

# The importance of self-efficacy and educational aspirations for academic achievement in resource-limited countries: Evidence from Ghana

David Ansong<sup>a</sup>, Sarah R. Eisensmith<sup>a</sup>, Moses Okumu<sup>b,\*</sup>, Gina A. Chowa<sup>a</sup>

<sup>a</sup> University of North Carolina, School of Social Work, 325 Pittsboro St., CB#3550, Chapel Hill, NC 27599-3550, USA

<sup>b</sup> Factor-Inwentash Faculty of Social Work, University of Toronto, 246 Bloor Street W, Toronto, ON M5S 1V4, USA

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## ABSTRACT

**Introduction:** Research on the influence of academic self-efficacy and educational aspirations on academic performance is underdeveloped in resource-limited countries. This study replicates and expands on earlier research that investigated a complex network of relationships between academic self-efficacy, educational aspirations, and academic performance.

**Methods:** Data from 4282 adolescents in Ghana and path analysis were used to test the causal pathways, and path invariance analysis was used to assess the moderation role of gender. Instrumental variable techniques were used to validate the path models.

**Results:** Increase in academic self-efficacy indirectly accounts for improvement in academic performance through the mediational role of educational aspirations. The effects of self-efficacy on educational aspirations, and educational aspirations were stronger for boys than for girls.

**Conclusions:** These findings suggest that in resource-limited countries where the financial burden of schooling tends to be a demotivating factor, interventions that target adolescents' academic self-efficacy may be an effective means to boost educational aspirations and academic performance. Interventions should be tailored to meet the needs of all students so that all children can think of school as an important part of their lives and aspire to achieve, now and in the future.

Students' academic performance is an important determinant of their educational success and progression. Students with low grades are more likely to drop out of school (Gyan, Mabefam, & Baffoe, 2014; Organisation for Economic Co-operation and Development [OECD], 2016). Conversely, students with high grades are more likely to progress to higher levels of education, thereby increasing their prospects for a meaningful livelihood. What influences academic performance? Across the globe, research indicates that multiple factors affect academic performance (Honnicke & Broadbent, 2016; Multon, Brown, & Lent, 1991; Robbins et al., 2004). Research in education suggests that these predictive factors broadly emanate from four levels—the individual (biological and psychological factors), family and peer (socio-economic status and peer influences), school (infrastructure and learning environment) and societal levels (sociocultural norms)—(Chavatzia, 2017). In resource-limited countries like Ghana, because access to education is the most significant challenge to education, most discourse and remedial efforts tend to emphasize issues around infrastructure and resource deficits (Ansong, Chesworth, Okumu, Ansong, & Wabwire, 2018). What is missing from much of the previous research on academic performance in Ghana and many low-income countries is the role of psychosocial factors in shaping academic performance.

\* Corresponding author.

E-mail addresses: [ansong@email.unc.edu](mailto:ansong@email.unc.edu) (D. Ansong), [srabiner@live.unc.edu](mailto:srabiner@live.unc.edu) (S.R. Eisensmith), [moses.okumu@mail.utoronto.ca](mailto:moses.okumu@mail.utoronto.ca) (M. Okumu), [chowa@email.unc.edu](mailto:chowa@email.unc.edu) (G.A. Chowa).

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Indeed, even when psychosocial influences are discussed, the focus on psychosocial determinants such as self-efficacy and aspirations pales in comparison to the emphasis on family, peer, school, and societal factors.

In resource-limited countries, researchers have an opportunity to lead the way to produce rigorous evidence to draw the attention of policymakers, educators, and other stakeholders to the psychosocial barriers to academic performance. However, scholarship on the role of psychological factors such as educational aspirations and academic self-efficacy on academic performance is underdeveloped in the literature, particularly in sub-Saharan Africa. By applying a psychosocial lens, this line of research could help build on other ongoing efforts to address the downward trends in academic performance in many regions of sub-Saharan Africa. Failure to holistically address the poor academic performance trends in subregions such as West Africa (Ani, 2017) could put additional strain on the human resource deficits in these regions. More research into the connections between self-efficacy, educational aspirations, and academic achievement could lead to more evidence-informed interventions and policies that foster students' educational self-development.

Bandura and colleagues are credited with the earliest rigorous theorization (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; 1996) and testing of the psychosocial effects of self-efficacy and aspirations on academic achievement (Carroll et al., 2009; Zimmerman, Bandura, & Martinez-Pons, 1992). Since then, several scholars have expanded the initial theorization and examined a complex network of relationships between academic self-efficacy, educational aspirations and academic achievement, primarily in the US, Australia, and other developed economies (Carroll et al., 2009; Garg, Melanson, & Levin, 2007; Martin, 2007). Thus far, evidence clarifying the linking mechanisms between these constructs in resource-limited settings such as Ghana is sparse.

By using large data from a West African country (Ghana) to explore the relationships between self-efficacy, academic aspirations, and academic achievement, this article replicates and builds on the work of Zimmerman, Bandura, and Martinez-Pons in the late 1990s and the further expansion by Carroll and colleagues in the late 2000s. First, there is a need for new evidence on how self-efficacy explains the differences in students' educational aspirations and academic achievement (Riggio, 2012). Evidence on the pathway from educational aspirations to educational achievement is still unclear (Abu-Hilal, 2000; Carroll et al., 2009; Fraser & Garg, 2011).

Second, this article seeks to extend the external validity of the work of Zimmerman et al. (1992) and Carroll et al. (2009). Research linking self-efficacy, aspirations, and academic achievement have received little research attention in the literature from Ghana and low-resource regions, especially among those with cultures that underemphasize self-concepts and individual characteristics in favor of the prominence given to family and group characteristics. Such considerable emphasis on the family and group explains, at least in part, the dearth of empirical literature on the role of academic self-efficacy in collectivistic contexts (Schunk & Usher, 2011; Woodward & Denton, 2013; Yan & Gaier, 1994). As Mpofo (1994) explained, "private thoughts and feelings about the self and others are not considered pertinent to an individual's view of the self" in collectivistic cultures such as those in Africa, Asia, the Middle East, Pacific Islands, and Central and South America (p. 342). In other words, because self-concepts are relatively less prominent in collectivist cultures, academic self-efficacy might not be as strong a predictor of educational aspiration and academic achievement as in more individualistic cultural contexts. Because parents and elders have enormous control as authority figures in Ghanaian families and among cultures with a collectivistic orientation, the aspirations and plans these key persons have for children might be a stronger predictor of children's educational aspiration than the children's preferences. The elder's authority in decision making in traditional collectivistic cultures was explained by Leake and Black (2005): "elders may have the final say about how far their children go in school, who they marry, or where they work" (p.19).

It is important to acknowledge that while collectivistic cultures similarly prioritize the community, the values, traditions and practices represented by different cultures are diverse and varied. This study uses data from one country (i.e., Ghana) that is collectivistic to begin to expand the current discussion of academic self-efficacy, educational aspirations, and academic performance.

## 1. Theoretical underpinning and empirical evidence

The framework for understanding how students' academic self-efficacy influences educational aspirations and achievement is rooted in Bandura's (1997) social cognitive theory (SCT). Prior studies have used Bandura's theory to understand the predictors of educational aspirations (Bandura, Barbaranelli, Caprara, Vittorio & Pastorelli, 2001; Fraser & Garg, 2011; Johnson, 2000; Uwah, McMahon, & Furlow, 2008). SCT holds that a student's belief in his or her ability to accomplish a task will affect that student's personal goals and aspirations for a future life. SCT reflects a view of human agency, that is, a belief that individuals seek to exert control over the outcomes of their actions. From this perspective, people plan and act with intentionality, self-reflection, and forethought. Thus, a person's beliefs about his or her ability to perform enable the person to actively choose and pursue academic goals rather than passively respond to events in the environment (Riggio, 2012). In other words, the SCT favors a model whereby environmental influences (e.g., family members) and internal dispositions are both important in determining a person's cause of action. If this theoretical conception holds in collectivistic cultures, then it means that even in households in which parents and other adults usually have a dominant role in deciding children's educational trajectories, the beliefs and preferences of the children might still matter in forming each child's goals and aspirations.

Globally, a student's belief that he or she can reach an academic goal can be a primary determinant of the person's interest in the task or goal, choice of actions, and behavior related to task or goal, and ultimately, the task performance or goal attainment. People have little incentive to aim high or persevere in the face of difficulty, unless they believe they can produce the desired outcomes through their actions (Bandura, 1993; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996, 2001). Therefore, self-efficacy is thought to influence students' educational aspirations, their motivation to achieve goals, and their choice of and commitment to activities and behaviors needed to achieve their goals (Bandura, 1993; Bandura, Barbaranelli, Caprara, & Pastorelli, 2001).

### 1.1. Academic self-efficacy

Academic self-efficacy is an individual's belief about his or her ability to achieve self-valued goals and standards related to education (Bandura, 1993; Muris, 2001; Zimmerman & Bandura, 1994). Students develop academic self-efficacy by evaluating and interpreting their task performance, which represents a self-judgment of competence (Bandura, Barbaranelli, Caprara, Vittorio & Pastorelli, 2001; Usher & Pajares, 2008). Students' academic self-efficacy is likely to increase when they believe their academic efforts were successful, and likely to diminish when students feel their efforts were insufficient (Bandura, Barbaranelli, Caprara, Vittorio & Pastorelli, 2001; Schunk & Usher, 2011). While there are clear paths from students' academic self-efficacy, effort, persistence and goal setting to eventual academic success among students from Western cultures (Bandura et al., 2001; Honicke & Broadbent, 2016; Pajares, 1996; Zimmerman, 2000), the current study explores the nature of the relationship between academic self-efficacy and academic performance in a non-Western, individualist cultural setting.

Cultural variations exist in how strongly people feel about their abilities (Oettingen, 1997; Scholz, Doña, Sud, & Schwarzer, 2002). For instance, Scholz et al. (2002) concluded that there are "a number of cross-cultural differences that merit further investigation" from their study involving nearly 20,000 participants across 25 countries (p.242). Contrasted with individualistic-oriented cultures (i.e., the U.S. and most of northern and western Europe, Australia, and New Zealand), collectivistic cultures (e.g., Africa, Asia, the Middle East, Pacific Islands, and Central and South America) tend to report lower self-efficacy beliefs because of the emphasis on groups' abilities rather than individual abilities (Schunk & Usher, 2011; Woodward & Denton, 2013; Yan & Gaier, 1994). In collective-oriented cultures, the confidence that students have in their familial and social relations combined with social support from parents were shown to be strong predictors of students' academic performance (Nyarko, 2011; Wu, Tsang, & Ming, 2014).

### 1.2. Educational aspirations

Educational aspirations, defined as an individual's beliefs about his or her chances of attaining a certain degree of education (Abu-Hilal, 2000), is determined by factors across multiple domains (Fraser & Garg, 2011). At the household level, parents' educational attainment, occupation, and level of involvement with their children, directly and indirectly, influence their children's educational aspirations (Hoover-Dempsey & Sandler, 1997; Spera, Wentzel, & Matto, 2009). At the individual level, the key determinants of students' educational aspirations include personality traits, past achievements, their acceptance of gender and cultural stereotypes, and psychological factors such as academic self-efficacy (Eccles & Wigfield, 2002; Garg, Kauppi, Lewko, & Urajnik, 2002; Salami, 2008). What has not been adequately investigated, particularly in resource-limited countries, are the pathways through which student-level factors such as academic self-efficacy affect educational aspirations, and, in turn, affect academic achievement. The current study uses the social cognitive theory to test causal pathways through which academic self-efficacy directly influences academic achievement and indirectly through the intervening role of educational aspirations of adolescents at the junior high school level in Ghana. In 2009, Carroll and colleagues tested a similar model with data on 935 students from Australia. They found that academic self-efficacy directly affects academic achievement; however, their data did not support an intervening role of educational aspirations.

### 1.3. Academic self-efficacy and educational aspirations

Given the well-known contextual differences between collectivistic and individualistic cultures (Srivastava, 2015), we cannot infer with a high level of confidence that the nature of the relationships among academic self-efficacy, education aspiration, and academic achievement found in Carroll et al. (2009) is universal. Using data from Ghana, the present study drills down to mechanisms that potentially link academic self-efficacy to academic achievement through educational aspirations in a collectivist context. In so doing, the study contributes to the empirical clarity on these associations and their implications for targeted interventions that policymakers and educators can invest in to enhance the educational well-being of students. If self-efficacy is highly dependent on cultural context (Evans, 2014), the nature of the relationship between self-efficacy and outcomes such as educational aspirations and academic achievement may as well vary between individualistic and collectivist cultures.

## 2. Gender differences

The current study also aims to assess the extent to which the main model is different for boys and girls. The existing literature suggests gender differences in adolescents' academic self-efficacy and educational aspirations. Culturally ascribed gender roles tend to account for gender differences in academic self-efficacy (Kling, Hyde, Showers, & Buswell, 1999; Nunn & Thomas, 1999) and academic achievement (Mutekwe, Modiba, & Maphosa, 2012). The evidence on gender differences in educational aspirations among adolescents is also robust (Fabes et al., 2014; Tumino & Taylor, 2015). Because cultural factors tend to affect girls' academic self-efficacy differentially; it is plausible that self-efficacy influences boys and girls differently. The key question is whether gender moderates the connection between academic self-efficacy, educational aspirations, and academic achievement. Evidence on the extent to which these relationships vary or do not by gender could be valuable in informing future initiatives that address important psychosocial factors that perpetuate the gender gaps. Such insights could have implications for how interventions and programs are tailored to address the unique needs that boys and girls may have.

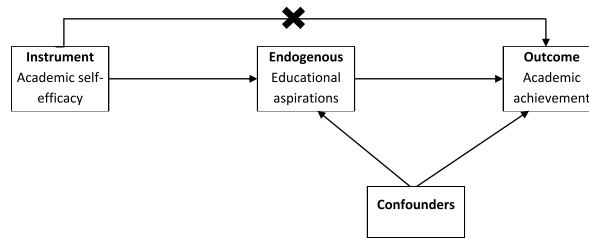


Fig. 1. Conceptual model of a causal chain from academic self-efficacy, to aspirations, to academic achievement.

### 2.1. The current study

The present study aims to answer whether junior high school students' academic self-efficacy is associated with their academic aspirations and achievement. By focusing on academic self-efficacy and aspirations, this study aims to strengthen the evidence on the psychosocial antecedents of academic achievement, particularly among adolescents from a collectivistic culture. In low-resource countries, because of the enormity of infrastructural challenges in the education sector, most education interventions and investments geared toward infrastructural upgrade, with limited attention to psychosocial well-being (Mogaji, 2007; Ramalingam & Nath, 2012). Although self-efficacy has been thoroughly discussed in education and developmental psychology literature, most studies have focused on students from Western cultures (Pajares, 1996). This gap in the literature is worth exploring because of evidence showing the existence of cultural variation in how people perceive their educational abilities (Scholz et al., 2002). As illustrated in the conceptual model in Fig. 1, this study tested a hypothesis of a causal path from academic self-efficacy beliefs through educational aspirations to academic achievement. We also tested whether the causal chain model of academic self-efficacy to educational aspirations, to academic achievement varied by gender.

## 3. Research methods

### 3.1. Data source

Data for the study came from the YouthSave project in Ghana, which used a cluster randomised pretest-posttest design. The study participants came from the 54 districts. These were a mix of rural and urban selected from eight of Ghana's ten regions, except Upper East and Upper West Regions (see Chowa et al., 2015). A list of the 581 public schools within the host districts was obtained from the district education offices of the Ghana Education Service. A simple random sampling strategy was used to select 100 junior high schools from a sampling frame of 581 schools. Next, 61–63 adolescents were randomly selected from each school to participate in the project, leading to a sample size of 6252 for the original study. Among the 6252 who agreed to participate in the project, the current study focuses on only 4282 adolescents who, together with their parents, provided information on the endogenous and exogenous variables discussed in the measures section. Two waves of data were collected with an identical instrument, first in 2011 and again in 2014. The research team implemented several measures at the outset of the study to minimize the limits of self-report, including expert review of the instruments and pilot testing through three data collection methods, namely, cognitive interviews, qualitative interviews, and surveys. A team of researchers from the University of North Carolina at Chapel Hill, the Center for Social Development at Washington University in St. Louis, and the University of Ghana developed and implemented the research protocols. Institutional Review Boards approved the study protocols at each of the three universities.

### 3.2. Measurement

#### 3.2.1. Outcome

The outcome variable, *students' academic achievement*, represents students' composite score in English and math subjects. The scores, each ranging from 0 to 200 points, were obtained from students' administrative records in 2014. School teachers compile these grade reports at the end of the academic term. English and math subject scores were used as proxies for academic achievement because they measure literacy and numeracy skills, both of which shape future success (Department of Education and Skills, 2011). Studies in Ghana have consistently used performance in these two subjects as proxies for overall academic achievement (Ansong, Chowa, & Sherraden, 2015; Ansong & Chowa, 2013; Ansong, Ansong, Ampomah, & Afranie, 2015; Chowa, Masa, Wretman, & Ansong, 2013; Osafo-Acquah & Asamoah-Gyimah, 2009).

#### 3.2.2. Endogenous variable

The endogenous variable was *educational aspirations*, which measured the educational aspirations of Ghanaian junior high school students in 2014. Students responded to a single question that asked: "Ideally, what level of education would you like to complete?" The original response set included to *complete junior high school*, *senior high school*, *post-secondary education*, such as a diploma or high national diploma, or *university-level education*. These responses were collapsed into two: *up to secondary school* (0), and *post-secondary* (1).

### 3.2.3. Instrument

The instrumental variable, *academic self-efficacy*, was measured in 2011. The academic self-efficacy scale was adapted from a brief questionnaire developed to measure the social, emotional, and academic self-efficacy of children living in the United States (Muris, 2001). Respondents were asked to rate their level of confidence in their ability to manage their learning behavior, master academic subjects, and fulfil academic expectations (Muris, 2001). With the original scale, items were scored on a 5-point scale ranging from *not at all* (= 1) to *very well* (= 5). The YouthSave project sought to improve response variability by expanding the response set to an 11-point scale for each item (Alwin, 1997; Dawes, 2002; Griffin & Lowenstein, 2001). The revised response options ranged from *cannot do at all* (= 0) to *moderately can do* (= 5) to *highly certain can do* (= 10). Given that the scale has been validated for use in Ghana in a psychometric study (Ansong, Rabiner, Masa, & Chowa, 2016), we used the linear combination method to create an academic self-efficacy index. The Cronbach's alpha for the scale was 0.74 (Ansong et al., 2016).

### 3.2.4. Exogenous variables

Although the causal structure of our model accounts for differences between baseline-adjustments and non-adjustments (Glymour, Weuve, Berkman, Kawachi, & Robins, 2005), we opted for a more conservative approach by adjusting for pretest *achievement scores* and *parents' aspirations* for their children to improve the prediction. Students' 2011 *academic achievement score* was an aggregate of students' performance in English and math subjects, as recorded in the school administrative records. *Parental education aspirations for their children*, was an ordinal variable obtained in 2011 with the following responses: *junior high school*, *senior high school*, *post-secondary education*, such as a diploma or high national diploma, and *university-level education*. For the purpose of data analysis, these responses were collapsed into two: *up to secondary school* (0), and *post-secondary* (1).

## 3.3. Data analysis

### 3.3.1. Path analysis and selection of final model

Path models were first estimated in Mplus 7.4. We used the weighted least squares means- and variance-adjusted (WLSMV) estimation method because this method is best suited for ordinal and non-normal data. Also, because the sample was drawn from different schools, we used the cluster option in Mplus to correct for potential clustering in the standard errors and chi-square estimation. The valid sample for data analysis for this study was reduced to 3317 participants, which was the number of student participants and their parents who provided information on the analytic variables at both measurement occasions.

The path model tested the causal chain from academic self-efficacy through students' educational aspirations to academic achievement. This hypothesized relationship is similar to the hypothesis Zimmerman et al. (1992) tested with 102 students in a US high school, and Carroll et al. (2009) replicated with 935 students in 10 Australian high schools in 2009. To address possible hidden bias in the current data, we hypothesized the path model in a way that allowed us to confirm that self-efficacy (the instrument) was highly correlated with aspirations (endogenous variable) but did not independently affect academic achievement (the outcome; see Fig. 1). This path structure, which is analogous for instrumental variable analysis, helps us to see the true effect of aspirations on academic achievement. We also adjusted for *parents' aspiration for child* and *students' pretest academic achievement scores* to improve the estimation.

### 3.3.2. Gender invariance analysis

After confirming that the model fits the observed data, we used a multi-group framework to test whether the model was invariant across the two gender groups. This path invariance test (moderation test) goes beyond the work of Zimmerman et al. (1992), and Carroll et al. (2009) by examining whether gender moderates the hypothesized relationships. A five-step process was used to assess the path invariance. First, we tested the overall model and then separately examined the model fit for boys and girls. The third step involved the configural invariance model (baseline model). Because the baseline model fits the data well, we proceeded to the path invariance model where we constrained all the path coefficients to be equal for boys and girls. Lastly, we used a chi-square difference test to compare the configural and path invariance models to determine whether the coefficients (paths) were different for boys and girls. We also tested scalar invariance by holding the intercepts constant for both genders.

### 3.3.3. Model fit assessment of path models

We assessed the fit between all hypothesized path models and the observed data using four recommended fit criteria:  $\chi^2/df$  ratio (good if  $> 1$ ); root mean square error of approximation (RMSEA; mediocre fit if between 0.08 and 0.10, good if  $\leq 0.05$ ); comparative fit index (CFI; acceptable if  $> .90$ , good if  $> 0.95$ ); and the Tucker-Lewis index (TLI; acceptable if  $> .90$ , good if  $> 0.95$ ) (Bowen & Guo, 2012; Costello & Osborne, 2005; Hu & Bentler, 1999; Kline, 2005). Table 1 presents the covariance matrixes used to estimate the path models for the full sample as well as the gender-specific subsamples.

### 3.3.4. Instrumental variable analysis

To increase our confidence in the causal attribution in our path model, we used the instrumental variable method with two-stage least squares estimation to validate the final model in Stata 15. We used the *estat endogenous* Stata command to perform the Durbin Wu-Hausman test to confirm the validity of aspirations as endogenous. We also used the *estat firststage* Stata command to test for weak instrument (Stock and Yogo, 2005). In all instrumental variable modeling, the clustered robust option was used to adjust for potential clustering in schools.

**Table 1**  
Covariance matrixes for full sample and gender-specific subsamples.

Full sample <sup>a</sup>	Academic achievement (endline)	Educational aspirations	Academic self-efficacy	Parent's aspirations	Academic achievement (baseline)
Academic achievement (endline)	1538.581				
Educational aspirations	1.982	0.224			
Academic self-efficacy	48.898	4.191	699.591		
Parent's aspirations	0.925	0.030	0.595	0.123	
Academic achievement (baseline)	303.538	1.679	168.922	0.850	2020.140
<i>Boys-only subsample<sup>b</sup></i>					
Academic achievement (endline)	1666.255				
Educational aspirations	2.427	0.197			
Academic self-efficacy	45.102	0.847	103.401		
Parent's aspirations	0.374	0.021	-0.018	0.098	
Academic achievement (baseline)	240.258	1.070	71.593	0.221	2441.552
<i>Girls-only subsample<sup>c</sup></i>					
Academic achievement (endline)	1800.256				
Educational aspirations	1.456	0.207			
Academic self-efficacy	25.042	0.426	97.567		
Parent's aspirations	0.712	0.028	0.247	0.131	
Academic achievement (baseline)	103.775	0.952	46.526	0.956	2204.958

<sup>a</sup>  $N = 4282$ .

<sup>b</sup>  $n = 2077$ .

<sup>c</sup>  $n = 2205$ .

## 4. Results

### 4.1. Descriptive characteristics

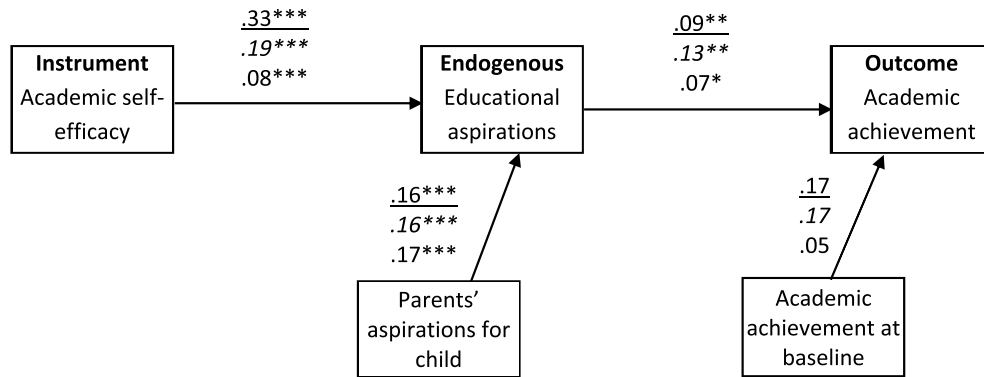
Table 2 presents the descriptive characteristics of the full sample as well as the gender-specific subsamples. Roughly half (53.9%) of the sample consisted of boys. Students' academic self-efficacy scores had a mean of 46.01 ( $SD = 27.47$ ). Gender differences for academic self-efficacy were significant ( $t = 2.27, p = .02$ ), suggesting students' perceptions of their ability to achieve in school do varies by gender. Most students (71%) aspired to attain a post-secondary education, but the gender differences in educational aspirations were not statistically significant ( $\chi^2 = 2.44, p = .12$ ), suggesting that gender is not associated with educational aspirations. The average student's achievement score was 120.72 ( $SD = 44.56$ ) at pretest and 110.28 ( $SD = 37.87$ ) at posttest. Gender differences in grades were neither significant at pretest ( $t = 1.55, p = .12$ ) nor at posttest ( $t = 0.73, p = .47$ ). Nearly all parents (85%) indicated hopes that their child would attain a post-secondary education. The gender differences were significant ( $\chi^2 = 2.44, p = .12$ ), with slightly more parents wanting their male children to advance to the highest level of education possible rather than girl children.

**Table 2**  
Descriptive statistics of the full sample and gender-specific subsamples.

	Full sample	Boys	Girls
	M(SD)	M(SD)	M(SD)
Academic achievement (endline)	110.28[37.87]	124.16(48.24)	111.02(40.85)
Academic achievement (baseline)	120.72[44.56]	112.36(39.26)	122.26(47.15)
Academic self-efficacy	46.01(27.47)	61.02(10.06)	60.44(10.11)
	Freq[%]	Freq[%]	Freq[%]
Child's educational aspiration			
Up to secondary	1614[37.70]	586[28.20]	661[29.99]
Post-secondary	2668[62.30]	1491[71.80]	1544 [70.01]
Parent's aspiration for child			
Up to secondary	639[14.90]	230[11.08]	338[15.33]
Post-secondary	3643[85.10]	1847[88.92]	1867[84.67]

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .





**Fig. 2.** Results of path analysis showing path coefficients for the full sample (top, underlined), and boys-only (middle, *italic font*), and girls-only (bottom) sub-samples.

#### 4.2. Results of path model

**Fig. 2** presents the standardized solutions for the final model based on the full sample. The results confirmed that higher academic self-efficacy would directly lead to higher educational aspirations and aspirations in turn affect academic achievement ( $\chi^2 = 4.58$ ,  $df = 3$ ,  $p = .21$ , RMSEA = 0.01, 90% CI [0.00–0.03], CFI = 0.98, TLI = 0.96). In this model, academic self-efficacy was significantly, positively associated with educational aspirations for the entire sample ( $\beta = 0.33$ ,  $p < .001$ , 95% CI [0.26–0.40],  $R^2 = 0.14$ ), and educational aspirations was associated with academic achievement ( $\beta = 0.09$ ,  $p < .01$ , 95% CI [0.04–0.14],  $R^2 = 0.04$ ). The Sobel test for the indirect effect ( $\beta = 0.03$ , 95% CI [0.001–0.002]) confirmed the mediation role of educational aspirations. In a different model where the path from academic self-efficacy to academic achievement was freed, the model had a poor fit, with the CFI (0.67) and TLI (0.41) well below the recommended values.

#### 4.3. Results of instrumental variable approach

When the instrumental variable method with two-stage least squares estimation method was used to account for confoundedness, academic self-efficacy was positively predictive of educational aspiration ( $\beta = 0.39$ , Robust SE = 0.26,  $p = .02$ ), and educational aspirations was in turn positively predictive of academic achievement ( $\beta = 0.59$ , Robust SE = 0.07,  $p < .001$ ). The results are robust because the null hypothesis of weak instrument was rejected (Partial F-statistics = 23.95, which is above the recommended cut-off of 10). The statistically significant result of the Durbin Wu-Hausman test ( $F = 4.65$ ,  $p = .03$ ) also confirmed the validity of educational aspirations as endogenous.

#### 4.4. Gender invariance results

Results of the gender invariance test show that gender moderates the causal chain from academic self-efficacy through educational aspirations to academic achievement. As shown in **Table 3**, the results from the first three steps in the invariance test showed the overall model, boys-only model, and girls-only model all exhibited good fit. Similarly, the configural invariance (baseline model:  $\chi^2 = 6.53$ ,  $df = 6$ ,  $p = .37$ , RMSEA = 0.01, 90% CI [0.00–0.03], CFI = 0.99, TLI = 0.99) and the path invariance model ( $\chi^2 = 16.92$ ,  $df = 10$ ,  $p = .08$ , RMSEA = 0.02, 90% CI [0.00–0.03], CFI = 0.95, TLI = 0.92) fit the data well. The result of the chi-square difference test that compared the configural and path invariance models was statistically significant ( $\Delta\chi^2 = 10.39$ ,  $df = 4$ ,  $p = .03$ ). Additional chi-square difference tests that compared the scalar invariance model and the configural model ( $\Delta\chi^2 = 133.04$ ,  $df = 8$ ,  $p < .001$ ) and path invariance model ( $\Delta\chi^2 = 122.62$ ,  $df = 4$ ,  $p < .001$ ) were all statistically significant. This implies that the

**Table 3**  
Model fit indices.

Model	$\chi^2(df)$	<i>p</i> -value	$\chi^2/df$ ratio	RMSEA <sup>a</sup> (90% CI <sup>b</sup> )	CFI <sup>c</sup>	TLI <sup>d</sup>
Full mediation model	4.58(3)	.21	1.53	.01(.00, .03)	.98	.96
Boys-only model	3.67(3)	.29	1.22	.01(.00, .04)	.99	.97
Girls-only model	2.89(3)	.41	0.96	.00(.00, .04)	1	1
Configural invariance model (Baseline model)	6.53(6)	.37	1.08	.01(.00, .03)	.99	.99
Path invariance model	16.92(10)	.08	1.69	.02(.00, .03)	.95	.92

<sup>a</sup> RMSEA = root mean square error of approximation.

<sup>b</sup> CI = Confidence interval.

<sup>c</sup> CFI = comparative fit index.

<sup>d</sup> TLI = Tucker-Lewis index.

path coefficients and intercepts are significantly different for boys and girls. In other words, gender moderates the collective associations between academic self-efficacy, educational aspirations, and academic achievement. The significant standardized coefficient for the path from academic self-efficacy to aspirations was twice as much in the boys-only sample ( $\beta = 0.19, p < .001$ ) than in the girls-only sample ( $\beta = 0.08, p < .001$ ). The path from educational aspirations to academic achievement was similarly twice as much in the boys-only sample ( $\beta = 0.13, p < .01$ ) than in the girls-only sample ( $\beta = 0.07, p < .05$ ). One standard deviation increase in students' educational aspirations is associated with a 0.08 standard deviation increase girls' academic achievement and twice as much increase in boys' achievement. The Sobel test for the indirect effect confirmed that the indirect causal chain from academic self-efficacy to academic achievement was stronger for boys ( $\beta = 0.024, 95\% \text{ CI } [0.008-0.041]$ ) than girls ( $\beta = 0.001, 95\% \text{ CI } [0.001-0.011]$ ). In other words, while a one standard deviation increase in academic achievement indirectly leads to a 0.001 increase in girls' academic achievement, the same one standard deviation increase in academic achievement produces far greater increase (24 folds) in boys' academic achievement.

## 5. Discussion

This study sought to replicate and extend the external validity of two forerunner studies (Carroll et al., 2009; Zimmerman et al., 1992) that examined the connection between psychosocial indicators such as adolescents' academic self-efficacy, educational aspirations, and their academic achievement. Rather than focus on the mere existence of a relationship, this study builds on prior research in multiple ways. First, as in the prior studies (Carroll et al., 2009; Zimmerman et al., 1992), the current study uses a structural equation modeling (SEM) analytic framework, but also goes further to use an instrumental variable framework to substantiate results from the path analysis, thus strengthening the causal conclusions from the current study. Second, the current study replicates previously tested connections between self-efficacy, aspirations, and achievement (Carroll et al., 2009; Zimmerman et al., 1992), but this time in a more heterogeneous and nationally representative sample from a low-resource country, thus expanding the generalizability of the evidence largely established in developed economies. In other words, this replication study, which covered 80% of the administrative regions in Ghana, expands the predominantly Western-based literature to offer new insights into how these relationships exist in contexts that are primarily collectivistic in orientation and resource-limited. Third, unlike the forerunner studies (Carroll et al., 2009; Zimmerman et al., 1992), the current research conducts a moderation test by comparing the hypothesized relationships across the subpopulations of boys and girls. The incorporation of a moderation test (path invariance test) in this study avoids the tendency to assume equal experiences for boys and girls in collectivistic countries. Instead, this study accommodates a more realistic scenario of observable differences in the hypothesized relationships across different subpopulations.

Overall, the findings suggest that children's academic self-efficacy shape their educational aspirations, which in turn shape their academic achievement. This evidence of a predictive influence of academic self-efficacy beliefs on the educational aspirations of adolescents in Ghana is consistent with the extant literature with students of similar ages in Western contexts such as the US (Bandura et al., 2001), Australia (Zimmerman & Bandura, 1994), and Italy (Caprara et al., 2008). When students are confident of their academic capabilities, they can set educational aspirations that propel them to academic excellence. Young people with little or no confidence in their academic abilities might be less inclined to plan for higher levels of education that would require advanced academic skills and greater effort to be successful. The negative implications of the lack of confidence in one's academic abilities on educational aspirations may be exacerbated in low-resource countries like Ghana where some young people already lack optimism about their capacity to afford a secondary and postsecondary education (Sabates, Akyeampong, Westbrook, & Hunt, 2010).

We found a significant direct relationship between educational aspiration and academic achievement in both the path analysis and instrumental variable models. There is a similarity in the direct pathway from educational aspiration to academic achievement between the present study and those described by Zimmerman et al. (1992); in both studies, academic aspirations have positive effects on academic achievement. However, this finding of positive direct effect is inconsistent with the non-significant findings from Carroll et al. (2009). This finding inconsistency may be because our study focused on the combined performance in English and math subjects (Carroll and colleagues used only English scores), not to mention the different cultural contexts; the sample for the current study came from Ghana, while Carroll and colleagues focused on Australia. The inconsistent finding may also be a case that the present study employed several additional measures to improve the estimation of causal effects. It is worth noting that we used time-dependent data (pretest and posttest), which is consistent with the temporal sequence criterion for causal inference. We also adjusted for school-level clustering (which addresses possible loss of independence of observations) and validated the model with the instrumental variable approach (which adjusts for observed and unobserved confounding). The instrumental variable approach is a well-known method for estimating causal effects in both experimental and observational data, particularly when there is an intervening variable (Gennetian, Bos, & Morris, 2002). Because of the versatility of the instrumental variable approach, we did not have to manipulate students' academic self-efficacy or educational aspirations through an external mechanism, as one would in randomised experiments. Another merit of our dual analytical approach is that we were able to not only provide estimates of the causal effects but also provide insights into a linking mechanism through which academic self-efficacy affects academic achievement. Knowing such linking mechanisms has implications for improving program conceptualizations, design, implementation. As Gennetian et al. (2002) aptly put it, 'answering these "how" questions can help policymakers design more effective interventions and can help them make difficult policy trade-offs' (p.2).

Evidence from this study is also consistent with the assertion of the social cognitive theory that both socio-environmental influences and personal dispositions are important determinants of an individual's plans and actions (Zimmerman & Bandura, 1994). Per our data, parents' educational aspirations for their children (i.e., part of the social environment) is predictive of children's educational aspirations, which supports previous research (Zimmerman et al., 1992). As illustrated in Fig. 2, the strength of the paths



from children's self-efficacy and parents' educational aspirations for their children to children's educational aspirations were positive and statistically strong in the full sample as well as the gender-specific subsamples. This finding directly aligns with Zimmerman's *et al.* (1992) study that found academic self-efficacy among high school students and parent's goal setting had a similar predictive effect on students' goal setting.

Although our findings speak to the predictive effectiveness of parents' educational aspirations for their children as did previous studies (e.g., Bellon, Ngware, & Admassu, 2017; Ingram, Wolfe, & Lieberman, 2007), we offer a caveat. Extreme, overly ambitious parental aspirations for their children's education could potentially undermine children's ability to concentrate and succeed (Murayama, Pekrun, Suzuki, Marsh, & Lichtenfeld, 2015). The key question then is whether school authorities could leverage parent-teacher association meetings and other engagement opportunities to educate parents on best practices and the possible detrimental effects of overly high aspirations for their children. For now, an investigation into a possible healthy threshold of parental aspirations for their children is outside the scope of the current study, and therefore, we recommend that future research studies use appropriate data to consider a further investigation into this question.

Unpacking the hypothesized relationships from a gender perspective, we find that boys and girls vary in how their academic self-efficacy beliefs indirectly affect their academic achievement. Although the descriptive statistics show that students' perceptions of their ability to achieve in school do not vary by gender when it comes to its effect on their educational aspirations the relationship is stronger for boys than girls. Regarding the effect of educational aspirations on academic achievement, the gender gap narrows but only slightly. All students, but more so girls, will feel valued, and in turn, will value their work if provided with a school environment that supports their feelings, enhances a positive perception, and includes school activities in which all students are encouraged to participate. Overall, the result of gender differences confirms the importance of tailoring interventions to meet the unique needs for boys and girls within the home and school environments so that all children can view school as a significant part of their lives and begin to think about their future educational aspirations.

The study has limitations, and therefore, results should be interpreted with caution. The first limitation is about the generalizability of results beyond the Ghanaian context. Although the study uses a large random sample of students and their parents, the data came from Ghana and might not reflect the experiences of people in other resource-limited countries and collectivistic cultures. Second, the risk of measurement error might be high because most of the variables used in the study relied on self-reports. The research team aimed to minimize the risk of measurement error by following best practices in instrument development and testing: expert review of the instruments and pilot testing with multiple data collection methods.

## 6. Implications

Notwithstanding the limitations, this study offers important educational implications regarding how academic self-regulation can enable students to achieve educational self-development. Overall, the findings suggest the need for a holistic yet tailored approach to improving the educational well-being of children in resource-limited countries. In this context, a holistic approach means that the emphasis on physical infrastructure and instructional needs of schools should not shortchange the necessary investment in schools' capacity to address the psychological well-being of students. Policies and interventions that support the psychosocial and emotional needs of students ought to be an integral component of the education sector strategic plans. Within resource-limited countries that have a collectivistic way of living, it is likely that the gap between good and poor self-directed learners will widen depending on the support that students receive (Bandura *et al.*, 1996). Researchers and educators need to develop methods to identify students with low academic self-efficacy and adopt methods and practices that will enable them to support the students to develop academic self-efficacies and set achievable educational aspirations. Guidance and counseling units could be strengthened to proactively coordinate with parents to assist students who might need advice on their educational plans.

## 7. Conclusion

While the importance of understanding how students' social-emotional well-being contributes to their educational outcomes is widely acknowledged, few studies, particularly those conducted in junior high schools in resource-limited countries, have focused on the connection between academic self-efficacy beliefs, educational aspirations, and academic achievement (Wang & Eccles, 2013). However, with the emerging middle class in many resource-limited countries, the question of whether self-referent concepts affect students' educational well-being will become even more prominent and relevant. These countries could use more empirical studies that apply the social cognitive theory to examine how academic self-efficacy in concert with parents' aspirations are directly predictive of students' educational outcomes. The findings from the current study and related studies will be crucial in intervention and policy development to ensure the achievement of sustainable educational development goals. Units focused on teachers' professional development as well as guidance and counseling units could benefit from more context-relevant empirical evidence on how to identify academic self-efficacy beliefs and guidance on ways to help students develop or increase self-efficacy beliefs.

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