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Community involvement and socioeconomic achievement gap in 14 sub-Saharan African countries

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ABSTRACT

As a global trend, sub-Saharan African (SSA) countries have increasingly received reforms from international organizations (IOs) to improve learning achievements for marginalized groups by promoting community involvement in school governance. The idea is to mobilize local resources and lessen the 'burden' on the central government. This paper examines the association between community involvement in school affairs and inequality in achievement by socioeconomic status (SES) using data from the Program for the Analysis of Education Systems (PASEC) 2019 survey of 14 Francophone SSA countries. Results suggest that community involvement is not significantly associated with the SES math achievement gap and does not substantially explain the gap. Contrarily, school resources substantially explain achievement gaps between lower- and higher-SES students. Our findings remain similar in several specifications, including using different inequality measures. We argue that involving local communities may not fully address the challenges of insufficient school resources and individual-level poverty in SSA.

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Community involvement; school governance; educational inequality; SES; sub-Saharan Africa

In many low- and middle-income countries (LMICs), resource scarcity and low school quality remain persistent barriers to learning, particularly for marginalized children. To address these challenges, international organizations (IOs) have increasingly advocated for grater *community involvement* in schools across sub-Saharan Africa (SSA). Community involvement refers to the active participation of local stakeholders in supporting schools through a range of activities, including financial contributions (e.g., donations), voluntary or paid teaching, paying school fees for pupils, and participating in curriculum and course content decisions. This practice aims to reduce reliance on the central government budget, maximize resource mobilization at the grassroots level (Hossain 2021), and ultimately enhance learning outcomes for marginalized children (Barrera-Osorio, Fasih, and Patrinos 2009; Okitsu and Edwards 2017), thus narrowing achievement gaps. The diffusion of this policy model increasingly started in the late 1980s through structural adjustment programs (SAPs) by the International Monetary Fund (IMF) and the World Bank (WB). Given the focus of this scheme on promoting educational achievements for marginalized children, this study examines whether community

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involvement is associated with minimizing or widening inequality in learning achievement by socioeconomic status (SES) in 14 Francophone SSA countries. Notably, a long strand of sociological literature suggests that school autonomy (resulting from community-led education provision), as opposed to standardization (providing equal standards across schools) (Allmendinger 1989), tends to reinforce inequality in educational achievement (e.g. Gamoran 1996; Van de Werfhorst and Mijs 2010). This puzzle, however, remains relatively unexplored in SSA countries.

Greater community support in public and community-run non-state schools has been promoted through mechanisms, such as school-based management (SBM) and mandatory formation of school management committees (SMC) in educational institutions. IOs have implemented this management style across LMICs. Our analysis of WB project documents on all available primary and secondary education projects shows that this IO has increasingly implemented community and SBM in SSA and other LMICs since the late 1980s (Figure 1).

While the diffusion of these reforms has been on the rise (Hossain 2022, 2024), it is still not clear how this management paradigm can compensate for the challenges led by resource scarcity in LMICs. Proponents claim that community involvement will improve educational systems by 'mobilizing' local resources. The mechanism, however, remains opaque. This is because resource-scarce areas tend to experience widespread poverty and require support, making resource mobilization less relevant.

Despite the increasing focus on IOs and nation-states, there is a paucity of literature analyzing whether community involvement in schools in SSA is linked to minimizing achievement gaps between lower- and higher-SES students. It is also not clear to what extent

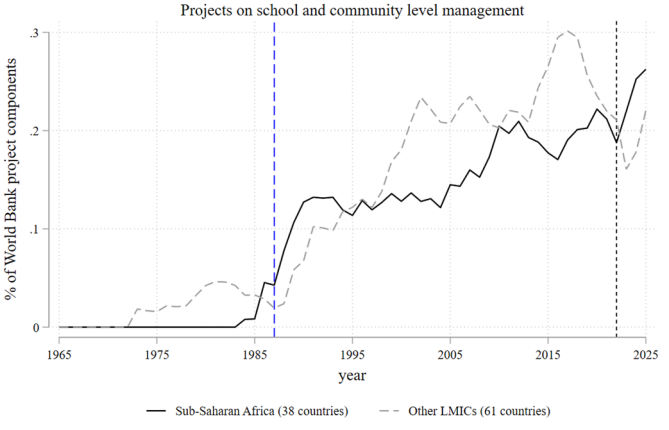

Figure 1. Proportion of World Bank project components focusing on school and community-based management of educational activities in 38 sub-Saharan African countries.

Notes: Figure 1 is based on extensive research and manual coding of WB projects on primary and secondary education in 99 LMICs including 38 countries from SSA, implemented between 1965 and 2022. Figure 1 includes 13 of the 14 SSA countries selected for this study. The solid growth lines are the country-year mean of all available project components focusing on school and community-based management of educational activities in SSA. The vertical dash line in 1987 indicates a notable increase of the promotion of these reforms during the late 1980s through different schemes, such as structural adjustment programs. The growth lines beyond 2022 suggest some projects are still ongoing. SSA countries are Angola, Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Republic of Congo, Cote d'Ivoire, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Uganda, and Zambia.

greater community involvement interplays with the relationship between school resources and learning achievement in SSA. This is because research from relevant fields suggests that autonomous governance of public services tends to serve better in well-off local areas, as local elites may create pressure to divert services (Bardhan and Mookherjee 2005; Essuman and Akyeampong 2011).

While the proponents of community involvement, as part of decentralizing the educational systems to the school level, have primarily emphasized its potential to enhance overall learning outcomes, a key point they make regarding its application in LMICs is its capacity to specifically address the needs of 'the poor' (World Bank 2007, 2). As Barrera-Osorio, Fasih, and Patrinos (2009) argue:

> "Decentralizing power to the school level also may improve service delivery to the poor by giving poor families a say in how local schools operate, and by giving schools an incentive to ensure that they deliver effective services to the poor and penalizing those who fail to do so" (Barrera-Osorio, Fasih, and Patrinos 2009, 97).

Specifically, advocates contend that low-income communities would benefit from this scheme by (1) providing disadvantaged people more choices for school selection, (2) giving them a voice, (3) making it easier to access information, and (4) rewarding or penalizing schools based on their service to poor people (Barnett 1996; Barrera-Osorio, Fasih, and Patrinos 2009). This focus on disadvantaged groups indicates a potential for this scheme to reduce the SES achievement gap. Moreover, high-income countries, often seen as a benchmark when implementing these reforms in LMICs, adopt SBM and school autonomy to level educational outcomes (Barrera-Osorio, Fasih, and Patrinos 2009; De Grauwe 2005). For instance, Breen (2022) asserts that in the UK, significant reforms have revolved around policies, such as 'greater school autonomy and accountability', driven by the objective of 'equalizing […] education among those from different backgrounds' (p. 5). However, evidence suggests that the outlined mechanisms of community involvement overlook how socioeconomic status and other structural barriers can discourage marginalized groups from being involved in school activities and decisions (Hossain 2021). De Grauwe (2005) argues that SBM and similar practices have 'become an instrument in the hands of the elite to build up its power, leading to greater inequities' (p. 6).

Past research from SSA finds that school characteristics, such as infrastructural and teaching resources, account for a large portion of the learning achievement gaps by SES. That is, the effect of family background largely disappears once school backgrounds are held constant (Armand, Herman, and Honoré 2024). But little is known about whether institutional factors, including community involvement, which have been vigorously promoted in the region by IOs,[1] also play a role in learning achievement and inequalities by SES. We address this research gap by examining two research questions (RQ):

1. RQ1: How does community involvement compare to other school characteristics in explaining the relationship between SES and the learning achievement of primary-level graduating pupils in 14 SSA countries? Here, 'other characteristics' refer to school resources, ownership, and urban or rural location.
2. RQ2: To what extent does the relationship between SES and learning achievement vary by the level of community involvement in schools? This question examines whether community involvement acts as a moderating factor in learning inequality.

To address these two RQs, we use newly available comparative assessment data collected by the Program for the Analysis of Education Systems (PASEC) in 2019. This rich dataset contains information about children's math and reading achievements, their family background, including SES, and school and teachers' characteristics. In the following theoretical section, we discuss the importance of school resources and community involvement in accounting for variation in learning achievement and learning inequality, drawing on the perspectives of both advocates and critics. We then present data and methods to answer our research questions, explain the findings, and conclude with a final section.

Theoretical overview

School resources and educational inequalities by SES

The relative importance of individuals' SES compared to school characteristics (e.g. resources) for predicting learning achievement in LMICs has long been debated in sociology and education science literature since the seminal work of Heyneman and Loxley (1983). Recent evidence also suggests a weaker correlation between family SES and learning achievement in LMICs compared to high-income countries (Lee and Borgonovi 2022). Nonetheless, while some studies support the 'Heyneman-Loxley effect' that school resources play a more dominant role than the SES for learning achievement in LMICs (Downey and Condron 2016; Heyneman 2017), others do not (Baker, Goesling, and LeTendre 2002; Bouhlila 2015; Hanushek and Luque 2003; Huang 2010). Aligning with the former view of the 'Heyneman-Loxley effect', Armand, Herman, and Honoré (2024) find that school quality in SSA countries considerably varies in terms of infrastructural and instructional capacity, which explains substantial SES-related achievement gaps. Contrarily, the latter strand of research rather emphasizes the influence of families' success-promoting values and behaviors (Pryor 2005), children's mental and physical well-being (ILO 2013; Walker et al. 2007), and the interaction of family SES with school quality (Kadio 2023).

School resources and the learning environment have appeared important for greater equality in academic achievements in many LMICs. However, advocates for less government intervention and more locally based management argue that providing the education sector with more financial support 'in no way is that sufficient' (Barrera-Osorio, Fasih, and Patrinos 2009, 26). They suggest that relying on local institutions not only complements the central government's resource scarcity but also helps generate innovative responses to learning challenges in schools. However, the effectiveness of greater locally based service provision in reducing SES-related educational achievement gaps is not evident (Nishimura 2017). As we have argued, this could be due to insufficient resources at the individual level.

Critical review of the link between community involvement and learning inequality

In this section, we first explain how community involvement is understood in the current literature. Then, we critically review existing research about whether and how community involvement may be beneficial for reducing learning inequalities.

Community involvement: proponents

According to proponents, community involvement in school decisions shares the cost and management of education between governments and local stakeholders, often through SBM and SMC schemes in LMICs. This decentralizes decision-making to the school level, involving principals, teachers, parents, and local leaders. To align education with community structures and needs, these schemes remain flexible, allowing variations in decision-making processes (Barrera-Osorio, Fasih, and Patrinos 2009). In SSA, community involvement often focuses on budgeting, facilities maintenance, and supplementary teaching, while in developed economies, it promotes more stakeholder participation in school management (Avvisati et al. 2014).

Proponents argue that community participation can enhance student performance, non-cognitive skills, and aspirations (Patrinos et al. 2007). Parental involvement strengthens relationships with teachers and improves school accountability, leading to better learning outcomes. They posit that this approach particularly benefits marginalized communities by empowering disadvantaged parents, ensuring a fairer distribution of resources, and reducing inequalities (Barrera-Osorio, Fasih, and Patrinos 2009).

Criticisms

However, previous research has raised severe criticisms regarding the anticipated relationship between community-based school management and greater equality in achievement. These criticisms are related to (1) structural hindrances, such as poverty, informal governance, and corruption, and (2) flaws in the mechanism proposed by advocates.

First, proponents of community involvement contend that granting local governments and schools more control over education will give parents and communities, especially those marginalized, more influence on school decisions. This, in turn, is expected to lead to better outcomes for everyone, thus narrowing the achievement gaps (Barrera-Osorio, Fasih, and Patrinos 2009). However, this perspective overlooks the reality that poverty and other social barriers may hinder disadvantaged parents from partaking in decision-making processes. Some experts argue that this approach neglects the needs of low-income people and may prove ineffective (Summers and Pritchett 1993). Even when low-SES parents attend school meetings, their opinions may not carry much weight due to the prevalence of clientelist politics and corruption in the decision-making processes of school management committees and local governments in many LMICs (Essuman and Akyeampong 2011). Consequently, school decisions may be controlled by a select few people, often serving the interests of politicians and bureaucrats, potentially exacerbating achievement gaps. Research finds that the increased influence of local politicians in public schools with greater autonomy can prompt parents to transfer their children to private schools (Joshi 2014). To avoid this outcome, scholars have identified several prerequisites for successful autonomy, including a country's prior experience with local autonomy and democracy, well-defined responsibilities, and a comprehensive stakeholder participation plan (Briggs and Wohlstetter 2003; Lugaz et al. 2010; Mfum-Mensah and Friedson-Ridenour 2014; Yamada 2014). However, these factors are often lacking in many LMICs.

Second, community involvement emphasizes the formulation of local and school-based education policies, such as curriculum development, hiring teachers, and budget management, while minimizing central government interventions. However, studies from high-income countries suggest that uniform and standardized education policies are associated with

equalizing educational outcomes. This is because children from all socioeconomic backgrounds are more likely to have access to similar opportunities and learning environments when the education system is more uniform (Van de Werfhorst and Mijs 2010). Breen (2022) argues that policies like school autonomy have limited effectiveness in tackling inequality, as there is greater variation in educational outcomes within schools than between schools. Empirical evidence from past research supports such arguments (e.g. Chiu and Khoo 2005; Chmielewski and Reardon 2016; Gamoran 1996), contradicting the idea promoted by supporters of community involvement in LMICs that granting more autonomy to schools will positively impact the education of poor children (Barrera-Osorio, Fasih, and Patrinos 2009).

Moreover, according to previous research, transferring financial and educational responsibilities to schools and local communities in LMICs did not benefit the marginalized. For example, in Nigeria, devolving the financial system in this manner has resulted in higher education costs for low-income families and no improvement in outcomes (Geo-Jaja 2004). In several South American countries, including Argentina, Chile, Colombia, and Mexico, increasing financial autonomy has widened disparities in educational outcomes between affluent and less well-off schools (Prawda 1993). Similarly, in Mexico, this autonomy has led to differences in teaching quality between rural and urban schools (Reimers and Cárdenas 2007). Research has also found that in less standardized educational systems, i.e., with weaker national control, students from lower socioeconomic backgrounds are more likely to attend schools with limited resources and less qualified teachers (Akiba, LeTendre, and Scribner 2007).

Finally, a goal of community involvement is to reduce burdens on the central government by mobilizing local (non-)financial resources, such as providing teaching support when required. However, local areas are unequal in terms of wealth and community capability, likely leading to an increase in the achievement gap (Cuéllar-Marchelli 2003; Nishimura 2017).

Theoretical framework. Figure 2 illustrates the relationship between SES and learning achievement, considering the role of community involvement and school resources. This is not a formal model but rather a schematic representation of the relationships between different variables. This is a condensed version of the theoretical framework explanation, which is expanded further in the Online Supplement, henceforth, 'the Supplement', (Note S1). Line ***c*** represents the total effect of SES on achievement, while ***c′*** shows the direct effect. Lines ***a*** and ***b*** examine whether community involvement mediates this link, potentially reducing (**negative *a*, positive *b***) or reinforcing (**positive *a*, positive *b***) inequalities. School resources mediate SES effects (paths ***e*** and ***f***) and may influence community involvement (path ***g***). Individual characteristics like hunger and child labor may be associated with achievement (paths ***h*** and ***i***). Line ***d*** tests whether community involvement moderates the SES-achievement gap ***c′*** (see Note S1 in the Supplement for more).

Data and methods

To address the research puzzle explained, we utilize PASEC 2019 dataset from 14 Francophone SSA countries: Benin, Burkina Faso, Burundi, Cameroon, Chad, Democratic Republic of Congo, Republic of Congo, Cote d'Ivoire, Gabon, Guinea, Madagascar, Niger, Senegal, and Togo (PASEC 2021). PASEC 2014 was the first wave involving 10 Francophone African countries, and 2019 is the second wave, which was made available to researchers (on request) in late 2021. This rich dataset contains information about the math and reading

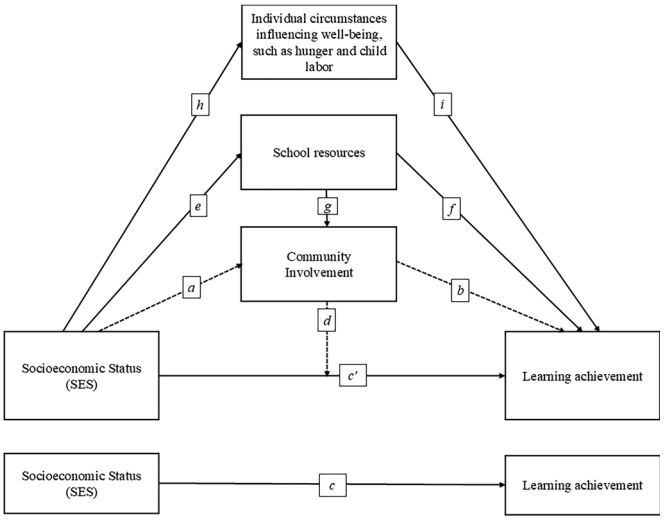

Figure 2. Theoretical framework.
Notes: Schematic relationship between SES and math achievement before and after accounting for factors including community involvement and school resources. This is to simplify the theoretical framework. Actual models and measures of the explanatory variables are presented in the methods section.

achievements of pupils in grades 2 and 6 or the end of primary education level, their socioeconomic background, and demographic and school characteristics.

Dependent variable: math achievement

The dependent variable in the study is math achievement, as it is arguably more comparable across countries than other skill areas. Besides, we find a high correlation between math and reading achievement. Similar to other international assessments, such as the Program for International Student Assessment (PISA), after carrying out the test, each student is assigned five plausible values in math scores, calculated from an item response model also known as the Rasch model (PASEC 2021). We incorporate these plausible values in all our analyses using Stata's 'pv' command (Macdonald 2019). The math achievement has been transformed with an overall mean of 500 and a standard deviation of 100. This means each country has an identical contribution to transforming the achievement scores that are comparable. We present descriptive statistics for all variables by country in Table S1 of the Supplement.

Independent variables: student level

Key variable: socioeconomic status (SES)

The main student-level independent variable is their SES, which is a composite index derived from the household possessions of certain items, proxying wealth. These items include electricity, radio, television, computer, running water tap, car, tractor, freezer, air conditioner, and latrines with running water. The variable was created by PASEC using the Rasch model. To facilitate interpretation, this index has been transformed by PASEC at an international level with an international mean of 50 and a standard deviation of 10.

Student-level control variables

Other explanatory variables at the student level include: first, the frequency of child labor indicates whether a child engages in manual labor or business. The three categories include (1) never, (2) sometimes (up to 4 times per week),[2] and (3) always. Second, gender is a binary variable denoting either male or female students. Third, while all students in this study are from grade 6, there is variation in age, which we incorporate into the analyses.

Fourth, we do not have detailed information on parents' education, which may affect students' achievement. The only variable available in the dataset is whether their parents can read French, which we include in the analyses. Fifth, we also account for whether students get help with homework at home, as it can also influence their learning achievement. Sixth, we account for the number of days students are hungry at school in a week. Seventh, we also include whether they get meals at school, as exposure to school nutrition can improve achievement scores (Chakraborty and Jayaraman 2019).

Independent variables: school level

Key variable: community involvement index

The main school-level independent variable in this study is the community involvement index provided in the dataset based on 20 indicators using the Rasch model, similar to the SES index. Of the 20 questions in the questionnaire, nine are related to whether schools are cooperative with parents with a 4-point Likert scale: never, once, 2–3 times, or more than 3 times a year. Examples of items include whether schools keep parents informed about their (schools') overall academic performance, the child's learning progress, improved facilities, and whether they discuss concerns about the child's learning. We reconstruct these items as binary indicators and plot them in Figure 3(A). All items and Likert scales are presented in Table S2 of the Supplement.

The second set of indicators in the index is five items about whether different associations in schools are non-existent, inactive, or active, capturing broader communities around the school beyond parents. The associations include a parent-teacher association and a school management committee, as we plot in Figure 3(B) and further provide descriptive statistics in Table S3 of the Supplement. The index further includes six indicators of whether local communities are overall involved in school function or extracurricular activities, constructing schools, purchasing educational equipment, supporting or recruiting teachers, and supporting students in difficulty. We also present these items in Figure 3(C). As mentioned, for analytical simplicity, we utilize the composite index of community involvement in PASEC, which was constructed using the item response theory (IRT) method and, in particular, the Rasch model (see the PASEC manual: PASEC 2021). This is to assess the overall level of community involvement by using latent traits or items, which cannot be holistically measured by only a single factor. While we present the main results using the continuous index, we also run robustness checks using a categorical variable derived from dividing the index into a tertile indicator, which we present in the Supplement (see the Findings section). Additionally, we run further tests using three disaggregated measures of community involvement, according to Figures 3(A–C), as discussed in the sensitivity analyses in the Supplement. Finally, community engagement here reflects the perspectives of schools, as the questionnaire was administered to school authorities, consistent with previous research (e.g. Hossain 2021; Barnett 2013).

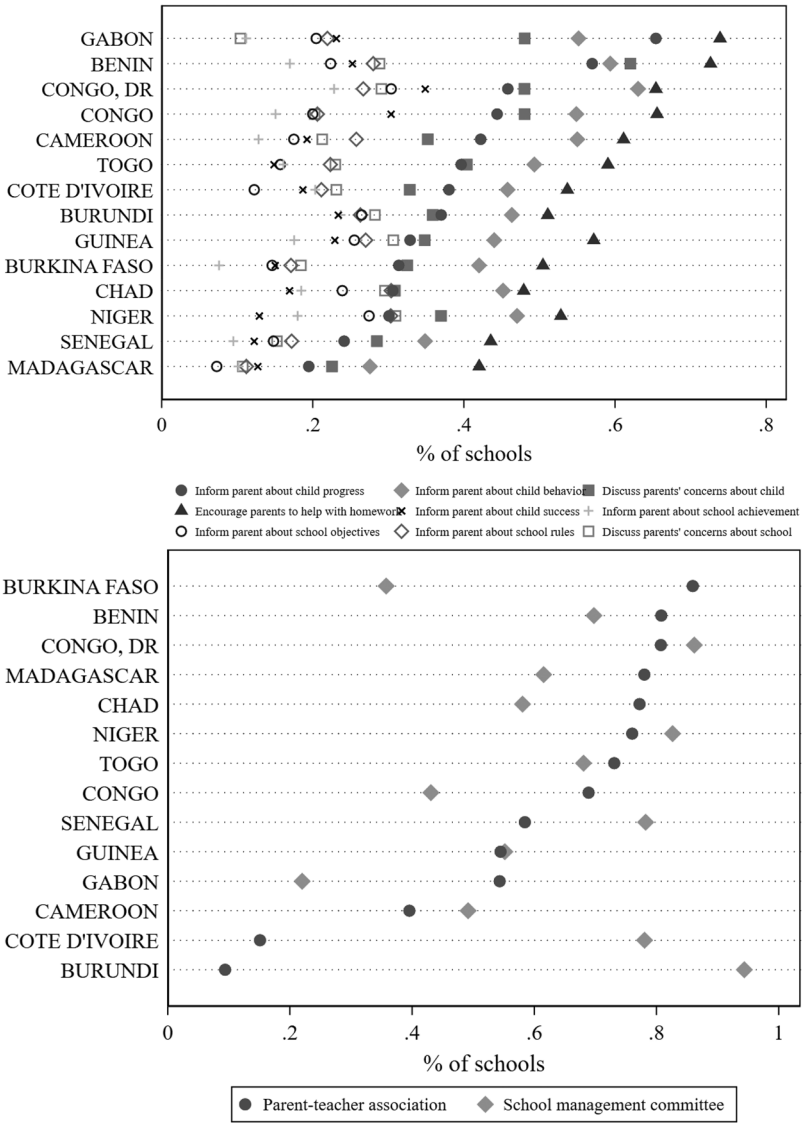

Figure 3. (A) Schools that encourage or keep parents informed three or more times each year in nine different ways. (B) Schools with two common types of 'active' associations, compared to those with 'inactive' or 'non-existent' ones. (C) Whether there is any community involvement in different activities of school.

Notes: (a) These items were originally coded in 4-point Likert scales. To report here, we construct binary measures indicating schools involve parents in school activities in different ways three or more times each year (1) or not (0). The other three categories are: (1) never, (2) once, and (3) 2–3 times each year. Descriptive statistics for all points in the Likert scale are presented in Table S2 of the Supplement. (a) These items were originally coded in three categories: associations are (1) non-existent, (2) inactive, and (3) active. To report in this graph, we construct binary measures indicating whether the associations are active or not in a school. Descriptive statistics for all three categories are presented in Table S3 of the Supplement. (b) The dataset has five association types; the remaining are presented in the same Supplement as well. These are binary items, and the markers refer to the share of schools stating that there is community involvement in different areas as suggested in the legends.

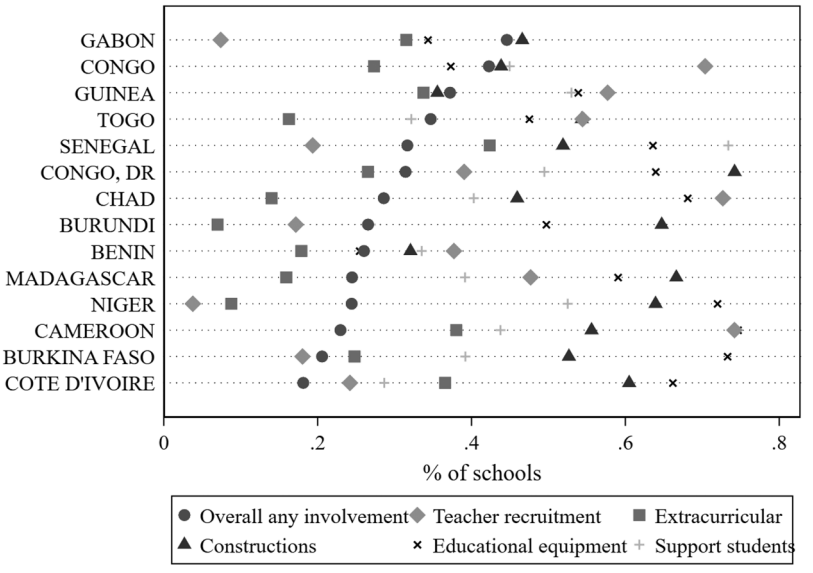

Figure 3. Continued.

School-level control variables

School-level control variables are: first, the school infrastructure index is a school-level key independent variable, which is a composite index of 27 indicators covering items, such as the status of classrooms, playgrounds, fences, water and sanitation, office rooms, building materials, electricity, a photocopier, a computer, a television, the internet, and a canteen. Second, we also account for schools' neighborhood amenities, a composite index composed of 11 indicators, including transportation, electricity, hospitals, and other amenities in the surrounding areas. Both variables have been transformed with an overall mean of 50 and a standard deviation of 10, similar to the SES index (PASEC 2021). Third, the urban or rural location of schools is a binary variable. Fourth, the school ownership variable has three categories: whether a school is public, private, or community-run.

Empirical strategies

Research question 1. Our first research question concerns the extent to which community involvement explains the relationship between SES and math achievement, compared to other school characteristics, such as school resources, ownership, and location. To examine this question, we fit Equation (1),

$$M_{ij} = \alpha + \beta_1 S_{ij} + \beta_2 C_j + \boldsymbol{\beta}_3 \boldsymbol{H}_j + \boldsymbol{\beta}_4 \boldsymbol{T}_{ij} + \varepsilon_{ij} \quad (1)$$

where i refers to students and j denotes schools, and the math achievement of students M is the outcome variable. α is an intercept and β_1 is the corresponding coefficient for SES S. In a step-by-step model-building process, we add community involvement C (where β_2 is the related coefficient) in the model to examine whether it affects the coefficient for the SES. We further control for other school characteristics $\boldsymbol{H}$, where $\boldsymbol{\beta}_3$ is the corresponding coefficient vector. This is to examine whether school resources, ownership, and location may explain the SES gradient more than community involvement. The model also includes student-level controls $\boldsymbol{T}$, as mentioned in the variable section, with a related coefficient

vector $\boldsymbol{\beta}_4$ and ε_{ij} is an error term. We first estimate Equation (1) by running pooled regression models on all countries using country fixed effects. We then estimate the equation for each of the 14 countries to assess whether the results remain consistent, as explained in Note S2 of the Supplement.

To understand the contribution of each independent variable in explaining the SES gap in learning achievement, we apply a Blinder (1973) and Oaxaca (1973) decomposition analysis. This is explained in detail in the sensitivity analyses in Notes S3 and S4 of the Supplement.

Research question 2. Our second research question investigates whether community involvement acts as a moderator in the relationship between SES and math achievement. In this context, this means assessing the extent to which SES slopes change due to community involvement. We extend Equation (1) and fit Equation (2) to investigate this question,

$$M_{ij} = \alpha + \beta_1 \mathrm{S}_{ij} + \beta_2 C_j + \beta_3 (\mathrm{S}_{ij} \times C_j) + \boldsymbol{\beta}_4 \boldsymbol{H}_j + \boldsymbol{\beta}_5 \boldsymbol{T}_{ij} + \varepsilon_{ij} \tag{2}$$

where, in addition to Equation (1), we add another parameter, represented by coefficient β_3, which interacts SES with community involvement. Like Equation (1), we also estimate this equation by first running pooled regression models on all countries, and then separately on each country.

Moreover, we also conduct robustness checks using within-school students' SES variance instead of student-level SES, as discussed in the Findings section. This is to examine if the distribution of SES within a school may influence how community involvement may mediate or moderate its relationship with achievement, as we explained in the theoretical section. To do this, we stick to Equations (1) and (2) but replace student-SES with the school-level SES variance. Furthermore, we consider math achievement variance within schools as an indicator of overall inequality. This robustness check is to capture inequality that is not addressed by SES but can have a linkage with community involvement.

Findings

As we can see in Figures 3(A–C), there is variation in involving communities and parents in school activities and decision-making across the 14 countries. Specifically, Figure 3(A) shows that 44 to 72% of schools engage parents by encouraging them to help children with homework. This engagement goes up to 61% when schools inform parents about a child's behavior, and up to 65% when they inform parents about a child's learning progress. Similarly, parent-teacher associations (PTA) and SMCs are active in all countries. For instance, up to 95% of schools in Burundi, 87% in the Democratic Republic of Congo (DRC), and 84% in Niger have active SMCs. Similarly, the percentage of active PTA is also noticeable. Additionally, community involvement in a variety of activities, including teacher recruitment, school construction, and supporting students, also varies across the selected countries.

The availability of school resources or the distribution of students from different SES groups does not influence the level of community involvement in schools. The correlation between the community involvement index and the school resources variable is negligible ($r = 0.007$). Likewise, the overall relationship between community involvement and within-school variance of students' SES is weak ($r = 0.035$). This pattern of weak correlations remains consistent across all the selected countries.

RQ1: Community involvement and socioeconomic inequality in math achievement

Our primary focus is to examine whether and how the variation in community involvement practices across schools and countries may influence the relationship between the SES of students and their math achievement. To assess the mediating role of community involvement (i.e. research question 1), we fit Equation (1) on all 14 countries using country fixed effects. As demonstrated in Table 1, Models 1 and 2 show a positive and statistically significant relationship between SES and math achievement, before and after controlling for individual characteristics. This means higher-SES pupils are significantly more likely to achieve higher scores than lower-SES students. Although the coefficients are slightly reduced, the results do not change much when we use school fixed effects in Model 3. However, the results change with school fixed effects when analyzing each country separately, as discussed below.

Importantly, including community involvement in Model 4 does not change the coefficient size much compared to Models 1 and 2. This similarity indicates that community involvement does not notably explain the relationship between SES and math achievement. Besides, the results demonstrate that community involvement is not significantly associated with overall math achievement.

Nonetheless, adding the school ownership variable reduces the magnitude of the SES gradient, though it remains statistically significant. When we separately include school resources and neighborhood amenities in Model 6, the significance of the SES gradient disappears, and the coefficient size is noticeably reduced. For instance, in Model 5, the SES gradient for quartile 4 is 24.6 points in math achievement compared to those in quartile 1, which becomes 12.6 in Model 6, and is no longer statistically significant. When we exclude neighborhood amenities from the model, the result does not change much but we keep this variable in this model as these amenities can contribute to making schools more resourceful. Furthermore, to account for potential non-linear effects of community involvement, we present results in Table S4 of the Supplement, where the variable is categorically divided into tertiles. The results, however, remain consistent.

Furthermore, when school-mean SES (i.e. school composition) is added to the model, as shown in Table S5 of the Supplement, a mild individual SES effect (notably in the highest SES quartile) re-emerges. This likely reflects the fact that while school resources account for institutional inequality, individual high-SES students may still benefit from additional family-level support or capital that goes beyond both school quality and peer composition. Thus, school composition and individual SES appear to capture distinct dimensions of educational advantages in this instance. Nonetheless, the role of community involvement still remains negligible in the model.

Additionally, we also run analyses using within-school math achievement variance as an indicator of inequality. As shown in Table S6 of the Supplement, community development does not have any significant association with this outcome variable before and after controlling for different characteristics.

Besides, we present results from the country-specific analysis in the Supplement, which largely echo findings from pooled analyses in Table 1 with some heterogeneity, as we discuss in the Supplement (Note S2 and associated Figures S1, S2 and S3).

Table 1. Predictors of math achievement including SES and community involvement.

	Dependent variable: math achievement of grade 6 pupils						
	No controls	+ Individual controls	School fixed effects	+ Community involvement	+ Private, urban	+ School resources	+ Interaction model
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Socioeconomic status (SES)—ref: SES 1 or poorest							
SES 2	9.77***	8.62***	7.16***	8.62***	5.39**	2.89	−12.7
	(1.07)	(1.38)	(1.12)	(1.36)	(1.65)	(2.05)	(13.7)
SES 3	24.6***	20.7***	16.7***	20.7***	9.75**	3.72	20.0
	(3.23)	(3.51)	(1.57)	(3.50)	(3.11)	(3.46)	(13.9)
SES 4 (richest)	54.4***	45.2***	37.7***	45.2***	24.6**	12.6	46.1
	(11.1)	(10.6)	(8.02)	(10.6)	(8.38)	(6.79)	(27.9)
Community involvement index				−0.022	−0.027	−0.021	0.14
				(0.075)	(0.11)	(0.12)	(0.27)
Community involvement index × SES (ref: SES 1)							
Community involvement index × SES 2							0.31
							(0.24)
Community involvement index × SES 3							−0.33
							(0.21)
Community involvement index × SES 4							−0.68
							(0.43)
School infrastructure index						1.88***	1.91***
						(0.31)	(0.31)
Neighborhood amenities index						0.51***	0.48***
						(0.063)	(0.058)
Sex (ref. male)		−7.97***	−5.98***	−7.98***	−8.24***	−8.55***	−8.44***
		(0.70)	(1.18)	(0.71)	(0.72)	(0.67)	(0.71)
Age		−7.63***	−5.15***	−7.63***	−6.77***	−6.26***	−6.28***
		(0.90)	(0.29)	(0.90)	(0.73)	(0.75)	(0.72)
Child labor (ref: never)							
Sometimes (up to 4 times per week)		−8.28***	−8.61**	−8.29***	−7.05***	−7.61***	−7.74***
		(1.65)	(2.81)	(1.67)	(1.74)	(1.42)	(1.39)
Always		−17.8***	−15.8***	−17.8***	−15.9***	−15.6***	−15.5***
		(3.31)	(1.31)	(3.35)	(3.26)	(2.94)	(3.05)
Parents can read French		2.15	−2.09*	2.15	1.63	0.66	0.66
		(2.87)	(0.88)	(2.87)	(2.74)	(2.34)	(2.31)
Child get help with homework		4.99**	10.0***	4.98**	3.44	1.84	1.72
		(1.60)	(2.24)	(1.56)	(2.01)	(2.01)	(2.01)

(*Continued*)

Table 1. Continued.

	Dependent variable: math achievement of grade 6 pupils						
	No controls	+ Individual controls	School fixed effects	+ Community involvement	+ Private, urban	+ School resources	+ Interaction model
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Hungry at school (ref: always)							
3–4 times		5.16***	3.62***	5.16***	4.40**	3.77*	3.91*
		(0.95)	(0.92)	(0.96)	(1.41)	(1.70)	(1.71)
1–2 times		20.5***	22.1***	20.5***	18.2***	16.5***	16.5***
		(3.52)	(4.09)	(3.52)	(3.96)	(3.94)	(3.84)
Never		12.1***	15.6***	12.1***	10.4***	10.5***	10.5***
		(1.00)	(1.03)	(0.99)	(1.03)	(1.46)	(1.36)
Child gets meal at school		−1.05	12.7***	−1.04	−1.96	−3.96	−3.73
		(4.73)	(3.68)	(4.71)	(5.00)	(4.29)	(4.27)
Urban (ref: rural)					18.3***	2.91**	3.04**
					(2.31)	(1.07)	(1.07)
School ownership (ref: public)							
Private					21.2***	10.5	10.9
					(3.70)	(6.50)	(6.50)
Community-run					−8.31	−3.68	−3.93
					(5.64)	(4.41)	(4.76)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School fixed effects			Yes				
Constant	509.5***	602.3***	531.6***	603.4***	591.5***	480.2***	472.1***
	(9.80)	(23.9)	(7.43)	(26.7)	(24.8)	(40.1)	(47.2)
Observations	48,975	48,975	48,975	48,975	48,975	48,975	48,975
Schools	1132	1132	1132	1132	1132	1132	1132
Countries	14	14	14	14	14	14	14

Notes: Models 1–6 were estimated using Equation (1) and Model 7 was estimated using Equation (2). Standard errors in parentheses.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Finally, as noted in the methods section, we conduct an Oaxaca-Blinder decomposition analysis of the math achievement gap between higher- and lower-SES students. As explained in Note S4 (and associated Tables S7–S10 and Figures S4–S6) of the Supplement, community involvement explains almost none of the achievement gap between lower- and higher-SES students. By contrast, school resources explain a considerable portion of the SES achievement gap.

RQ2: The interaction between SES and community involvement

In research question 2, we investigate whether the SES gradient varies by the level of community involvement. To do so, we include an interaction between SES and community involvement in Model 7 in Table 1. However, we do not observe any significant differences in math achievement by SES based on increased community involvement. This is quite similar when we do not control for the school resources variables. When investigating the moderating mechanism, we also treat community involvement as a categorical variable and present the results in Table S4 of the Supplement. The results remain largely unchanged except for one instance: in schools with medium-level community involvement, only pupils in the wealthiest SES quartile tend to achieve lower grades than those in the lowest quartile.

Akin to the pooled analysis, we also examine the interaction between SES and community involvement in each country to see if there is any moderating effect, but results remain consistent with pooled analyses, as presented in the Supplement (Note S5 and associated Figure S7 and Tables S11–S13). In summary, the moderation analyses indicate that the results are mainly null. While some instances indicate that community involvement might be associated with reducing achievement gaps, these results are inconsistent. We, however, observe in the mediation analyses that school resources and neighborhood amenities may play a greater role in explaining the SES coefficients.

We present a series of sensitivity tests, including running regression with additional controls and decomposition analysis, as discussed earlier and presented in sensitivity analyses in Note S4 of the Supplement.

Discussion and conclusion

In this paper, we empirically examine the association between community involvement and SES-related achievement gaps in math in 14 Francophone SSA countries. We particularly focus on how far community involvement may explain and moderate the SES-related achievement gaps. Our research puzzle is based on the fact that IOs have been promoting the implementation of community involvement in education in this region and other LMICs since the late 1980s. According to its advocates, this scheme can help overcome challenges in education through local resource mobilization, innovative school management, contextual knowledge from 'indigenous' people, more participatory and accountable school decisions, and empowering marginalized communities. These practices would presumably lead to improved achievement and reduced achievement gaps. Our study investigates whether more community involvement is associated with a decrease in the achievement gap.

We utilize a comprehensive set of indicators to construct a community involvement index. Our results suggest that this management index does not substantially explain the relationship between SES and math achievement. We rather find that school resources play a greater role in explaining the SES gradient on math achievement in all 14 countries. Moreover, our analyses on the moderating role of community involvement in achievement gaps mostly yield null results, with only a few instances of lower achievement gaps in schools with higher levels of community involvement. Results from these instances are not consistent.

We run different robustness checks, including taking community involvement as a categorical indicator, the replacement of student-level SES with SES variance in school, and math achievement variance in school as a sign of overall inequality. The results indicate a similar story across these analyses. Additionally, we examine whether the interaction between community involvement and school resources may influence the SES gradient in math. We do not find such evidence (not presented here).

It has been suggested that involving local communities in school activities can lead to increased involvement of parents, especially those from disadvantaged backgrounds, which can result in better academic outcomes and reduced disparities. However, previous research has shown that higher levels of community involvement do not necessarily translate into increased communication between parents and teachers regarding their child's academic progress (Hossain 2021). Our findings do not provide strong evidence that community involvement is associated with reduced achievement gap. Our findings also support existing research suggesting that community participation does not explain variation in math achievement in Malawi; instead, school resources do (Barnett 2013). We argue that poverty and resource constraints in schools may play a greater role in predicting students' learning achievement in Francophone SSA countries, similar to other LMICs. Additionally, the largely null findings also suggest that community involvement is not associated with exacerbating learning inequalities.

Future direction

Contextualizing community involvement

Our findings highlight the need to revisit the meaning and measurement of community involvement in the context of SSA. While the composite index we use offers a broad measure of school-reported activities, it largely captures formalized and procedural forms of engagement. The underlying items reflect whether schools inform parents, hold meetings, and host functioning associations, such as school management committees or parent-teacher associations, along with whether the broader community contributes to school infrastructure, teaching, or student support. However, these indicators may not fully reflect the depth, quality, or inclusiveness of community participation. For instance, the presence of associations or the frequency of meetings does not necessarily indicate that diverse voices are included or that parents and community members meaningfully influence school decisions. This is especially relevant in settings where informal governance arrangements, poverty, and unequal power dynamics may restrict the ability of less advantaged groups to influence outcomes, even when formally included.

In such contexts, community involvement may function more as a procedural requirement than a channel for shared accountability or empowerment. As previous research has shown, school committees can be dominated by local elites or used to legitimize decisions

already taken by school authorities or local politicians (e.g. Essuman and Akyeampong 2011; Joshi 2014). The data collected through school questionnaires cannot easily distinguish between inclusive participation and top-down communication or passive involvement. As a result, the index may mask important variation in how community involvement operates across different schools and social contexts. This raises the need for more fine-grained approaches that consider both the form and function of community engagement, including whether participation is consultative or genuinely deliberative, and whose interests are represented in the process. Revisiting the construction of such indices with attention to power, representation, and context-specific practices could offer a more accurate picture of how community involvement shapes school functioning in SSA.

At the same time, our results suggest that the effectiveness of community involvement as a mechanism for improving educational equity cannot be assumed. As discussed, the theoretical benefits of decentralized governance rely on certain preconditions, such as transparency, accountability, and equal capacity to participate, that are often absent or unevenly distributed. This may explain why we observe limited or inconsistent associations between the community involvement index and school outcomes. Rather than viewing community participation as a universally positive input, future work should consider it as a contingent and potentially uneven process that interacts with broader political and institutional conditions. Our use of disaggregated items in sensitivity analyses is a step in this direction, but more targeted survey instruments and qualitative insights are needed to fully capture the character and consequences of community involvement in education across SSA.

Additionally, this study approaches community involvement partly through the lens of parental engagement, which forms the core of the available indicators in the dataset. But we also have five indicators about the activities of different associations in schools, which also include community members. While the theoretical literature often defines community involvement in broad terms, involving a range of local actors and decision-making processes, our focus on parental contact, communication, and participation in school-level structures with other community members captures one important dimension of how schools relate to their communities. In many SSA contexts, parents are the most immediate and consistent point of contact between schools and the broader community, and their involvement often reflects wider dynamics of trust, accountability, and responsiveness, since PTAs, for instance, also involve other parents and community members. That said, due to data limitations, this approach does not comprehensively capture other forms of community participation, such as engagement by local leaders, civil society groups, or informal networks. Future research could expand on this by incorporating a wider set of indicators, including perspectives beyond those of school authorities, to build a more comprehensive picture of how schools interact with different segments of the community. Understanding these diverse relationships will be important for assessing the conditions under which community involvement contributes to improved and more equitable education outcomes.

Path dependence

First, our study uses recent data from a single time point, limited to exploring historical precedents that could have changed the roles of local stakeholders and their impact on learning inequality. We illustrate a specific case here, open for further exploration in future research. Research has documented the distinctive educational strategies adopted by colonial

powers in SSA, leading to substantial variations in schooling systems and learning outcomes across territories. For instance, the French pursued assimilation through a strongly centralized, rigidly hierarchical administration, significantly limiting local community autonomy (Bolt and Bezemer 2009). Meanwhile, centrally administered education systems reduced the influence of churches and mosques in school management (Garnier and Schafer 2006). This involved standardized educational systems using the French language, primarily to train local elites for colonial administration roles (Clignet and Foster 1964; Cogneau and Moradi 2014; Frankema 2012). Post-French colonial rule, educational systems have remained largely centralized, employing nationally standardized curricula taught in French with teachers appointed by the central government (Garnier and Schafer 2006). Belgium took a somewhat similar strategy in the Democratic Republic of Congo, where school curriculum and finances were also heavily centralized (Boyle 1995; Vanthemsche 2012).

In contrast, British colonial rule minimized interference from the central authority with local entities, allowing more local autonomy in education (Clignet and Foster 1964). This included permitting religious organizations to provide educational services and enabling educational decisions by school committees and local communities (Garnier and Schafer 2006; Heyneman 1975). Research suggests that this competition among religious organizations aimed to attract pupils by offering high-quality primary schools, resulting in higher enrollment rates and more years of education in British African colonies compared to Francophone colonies (Gallego and Woodberry 2010). However, immediately after independence in some countries, for instance, Uganda, the state assumed centralized control over schools by eliminating SMCs and excluding religious leaders from management (Heyneman 1975). While the aim was to equalize educational outcomes, curtailing school autonomy has been said to induce a decline in local participation and unequal distribution of school resources within and across districts (Heyneman 1977a). Additionally, the imposition of standardized fees exacerbated the inequality in educational opportunities (Heyneman 1977b, 1979). This example shows that the centralization of educational governance in the post-colonization era constrained the roles of headmasters, local religious organizations, and community members. In contrast, francophone SSA lacks historical precedents for a decentralized education system. Therefore, the introduction of SBM and community involvement and their inequality consequences need to be understood differently based on the context of the country. The findings in our analyses are limited to Francophone SSA countries and may not necessarily apply to other developing regions with different historical origins, for instance, countries with a longer history of decentralized management and local participation. This leaves room for future research to explore the validity of our findings in other contexts.

Second, while we strive to address the sources of endogeneity, as explained in sensitivity analyses of the Supplement, the nature of the study design and cross-sectional data limit the causal interpretation of our findings. Third, the 14 countries in the study are likely to exhibit socio-cultural, economic, and political differences. Unfortunately, we could not delve deeper into analyzing the contextual elements that might explain how community involvement works in these contexts and the reasons why this practice may lead to larger (in)equality in educational achievement. The cross-national assessment, PASEC, that we have used may not adequately capture differences in the meaning of community involvement across the selected countries. A more comprehensive and contextual understanding of local participation is needed to examine the influence of community involvement within and

across countries. Fourth, the questionnaire is based on responses from school administration rather than parents, as this information is not available in the dataset for the latter group. Despite this, our results align with previous findings from Malawi that finances, rather than community involvement, explain more variation in achievement (Barnett 2013). Future research can extend to whether parents' experience of community engagement in school activities affects learning inequalities.

Notes

1. The role of IOs is discussed to show the motivation of the study. We do not analyze the effects of the intervention by IOs in this study.
2. To construct category 2, we combined two categories of child labor '3–4 times' and '1–2 times' in the original dataset, due to a small number of observations in these categories.

Ethical approval

Ethics approval was not required for this study as it did not involve any human subjects.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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