path from academic expectations to English scores is statistically significant in the full (b = 0.21, $p < .001$), female-only (b = 0.22, $p < .001$), and male-only (b = 0.21, $p < .001$) samples. In all three samples, the paths from household assets to youth academic expectations are not statistically significant (full sample: b = -0.58, $p > .10$; female-only sample: b = 16.61, $p > .10$; male-only sample: b = -0.86, $p > .10$). Thus, there is no support for the hypothesis ($3b$) that academic expectations mediate the association between household assets and young people’s English scores. Likewise, because the potential mediational effect is not statistically significant in the female and male samples, there is no evidence to support the hypothesis ($6b$) that gender moderates the indirect association between household assets and young people’s English scores through academic expectations.

The path from parents’ income to youths’ academic expectations for the English model is negatively and statistically significant in the full sample (b = -1.98, $p < .05$), which means that there is an indirect path from parents’ income to English scores through academic expectations. Thus, the data supports **Hypothesis 3a**, which posits that academic expectations mediate the
association between parents’ income and young people’s English scores. The extent of the indirect association is 3.91 (i.e., $-1.98 \times -1.93 = 3.91$). Similarly, there is a statistically significant direct path from parents’ income to academic expectations in the male-only sample ($b = -1.93, p < .10$) but not in the female-only sample ($b = 10.84, p > .10$). The gender difference means there is support for Hypothesis 6a that gender moderates the indirect association between parents’ income and young people’s English scores through academic expectations.

**Mediating role of youths’ academic expectations in math score outcomes.** There is evidence of mediation by academic expectations in the full, female-only, and male-only samples. First, I established that the pathway from young people’s academic expectations to math scores is statistically significant for full ($b = 0.14, p < .01$), female-only ($b = 0.12, p < .01$), and male-only ($b = 0.13, p < .05$) samples, which means there will be evidence of mediation if a statistically significant path exists between any of the economic resources and the mediator (i.e., Path a). Results show that the path from parents’ income to academic expectations is not statistically significant ($b = 0.15, p > .10$), which discounts the hypothesis (3c) that academic expectations mediate the association between parents’ income and young people’s math scores. Likewise, the path from parents’ income to academic expectations is not statistically significant for the female-only ($b = 0.31, p > .10$) and male-only ($b = 1.81, p > .10$) samples, which means there is no evidence to support the hypothesis (6c) that gender moderates the indirect association between parents’ income and young people’s math scores through academic expectations.

However, there is a significant indirect relationship between household assets and math scores. First, the path from household assets to academic expectations in the full sample is statistically significant ($b=2.39, p < .05$), which supports the hypothesis (3d) that academic expectations mediate the association between household assets and young people’s math scores.
The strength of the indirect relationship is 0.33 (i.e., \(2.39 \times 0.14 = 0.33\)). In addition, the path from household assets to academic expectations in the female-only (\(b = 2.08, p < .05\)) and male-only (\(b = 5.46, p < .05\)) samples are statistically significant. The magnitude of the indirect relationship for males (i.e., \(5.46 \times 0.13 = 0.71\)) is nearly thrice that for females (i.e., \(2.08 \times 0.12 = 0.25\)). This finding supports that hypothesis (6d) gender moderates the indirect association between household assets and young people’s math scores through academic expectations.

**Conclusion**

Overall, results show that there is no direct relationship between economic resources and academic performance, at the 95% confidence level. However, at the same confidence level, results show that both types of economic resources—parents’ income and household assets—are associated with educational outcomes through different mediating mechanisms. While results indicate that economic resources are associated with academic performance, it is through the intervening variables of academic self-efficacy and academic expectations. The study also finds evidence of gender differences. Nine (75%) of the 12 individual and household characteristics vary by gender. Gender moderates all but of the statistically significant indirect relationships between economic resources and academic performance. Where evidence of gender differences exists, results consistently favor males over females.
CHAPTER 6: DISCUSSION

Summary of Findings

The purpose of this study is to examine the pathways through which economic resources are associated with educational outcomes for Junior High School students in Ghana. Assets-effects is the main theoretical framework guiding the study. This framework posits that asset ownership and the process of accumulating assets change young people’s mental representations in ways that improve academic self-efficacy and future expectations, which in turn influence a range of developmental outcomes (Scanlon & Adams, 2009; Sherraden, 1991). The theory of assets effects also suggests that assets create educational advantages by facilitating access to educational resources and services that improve educational outcomes (Elliott, 2013). Using this theoretical framework, prior empirical evidence, and data from the cross-sectional baseline survey from the YouthSave Ghana Experiment, I examined 24 hypotheses clustered into the following three categories:

1. *Direct relationships*: Different types of economic resources have varying direct effects on academic performance.

2. *Mediated (indirect) relationships*: Different types of economic resources affect academic performance through young people’s academic self-efficacy and expectations.

3. *Moderated relationships*: Direct and mediated relationships between economic resources and academic performance differ by gender.

In all, the study finds support for eight hypotheses. None of the hypothesized *direct relationships* are supported: Half (4 out of 8) of the hypothesized *indirect relationships* are supported. A third
(4 out of 12) of the hypothesized *moderated relationships* are supported. Table 7 summarizes the list of hypotheses supported.

Table 7. Summary of hypotheses supported (8 out of 24 hypotheses supported)

<table>
<thead>
<tr>
<th>Category of hypotheses</th>
<th>Count of supported hypotheses</th>
<th>List of supported hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct relationships</td>
<td>0 out of 4</td>
<td>None</td>
</tr>
</tbody>
</table>
| Indirect relationships | 4 out of 8                    | 1. **Hypothesis 2b**: Academic self-efficacy mediates the association between household assets and young people’s English scores.  
2. **Hypothesis 2c**: Academic self-efficacy mediates the association between parents’ incomes and young people’s math scores.  
3. **Hypothesis 3a**: Academic expectations mediate the association between parents’ income and young people’s English scores.  
4. **Hypothesis 3d**: Academic expectations mediate the association between household assets and young people’s math scores. |
| Moderated relationships| 4 out of 12                   | 1. **Hypothesis 5b**: Gender moderates the indirect association between household assets and young people’s English scores through academic self-efficacy.  
2. **Hypothesis 5d**: Gender moderates the indirect association between household assets and young people’s math scores through academic self-efficacy.  
3. **Hypothesis 6a**: Gender moderates the indirect association between parents’ income and young people’s English scores through academic expectations.  
4. **Hypothesis 6d**: Gender moderates the indirect association between household assets and young people’s math scores through academic expectations. |

Overall, findings reveal that the relationship between household economic resources—parents’ income and household assets—and youth academic performance is more evident and stronger when intervening variables—young people’s academic self-efficacy and expectations—are taken into account. For the most part, these indirect relationships are positive, meaning the
more access young people have to economic resources, the higher their academic expectations and sense of self-efficacy, and these in turn lead to better academic performance. The many instances of no significant direct relationships between economic resources and academic performance suggest that knowing the amount of economic resources owned by a youth’s household is not enough to explain success in academic performance. Findings also suggest that gender moderates all the significant indirect relationships between economic resources and academic performance. Compared to school characteristics, more individual assets appear to explain academic performance, which is discussed in this chapter.

**Direct Relationship between Household Economic Resources and Academic Performance**

Findings from this study suggest that there is no statistically significant *direct* relationship between either type of the economic resources—parents’ income and household assets—and academic performance. This finding is consistent with studies by Easton-Brooks and Davis (2007), Williams Shanks (2007), and Phillips et al. (1998), as they also found no significant relationship between assets and English scores. The difference between this non-significant finding and the significant findings from previous empirical studies in the US could be a reflection of contextual and cultural differences. As discussed in Chapter 1, JHS education in Ghana is constitutionally guaranteed and required for all school-age youth. Besides, the government provides basic school supplies and free lunch in some deprived schools. Perhaps, these policies and provisions have negated the potential effects that lack of household economic resources could have on young people’s educational experience at the JHS level. In the absence of these programs, household economic resources could make a difference in JHS students’ educational experience because only those who have economic resources would be able to afford educational expenses.
Another reason for the contradictory results could be that the assets of most households in the study are below a critical threshold to trigger an effect on academic performance. The worth of household assets may not have been high enough to help pay for necessary school supplies. Perhaps having household assets makes a significant difference in young people’s academic performance once it reaches a certain threshold (Sherraden & McKernan, 2008). Empirical evidence has yet to determine an asset threshold that would make a difference in educational outcomes.

Besides, youth in the study did not personally own the household assets measured in the study. Therefore they may not benefit from the assets-experience that comes with direct ownership or management of assets. As discussed in Chapter 2, there is a learning component of asset accumulation and ownership. When young people participate in accumulation and management of assets, they gain practical experiences some of which may reinforce knowledge acquired in the classroom and affect their academic performance. Perhaps, if these assets were owned by youth in this study, they may have had positive asset-experiences that would directly impact their academic work. On the other hand, we know certain types of assets lead to negative asset-experience which may have negative influence on academic performance. Some youth in the study may have assisted their households to manage assets, such as farmlands or business ventures that are known to take students’ time away from academic work. Since this study did not assess the nature of the asset-experience of youth, it is not possible to draw definitive conclusions about the direction of the asset-experience. Nevertheless, there is a possibility that some youth in the study spent more time on households assets compared to schoolwork, and that may have neutralized the positive effects that household assets could have had on their academic performance.
The finding that parents’ income is not associated with educational outcomes is not atypical. Some studies find significant associations, but others fail to find support for such relationships. Studies in SSA generally find significant relationships between parents’ income and educational outcomes. For instance, studies from SSA countries such as Ghana, Côte d’Ivoire (Acheampong, 2007; Tansel, 1997), Mozambique (Bilale, 2007; Handa, Simler, & Harrower, 2004), Guinea (Glick & Sahn, 2000), and Ethiopia (Cockburn & Dostie, 2007) suggest that higher parents’ or household income correlates with improved educational outcomes. On the other hand, studies by Corwyn and Bradley (2002), Shea (2000), and Chevalier et al. (2005) find non-significant relationships between parents’ or household income and educational outcomes in the US. One possible reason for the difference in findings is that the studies in SSA do not test income separately from other measures of socio-economic status. To assess the true association between parents’ or household income and educational outcomes, this study separates income from other measures of socio-economic status.

Methodological difficulties in measuring income in developing countries also could account for the variations in findings. Many individuals and households in SSA earn seasonal income (Prakongsai, 2006), and the data in some studies may be unreliable depending on when they were collected (Moser & Felton, 2007). Moreover, a large proportion of households in the developing world earn income from the informal sector, through self-employment, and by performing a variety of economic activities. Thus, reliance on study participants’ memory recall for income data is insufficient (Sahn & Stifel, 2003). Studies use different methods of data collection that may contribute to different findings.

Aside from the possible methodological explanations for differences in findings, perhaps parents’ income is not as important until students transition from JHS to SHS. As discussed in
Chapter 1, there is no tuition fee for JHS, but there is little government support at the SHS level. Thus, it is possible that parents’ income would be more relevant at the SHS level because that is when more economic resources are needed to pay for tuition and school supplies. Some students are even excluded from class or taking SHS standardized exams for non-payment of tuition fees (Amoah, April 2013; Daily Guide, May 2012; GNA, April 2013; Owusu, 2012). Such situations are unlikely at the JHS level because the cost of supplies is comparatively lower, and the government covers tuition and subsidizes examinations fees (See GNA, March 2009).

Given that this study finds no significant direct relationship, it is possible that the slightest contextual difference could explain the varying results. Because of the regional inequality in school infrastructure in Ghana (Higgins, 2009; Jebuni, McKay, & Shepherd, 2007), academic performance may be more sensitive to small variations in household assets. For instance, many pupils in some districts in Ghana carry chairs and tables to school daily (GNA, 2012). Lack of household durables (i.e., assets) such as furniture could negatively affect youths’ schooling. Studies in Ghana show that not having a school desk and chair is a major reason for school dropout (Akyeampong et al., 2012; Ampiah & Kwaah, 2010; Rolleston, et al, 2010).

Mediated (Indirect) Relationships between Household Economic Resources and Academic Performance

This study aimed to test the potential mediational roles of academic self-efficacy and expectations in the relationship between economic resources and academic performance. Overall, results indicate that economic resources are indirectly associated with educational outcomes through academic self-efficacy or expectations. This finding provides empirical support for the theory that having economic resources affects the way people think about their capabilities, which may in turn change their behaviors and lead to positive developmental outcomes (Scanlon
& Adams, 2009; Sherraden 1991). The findings also corroborate empirical evidence that suggests that economic resources influence the way people perceive the world, which affects their behavior (Yadama & Sherraden, 1996; Zhan, 2006).

One surprising result from this study is that the most significant way by which economic resources are associated with academic performance appears to be through the mediating variables of academic self-efficacy and expectations. Having economic resources does not directly explain much of the variability in academic performance, which is evident in the no direct relationship between household assets and math scores. The question then is why academic self-efficacy and expectations are so important to the connection between economic resources and educational outcomes?

One explanation from the asset-effect framework is that economic resources help create the necessary conditions for motivating young people to perform well in school. Researchers find that having savings has various cognitive and behavioral effects on young people (Chowa, 2008; Sherraden et al., 2005). Having economic resources may facilitate acquisition of the self-efficacy needed to perform well in school. For instance, Ghanaian parents who have more economic resources may be able to make significant investments in their children’s capabilities. A study by Akaguri and Akyeampong (2010) shows that it costs households in the lowest income quintile 16% of their income to enroll a child in a public school, but it costs households in the highest income quintile only 1.7% of their income. Households in the lowest income quintile must invest a considerable proportion of their resources to develop their children’s capabilities.

Similarly, when parents invest considerable resources into their children’s education and school supplies, students are likely to have higher expectations of their own academic work. This study suggests that household resources are associated with academic performance through their
influence on academic expectations. This finding is consistent with evidence from other studies that shows that asset ownership even by young people instills confidence and raises expectations (Elliott, 2008; Elliott, Chowa, & Loke, 2011; Loke, 2009).

More research on assets and education are using psychological factors, such as self-efficacy and expectations, to help explain the relationship between assets and educational outcomes (Elliott, 2011). In general, these studies have focused on parents’ expectations (Williams Shanks & Destin, 2009), and relatively few have investigated the effects of young people’s self-efficacy and expectations as linking mechanisms between economic resources and educational outcomes (Hayes et al., 2012; James, 2010; Schunk, 2011; Sun, Buys, & Wang, 2012). Because the present study suggests that these mediating psychological factors provide the most compelling explanations of the link between economic resources and educational outcomes, it is important that they are factored into how we understand the importance of assets for educational success (Zhan & Sherraden, 2009).

**Gender as a Partial Moderator in the Relationship between Household Economic Resources and Academic Performance**

In addition to demonstrating indirect associations between economic resources and educational outcomes, results from this study also suggest that the nature of these relationships sometimes depends on the young person’s gender. First, results show that gender does not affect either the direct or indirect relationships between parents’ income and math scores, which perhaps shows that the gender gap in math performance is narrowing (Kane & Mertz, 2012; Hyde & Mertz, 2009). Traditionally, boys outperform girls in math, but providing equal access to opportunities through economic resources may help reduce this gender gap. A cross-country
A study of 19 African countries shows that even when boys outperform girls on math tests, the difference is small (Dickerson, McIntos, & Valente, 2013).

A weak but statistically significant gender difference does exist when it comes to English scores, which is consistent with other empirical evidence from SSA (Abukari, 2010; Johnson, Crosnoe, & Elder, 2001; Sahn, 2000). However, this study’s moderation results are different from others’ because the inclusion of the mediating factors of academic expectations sometimes changes the direction of the relationship in favor of males. For instance, there is no significant gender difference in the direct relationship between parents’ income and English scores until academic expectations act as a mediator. In this case, the relationship is significant and negative for males but positive for females.

Historically, girls have not had as many educational opportunities as boys because of Ghana’s dominant patriarchal culture (Abukari & Laser, 2013). A family with few resources often would invest in boys’ schooling, so girls may become more sensitive to and take greater advantage of educational opportunities. The finding that higher parental income favors girls is consistent with a study conducted by Appleton (1995b) in Cote d’Ivoire, which shows that girls outperform boys when households have more economic resources to begin with.

On the contrary, when academic self-efficacy mediates the association between household assets and English scores, results show a significant negative relationship for females but not males. The negative effect of household assets on females’ self-efficacy reduces the positive effect of self-efficacy on educational outcomes, which results in an indirect negative effect of household assets on educational outcomes. Clearly, this is an unexpected impact that possibly supports the idea that the asset experience could have negative effects on outcomes, especially if the asset accumulation process takes young people’s time away from schoolwork.
Overall, the mixed findings for the moderating role of gender suggest different economic resources have varying impacts on girls’ and boys’ education. Specifically, household assets may not always enhance girls’ education. As this study reveals, when the indirect association between household assets and educational outcomes is statistically significant, the relationship is positive for males but negative for females. Such evidence should raise concerns about the effectiveness of asset building strategies (Scanlon & Adams, 2009). Because different assets are combined to form an assets index in this study, it is not clear whether specific types of assets contribute to the negative relationships for female youth. Clearly, this is a question that needs further investigation to explain the dynamics.

**Relationship between School-Level Variables and Academic Performance**

Results show that the relationships between the number of teachers without postsecondary qualifications and math and English scores are weak and not statistically significant at the 95% confidence level. The weak and nonsignificant relationships are consistent with studies in Ghana that suggest that teacher qualifications influence student learning the most when other related factors such as conditions of service are favorable (Agyemang, 1993; Etsey, 2005). In other words, while academic and professional qualifications of teachers are necessary, they are not sufficient to transform student learning and academic performance. Making sure all schoolteachers, particularly those in rural areas of Ghana, are professionally trained is laudable but inadequate to transform academic performance of students if teachers are not well-motivated or do not have instructional resources to do teach effectively. For instance, private schools in Ghana are mostly staffed with “untrained” teachers and yet they outperform public schools staffed with predominantly trained teachers because other factors such as school management
systems, community involvement, and the lack of instructional materials are key factors in explaining the performance differences (Akyeampong, 2003).

This study also finds that student-to-teacher ratio is not significantly associated with English and math scores, which is counterintuitive and contradicts previous research in which students in smaller classes outperform those in larger classes (Etsey, 2005). The importance of student-to-teacher ratio is based on the idea that teachers are able to give direct and individual attention when there are fewer students in the class. However, it seems there is a threshold effect, and student-to-teacher ratio begins to have a negative effect after it exceeds a certain number. A study by Kraft (1994) finds that class size in Ghana does not have a negative effect on academic performance until there are more than 40 students, and studies by Hanushek (1996, 1999) suggest that class size has no effect on academic performance. Findings from the present study and others suggest that class size may not be detrimental to academic performance in every case. Smaller teacher-to-student ratio may be beneficial at earlier grades when students need more individualized support and attention from teachers (Lee et al., 2005; Greenwald & Hedges, 1996; Nye & Hedges, 2000; Wößmann & West, 2006; Michaelowa & Wittmann, 2007).

**Relationship between other Control Variables and Academic Performance**

Numerous control variables are significantly associated with educational outcomes. First, young people’s rate of school attendance has a statistically significant and positive relationship with math and English scores, which means that youth who attend school regularly tend to do better academically. This is consistent with a study by Norviewu-Mortty (2012) who finds that regular school attendance in Ghana boosts subject grades in continuous assessment and final examination scores at the JHS level. Other studies find strong relationships between school attendance and other educational outcomes (Allensworth & Easton, 2007; Railsback, 2004).
When students attend school, they acquire more knowledge and skills by learning directly from their teachers and peers. The Government of Ghana has adopted free tuition, free school uniforms, and school feeding programs at the basic school level to encourage not only high enrollment rates but also regular attendance.

The direction of relationships between some covariates and educational outcomes contradicts earlier studies. For instance, age has a negatively and statistically significant association with educational outcomes. On average, older students have lower math and English scores than their younger peers, which is contrary to results from studies in Ghana and other countries (Busari, 2012; Yousefi, 2010). However, the finding indicating that younger students perform better than older ones in English score is consistent with the critical period hypothesis in language acquisition studies which posits that children are better equipped in acquiring a second language when they are younger than when older (Ampaabeng & Tan, 2012). It is possible that as young people mature in age and begin to engage in work or other income-generating activities, their interest in school wanes. The Ghana Statistical Service (2003) finds that 34.58% of study participants aged 6–11 and 44.26% of participants aged 12–15 dropped out of school because they felt it was uninteresting. This suggests that some young people lose interest in school as they grow. There is also a question of why such older students still attend JHS? Could it be that older students are repeating grades or have had interruptions in schooling for various reasons? These needs more investigation to clarify the reasons for the inverse relationship between age and academic performance at the JHS level in Ghana.

Another unexpected finding is that planned effort—the number of hours students spend on school work after normal school hours—is negatively related to English scores, and is not significantly associated with math scores. It is possible that there is noise in the data either
because of social desirability bias or inaccurate reporting by students. Nevertheless, research suggests that although out-of-school time can generally benefit students academically, the quality of study time may be more important (Beer & Beer, 1992; Gortner Lahmers & Zulauf, 2000).

For instance, a study by Plant, et. al. (2004) finds that the amount of study time only emerged as a significant predictor of academic performance when the quality of study and other factors were taken into consideration. Perhaps, parental involvement may be necessary to provide a favorable learning environments at home and help structure how their children study during out-of-school hours. Thus far, studies show that Ghanaian parents are not sufficiently engaged in their children’s schooling (Nyarko, 2011; Pryor & Ampiah, 2003) and this may contribute to the negative effects of planned effort on English performance.

This study also finds that commitment to school is positively associated with academic performance, suggesting that youth’s commitment to their academic work may be fundamental to their academic success. Jenkins (1995) finds that students’ committed to school are less likely to engage in school crime, misconduct and nonattendance, all of which may affect academic performance. These findings are consistent with prior research in the United States that have shown positive association between student commitment and academic performance (Johnson, Crosnoe, & Elder, 2001).

**Challenges and Limitations**

This study uses cross-sectional data, which limits ability to make causal inferences. Ideally, a dataset with two or more time points would be used to trace the causal pathways through which economic resources affect educational outcomes. Future data will be collected as part of the YouthSave project to allow for testing of these relationships. In the meantime, the
present study is a test of correlational relationship between these concepts, an important first step.

Participants for this study were sampled randomly from eight out of the 10 regions of Ghana. Thus, it may not sufficiently represent youth in Ghana because of the exclusion of these two regions. Likewise, results may not be applicable to other parts of the world. Replication of this study with data from other regions would help confirm and build on emerging evidence about the effects of assets on educational outcomes.

In addition, some of the self-reported measures of economic resources might include unintentional measurement errors. For instance, given the cultural sensitivities surrounding disclosure of income, this study cannot rule out under-reporting or over-reporting of income. Similarly, the latent constructs for self-efficacy and parental involvement used in the analyses may not tap into all possible dimensions of the constructs. If this is the case, it could have implications for the validity of the measures, even though all constructs had high validity scores. This is the first time the self-efficacy and parental involvement scales have been adapted to fit the Ghanaian context. The lack of standardized scales for these constructs presents an opportunity for future research to build on these adapted scales and eventually standardize them for use in SSA and other developing countries.

Despite these limitations, this study has a number of methodological strengths that expand the conceptualization and testing of direct and indirect effects of different types of economic resources on young people’s educational outcomes. In addition to the large sample size with adequate representation of males and females, the Multilevel SEM approach is one of the most rigorous approaches for assessing mediation and hierarchical data (Bowen & Guo, 2011). This unified framework accommodates multiple mediation pathways with nested data. This study
also provokes further investigation into specific types of household assets and their effects on educational outcomes.
Chapter 7: Implications and Conclusion

Implications for Policy

This study provides revealing evidence on the potential relationships between economic resources and educational outcomes in Ghana. The findings concerning possible gender differences could inform policy makers on economic resources that may promote parallel outcomes for boys and girls. Results from this study indicate that the indirect influence of household economic resources on academic performance is different for boys and girls. The evidence of gender differences should inform public discourse and policy makers about specific types of economic empowerment and asset building strategies that promote equal developmental outcomes for both genders. This could be an important boost for ongoing efforts to promote gender equality in terms of not only access to resources but also equality of outcomes, such as academic performance.

Findings from this study also suggest that income and assets do matter, though indirectly through psychological factors such as academic self-efficacy and expectations. These psychological factors are more predictive of youth academic performance at the JHS level than economic resources. Thus, the Ghana Education Service and policy makers should consider supplementing current education programs at the JHS level with policies and programs that promote better psychological outcomes. Effective training of teachers and continued professional development to build their capacity to enhance students' self-esteem will be a good way to improve students’ psychological well-being. Because of shortage of high-caliber teachers and inability to retrain trained teachers, many basic schools in rural areas rely on untrained teachers (i.e., teachers who are not formally trained to teach) (Aboagye, 2008). Untrained teachers at the JHS level will need upgrading to ensure that all JHS teachers in rural and urban areas are trained.
to attain the minimum professional qualification. The Ministry of Education in Ghana has initiated a four-year school-based in-service program to train and offer untrained teachers a diploma in basic education. The curriculum for this program will have to include education of psychological well-being to ensure that teachers are not only capable of teaching course content but are also competent enough to understand classroom climate and offer support to students struggling with low self-esteem and other psychological challenges. Similarly, more resources should be invested into school psychologists, school social workers, and guidance counselors to provide psychological therapies and services in school settings. Government should aim at providing all schools with counseling units where both students and teachers would benefit from behavioral consultation, individual and group counseling, or psycho-educational assessment and receive appropriate and timely referrals.

While focusing on strategies to boost youth psychological outcomes, there should also be a broad array of development strategies that promote accumulation of household economic resources for future educational needs because of two reasons. In the first instance, economic resources in the short term are important for improving psychological outcomes because this study reveals that assets and income are associated with academic self-efficacy and expectations in diverse ways. Secondly, household economic resources in the long term would be crucial when students are transitioning from JHS to SHS. It may be that, because education is free at the JHS level, household economic resources would become more important to young people when they move from the JHS to the SHS level where government support is rather limited. The Government of Ghana may have to broaden the current emphasis on income-based approaches to include asset development strategies. This may require changes to existing programs and realignment of government resources from some income-based programs to asset-based
programs. One particular social protection program in the Ghanaian context that can be revised in the long-term is the Livelihood Empowerment against Poverty Program (LEAP). LEAP is a social cash transfer program that provides income support for extremely poor households across Ghana. The goal is to alleviate short-term poverty and encourage schooling and long-term human capital development. This program can be redesigned or upgraded to incorporate asset-based policies. The inclusion of such policies can help beneficiaries save some of the income as a way of reducing vulnerability to shocks associated with high tuition fee during transition from JHS to SHS level.

More importantly, policy makers should pay attention to evidence-based research in the design of educational policies. It seems that the non-significant finding of direct asset-effect is suggestive of the success of government policies and programs to equalize access and opportunities at the JHS level. In other words, having economic resources may have significant effect on academic performance when there are limited educational infrastructure and government support. Prior evidence has demonstrated that, from 2005 to 2006, government programs such as introduction of the capitation grant (i.e., elimination of school fees) lead to 67% increase in enrolment at the Kindergarten level, 9.7% increase at the primary level, and 10% at the JHS level, and it also narrowed the gender gap in enrollment (UNGEI, n.d.). With these increases, one can safely assert that, prior to the elimination of school fees, household economic resources were possibly having a significant effect on enrolment because only households that had economic resources could afford to enroll their children in school. Perhaps, similar government efforts at the JHS level such as provision of enough schools, infrastructure, and elimination of fees could be replicated at the SHS level to ease access.
Empirical studies on accumulation of economic resource and their effects in SSA are increasing; however more rigorous studies are needed to clarify asset effects and the policy options discussed above. The GoG has to do more to support educational research in Ghana. The Ghana Education Trust Fund (GETFund) was established by the GoG in 2001 to among other things, provide financial support for research (Atuahene, 2013). Yet research in Ghana has not received priority funding from the GETFund because of competing demands from infrastructure development and other sectors of education. The GoG should do more to incentivize and encourage research through grants and tax incentives. Such investments will generate ample evidence on how economic development interventions and strategies might foster better psychological and educational outcomes of school-going youth in Ghana. Other ways government could support education research is by facilitating researchers’ access to data on education such as the BECE results and national, regional, and district level data of SHS intake. Currently, these types of data are hard to access from the Ghana Education Service, thus hindering researchers’ ability to rigorously assess determinants of academic performance at the JHS level as well as transition to SHS.

Implications for Future Research

In developed countries, emerging empirical evidence suggests that there is a positive relationship between specific types of economic resources and educational outcomes. Findings from the present study only suggest indirect relationships between economic resources and educational outcomes in Ghana. This area of research however needs replication to confirm the nature of the relationships. Because the current study and other empirical research in SSA have had mixed findings, additional research needs to clarify the nature of the relationships between different types of economic resources and educational outcomes among different genders, age
groups, educational levels, and geographical areas, especially the rural-urban divide. It could be that because rural areas generally have limited educational infrastructure, it would take significant amount of household economic resources to improve educational outcomes compared to urban areas where better educational infrastructure exist. The reverse could be that students in urban areas face transportation hurdles and other challenges which may affect their school attendance and other educational outcomes. These are all possibilities that remain to be tested.

Similarly, this study finds that a significant proportion of the variation in academic performance is explained at the school level, yet the school-level variables in the model (i.e., class size and teacher qualification) did not explain much of the variation. Perhaps, most of the unexplained variation at the school-level would be accounted for if the study controls for more school-level variables. Also, the large intra-class correlation coefficient (ICC) at the school level raises the question of whether there is self-selection into schools. In other words, are households with more economic resources attracted to good schools that tend to be in good neighborhoods, and are households with limited economic resources more attracted to nonperforming schools often concentrated in poor neighborhoods? Given the extent of homogeneity among public schools in Ghana and the fact that probability sampling approach was employed in selecting the sample for this study, the possibility of selection bias is slim. Nevertheless, it would be important to conduct further investigations to ascertain whether there is evidence of selection bias, regardless of the cluster randomized sampling strategy employed in selection of study participants.

As stated in Chapter 6, the cross-sectional design of this study limits its ability to establish true causal relationships between economic resources and educational outcomes. Future research will have to use experimental and longitudinal research designs and datasets to test
these potential associations. By using baseline data from the Ghana YouthSave Experiment, the present study is the first of several steps necessary to establish causality in the relationships between economic resources and educational outcomes. The next step for the larger YouthSave Experiment is to meet the *temporal sequence* criteria for causality because it is logically necessary that economic resources (the cause) is measured before academic performance (the effect) to be able to establish causality. Beyond that, establishing a mediated causal relationship ideally would require a longitudinal design with at least three waves of data. Economic resources (the cause) would have to be measured at wave 1, academic self-efficacy and expectations (the mediators) at wave 2, and academic performance (the effect) at wave 3. With its rigorous experimental design, the larger YouthSave Experiment in Ghana is well positioned to help clarify these potential causal relationships. After post-test data are collected, the YouthSave research team will be able to test potential causal relationships between specific types of economic resources—such as youth savings—and educational outcomes.

One key issue that assets and education researchers aim to address is whether assets have long-term developmental outcomes, including helping young people progress through different educational stages. Certainly in Ghana, an important question that needs to be addressed is whether assets contribute significantly to successful transition from JHS to SHS and then to completion of SHS. Given the need to pay much higher costs at SHS level, it seems likely that assets will have an effect, at least on access to school. This study’s findings about the indirect effects of economic resources is an essential first step to a long-term empirical investigation of ways that certain economic resources foster educational progression in Ghana. If other studies confirm this relationship, the next logical step would be an investigation into the types and levels of economic resources that may result in affordability of and successful transition to SHS. To
address these important questions about transition to higher education, studies would have to use youth longitudinal datasets that cover different levels of educational systems, such as the JHS and SHS levels in Ghana.

The use of appropriate research designs and youth datasets would help to empirically clarify the potential relationships between economic resources and educational outcomes of youth in Ghana and other SSA countries. Such clarifications have implication for the growing interest in asset-based interventions in SSA. The present study proposes and examines potential direct and indirect relationships between economic resources and educational outcomes in Ghana. To advance this area of work, rigorous research will have to replicate this study in other SSA countries. Also, the field may do well to move toward testing possible causal relationships between specific types of economic resources and specific educational outcomes among different youth groups. Different age groups may have different experiences with economic resources, the effects of which may vary by the phases of a young person’s life.

**Conclusion**

A key insight from this study is that parents’ income and household assets have different indirect relationships with academic performance of young people. However, the process that connects these economic resources to academic performance is through the mediating variables of young people’s academic self-efficacy and expectations. Findings also suggest that some of these relationships may be moderated by gender. These findings have added to what is known about the pathways through which parents’ income and household assets affect young people’s academic performance. This study is one of the first empirical investigations into potential connections between different kinds of economic resources and educational outcomes for JHS students in Ghana. These findings could have implications for policy options to improve
educational progress and human capital development of young people in Ghana and other SSA countries. The findings could also have implications on the larger YouthSave Ghana Experiment in Ghana. Knowing the nature of the relationship between certain types of economic resources and academic performance at baseline will allow researchers to understand the dynamics of young people’s own savings and assets better and how they may impact on academic performance in the long term. Questions such as, what impact could existing economic resources have on the level of influence of youth savings accounts on academic performance may be answered when we control for prior economic resources (i.e., parents’ income and household assets) at endpoint.
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Appendix A: Public and private JHS enrollment trends from 2001 to 2010
Appendix B: Illustration of the transition from primary school through SHS

- 90% of primary school pupils transition to JHS
- 71% reach JHS 3
- 61% take exit exam (BECE)
- 35% pass 4 core courses and transition to SHS

- 10% don’t
- 29% don’t
- 26% fail at least 1 course
Appendix C. Illustration of how the current study fits into the larger YouthSave project
# Appendix D: Data Abstraction Form for School Records

<table>
<thead>
<tr>
<th>Name</th>
<th>Continuous assessment score</th>
<th>Exam score</th>
<th>Class teacher’s assessment of student</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Attendance</td>
<td>Math</td>
<td>English</td>
</tr>
<tr>
<td></td>
<td>(Number of days)</td>
<td>Math</td>
<td>English</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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