



The effects of parental involvement on academic performance of Ghanaian youth: Testing measurement and relationships using structural equation modeling



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ABSTRACT

Research in developed countries suggests that parental involvement is associated with youth academic success. However, little is known about the overall impact of parental involvement on youth academic performance in developing countries. Further, it is unclear what type of parental involvement impacts the academic performance of youth from developing countries. This study examines whether parental involvement at home and school are meaningfully different constructs in a population of Ghanaian youth and their parents, and whether parental involvement predicts academic performance. Results suggest a multidimensional construct consists of home and school involvement. The effect of parental involvement on youth academic performance appears to be a function of the type of parental involvement. Home-based parental involvement is positively associated with academic performance, while school-based parental involvement is negatively associated with academic performance. Parental involvement in youth's education has important implications for academic performance. Parental involvement in education has the potential to model positive attitudes toward school as well as adaptive academic practices, thus sending the message to youth that school is important.

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1. Introduction

Research has shown that parental involvement contributes to youth academic success. In fact, children are more likely to apply themselves and to perform better in school when their parents show an interest in their school work, are willing to assist them with homework, and are willing to hold their children accountable on school assignments. When parents or guardians challenge youth about their school work, youth who do not work hard at school, begin to perceive working hard at school as valuable because their parents demonstrate that they value school.

Although research in developed countries such as the United States has found evidence of how parental involvement contributes to youth academic performance (see for example, Fan & Chen, 2001; Houtenville & Conway, 2008; Jeynes, 2003, 2007), there is a dearth of literature on the overall impact of parental involvement on youth academic performance in developing countries. Further, it is unclear what type of parental involvement impacts the academic performance of youth from developing countries. Such questions are important in a context where parents do not have the education to engage their children in schoolwork or the resources to hire tutors to help their children with school work. Does the

involvement of such parents in parent–teacher association meetings, volunteering at school, talking to their children about the importance of school matter? This study will begin to answer these questions and contribute to the literature on the relationship between parental involvement and academic performance in Ghana.

Although parental involvement is important in developing countries as it is in developed countries, all the measures of parental involvement used in studies so far are based on scales that have been established in the context of developed countries. Therefore, this paper focuses on the measurement validity of the basic distinction between parental involvement at home and at school in a sample of Ghanaian youth and their parents. Research on parental involvement and academic outcomes among U.S. studies have suggested that parental involvement is best understood as taking multiple forms; at a minimum, parental involvement appears to differ based on the context (i.e., home vs. school; Giallo, Treyvaud, Matthews, & Kienhuis, 2010; Jeynes, 2003). In addition, research demonstrates that parental involvement at home and at school is positively linked to a variety of academic outcomes (Jeynes, 2003, 2007). However, research on parental involvement at school is more mixed than research on involvement at home, particularly with regard to different racial and ethnic groups (Fan, 2001; Sui-Chu & Willms, 1996). In addition to influencing educational outcomes, parental involvement may also mediate the relationship between socioeconomic status (SES) and academic performance (Altschul, 2012; Lareau, 2011). We will use the validated measurement of a parental

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involvement scale to examine the relationship between parental involvement and academic performance.

This study contributes to literature by testing an adaptation of a parental involvement scale that considers the differences in parental involvement in developed countries versus developing countries and investigates the relationship between home- and school-based parental involvement and academic performance. The study addresses that issue by exploring the following research questions:

1. Are parental involvement at home and at school meaningfully different constructs in a population of Ghanaian adolescents and their families?
2. Is parental involvement related to the academic performance of Ghanaian adolescents?
3. Does parental involvement mediate the relationship between SES and academic performance for Ghanaian adolescents?

This study begins with a literature review of parental involvement, including its different conceptualizations and effect on academic performance. Next, we present the data and methodology used for the investigation, including confirmatory factor analysis and general structural equation modeling. We then present and discuss findings and conclude by highlighting limitations and stating implications for program development, policy, and future research.

1.1. Parental involvement and academic performance

1.1.1. What is parental involvement?

Parental involvement is defined in a variety of ways in the literature. Epstein's (1995) typology of parental involvement includes six categories: basic parenting, facilitating learning at home, communicating with the school, volunteering at the school, participating in school decision-making, and collaborating with the community. Other studies use a typology of parental involvement that is based either on intuitive appeal or on factor analysis of existing data (Izzo, Weissberg, Kasprow, & Fendrich, 1999; Sui-Chu & Willms, 1996).

Studies that do not apply a multifaceted typology of parental involvement tend to describe it either as a unidimensional construct (McCarron & Inkelas, 2006; Oyserman, Brickman, & Rhodes, 2007) or distinguish it broadly using the context where parental involvement takes place: at home or at school (Giallo et al., 2010; Jeynes, 2003). Home-based parental involvement generally includes helping students with homework, talking with them about school, expressing high expectations and encouraging school success, reading with students, engaging in educational activities and outings, and providing structure at home that is conducive to learning (Altschul, 2012; Nyarko, 2010; Sui-Chu & Willms, 1996). The school-based definition includes visiting the school, volunteering at school, participating in school events and school organizations, communicating with teachers and school staff, and having quality relationships with teachers (Izzo et al., 1999; Mau, 1997; Nyarko, 2011; Oyserman et al., 2007). These definitions have been applied in developed countries, but have seldom been explored in developing countries, with notable exceptions for Nyarko's (2010, 2011) studies in Ghana, which defined parental involvement based on home and school contexts.

While existing literature does not support collapsing all aspects of parental involvement into a unidimensional construct (Epstein, 1990; Epstein & Sanders, 2002; Fan, 2001), distinguishing between involvement at home and at school can be instructive for at least two reasons. First, some studies that have differentiated between home- and school-based parental involvement have found contradictory effects of the two types of involvement; namely, that home-based involvement had significant positive effects while school-based involvement was significantly negatively related to academic outcomes (Izzo et al., 1999; Sui-Chu & Willms, 1996). Second, interventions to promote parental involvement will vary based on the context in which it will occur. Interventions to promote parental involvement at school might include

teacher training to encourage building relationships between families and schools, while interventions to promote parental involvement at home might include parent workshops that build parents' educational skills and knowledge.

1.1.2. The relationship between home-based parental involvement and youth academic performance

Numerous studies, mostly from developed countries, have shown that parents are more likely to be involved with their children at home than they are to be involved in their child's school (Lee & Bowen, 2006; Mau, 1997; Patrikakou & Weissberg, 2000). Research has also demonstrated a positive relationship between parental involvement at home and a range of school-related outcomes, including academic achievement, school engagement, and socio-emotional adjustment (Altschul, 2012; Izzo et al., 1999; Jeynes, 2003, 2007; Sui-Chu & Willms, 1996). High educational expectations, often considered an aspect of parental involvement at home, have been shown to be positive predictors of academic outcomes (Jeynes, 2003, 2007).

Although U.S. research generally supports the positive effects of parental involvement at home on educational outcomes, a few studies suggest that there may be no effect, or perhaps even a negative effect, of parental involvement in homework (Altschul, 2012; Jeynes, 2007; Mau, 1997). These studies all focused on adolescents, and separated parental involvement at home into multiple fine-grained categories. In spite of negative or non-significant results regarding parental involvement in homework, two of the studies nevertheless found positive effects of other aspects of involvement at home, such as enriching activities, high educational expectations, and discussion of school materials (Altschul, 2012; Jeynes, 2007). Thus the preponderance of evidence suggests that parental involvement at home has positive effects on educational outcomes, with the possible narrow exception of involvement in homework completion. Parental involvement in homework may be particularly problematic for adolescents, perhaps due to the increasing difficulty of their schoolwork, or their developmentally appropriate desire for increased autonomy (Erikson, 1983).

1.1.3. The relationship between school-based parental involvement and youth academic performance

Unlike the generally positive findings with regard to parental involvement at home, studies that have examined the effects of parental involvement at school in the U.S. have yielded somewhat more mixed results. Many studies have shown that parental involvement at school is positively associated with academic outcomes, including grades (Barnard, 2004; Hill, 2001; Jeynes, 2007; Marschall, 2006), classroom behavior (Hill et al., 2004; Oyserman et al., 2007), aspirations (Hill et al., 2004), and school completion (Barnard, 2004). However, other studies of parental involvement which have differentiated between parental presence at school (such as volunteering and involvement in activities) and parental contacts or communication with teachers have found that general parental involvement at school has a positive effect on academic outcomes, while parental contact with the school is negatively associated with academic achievement (Fan, 2001), school engagement and socio-emotional adjustment (Izzo et al., 1999), and math and reading scores (Sui-Chu & Willms, 1996). Authors of studies which found negative relationships between parental communication with school and academic outcomes often suggest that the relationship may be explained by increased communication between parents and schools (a common element of measures of parental involvement at school) in response to a student's academic difficulties (Fan, 2001; Izzo et al., 1999).

1.1.4. The role of socio-economic status in parental involvement and academic performance

Empirical research has consistently found significant associations between a host of socio-demographic factors (e.g., economic circumstances, personal priorities, self-interest, self-efficacy, child's and parents' level of education, family structure, family size, and availability of

time and energy) and the nature, extent, and educational outcomes of parental involvement (Georgiou, 2007; Lavenda, 2011; Schimpl-Neimanns, 2000; Schmitt & Kleine, 2010). One of the most important of these predictors is socio-economic status (SES). For example, in U.S. studies, Lareau (1987, 2011) demonstrated that lower-SES parents were less likely to believe that it was their responsibility to manage their children's education, and were less heavily involved in both at-home educational activities and in participating at the school. Lower-SES parents are less educated, which may limit their perception of the skills and knowledge that they can offer to the school and their child (Hoover-Dempsey et al., 2005). Some research also suggests that lower-SES, or less educated, parents may have lower levels of self-efficacy with regard to their involvement in children's education (Hoover-Dempsey & Sandler, 1997; Lareau, 2011). Finally, lower-SES parents tend to have jobs that require them to work long and unpredictable hours, which can interfere with their ability to be involved at school and at home (Heymann, 2000; Hoover-Dempsey et al., 2005). At the same time, SES is strongly related to students' academic outcomes (Altschul, 2012; Mau, 1997; Sui-Chu & Willms, 1996). Further, research suggests that the observed relationship between SES and academic outcomes is mediated by parental involvement (Altschul, 2012; Sui-Chu & Willms, 1996).

1.1.5. The Ghanaian context

Ghanaian youth believe the benefits of education to be numerous and substantial, including having a good career and achieving economic stability (Addai & Pokimica, 2010; Chant & Jones, 2005). On a policy level, Ghana has made educational funding a high priority and has surpassed most other SSA countries in education spending (Adesina, 2009). However, recent research has shed light on ambiguous and ineffective policies with few or no positive outcomes (Osei, Owusu, Asem, & Afutu-Kotey, 2009). The 2008 Ghana Living Standards Survey finds that access to education, academic standards and achievement vary widely in the country, especially between urban and rural settings (Ghana Statistical Service, 2008). Numerous other studies show education and achievement gaps, particularly regarding education disparities among the poor and girls (Palmer, 2005; Pryor & Ampiah, 2003; Tuwor & Sossou, 2008). In addition, given the additional costs and resources and education requires, some Ghanaian parents question the value and benefits of school for their children (Chant & Jones, 2005; Laird, 2002), which may influence parent's level of involvement in their children's education. Similarly, parental and community involvement in schools often is lacking, which has been identified as a primary barrier to the further improvement of Ghana's schools (Nyarko, 2010; Pryor & Ampiah, 2003). When Ghanaian parents are engaged in their children's schooling, their involvement historically has been limited to school-related activities at home (e.g., ensuring completion of homework, Nyarko, 2011). However, the nature of parental involvement in Ghana is changing as more parents are interacting with schools by attending school meetings and recreational events (Chowa et al., 2012).

We are only aware of two studies conducted in Ghana—Nyarko (2010, 2011)—that have measured parental involvement at home and school in a systematic manner and examined its effect on youth's academic performance. These studies found that parental involvement at home was significantly positively associated with students' grades, while only mothers' involvement at school was significantly positively associated with grades (father's school involvement had not statistically significant impact; Nyarko, 2010, 2011).

While Nyarko's studies are a valuable first step in examining the importance of parental involvement in the Ghanaian context, they suffered from several limitations. For one, Nyarko examined home- and school-based parental involvement separately in two different studies, which prevents comparisons of effects between the two types of parental involvement. In addition, Nyarko's studies were based only on youth from three schools in a single region of Ghana, while the youth in this study were randomly selected from 100 schools in 8 of Ghana's 10

provinces. Unlike Nyarko's studies, the sample in this study is representative of low-income Ghanaian youth in public schools.

Finally, Nyarko's studies did not use sophisticated analytic techniques. For example, the Nyarko studies did not establish the validity of the parental involvement scales. We address this limitation in the current study by using confirmatory factor analysis to determine if a modified parental involvement scale performs adequately. Confirmation of the factor structure is critical in our current study because our scale was adapted from studies conducted in the United States and has never been validated in a sample of Ghanaian youth. Before examining the relationship between parental involvement and youth academic performance, we want to demonstrate that our data support the hypothesized dimensions of parental involvement and that the observed variables are adequate indicators of the proposed latent factors. We also apply structural equation modeling, to reduce measurement error and to simultaneously test relationships between multiple independent and dependent variables.

2. Method

2.1. Data and sample

This study used baseline data from the Ghana YouthSave Experiment. YouthSave is a five-year research project that investigates the potential of savings accounts as a tool for youth development and financial inclusion in developing countries, by co-creating tailored, sustainable savings products with local financial institutions and assessing their performance and development outcomes with local researchers. Although this research is in four countries, the data in this study are taken from the Ghana experiment.

The Ghana experiment is a cluster randomized study. One hundred schools were randomly selected from eight of Ghana's 10 regions. Fifty schools were assigned to the treatment condition, and another 50 schools were assigned to the control condition. Sixty students were initially and randomly selected from each school. We oversampled to take attrition into account. Oversampling was based on simple randomization by selecting an additional two to three students per school. The baseline sample consists of 6252 youth.

YouthSave (YS) is a longitudinal study. The baseline data were collected in May and June 2011. Follow-up data collection is scheduled for 2014. Data are collected on each youth's educational, health, psychosocial, and financial outcomes. Youth and parental demographics and socioeconomic characteristics, including involvement of parents in their children's education, are also collected. Youth and parental baseline data were collected using face-to-face survey interviews conducted by trained local interviewers. Youth school records, including math and English exams and continuous assessment scores, are also collected. With the exception of youth characteristics and asset ownership, all data used in the current study were taken from the parent questionnaire.

This study used a subset of the YouthSave baseline data. Out of 6252 youth in the experiment, only 4576 youth had a parent or guardian who was also interviewed at baseline. Although attempts were made to contact at least one parent or guardian of the youth, the remaining 1676 parents/guardian were not interviewed at baseline. Common reasons for non-response from parents/guardians include not being found at home at the time of the interview appointment and not responding to calls to make interview appointments. The researchers in collaboration with school authorities arranged or attended Parent-Teacher Association meetings to explain the study and reiterate the study's potential impact on education policy in Ghana. Several attempts were made to reach the parents through repeated phone calls and visits to their homes. Further out of the 4576 adult caregivers who were interviewed at baseline, only 3083 were either the mother or father of the youth. In other words, 1483 adult guardians were excluded in our analysis. Because we hypothesize that youth academic performance will be predicted by parental involvement, we only include youth whose parents were

interviewed at baseline in our analysis. Thus, the final study sample is 3083 pairs of youth and their parents.

Bivariate tests showed that youth whose parents were interviewed at baseline did not differ significantly ($p > .05$) with youth whose parents were not interviewed in terms of gender ($p = .505$) and all four measures of academic performance: Math ($p = .117$) and English exam scores ($p = .526$), and math ($p = .244$) and English ($p = .300$) continuous assessment scores. However, significant differences were observed with regard to age and educational aspiration and expectation of youth ($p < .05$). A slightly higher percentage of youth with interviewed parents reported higher educational aspiration and expectation, compared with their peers whose parents were not interviewed at baseline data collection. Significant socioeconomic differences were also observed between youth with and without interviewed parents ($p \leq .05$). On average, youth whose parents were not interviewed come from households that have more assets ($p < .01$), compared with youth whose parents were interviewed.

2.2. Measures

The analysis focused on 8 items comprised of questions focused on the frequency of which parents are involved in their children's education. The parental involvement scale was derived from prior studies in the United States (Ames, Tanaka, Khoju, & Watkins, 1993; Zhan, 2006). However, this scale was adapted to reflect the relevance of how parents in Ghana get involved in their child's education. This scale was an adaptation of the parental involvement scale used in the National Longitudinal Survey of Youth (NLSY) cited in Zhan (2006). We modified the response scale from 0 (*never*) to 4 (*once a week or more*) in NLSY to 1 (*never*) to 5 (*very often*) in YS Ghana. We also altered the recall period from "during first half of the school year" to "in the last academic year." We changed the wording from "parents attended school meeting" to PTA meetings. We added two items from the scale used by Ames et al. (1993) to the NLSY scale. The final items on the scale were assessed with five options ranging from 1 (*never*) to 5 (*very often*). The 8-item scale asked parents how often in the last academic year, did they: (a) attend parent-teacher association (PTA), (b) speak to youth's teachers and counselors, (c) attend school events, (d) volunteer at school, (f) check on youth's homework, (g) help with youth's homework, (h) talk about expectations for youth's school work; and (i) talk about what youth learned in school.

We also used four indicators of youth academic performance: Math and English exams, and math and English continuous assessment scores, and two indicators of socioeconomic status: household monthly income and number of dependents under 15 years old. Continuous assessment for both math and English had a maximum of 50 points. Similarly, exam scores for math and English had a maximum of 50 points. In other words, for math, the total score for the student would be a 100 with math continuous assessment accounting for 50% of the total score and math exams accounting for 50% of the total score. Continuous assessment is the total score of all the quizzes and assignments that students take during the semester. The exam is taken at the end of the semester. The continuous assessment and the exam each account for 50% of the total score for the semester for each course.

Further, we used six indicators of household socioeconomic conditions: household monthly income, number of economic dependents, and asset ownership, as well as parental employment status, marital status, and education level. Household monthly income, measured in Ghanaian Cedi (GHS), was the parent's self-report of typical household monthly income based on different sources including employment, productive assets, and remittances. Parents self-reported the number of dependents in the household based on the number of youth under 15 years old who relied on the parent for food, shelter, clothing or other basic needs. Asset ownership was a continuous variable measured by an asset index constructed using an approach recommended by Filmer and Scott (2012) and Filmer and Pritchett (2001). Youth were

asked whether or not their families own each of the 19 asset items. If youth reported their families own any asset items, they were also asked to identify the number of assets. Three broad categories of assets were included in the index: nine household possessions (radio, electric or gas stove, kerosene stove, electric iron, box iron, refrigerator, television, cellular phone, and land phone), six types of livestock (cattle, goat, sheep, donkey, pig, and chicken), and four transportation-related property (bicycle, motorcycle, canoe or boat, and car or truck). We conducted principal component analysis to determine the weight for each of the 19 asset items. A high index value indicates high level of asset ownership. Employment status was a dichotomous variable, having 1 for formal employment and 0 for informal employment. Marital status was also a dichotomous variable, having 1 for married and 0 for not married. Education level was a dichotomous variable, having 1 for some formal education and 0 for no formal education.

Consistent with prior studies on parental involvement, SES indicators were examined as having potential mediating effects on academic performance through parental involvement (Altschul, 2012; Desimone, 1999; Kim & Sherraden, 2011; Zhan, 2006). For instance, lower income and fewer assets may mean fewer resources for obtaining materials not only to enhance children's education but also to aid parents in getting involved in their children's education, which in turn, may affect academic outcomes. Parents with more dependents may have less time for getting involved in their children's education, which in turn, may negatively influence academic performance. Further, an extensive literature review suggests a relationship between SES and academic performance. For instance, being income and asset poor has been shown to be associated with lower academic performance (Brooks-Gunn & Duncan, 1997; Curley, Ssewamala, & Han, 2010; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Elliott, Destin, & Friedline, 2011; Williams Shanks, Kim, Loke, & Destin, 2010;). Theories have also proposed that the number of children in the household have negative effects on youth development (Blake, 1981; Zajonc & Markus, 1975). Research has shown the number of children in the household influences educational outcomes (Downey, 1995; Lu, 2009). With regard to parental involvement, research has shown a negative relationship between the number of siblings and parental involvement (Houtenville & Conway, 2008). The negative relationship between number of siblings and parental involvement may indicate parental time constraints.

2.3. Data analysis

The study relied on the analytical method structural equation modeling (SEM). Mplus 6.1 software was used to perform data analysis because of Mplus' ability to appropriately handle characteristics of our data including clustering of students in schools, missing data, and ordinal-level variables (Muthén & Muthén, 2010). SEM was used over other conventional regression models such as ordinary least squares (OLS) because of the nature of study variables and the complex and specific study hypotheses. Unlike OLS, SEM has the capacity to estimate and test relations between latent variables. Because SEM, particularly the factor analysis component, allows isolation of concepts from uniqueness and unreliability of observed indicators, SEM increases the probability of detecting association and obtaining free parameters close to their population values (Hoyle, 1995). Second, unlike OLS, which permits specification only of direct effects on a single outcome, SEM offers no default model specification and places few limits on what types of relations can be specified (Hoyle, 1995). SEM, particularly the structural analysis part, can analyze hypothesized relationships among latent and observed variables, which can serve as independent, control, mediator or dependent variables in the same model.

Because SEM combines simultaneous regression equations and factor analysis, the analysis was conducted in two phases. First, confirmatory factor analysis (CFA) was conducted to confirm the factor structure of the adapted scale; to determine if the adapted scale performs adequately in a sample consisting of Ghanaian parents, and to determine

whether the hypothesized factor structure adequately represented the relationships that exist in the data before estimating the general SEM model. The value of establishing measurement model adequacy prior to analysis of the structural model is widely considered a best practice (Anderson & Gerbing, 1988; Bollen, 2000; Bowen & Guo, 2012). Mean and variance-adjusted weighted least squares (WLSMV) estimator was chosen as the estimation procedure because data were ordinal (Bollen, 1989; Muthén & Muthén, 2010). The fit indices used to evaluate goodness of model fit included chi-square (Bollen, 1989; Kline, 2011), root mean square error of approximation (RMSEA; Browne & Cudeck, 1993), comparative fit index (CFI; Hu & Bentler, 1999), and Tucker-Lewis index (TLI; Hu & Bentler, 1999).

We specified two competing measurement models. In the primary model, the items were hypothesized to load on two dimensions or latent factors: parental home involvement and parental school involvement. These latent factors were defined on the basis of theoretically and empirically salient aspects of parental involvement in youth education (Comer, 1995; Giallo et al., 2010; Jeynes, 2003). Parental home involvement included four items that assessed how often parents and youth communicated about school and learning. Parental school involvement was also a four-item subscale that assessed how often parents attended and participated in school events. In the alternative measurement model, we hypothesized a 1-factor model in which all items loaded on a single parental involvement construct (McCarron & Inkelas, 2006; Oyserman et al., 2007).

Second, after the measurement model was evaluated to be adequate, we specified four competing general SEM (or structural models), which included directional relationships, based on theory and prior research, from parental involvement factors to four observed academic performance indicators. The structural model allowed the testing of the study hypotheses. Because multiple models may have adequate fit, demonstrating that one structural model not only fits the data well but also has superior fit compared to an alternative model, increases confidence

in the findings (Bowen & Guo, 2012). The chi-square difference test was used to determine which of the competing models had better fit to the data. Because we used WLSMV as the estimator, the chi-square difference testing was done using the DIFFTEST option in Mplus.

After establishing the measurement model that fit our data better, we specified and tested four competing structural models. In the primary general SEM model, we hypothesized that all indicators of youth academic performance were predicted by both parental home and school involvement (Epstein et al., 2002; Hoge, Smit, & Crist, 1997; Jeynes, 2003, 2005). The first alternative model hypothesized that academic performance was predicted only by parental school involvement (Oyserman et al., 2007). The second alternative model specified that academic performance was predicted only by parental home involvement (Mau, 1997; Sui-Chu & Willms, 1996; Van Voorhis, 2003). The third alternative model included five indicators of socioeconomic status – household asset ownership, household monthly income, number of household dependents, parental employment, and marital status – as predictors of parental involvement (Altschul, 2012; Lareau, 1987; Moles, 1993). The third alternative model hypothesized that parental involvement mediated the effects of socioeconomic status on academic performance (Altschul, 2012, Kim & Sherraden, 2011).

3. Results

3.1. Descriptive statistics

The study sample had an equal percentage of boys and girls. Nearly 4 in 10 youth were in grade level 6. Three in 10 youth were in junior high school level 1 and 2. The average age of youth was 16. Table 1 presents the descriptive statistics of the sample and the average English and math scores. In general, youth had higher continuous assessment scores than exam scores. Math continuous assessment scores were slightly higher than English scores. English exam scores were slightly higher

Table 1
Descriptive statistics and bivariate analysis results.

Variables	% or <i>M</i> (SD)	Math		English	
		Exam	CAS	Exam	CAS
<i>Dependent variables</i>					
Math exam score	22.33 (9.58)	–	–	–	–
Math CAS	30.21 (10.49)	–	–	–	–
English exam score	22.99 (9.79)	–	–	–	–
English CAS	29.94 (10.43)	–	–	–	–
<i>Youth characteristics</i>					
Gender (female)	50%	1.83*	0.53	0.66	0.21
Age	16.14 (1.93)	–0.41*	0.06	–0.58*	–0.15
Class (level 6)					
JHS1	32%	–1.88*	0.65	–2.46*	0.22
JHS2	31%	–1.95*	–0.18	–1.93*	–0.06
<i>Parent and household characteristics</i>					
Gender (female)	31%	1.11*	1.00*	1.10*	0.98*
Age	44.78 (9.57)	0.04*	0.07*	0.04*	0.07*
Education (no formal education)	74%	–0.46	–1.20*	–0.08	–0.55
Marital status (not married)	78%	–0.84*	0.76	–0.54	0.15
Employment status (informally employed)	12%	1.43*	0.78	1.05*	0.33
Income (in USD) ^a	131.16 (199.67)	–0.03	–0.23	0.16	–0.20
Asset ownership	4.75 (2.92)	0.07	0.06	0.16*	0.05
Number of economic dependents	2.62 (1.90)	0.06	0.09	0.05	0.17
<i>Explanatory variable of interest</i>					
Parental school involvement	11.49 (4.45)	–0.05	–0.07	–0.04	–0.07
Parental home involvement	12.11 (4.07)	0.06	0.07	0.10*	0.09*
Number of youth	3083				

Note: % = percentage distribution for categorical variables; *M* (SD) = mean (standard deviation) for continuous variables.

Reference group is shown in parentheses for a categorical variable.

* $p < .05$.

^a Exchange rate used is 1 GHC = 0.66 USD, approximately the rate when baseline survey was conducted.

Table 2
Fit statistics for all measurement and structural models.

Model	N ^a	df	Fit index			
			χ^2	RMSEA (90% C.I.) ^b	CFI ^c	TLI ^c
Primary measurement	3078	19	290.60	0.07 (0.06–0.08)	0.96	0.94
Alternative Measurement	3078	20	1115.40	0.13 (0.13–0.14)	0.84	0.78
Primary structural	3083	43	252.68	0.04 (0.03–0.04)	0.97	0.95
Alternative structural 1	3083	47	262.55	0.04 (0.03–0.04)	0.97	0.96
Alternative structural 2	3083	47	223.79	0.03 (0.30–0.04)	0.97	0.96
Alternative structural 3	3083	94	3157.44	0.10 (0.10–0.11)	0.51	0.34

All χ^2 values have p values ≤ 0.001 .

^a The difference in sample size between CFA and SEM is due to Mplus' procedure for missing data imputation using full information maximum likelihood. In CFA, Mplus excluded five cases with missing values on all observed indicators. In general SEM, Mplus included the five cases and imputed their values using information based on observed outcomes that were included in the structural model. Further, general SEM results with 3078 or 3083 youth were not different across all structural models. Model fit did not change. Factor loadings and directions of relationship were the same. Most coefficients were the same, with some coefficients having a difference of less than 0.005.

^b RMSEA values ≤ 0.05 indicate close fit, values between 0.05 and 0.08 indicate reasonable fit (Browne & Cudeck, 1993)

^c For the CFI and the TLI, values ≥ 0.95 indicates good fit (Hu & Bentler, 1999)

than math. On average, parents reported slightly more frequent involvement at home ($M = 12.11$) than at school ($M = 11.49$). Nearly 7 in 10 of the parents interviewed were female. Nearly 8 in 10 were married. Twenty-six percent of parents had no formal education. Only 12% of parents were formally employed. The average number of household dependents who are 15 years old or younger was 3. Average household monthly income was 198 Ghanaian cedis or approximately \$131 in U.S. dollars. Table 1 also shows results of bivariate analysis of academic scores and youth and household characteristics. On average, boys had higher examination and continuous assessment scores than girls in the sample. Youth whose parents reported being formally employed (or salaried employees) had higher academic scores contrasted with youth whose parents reported being informally employed.

3.2. CFA results

We specified and tested two competing measurement models. In the primary model, we hypothesized that 8 parental involvement indicators would reflect two latent factors: parental home and school involvement. Each latent factor included four items. All hypothesized factor loadings, except for one loading per factor, were freed. All paths from latent error terms to observed indicators were fixed at 1.0. The latent factors were allowed to correlate freely. The primary measurement model met one of the four predefined fit criteria (CFI). Table 2 presents the fit statistics for all measurement and structural models. The results suggested that the relationships hypothesized by the model existed in our data. Fig. 1 depicts the primary measurement model, including standardized factor loadings. In the primary measurement model, all factor loadings were statistically significant ($p < .001$). All standardized factor loadings were above .60. All percentages of variance (or R^2 values) in each observed indicator that is explained by the primary measurement

model were greater than .40. Although there are no generally agreed upon R^2 cutoff values, higher values are desired because higher values denote that more of an indicator's variance is associated with the latent variable the same indicator is hypothesized to measure (Bowen & Guo, 2012). However, the alternative measurement model did not meet any of the four predefined fit criteria (see Table 2). The lack of model fit indicated that the relationships hypothesized by a 1-factor CFA model do not exist in our data.

3.3. General SEM results

The primary structural or general SEM model included directional relationships from each latent factor to all four indicators of academic performance. The primary structural model met three of the four fit criteria (RMSEA, CFI, and TLI, see Table 2). Results indicated parental involvement activities at home and at school are statistically significant predictors of youth academic performance. However, the direction of the relationships differed between the two parental involvement factors. Parental home involvement was positively associated with academic performance. Parental school involvement was negatively associated with academic performance. Except for math continuous assessment scores, the negative relationships between parental school involvement and academic performance of youth were statistically significant ($p < .05$). The positive relationships between parental home involvement and academic performance of youth were all statistically significant ($p < .05$). Fig. 2 illustrates the primary structural model, including the standardized path estimates. After examining all direct effects, parental home involvement had the largest significant positive effect size on English examination scores ($\gamma = .139, p < .001$). The effect size of parental home involvement on English continuous assessment scores was similar ($\gamma = .138, p < .01$). Further, parental school involvement had the largest significant negative effect size on English continuous assessment score ($\gamma = -.112, p < .05$), followed by English examination score ($\gamma = -.101, p < .05$). On average, the absolute value of effect sizes of parental home involvement on academic performance was slightly higher than the absolute value of effect sizes of parental school involvement.

3.4. Alternative general SEM models

3.4.1. Nested models

We compared the results of the primary model with the hypothesized alternative models. Alternative structural models 1 and 2 are nested in the primary model. Consistent with the primary model, alternative models 1 and 2 met three of the four predefined fit criteria (RMSEA, CFI, and TLI, see Table 2). However, results of the χ^2 test for difference testing showed statistically significant p values. When we compared the primary model and alternative model 1, results of χ^2 test for difference testing showed a value of 25.76 and 4° of freedom. This change in χ^2 , given the corresponding change in degrees of freedom, was statistically significant ($p < .001$). When we compared the primary model and alternative model 2, results of the χ^2 test for difference testing showed a value of 13.74 and 4° of freedom. This change in χ^2 , given

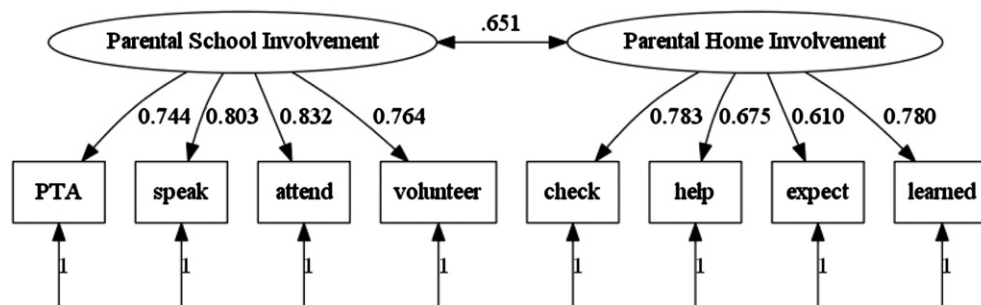


Fig. 1. Primary measurement model: 2-factor parental involvement scale. All factors loadings were significant at $p < .001$.

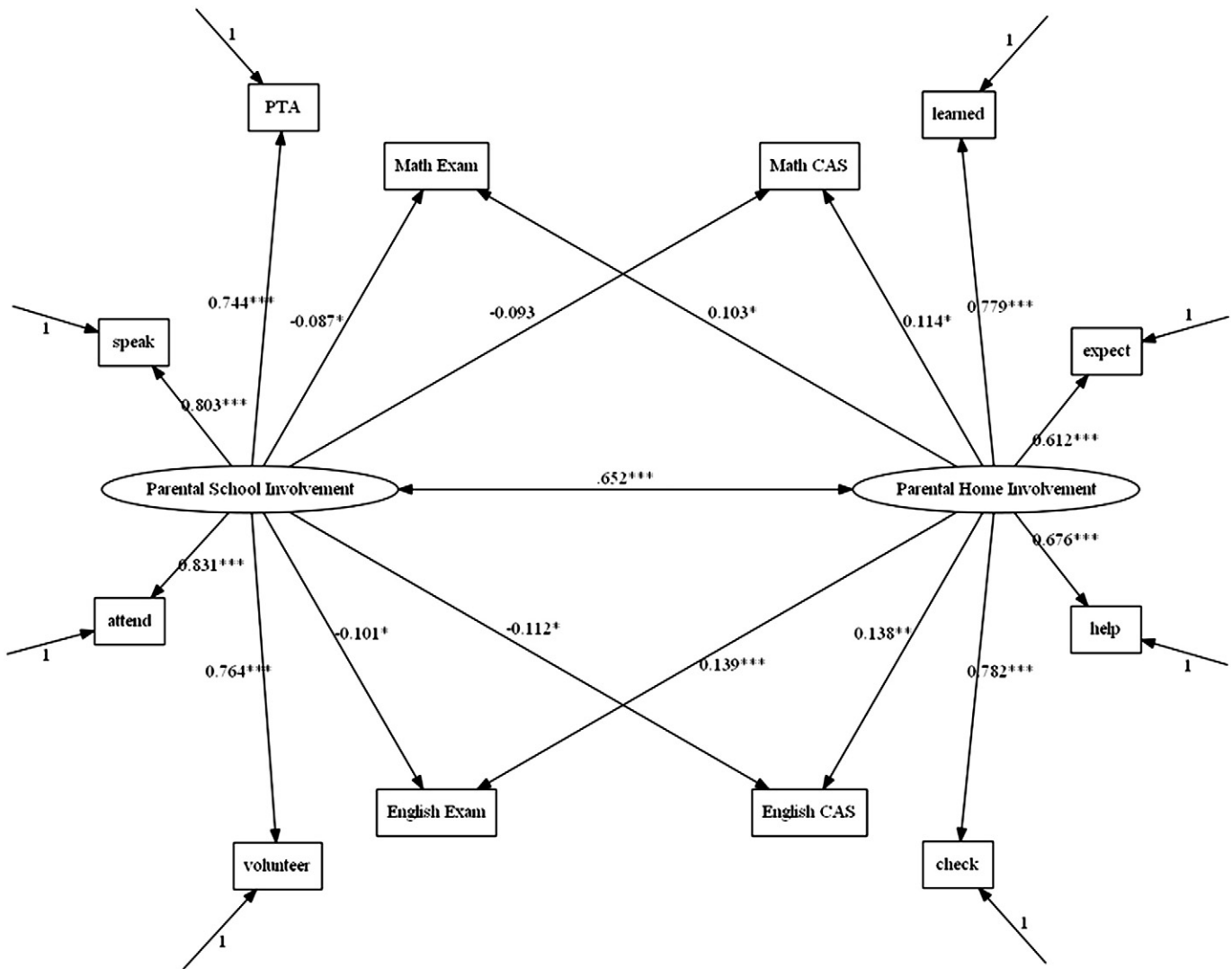


Fig. 2. Primary structural model: relationships between parental home and school involvement and academic performance. Standardized estimates were presented. * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed test.

the corresponding change in degrees of freedom, was also statistically significant ($p < .01$). Because both χ^2 tests for difference testing had significant p values, the model fit became statistically significantly worse. In this case, we retained the less parsimonious and restrictive primary model because it was better than the two nested alternative models. The statistically better fit of the primary model outweighs the improvement in parsimony of alternative models 1 and 2.

3.4.2. Non-nested model

Based on prior research, we added five measures of socioeconomic status—household asset ownership, household monthly income, number of household dependents who are under 15 years old, parental employment status, and marital status—as direct predictors of parental home and school involvement and indirect predictors of academic performance. Because alternative model 3 included five more observed variables than the primary structural model, model 3 is non-nested. Alternative structural model 3 did not meet any of the predefined fit criteria (see Table 2). Compared with the other structural models, model 3 had the worst fit to our data. Further, when we added parental education level as direct predictor of parental home and school involvement and indirect predictor of academic performance, the model did not meet any of the predefined fit criteria [$\chi^2(104) = 2855.92$, $p < .001$, RMSEA = 0.09, CFI = 0.54, TLI = 0.39].

4. Discussion

4.1. Parental involvement is multidimensional in the Ghana YouthSave baseline data

This study tested the validity of a parental involvement scale adapted from studies conducted in the United States and found that the scale also performs adequately for a sample of young Ghanaians. We examined parental involvement as a one dimensional construct that is both home-based and school-based versus a multidimensional construct that distinguishes parental involvement either as school-based or home-based. We found that a multidimensional parental involvement construct exists in our sample of young Ghanaians. We had 8 indicators in the CFA for the parental involvement construct, which included how often parents attended PTA, spoke to their child's teacher and counselor, attended school events, volunteered at school, checked their child's homework, talked to their child about what they learned in school, talked about expectations for school work, and talked about what youth learned in school. One factor, which was clearly the school-based parental involvement factor, included 4 indicators: parents' attendance at PTA meetings, parents' communication with their child's teacher and counselor, parents' attendance at school events, and parents' volunteerism at school. The second factor, which was clearly the home-based parental involvement, included 4 indicators: checked their child's homework, talked to

their child about what they learned in school, talked about expectations for their youth's school work and talked about what their youth learned in school. These indicators show a clear demarcation of the home versus school dimension consistent with prior studies in developed countries.

Although we modified some items to ensure relevance to the Ghanaian context, our results suggests that the adapted scale performed adequately in a sample consisting of Ghanaian youth and their parents and the hypothesized factor structure of parental involvement at home and school existed in our data. Having valid measures of parental involvement in Ghana allows for testing how parental involvement as a construct affects youth academic performance in Ghana and other developing countries. This will increase confidence in results and provide evidence that may guide policymakers to develop appropriate interventions that will increase academic performance in resource-constrained contexts.

A strength of the current study is its use of items that are appropriate for low-income youth population and their parents in the study. Because majority of parents in the study have limited education, they are also hampered by the ways in which they can help their children with homework. Nevertheless, there are other ways parents can be involved in their children's education, including by monitoring whether their children are doing their homework or not, by monitoring their children's performance at school, and by discussing their children's academic goals. The indicators that measure home-based parental involvement in this data include how often parents checked their youth's homework, helped with their youth's work, talked about expectations for their youth's school work and what their youth learned in school. These indicators are in line with the theme of not restricting parental involvement to measures that would involve some type of literacy. The only indicator that could perhaps directly measure the level of education of the parent is helping the youth with their homework. Otherwise, the other three items measured parent engagement in discussing some aspect of their youth's school work and expectations regardless of their education level.

4.2. Parental involvement does improve academic performance

We further examined the relationship between parental involvement and youth academic performance and the mediating effects of parental involvement in the relationship between parental SES and academic performance. Findings of the contributions of home-based and school-based parental involvement to academic performance suggests that the model offers a useful framework for understanding how parental involvement could impact youth academic performance. Based on our findings, the effect of parental involvement on youth academic performance in Ghana seems to be a function of the type of parental involvement.

Consistent with past research in the U.S. and Ghana, we found a significant positive relationship between parental involvement at home and academic achievement in math and English. In this study, we used two measures of academic performance and separated academic performance into two components: continuous assessment and exam scores. Although prior studies (for example, Nyarko, 2010, 2011) have used aggregated scores, we separated the scores to identify the subjects and component of each subject influenced by parental involvement. This method enabled us to examine if the effects of parental involvement are specific to a subject or its component. Parental home involvement had a larger effect size on English scores than on math scores. This finding is consistent with previous studies in developed countries. For example, Izzo et al. (1999) found that the effect of parental home involvement on reading achievement was slightly larger than the effect on math achievement. Zhan (2006) also found that parental supervision of homework (a facet of home involvement) was significantly related to reading scores, but not math scores. Parents whose children did well academically appear to be more involved at home with their children's school work.

On the other hand, we found that parental involvement in school was negatively related to math and English scores of Ghanaian adolescents. As with home involvement, effects of parental school involvement were larger for English scores than for math scores. Our results contradict the statistically significant positive relationship that Nyarko (2011) reported between Ghanaian mothers' parental involvement and students' academic performance, as well as numerous studies which have found positive relationships between parental school involvement and academic outcomes in the U.S. We propose two related reasons for this. First, as noted in section 1.3, past research conducted in the U.S. has occasionally found negative relationships between parental contacts or communication with school staff and students' academic achievement (Fan, 2001; Izzo et al., 1999; Sui-Chu & Willms, 1996). This is generally assumed to be due to increased contact between family and school in response to student difficulties. This is a particularly plausible explanation in the Ghanaian context, where parental involvement at school has not historically been the norm as it is in the U.S. Thus, when things are going well at school, the default between parents and the school may be distant, while parents whose children are not doing well academically may become more involved at school.

Second, Nyarko's study did not simultaneously evaluate the effects of parental involvement at home and at school, despite the fact that the different types of parental involvement tend to be fairly highly correlated (note for example the correlation coefficient of .652 between the two psychometrically distinct measures used in this study). It may be that once the positive effects of parental involvement at home are controlled-for, additional parental involvement at school has negative effects, for the reasons noted above.

Our results did not support an indirect effect of parent SES on academic performance through parental involvement. This is in contrast to research in the U.S. which suggests that there is a strong effect of SES on both parental involvement and academic achievement. It is likely that for Ghanaian families, the factors influencing parental involvement differ from those that are important in the U.S. Our findings suggest that SES may be one factor that does not affect parental involvement in Ghana. However, the lack of research on parental involvement in Ghana up to this point precludes drawing firm conclusions on the matter. Given that parental involvement at home appears to be an important predictor of academic achievement in Ghana, it will be necessary for future research to explore the variables that influence involvement.

Although the size of the association between parental involvement and academic performance is small (less than half a point), the findings still suggest a statistically significant relationship. The positive finding of home-based parental involvement offers insight into the importance of parents talking to their children about school and encouraging them to complete their homework even when parents are unable to assist with homework. Our findings have implications for how to engage parents with lower levels of education. With the exception of one item (helping with youth's homework), the indicators used to measure parental involvement at home do not generally involve an assessment of parents' literacy levels or their ability to help their children with their homework. Regardless of education level, parents can discuss what their children are learning in school, their expectations for their child's performance at school and their child's educational aspirations and goals. All these issues are outside the content of academic subjects. Oyserman, Bybee, Terry, and Hart-Johnson (2004) posit that when children have a goal, and they can visualize a pathway to that goal, they are successful. Having concrete steps toward their academic goal such as completing homework and assignments, and understanding class material so that they can do well on their assignments and quizzes, will help youth perform well academically. Thus, parents who regularly check in with their children to ensure that the youth remain focused on their goals would likely further assist in helping the youth to stay on track or even realign their efforts with their goals.

4.3. Limitations

This study has limitations that need to be considered as we interpret the findings and advance ideas regarding the conclusion. We only examined the effects of parental involvement on two measures of academic performance i.e. math and English. Other relevant measures of academic outcomes such as class attendance or absences, classroom behavior and other academic classes such as science and social studies may also be important. Therefore, our findings may be biased towards the factors that are included in our study.

Secondly, in our study, only a youth's biological or adopted parents were included. We excluded guardians who were interviewed at baseline because it was unclear if those interviewed were involved in youth education. However, it might be plausible that some guardians, such as older siblings and grandparents, are also involved in youth education in Ghana. Lastly, our data are cross-sectional, thus we present our findings with caution. Direction of relationship or causality is not known. More research should be conducted to unscramble the complex relationship between parental involvement and youth academic performance, particularly to address issues of reverse causality and potential confounding that may undermine results of cross-sectional studies. Although we suggest that the negative relationship between school-based parental involvement and academic performance may be due to parents' increased contact with the school in response to children's worsening academic performance, this explanation is one of many potential explanations and may not apply to all of the children in the study. We do not believe that all of the parents who reported frequent involvement at school in our study have children who have academic or behavioral problems. On the other hand, we propose that the direction of observed positive relationship between parental home involvement and academic performance is in the opposite direction, such that increased involvement at home causes better performance. Neither of these causal relationships can be directly tested by our data, due to the cross-sectional design and an inability to control for prior academic achievement. Longitudinal studies that track parental involvement and youth academic performance over time can provide a more accurate picture of the relationships, which may or may not continue to be linear.

Social capital theory would explain this differently, as it posits that a family's potential to develop human capital can benefit from relationships with other members of the community, particularly when members of the family's social network have access to special knowledge or resources (Coleman, 1988). In our case, the frequency with which parents attend activities at school means that they are interacting with teachers and other community members. Such regular interactions may enable parents to gather crucial information that may affect their child's academic success. For example, how well the student needs to perform to graduate to the next grade, how the child is currently performing, and which high schools the child can apply to given their current performance. In a developing country, this interaction with teachers and community members could be the only form of information gathering that parents have. Therefore, it would have substantial impact in the decision that parents make in terms of encouraging their children to perform better at school.

Further, considering that the population in this study has limited education, it may be that parents with such a low level of education are intimidated by school authorities who summon them to the school to discuss their child's behavior. Thereafter, these parents may feel the need to withdraw from the school because of the embarrassing experience they had with school authorities. Subsequently, they may then choose to engage more in home-based discussions with their child to try and influence their child's behavior from home. As a result, the parent's home-based involvement may increase while their school-based involvement may decrease. Such fluctuations may not affect the child's overall school performance but may explain how some parents with a child with problems at school may decrease involvement with

school not because their child does not have academic or behavioral issues but because the parents have decided to withdraw. Therefore, lack of involvement may not mean all is well either. Further research is needed to verify the claim and examine factors predicting parental involvement.

5. Conclusions

Our goal in this study was to investigate the measures of parental involvement, whether parental involvement is school-based or home-based or a one-dimensional construct. We specified and tested two competing measurement models. In the primary model, we hypothesized that 8 parental involvement indicators would reflect two latent factors: parental home and school involvement. The results showed that in this study, parental involvement is school and home-based, which is consistent with prior studies.

After the measurement model was evaluated to be adequate, we specified four competing general structural models, which included directional relationships, based on theory and prior research, from parental involvement factors to four observed academic performance indicators. Results indicated that parental involvement activities at home and at school are statistically significant predictors of youth academic performance. However, the direction of the relationships differed between the two parental involvement factors. Parental home involvement was positively associated with academic performance. Parental school involvement was negatively associated with academic performance. Our results may indicate that parental monitoring and encouragement at home should be encouraged because they impact youth academic performance. On the other hand, the reason for the negative finding of parental school involvement is still unclear. Because our data are cross-sectional and observational, our findings do not suggest parental school involvement has a negative impact on academic performance. Parental school involvement, as shown by prior research, does benefit student's academic performance and may need further investigation using longitudinal research of parental involvement in Ghana to either confirm or revise findings and implication.

The level of parental involvement in their children's education has important implications for academic performance. Social cognitive theory suggests that youth absorb messages about appropriate behavior and socially accepted goals by observing and talking with other important people in their lives (Bandura, 1977). Based on this assumption, parent involvement in education has the potential to model positive attitudes toward school as well as adaptive academic practices, thus sending the message to youth that school is important.

Overall, our study both supports and contradicts Nyarko's findings, one of the earlier studies on parental involvement in Ghana. However, our study presents more rigorously obtained findings compared to Nyarko's (2010, 2011) study, the only similar study we know of that has been conducted in Ghana.

Since previous research shows that parental involvement is predictive of children's educational outcomes and this study confirms these findings, future YouthSave studies on this relationship will focus on the impacts of parental involvement on academic performance in a context where assets are increased. YouthSave intervention aims to increase financial and other assets for youth and their families. Future studies can focus on isolating the impacts of parental involvement on academic performance holding assets constant.

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