When Information is Not Enough: Evidence from a Centralized School Choice System

Kehinde F. Ajayi, Willa H. Friedman, and Adrienne M. Lucas*

October 2, 2019

Abstract

Students often make school choice decisions with inadequate information. We study the effect of information using a randomized controlled trial covering 900 junior high schools in a setting with universal secondary school choice. Randomly selected Ghanaian junior high students (and some randomly selected parents) received guidance on application strategies and information about the selectivity and certification exam performance of secondary schools. We find that information changed the characteristics of schools to which students applied. Even though students were admitted to higher value-added schools, they were not more likely to matriculate on time or at all.

JEL: D84, I21, I24, I25, O15.

*Ajayi: World Bank. Friedman: University of Houston. Lucas: University of Delaware, NBER, and J-PAL. For useful comments and suggestions we thank Jim Berry, Eric Chyn, Justine Hastings, Chris Neilson, Jeremy Tobacman, and seminar participants at Georgetown University, Harvard Graduate School of Education, the University of Delaware, the University of Minnesota, and the Ghana Education Evidence Summit. We gratefully acknowledge funding from the Post-Primary Education Initiative of the Jameel Poverty Action Lab (J-PAL), the Weiss Family Program Fund, and the University of Delaware Institute for Global Studies' Global Exchange Program. For exceptional support in Ghana we thank Kym Cole, Jonathan Addie, Cornelius Adjei, and Helen Habib. Phillip Ross provided excellent research assistance. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and do not necessarily represent the views of the World Bank, its Executive Directors, or the governments of the countries they represent.

1 Introduction

Each year, millions of families face the daunting task of selecting a school for their child. School choice can offer families an array of academic options, but they can only accurately apply their preferences when they have adequate information about the available alternatives. Previous research from settings as varied as Boston, China, Ghana, Kenya, and Mexico has shown that families (especially those from lower socio-economic backgrounds) lack critical information, leading to sub-optimal choices and an inefficient allocation of household and schooling sector resources (Abdulkadiroğlu et al., 2006; Pathak and Sönmez, 2008; Lai et al., 2009; Lucas and Mbiti, 2012; Ortega Hesles, 2015; Ajayi et al., 2017).

This paper investigates the effects of information on school choice. We focus on three questions: 1) What information do parents and students say they want? 2) Does receiving this information affect choices and educational outcomes? 3) Does who receives this information matter? To address these questions, we conducted a randomized control trial in 900 junior high schools in Ghana, a country with universal secondary school choice. We designed and distributed a booklet, produced and screened a video, and had enumerators lead a workshop to close the information gaps that students, parents, and researchers had identified as barriers to efficient secondary school choice. Together, the intervention provided information on both how to navigate the school choice process and available secondary schools. We then experimentally varied receipt of this information among students in their final year of junior high school and their parents.

Theoretically, providing agents with information, especially the information they say they want, should result in more informed decisions and better outcomes. We find that even though our information was what principals, teachers, parents, and students stated would help them make more informed choices and was salient, our information campaign did not change enrollment or on-time matriculation. We found that respondents received, believed, and understood the information provided. Respondents even remembered specific details of the intervention materials more than one year later. The information changed students'

application decisions, but it did not improve outcomes during the transition to secondary school.

Despite the importance of school choice in many education systems, relatively few studies have looked at ways to improve students' interactions with existing centralized systems. Information interventions have focused on improving student applications to schools in non-centralized systems (Hoxby and Turner (2013) in US higher education; Allende et al. (2019) for Chilean primary schools), students sorting to higher quality schools or pressuring schools to improve in systems without formal applications (Banerjee et al., 2010; Mizala and Urquiola, 2013; Andrabi et al., 2017), how to finance higher education (Dinkelman and Martinez, 2014), the importance of peer networks (Dustan, 2018), and the returns to schooling (Jensen, 2010). Another avenue of research has advocated for changes to existing systems (Abdulkadiroğlu et al., 2006).

Information could be especially valuable in centralized systems where students have limited ability to sort ex post or gain admissions to multiple schools ex ante. Three existing studies focus directly on the effect of information provision on students' choices in such systems. Two of the interventions focused on simplifying and amplifying information in a relatively rich information environment. Relative to a control group that had access to a 100 page book on schools, Hastings and Weinstein (2008) found that providing simplified information to parents on the test score performance of schools in Charlotte-Mecklenburg Public School District in North Carolina led to parents choosing schools with higher test scores. (Corcoran et al., 2018) provided students selecting high schools in New York City with a one-page list of 30 geographically proximate schools with higher than median graduation rates. This intervention caused students to be more likely to match with higher-performing schools.[1] In a much less information rich environment, Ajayi et al. (2017) found that directly targeting parents in Ashanti, Ghana caused them to be more engaged in the school choice process using evidence from the same experiment as the current study.

[1]Other arms of the intervention layered additional treatments in addition to this list, but in most cases the authors are unable to reject equality with the basic treatment.

Further, few studies have experimentally varied who receives the information. In some of the above settings, information was made available through mailings, newspapers, village meetings, or through banners advertising success at schools. In Ghana, especially with low levels of parental literacy, students are often the primary conduit of information for their parents. Informing only students and teachers is easier and less expensive as they are accessible at school. Informing parents is more costly for parents and information providers because parents must be mobilized to receive information. However, targeting parents can magnify the effect of information provision. Parents generally pay for education expenses and often intervene in school choice ex post even if they are not aware of students' choices ex ante.[2]

Our findings have implications for the implementation and design of these school choice systems, particularly with regard to ensuring equal opportunities for students from underprivileged backgrounds. Additionally, we provide evidence that improving information, even by offering the information respondents want, may not be sufficient to overcome other structural barriers to improved decision making.

2 Schooling and School Choice in Ghana

2.1 Schooling

Ghana's school year starts in September and ends in July and consists of three terms–roughly September to December, January to April, and May to July. The 6-3-3 system consists of 6 years of primary school (P1 through P6), three years of junior high school (JHS1 through JHS3), and three years of secondary school (SHS1 through SHS3). Ghana has two types of secondary schools: academic track or technical/vocational track.[3]

[2]Most studies that have tried to estimate the role of parents in students' decision-making did not engage parents directly, instead varying whether students were asked to pass along information to parents (Dinkelman and Martinez (2014)) or varying the addressee on a mailing (Hoxby and Turner (2013)).

[3]The seven academic programs are Agriculture, Business, General Arts, General Science, Home Economics, Technical, and Visual Arts, and not all schools have all programs.

Students take two nationally standardized exams during their twelve years of schooling. At the end of JHS3, students take the Basic Education Certificate Examination (BECE). At the end of SHS3, students take the West African Senior School Certificate Examination (WASSCE). Passing these exams is a requirement to earn the equivalent of a diploma, and scores on the exams determine whether and what kind of additional schooling students can attend.

During the period under study, both primary and junior high school were tuition-free, but senior high schools stills required fees. For the 2016-2017 school year, the approved fees for an entire year at a government senior high schools were GHC551.50(USD$143) for day students and GHC1494.50(USD$387) for boarding students.[4] Many government schools unofficially charge additional fees such as parent teacher association dues, teacher motivation fees, infrastructure improvement levies, and exam registration fees.[5] Private schools were free to set their own fee schedule.

2.2 School Choice System

Students are admitted to at most one secondary school-program pair through a centralized admissions process implemented by the Ghana Education Service Computerised School Selection and Placement System (CSSPS). During February of the second term of JHS3, students register for the Basic Education Certificate Examination (BECE) and submit the four secondary school-program pairs to which they are applying to the CSSPS. Each student may apply to only one program at each secondary school and must list four choices on their forms.

Rules somewhat constrain students' choices. Each secondary school has an "Option" designation. Options 1 through 3 are public, senior high schools, with option numbers

[4]Charges varied by term. First term allowable charges were GHC405.50 (USD$105) for day students and GHC724.50 (USD$187) for boarding students. For terms two and three, the per-term allowable charges were GHC73 (USD$19) for day students and GHC385 (USD$100) for boarding students. Exchange rate based on the September 1, 2016 exchange rate of 1 GHC/3.8665 USD$. Expressed in 2016 dollars.

[5]Including all school-specific and approved feeds, Duflo et al. (2017) report per year average annual costs of secondary school of GHC 1921 for the cohort that graduated in 2012.

approximately inversely ranked by historic difficulty of admission.[6] Students can list at most one Option 3 school (the most competitive), two Option 2 schools, and four Option 1 schools. Public technical/vocational schools are Option 4, and all private schools (including both academic track and technical/vocational schools) are Option 5. Options 4 and 5 are typically not competitive to enter and very few students list these schools as they can gain entry outside of the centralized allocation system.[7]

A "catchment area option" adds additional complexity. Students who only select schools within 16 km of their JHS can select this option, which can increase their odds of admissions, as each SHS must set aside 30 percent of their seats in each program for students who select this option.

After students have completed the BECE in June, the CSSPS admits each student to at most one school. First, schools submit the number of seats available for first year students in each program. Then, the CSSPS uses a deferred acceptance algorithm to generate a list of students admitted to each school based on the number of seats available in each school, students' test scores, and students' preferences.[8] After all preferences have been considered, students with the highest test scores who were not matched to one of their preferred schools are arbitrarily allocated to schools with remaining seats. Students and schools are told of the matches in September, shortly before the start of the academic year.

Any school with unfilled seats, whether from insufficient demand in the CSSPS or admitted students not matriculating, can fill these seats with students who directly apply to the school. This unofficial second round lasts throughout the first term of secondary school,

[6]The options do not perfectly correspond to recent admissions cut-offs.

[7]In our data only about 1 percent of students listed a private school as one of their choices. Of those who do, they are most likely to list it as choice 4. About 8 percent listed a technical/vocational school as a choice.

[8]The CSSPS considers the first choices of all applicants. It conditionally admits the highest scoring applicants up to each school-program's capacity in the first round. For students not admitted to their first choice, it then considers their second choice. It compares students' scores relative to the scores of the conditionally admitted applicants from the first round, and replaces any conditionally admitted applicants from the previous round with students with higher test scores (i.e., through a deferred acceptance algorithm). These displaced students' second choices are then considered. This process repeats for choices 3 and 4. This algorithm yields an allocation equivalent to a serial dictatorship where students are ranked by descending score and the preferences of higher scoring students have precedence. As students are limited in their choices, this allocation mechanism is not strategy proof, but students should list their choices in order of preference.

resulting in students starting school late as they and their parents visit different schools trying to find an available match.

This system of applying to the next level of schooling is not unique to Ghana. China, Kenya, Lesotho, Liberia, Mexico, Romania, Trinidad and Tobago, Uganda, and Zambia use similar systems combining students' stated preferences with test scores to determine secondary school assignments. Further, an analogous system operates in US school districts with school choice for elementary, middle, and secondary school. In the US students are often ranked by a lottery instead of test score, but the issues of incomplete information on the part of the student and household are similar.

The centralized admissions process has some beneficial features for students. First, students can apply to any secondary school in the country. Second, by design, admissions to secondary school are based on expressed preferences and test scores, not subject to manipulation based on wealth or family connections.

Unfortunately, the process can be quite daunting for students. Previous research has shown that many students - especially the most marginalized - make their choices with limited information about options, resulting in choice errors (Lucas and Mbiti, 2012; Ajayi, 2013).

Specifically in Ghana, students submit their preferences often with limited knowledge about schools, their admissions likelihoods, or how to get the most out of their applications. As a result, fewer than half of students who attend secondary school do so at one of the schools they listed during the centralized process. Some are not admitted to schools to which they applied, but could have been admitted to relatively high value-added schools in the region. Others are admitted to schools they selected, but do not matriculate. Still others are not assigned to any school because they did not follow the rules. Nearly 4.6% of students who took the BECE and listed four choices were not assigned to any school because they either applied to more than 1 Option 3 schools or more than 2 Option 2 schools.

The process through which students deviate from their assignments, or fail to matriculate

to school at all, introduces a number of inefficiencies into the system.[9]

At the household level, five such inefficiencies exist. First, some students and their parents waste much of the first term trying to match with a new school, leading to enrollment delays and falling behind. Second, some students matriculate to a preferred school, but then drop out after learning more about it, wasting their time and school fees. Or they stay in the school but their bad attitudes impede their schooling, again wasting fees. Third, students matriculate to and attend all three years of secondary school, incurring associated direct costs and the opportunity cost of time, yet fail the secondary school certification exam. In some senior high schools, very few students pass the WASSCE. Fourth, students continue to select and attend these schools in which almost no students pass the WASSCE even though similarly priced schools with similar incoming exam scores and higher graduation outcomes are available. Fifth, some students who could succeed in secondary school fail to matriculate at all. Some of these issues are more substantial for students who come from junior high schools with lower exit exam scores, a decent proxy for socioeconomic status in this context. Conditional on their own scores, students from lower performing junior high schools apply to and are admitted to less selective secondary schools (Ajayi, 2013).

At the sector level, the churn in students that happens in the first term leads teachers to teach classrooms that are not full and wastes school administrator time that could be better spent on the educational mission of the school. As the government partially subsidizes school fees and pays teacher salaries, these are additional costs borne by the government.

[9]Households could prefer to engage in the ex post process rather than the ex ante CSSPS process. This is a high risk and much more expensive strategy–a particular school might not have open seats, principals can admit students at their will, and a member, or members, of the household would have to physically travel to the particular school to speak directly with the principal. Based on conversations with students and parents, they would rather be admitted through the CSSPS process and only engage in the ex post sorting because of a match that they perceive to be sub-optimal.

3 The Intervention

Given the inefficiencies that inadequate information introduces into the secondary school selection process, we sought to remedy the information deficit to increase the likelihood that students matriculate on time and continue their education.

While in one sense the allocation is a zero-sum game (i.e. when one student is admitted, then another is not), but a "good" school for one student might not be a "good" school for another. Regardless of economic assessments of school quality, existing evidence shows that students who are more pleased with their matches put forth more effort (Hastings et al., 2012) and students who are better matches with their college majors have higher labor market returns, even if the average return to the major is low (Kirkeboen et al., 2016). Given the delays in matriculation and failure to matriculate at all, substantial scope exists to improve the match between students and schools without necessarily making some students worse off.

We asked students what was their most important characteristics for school selection. Figure 1 displays their responses. The most important was academic performance followed by distance and cost. Other important characteristics were admission chances, future success, teacher quality, and whether the school was single sex. The schooling decision often involves the whole household and could also involve school personnel. We asked students who the most helpful person was in making their school choices. Overwhelmingly, students responded their parent or guardian, followed by sibling, head teacher (i.e. school principal), and classroom teacher (Figure 2). The importance of parents was reinforced through focus group discussions with parents and students who stated that one of the reasons students did not attend the school to which they were admitted was because parents did not like it and were not aware that the student had applied until after they were admitted. Based on the important characteristics and decision makers, we created a three-part information campaign–a booklet, a video, and a workshop. We termed the entire package GuIIDE–Guidance and Information for Improved Decisions in Education.

[Figure 1 about here]

[Figure 2 about here]

First, we created a booklet with information on the CSSPS process and details about each secondary school. The booklet was in English, the official language of instruction in JHS in Ghana. The booklet had two parts: information on application rules and strategies, and information about secondary schools in the Ashanti Region.

In the first part of the booklet, we provided students with the number of each Option that students were allowed to list, two simple strategies (do not list more competitive schools after less competitive schools and include a variety of schools in case the student's BECE score is higher or lower than expected), details about the catchment area option, and government approved senior high school fees for both day and boarding students. The section also contained a worksheet for students to calculate their likely raw percentage BECE score. This score is used for admissions, but we learned through piloting that students typically do not think about raw BECE scores.[10] Therefore, the first challenge for students when confronted with historical admission scores is to alter their thinking about their expected score from a 8 (worst) to 1 (best) scale to a 0 (worst) to 100 (best) scale. Figure 3 is the first content page of the booklet, outlining the application process and recommended strategies for selecting schools.

[Figure 3 about here]

The second part, and bulk of the booklet, was devoted to statistics about each secondary school in the Ashanti Region.[11] For each secondary school, we included the official school

[10]The BECE consists of six separate subject exams. Most students think and talk about their scaled BECE score with each subject graded on a scale from 8 to 1 with 1 being best. Therefore, a score on the BECE of 6, i.e. six scores of 1, is the highest score possible. Admissions to secondary schools is instead based on the raw score in which each subject score is measured from 0 to 100 with 100 being the best. This is equivalent to the percentage correct on each subject exam.

[11]In 2016, Ashanti had 8 Option 3 schools (most competitive), 27 Option 2 schools, and 67 Option 1 schools. We limited our intervention to JHS in Ashanti Region and only provided information on secondary schools in Ashanti Region for two reasons. First, Ashanti was the largest of Ghana's 10 regions by population and home to 20 percent of Ghana's population (subsequent to this study, the 10 regions were subdivided into 16 regions, Ashanti was not subdivided and remains the largest by population). Second, historically over 85 percent of students from Ashanti who attended secondary school did so in Ashanti.

code that students submit on the CSSPS form, the school name and nickname if relevant (e.g. Opoku Ware Senior High School is more commonly known as OWASS), the school's district and town or neighborhood, whether the school is single gender or mixed; whether the school is boarding, day, or mixed; and the programs offered. Ghana Education Service (GES), an agency of the Ministry of Education, produces a register of schools with all of this information (except the nickname). Each JHS gets one copy in the district office. Based on conversations with school leaders, many schools do not retrieve this information and others do not pass it along to their students.

We also provided information that was likely not available elsewhere. Based on administrative data from the CSSPS over the last three years, we included two measures designed to capture the competitiveness of admission to a particular school-program pair. First, we included the average BECE score of students admitted to the pair. Second, we included the BECE score of the 5th percentile admitted student–effectively the score threshold for admission. Finally, at the school level, we provided the number of students who took the WASSCE and the overall pass rate.[12] Figure 4 explains the layout of the school information. The booklet presented data by Option and by district. The full data, including programs and incoming BECE test scores, were organized alphabetically by school within each Option. School level data (code, name, district, gender, boarding, WASSCE performance, and Option) without the programme information was presented in the back, organized by district, enabling students to quickly compare schools in the same district or find a school's Option (and additional data) knowing only the school's district and name.

[Figure 4 about here]

The second component of the intervention was a video. We wrote and produced this video on the school choice process to make the booklet more salient and memorable to students. Our video starred a drama club from an Accra junior high school and featured them using,

[12]Government partners did not want any measures of value added included in the booklet. During the intervention school workshops, facilitators encouraged students and parents to consider WASSCE pass rates relative to average incoming BECE scores. The pass rate by program was not available.

understanding, and benefiting from the booklet. The plot focused on two students–Serwah and Krampah–and their school choice process, successes, and missteps.[13] The video also modeled how to have a conversation with parents about choices and priorities.[14]

We provided both an English and a Twi (the most common mother tongue in Ashanti) dubbed version of the video. Enumerators asked head teachers to decide which video should be screened in their school based on their assessment of their students' language skills.

The third component was a workshop. Enumerators distributed the booklet and screened the video during at-school workshops in January, near the start of the second term of the school year. During these workshops, the enumerator was also available to answer questions or do any spot translation into Twi. Because of the importance of parents in the decision making process, in some schools an additional workshop was held for parents only, at a time and day that the school expected parents to be available.

By providing students, and sometimes parents, additional information and resources on the school choice process, we hoped to assist students in making choices that would better match both their preferences, increasing match quality, and reducing ex post sorting.

4 Research Design

To test the impact of information on school choice, we conducted a 900 school randomized controlled trial (RCT). We randomly assigned 900 junior high schools in Ashanti to one of three groups: T1) control, T2) information to students and teachers, and T3) information to students, teachers, and parents. Students in T1 schools received no information. We provided students and teachers in T2 and T3 schools with information booklets and screened the video in a workshop during school hours. In addition, in T3 schools, we held parent workshops,

[13] Serwah was a diligent student who was not the top in her class but worked very hard and paid attention to the importance of the CSSPS. Krampah had higher test scores on mock BECE exams but did not take the CSSPS process seriously. After the BECE, Serwah was very happy being admitted to her second choice school while Krampah was not sure what he would do for secondary school since he did not have a high enough BECE to get into his first choice school and had not paid attention to his other choices.

[14] The CSSPS has a video available online that explains the history and purpose of the CSSPS process but does not provide guidance on how to navigate it.

providing information directly to parents.

We overlaid this primary randomization with a secondary experiment in which half of each group participated in a baseline survey in January of 2016, prior to any workshops, and half did not. This baseline survey (described in more detail in the Data section) may have prompted students to think more about the application process and encouraged them to seek out more information. By administering this survey in a random subset of schools (T1a, T2a, and T3a), we can measure how this increase in the salience of the applications, independent of the provision of additional information, changed students' knowledge and subsequent decisions.

5 Empirical Strategy

The primary conceptual difficulty in ascertaining the effect of information on student choices and subsequent outcomes is the typical non-random allocation of information. To overcome this difficulty, we randomly provided information to students and parents in some schools and not others. The resulting empirical estimation strategy is straightforward:

$$Y_{is} = \alpha + \beta_1 InfoStudents_s + \beta_2 InfoStudentsParents_s + \mathbf{W}_\mathbf{s}'\gamma + \varepsilon_{is} \quad (1)$$

where Y_{is} is the outcome for student i in school s, $InfoStudents_s$ is an indicator for whether school s was a school in which only students received information (Group T2), $InfoStudentsParents_s$ is an indicator for whether school s was a school in which both students and parents were targeted to receive information (Group T3), $\mathbf{W}_\mathbf{s}'$ is a vector of binary variables representing the stratification bin from which school s is drawn (see more details in the Data section), and ε_{is} is the idiosyncratic error, assumed to be independent across schools but allowed to be correlated within a school.

For our first outcomes we test for effects on student self-reported participation in the workshop and reports of using the information. Second, we test whether this changed self-

reported behavior. Third, we test whether students changed their application behaviors. Finally, we test whether the intervention affected secondary school matriculation. These outcomes are a mix of self-reported and administrative data. All self-reported data are from the half of study schools, equally divided among treatment statuses, in which we conducted a baseline survey to ensure that we were not conflating priming students to think about their choices with providing information. Because of our research design, we can test the effect of this priming versus information. For estimates with administrative data, we will use the entire sample, testing for the differential impact of being surveyed.

6 Sample Selection and Data

This study relies on both administrative and survey-collected data. This section first describes the sample selection then covers both the data collected in the field and the administrative data.

6.1 Sample Selection

We selected our sample from the universe of government JHS listed on the Ghana Education Monitoring and Information System (EMIS) school roster. To be eligible for the sample, a school had to be located in Ashanti, include all junior high school grades (JHS1 through JHS3), have at least one student qualify for secondary school admission in 2014, and be between the fifth and ninety-fifth percentile of JHS3 cohort size in Ashanti. Out of the 30 districts in Ashanti, we excluded one where we piloted the intervention and another with only 5 JHS. We randomly selected 22 districts out of the remaining 28 for the study.[15] These selected districts contained 1024 eligible JHS.

From this sampling frame, we randomly selected 900 schools to participate in the study. We stratified our random assignment of treatment arms by district, ensuring that we had at least one school assigned to each treatment arm in each district. Some schools had more

[15]We limited the study to 22 districts to reduce travel costs for the intervention.

than one section, or stream as they are known in Ghana, of JHS3. For these schools, we randomly selected a single stream to both survey and treat, returning to the same stream for follow-up visits.

6.2 Survey Data

We collected data directly from students in two rounds of surveys, from parents or guardians in another two rounds, and from an informed member of the students' household in the final round.

In January 2016, near the start of term 2 of the 2016-2017 school year, we conducted the baseline student and head teacher data collection in the 450 survey schools. The student survey asked questions about demographic characteristics of the students and their families, their previous educational experiences, knowledge of the application procedures and secondary schools, anticipated application choices, and educational and career ambitions. We also asked for contact information for their parents, older siblings with mobile phones, and other individuals who might know about their schooling outcomes in the future.[16]

During the same visits to collect student baseline information, enumerators also collected background information from head teachers regarding the demographic characteristics of the school, available resources, and previous application experiences of students.

For a subset of 1,000 students, we contacted their parents for a baseline survey, prior to their schools receiving the intervention. We asked parents similar questions to those we asked students in the baseline.

Between the baseline and JHS follow-up, enumeration teams administered the intervention to the students or students and parents based on the school's treatment status.

In March of 2016, near the end of term 2, after students submitted their choices to the CSSPS, we returned to the same schools to conduct the JHS follow-up. We attempted to talk to the same students asking similar questions as the baseline.

[16]Because of the high incidence of child fostering in Ghana, we asked for the contact information of parents or guardians and treated them equivalently. For simplicity, we refer to them as parents throughout this paper.

We used our collected contact information to survey via phone a random sample of 20 parents per school. The questions we asked were similar to those in the student JHS follow-up.

In April 2017 during what should have been the second term of secondary school, if students matriculated on time, we again contacted students' households based on our collected contact information. In this round, the SHS follow-up, we asked questions about the students current schooling (or not) and when the student matriculated or dropped out out of schooling. In contacting individuals for this round, we sought to speak with a member of the student's household who knew about the student's current schooling or working activities. This individual was most often the parent, older sibling, or the student themselves.

Figure 5 displays a timeline of fieldwork and student activities. We use these multiple collection rounds to measure changes in information, preferences, and beliefs and whether information changes choices and eventual outcomes.

[Figure 5 about here]

Table 1 contains selected summary statistics and demonstrates baseline balance across the three arms. Of particular note in the summary statistics are parents' education levels–only about 40 percent of fathers and 23 percent of mothers have education beyond JHS with about 12 percent of each not having any formal education. Therefore, most of our sample are first generation secondary school students and cannot rely on previous parental experience with secondary school admissions. These households could find the process especially daunting.

[Table 1 about here]

6.3 Administrative Data

The data in our booklet and our student-level administrative outcomes data come from the CSSPS secretariat. The booklet data were summarized at the school-program level based on the three prior years of scores. In addition to the data presented in the booklet, we also

calculated a school level value added measure. For each SHS, we use the school's residual from a regression of the BECE mean and BECE 5th percentile on the WASSCE pass rate.[17]

For student level outcomes, for all students in Ashanti who completed the CSSPS process we have their name, JHS name, four selected school-program pairs, their BECE scores, and the senior high school to which they were admitted. We use their BECE identification numbers to match students across the CSSPS and survey data. We match the remaining students using their name and JHS name.

7 Results

We first present results on whether students received the program as planned. Second, we present results on whether it changed their behavior, aspirations, and educational outcomes.

7.1 Program Implementation

Table 2 contains results of Equation 1 as a linear probability model with whether, during the first student follow-up, students reported having seen a booklet of school choices or a video about the school choice process. Being in either the treatment that targeted only the students or the treatment that targeted both the students and parents increased the likelihood that a student reported having seen a booklet with information about the school choices and the school choice process by about 14 percentage points (column 1). Over 82 percent of the control group also reported having seen a booklet. This could have been the GES booklet or our booklet borrowed from a friend. The video clearly left a very strong impression on students, increasing the likelihood that students reported having seen a video with information on the school choice system by over 76 percentage points (column 2). Fourteen percent of the control group also reported having seen a video. This could be

[17] On average, Option 3 schools have the highest value added, followed by Option 2, and Option 1. Private schools (Option 5) on average have value added between Options 1 and 2. All four distributions have substantial common support with the exception of some remarkably low value added estimates for some private schools.

a combination of being mistaken or having seen a previously produced CSSPS video that explained why the CSSPS was used but did not provide guidance on navigating the process. In both cases we fail to reject that the student only or student plus parents intervention had similarly sized effects.[18]

[Table 2 about here]

We next test whether students reported using the booklet to get academic information. Students were asked where they got information about the academic quality of secondary schools, selecting as many information outlets as relevant. Based on the results in Table 3, in both treatment arms students increased the likelihood that they used a booklet for academic information by about 17 percentage points (column 1). Even though almost all members of the control group (82 percent, Table 2) reported having seen a booklet, only 21 percent reported using a booklet for information, and our intervention almost doubled this likelihood. Students in treatment schools were less likely to report that they received information from the media (column 2), the internet (column 3), what people say (column 4), or another source (column 5). In all cases we fail to reject that the point estimates are the same across the two treatment arms and in almost all cases the point estimates on each treatment are different from 0.

Therefore, students report receiving and using our information in selecting their schools, shifting away from other sources of information.

[Table 3 about here]

7.2 Effort and Aspirations

We next test whether learning about secondary schools caused students to become more motivated in their schoolwork or to aspire to higher levels of education than they had before

[18]Based on data collected in the parent follow-up and analyzed in (Ajayi, Friedman, and Lucas 2017), parents in both treatment arms were about 11 percentage points more likely to report having seen a booklet. Parents in the parent treatment were further about 10 percentage points more likely than control parents to report having seen a video.

even though these were not targets of our intervention. We report these estimates as they could have been incidental to the intervention and any changes in motivation could affect the interpretation of subsequent results. Table 4 contains these outcomes. Students reported the number of days they were absent during the previous term. Our intervention did not affect this self-reported absenteeism (Column 1). Nor did our intervention affect the likelihood of students being present on the day of the follow-up visit (Column 2). While an interesting outcome itself, this also alleviates concerns about selective attrition biasing our other results. We also asked students their future schooling aspirations. Our intervention did not change the likelihood that a student aspired to at least SHS (Column 3) or at least university (Column 4). Consistent with these lack of changes, our intervention also did not affect actual BECE scores (results not presented).

[Table 4 about here]

In the final column we show that our intervention marginally increased (5 percentage points, significant at 10%) the likelihood that students thought the CSSPS process was fair, an increase of about 10 percent over the control group mean of 53 percent.

7.3 Information and Process

The intervention could have altered students' self-perceptions, their and their parents participation in the process, and what they most valued in a school. In this subsection, we test each. As part of the booklet, students in treatment schools received a worksheet to help them calculate their anticipated raw BECE score. To understand whether gaining admission to a particular SHS was likely, or unlikely, students had to know their raw BECE score on a 600 point scale with 600 being best. Students in the student only treatment schools statistically significantly reduced their estimated likely BECE score by 1.4 points (Table 5, Column 1). The estimate on intervention that included parents is negative and insignificant, but we cannot reject that the two arms had the same effect.

[Table 5 about here]

Our booklet encouraged students and parents to jointly consider options and our video modeled such a conversation. Our intervention increased the likelihood that parents were involved in the process. We asked students who would help them with their school choice selections and the intervention increased the likelihood that parents were involved by 4.9 (student only intervention) to 5.7 (student plus parent intervention) percentage points (Column 2). The other choices to this question were siblings, other family members, friends, head teachers, teachers, others, or no one. We do not find increases among any of these other groups and limited evidence (2.6 percentage points, student information only) in a decreased reliance on friends (results not shown).

The importance of parents in the process are echoed by parents themselves, but only when they were engaged with information directly (Ajayi, Friedman, and Lucas 2017, Table 2). In contrast to the students' responses that parents in both arms were more likely to be involved in the process, parents were only statistically more likely to report being involved when they were directly targeted for information–8 percentage points more likely to report providing help in the selection process and 6 percentage points more likely to be able to report students' selections.

Table 6 shows that the treatment shifted the attributes that students found important towards the information in the booklet. Students in treatment schools were more likely to say the most important factor to consider was their likelihood of admission (Column 1) and distance from home (Column 2).[19] These changes represent increases of 34 to 107 percent relative to the control group. Further, for likelihood of admission, we reject that the two treatment arms had similar effects. In contrast, students in student only treatment schools were statistically less likely to consider how the school might affect future success (Column 3) and students in the treatment arm that included parents were less likely to

[19]We did not provide distance from each JHS to each secondary school, instead we included information about the district and neighborhood of each secondary school, more information on location than was otherwise readily available.

consider the overall reputation of the school (Column 4) or the discipline features of the school (Column 5), two factors that were not addressed in the booklet. In contrast, students did not change their valuation of academic quality, single gender, cost, religious affiliation, or family connections. We provided information on the first three points, but not the last two. Overall, students in the treatment arms increased the likelihood that they selected schools based on an attribute we included in the booklet. Academic quality (Column 6) remained the most important (53 percent) across all groups.

[Table 6 about here]

7.4 Choices

The changes in student preferences were reflected in their choice behavior. Instead of relying on survey data, as in the analysis above, for these outcomes we have administrative data from the CSSPS.

Table 7 contains estimates of the effect of treatment on various characteristics of students' official choices. Consistent with distance being a primary consideration, students were more likely to apply only to schools in Ashanti (Column 1) or at least one school in Ashanti (Column 2). On average students listed as a first choices schools with the same WASSCE pass rate as their control group peers (66 percent pass rate, Column 3). Recall in the analysis above that students in treatment schools also stated that they were more likely to consider their admission chances. In Columns 5 through 7, consistent with this desire, students applied to schools with slightly lower historical BECE mean scores for their choices 2 and 3 in the intervention that included parents and for choice 4 across both interventions. We do not find any change in the students' actual BECE scores relative to the mean BECE scores of their choices as reported in the booklet (Column 8).

[Table 7 about here]

In Table 8 we consider the academic outcomes of official choices. While the intervention was designed to shift students away from schools with bad WASSCE outcomes, consistent

with students not changing (or perhaps decreasing) their value of the school's contribution to their future success, they were no more likely to choose schools with higher WASSCE pass rates (Column 1).[20] Because of an agreement with our data providers, the booklet did not present measures of value added. In workshops we encouraged participants to think about WASSCE pass rates relative to incoming BECE scores. We calculated value added using the WASSCE and BECE data from the booklet (see Data Section for more details). In Column 2 we estimate whether students applied to higher value added schools and find no difference by treatment status for the first choice, or all choices combined.[21]

[Table 8 about here]

The booklet also contained basic strategic advice: do not list a more competitive school after a less competitive school. Based on Columns 1 and 2 of Table 9, students did not change their behavior to correspond to this advice. We test whether students who received the intervention were more likely to list their choices in descending order of the BECE mean (column 1) or 5th percentile of BECE score (column 2) and find no effect with estimates between -0.0 and 0.9 percentage points. In the control sample, only approximately 10 percent of students listed schools in descending order of competitiveness based on BECE mean score.

[Table 9 about here]

We also test whether the intervention increased the likelihood that students exhibited consistent preferences across all four choices–all boarding (or not), all single sex (or not), or all the same program. Most students in the control schools applied to schools with the same residential option–boarding or day–and the same programs across different schools (67 percent and 60 percent, respectively). The information did not significantly change these likelihoods (Columns 3 and 4). The results for single gender (or not) are similar (not presented).

[20] This is similarly statistically insignificant for each choice separately (results not presented).
[21] These results are similar when estimated separately for each choice (results not presented).

Our intervention could have made some schools more attractive by drawing students' attention to a previously unknown school, updating students' priors about a known school, or even school placement on a page. Our intervention did cause students to select more popular schools. The average student in a treatment school selected as a first choice a school that was selected by on average 142 (information to students only) to 212 (information to parents and students) more students. In the control group, 2,460 students on average applied to each school listed as a first choice school. These increases are about 6 to 9 percent more students than applied to the control groups' first choice school. Students in treatment schools are also 2 percentage points more likely to apply to a first choice school in which 500 other students also applied.

7.5 Admissions and Matriculation

The intervention changed who participated in students' application processes, what they valued in schools, and their application behaviors. In this sub-section we test whether it changed their CSSPS admissions or eventual matriculation decisions. Recall that the intervention did not affect students' BECE scores, therefore the results that follow are due to changes in choices not changes in test scores.

Table 10 shows that the treatment did not change the likelihood that a student was admitted to secondary school (Column 1) or admitted to a school that from their choice list (Column 2).[22] The point values are small, 1 to 2 percentage points, and statistically insignificant. In the final three columns of Table 10 we test whether students were more likely to be admitted to one of their first three choices (Column 3), first two choices (Column 4), or first choice (Column 5). In all cases we find small (at most 2 percentage points) and statistically insignificant results. Students were more likely to be admitted to a school in Ashanti, about 2 percentage points across the two treatments (Column 6).

[Table 10 about here]

[22] Column 1 includes students with sufficiently high BECE scores who were placed arbitrarily by the CSSPS into a school with empty seats because all of their selected schools were full.

We next test whether the intervention changed the characteristics of the school-program pair to which the students were admitted (Table 11). Note this sample is limited to students who were admitted to a secondary school.[23] The students in the treatment arms were admitted to school-program pairs that had lower historical BECE scores as reported in the booklet, whether measured by mean BECE (Column 1) or the 5th percentile (Column 2). While statistically significant, in all cases the point values are small, indicating a 0.07 (information to students only) to 0.09 (information to students and parents) standard deviation change in the historical admission scores. These were not schools with worse WASSCE pass rates. They were admitted to schools with equivalent WASSCE pass rates (Column 3). Therefore, this intervention caused students to be admitted to schools of equal exit exam performance but with lower historical admissions standards. Taken together, we find that students are admitted to higher value added schools (Column 4). As a final test of school quality, we created an indicator variable with a value of 1 if a student was admitted to a school was a WASSCE pass rate below 25 percent. In the control group, about 7 percent of students are admitted to schools with such a low pass rate, and the intervention did not change this probability.

[Table 11 about here]

Despite indications above that the intervention might have improved match quality due to students making more informed choices and being admitted to marginally higher value added schools, their matriculation decisions were unchanged (Table 12). For these outcomes we rely on outcomes as reported by informed household members during what should have been the student's second term of secondary school. Students in the treatment arms are no more likely to be attending school (Table 12, Column 1).[24] Further, conditional on attending school,

[23]Columns 1, 2, and 4 are further limited to students who were matched to their preferences. We do not have data on program for students who were admitted to a school-program pair not on their choice list.

[24]Some of the 40 percent of students who were not attending school in this second term might still enroll and complete school in a subsequent year. Duflo et al. (2017) found that 47 percent of qualified students who had not yet enrolled in secondary school as of January of what should have been their first year completed secondary school within seven years.

they were no more likely to have started within the first six weeks of school, approximately on time in the Ghanaian context (Column 2). They are no more likely to be attending the secondary school to which they were admitted by the CSSPS (Column 3) or attending school in Ashanti (Column 4). Therefore, by revealed preference the matches do not appear to have improved.

[Table 12 about here]

8 Discussion

The motivation for this research was to reduce inefficiencies and wasted resources at both the household and education sector level that resulted from students ex post sorting. While choice and admissions outcomes changed, the potentially more important matriculation outcomes did not. Below we set out a number of potential hypothesis as to why improved information did not affect those outcomes based on data previously discussed and in depth interviews with households approximately one year after the conclusion of the intervention

First, we can rule out that people did not receive or understand the material or the process. We provided evidence above that intermediate outcomes (i.e. choice and priorities) changed. In in-depth interviews respondents mentioned that often "parents are too naive" and blame others when "it was their own mistake." One mentioned that she studied the booklet "so when it was time for selecting, I knew what I was doing." Students also noted how important it was to "know your standard and academic performance and compare it with the schools' acceptable grades."

A second concern is that we saturated the geographic area with booklets–all students were effectively treated because they had a friend or relative in a treatment school who let them borrow a booklet. Our 22 study districts contained 1,138 JHS, and 600 of them, 43 percent, received booklets. As with the prior concern, this seems unlikely since we were able to discern differences by treatment status for the intermediate outcomes.

Third, our intervention may not have moved intermediate outcomes enough to change matriculation decisions. Some students may not have been swayed by our intervention because it was too late. We tried to have the workshops close enough to the decision to be salient, but not too early, and may have missed the mark. According to our in-depth interviews, "I saw the book but my mind was already made up," "I chose the school I already had in mind," "the school that were in my mind, I was determined to attend one of them."

Fourth, while information was a constraint for some households, financial considerations might have been paramount for matriculation decisions. For students not in school during what should have been the first year of SHS, 76 percent said that fees were the most important barrier. In the qualitative work, students mentioned concerns about schools being "too expensive for you to afford" as a reason for eventual non-matriculation. In the booklet we provided the officially approved fees for government schools, but schools often charged additional fees, which were allowed as long as they were "reasonable."

Finally, in a low-resource setting with frequent unanticipated shocks, knowing school preferences in advance may be impossible. Households may have completed the CSSPS forms intending to adhere to the admissions, but an unanticipated shock could have prevented that realization.

9 Conclusions

As the increase in primary school enrollment and completion of the last 30 years moves into the secondary school sector, and an increasing number of African countries move to make secondary school free, efficiently using available resources is crucial. To improve the efficiency in the transition between junior high and secondary school in Ghana, we provided students and parents with information about the available secondary schools and the centralized system that allocates students to schools. To test the effects of this information, we conducted a 900-school RCT, enabling us to compare outcomes across three groups: students alone received information, students and parents received information, and a control

group that received no additional information. Based on both survey and administrative data, we find that students and parents wanted and received our information. Further, the characteristics of the schools to which students applied marginally changed, and they were admitted to higher value-added schools. Nevertheless, the improved information did not improve education outcomes – students were no more likely to start school on time or enroll at all. Based on interviews with students after the intervention, many said that they remembered the intervention, especially the video, but that they had either already made up their minds or that they were constrained in their matriculation decisions by distance to schools or lack of resources. The former suggests an intervention earlier in the school year, while the latter points towards a larger issue in the school choice system. Therefore, while allowing universal school choice can benefit students of all socioeconomic backgrounds, those with fewer resources may continue to make constrained choices.

References

Abdulkadiroğlu, A., P. Pathak, A. Roth, and T. Sönmez (2006). Changing the boston school choice mechanism. Working Paper 11965, National Bureau of Economic Research.

Ajayi, K. F. (2013). School choice and educational mobility: Lessons from secondary school applications in ghana. Institute for Economic Development Discussion Paper 259.

Ajayi, K. F., W. H. Friedman, and A. M. Lucas (2017). The importance of information targeting for school choice. *American Economic Review 107*(5), 638–43.

Allende, C., F. Gallego, and C. Neilson (2019, July). Approximating the equilibrium effects of informed school choice. Working Paper 628, Industrial Relations Section.

Andrabi, T., J. Das, and A. I. Khwaja (2017, June). Report cards: The impact of providing school and child test scores on educational markets. *American Economic Review 107*(6), 1535–63.

Banerjee, A. V., R. Banerji, E. Duflo, R. Glennerster, and S. Khemani (2010). Pitfalls of participatory programs: Evidence from a randomized evaluation in education in india. *American Economic Journal: Economic Policy 2*(1), 1–30.

Corcoran, S. P., J. L. Jennings, S. R. Cohodes, and C. Sattin-Bajaj (2018, March). Leveling the playing field for high school choice: Results from a field experiment of informational interventions. Working Paper 24471, National Bureau of Economic Research.

Dinkelman, T. and C. A. Martinez (2014, MAY). Investing in Schooling in Chile: The Role of Information about Financial Aid for Higher Education. *Review of Economics and Statistics 96*(2), 244–257.

Duflo, E., P. Dupas, and M. Kremer (2017). The impact of free secondary education: Experimental evidence from ghana. *Massachusetts Institute of Technology Working Paper Cambridge, MA*.

Dustan, A. (2018). Family networks and school choice. *Journal of Development Economics 134*, 372–391.

Hastings, J. and J. Weinstein (2008, November). Information, school choice, and academic achievement: Evidence from two experiments. *Quarterly Journal of Economics 123*(4), 1373–1414.

Hastings, J. S., C. A. Neilson, and S. D. Zimmerman (2012, August). The effect of school choice on intrinsic motivation and academic outcomes. Working Paper 18324, National Bureau of Economic Research.

Hoxby, C. M. and S. Turner (2013). Expanding college opportunities for low-income, high-achieving students. Working Paper 12-014, Stanford Institute for Economic Policy Research.

Jensen, R. (2010, May). The (perceived) returns to education and the demand for schooling. *Quarterly Journal of Economics 125*(2), 515–548.

Kirkeboen, L. J., E. Leuven, and M. Mogstad (2016). Field of study, earnings, and self-selection. *Quarterly Journal of Economics 131*(3), 1057–1111.

Lai, F., E. Sadoulet, and A. de Janvry (2009, August). The adverse effects of parents' school selection errors on academic achievement: Evidence from the beijing open enrollment program. *Economics of Education Review 28*(4), 485–496.

Lucas, A. M. and I. M. Mbiti (2012, May). The determinants and consequences of school choice errors in kenya. *American Economic Review 102*(3), 283–88.

Mizala, A. and M. Urquiola (2013, JUL). School Markets: The Impact of Information Approximating Schools' Effectiveness. *Journal of Development Economics 103*, 313–335.

Ortega Hesles, M. E. (2015). *School Choice and Educational Opportunities: The Upper-Secondary Student-Assignment Process in Mexico City*. Ph. D. thesis.

Pathak, P. and T. Sönmez (2008, September). Leveling the playing field: Sincere and sophisticated players in the boston mechanism. *American Economic Review 98*(4), 1636–52.

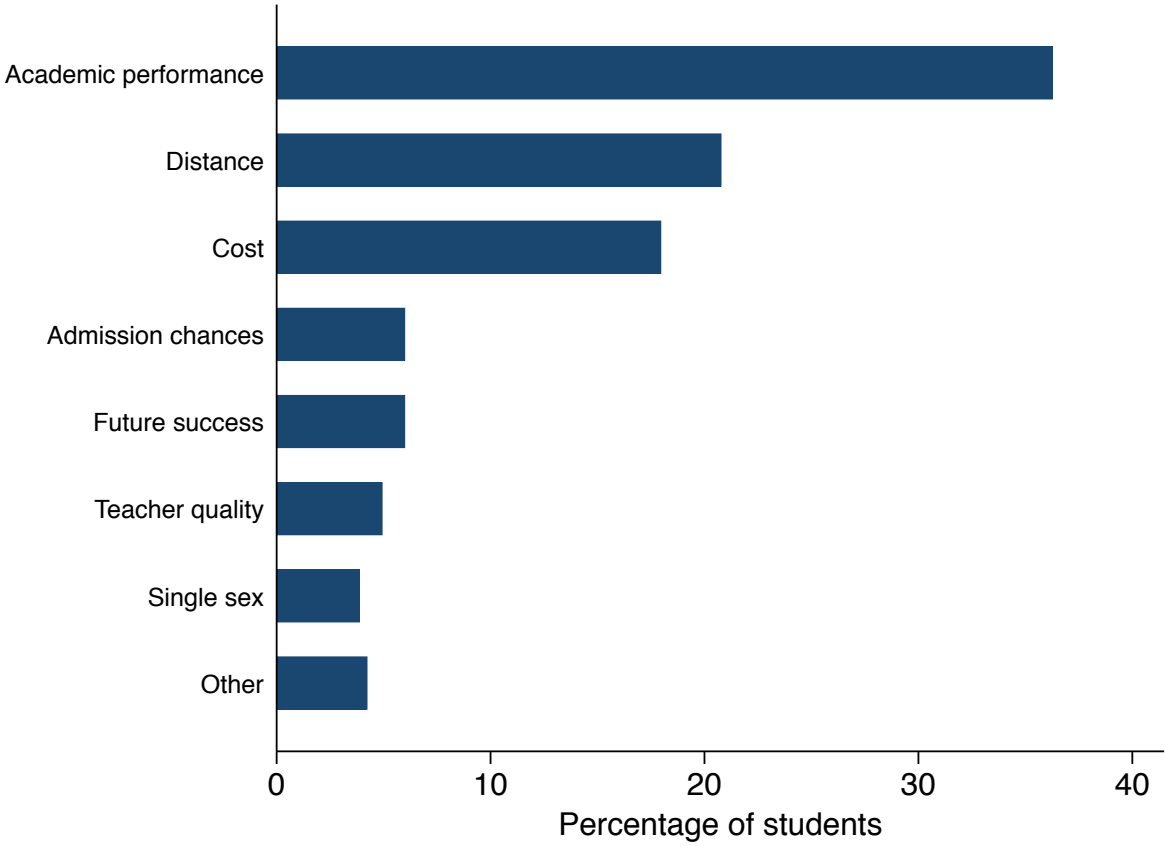


Figure 1: Most important characteristic for school selection

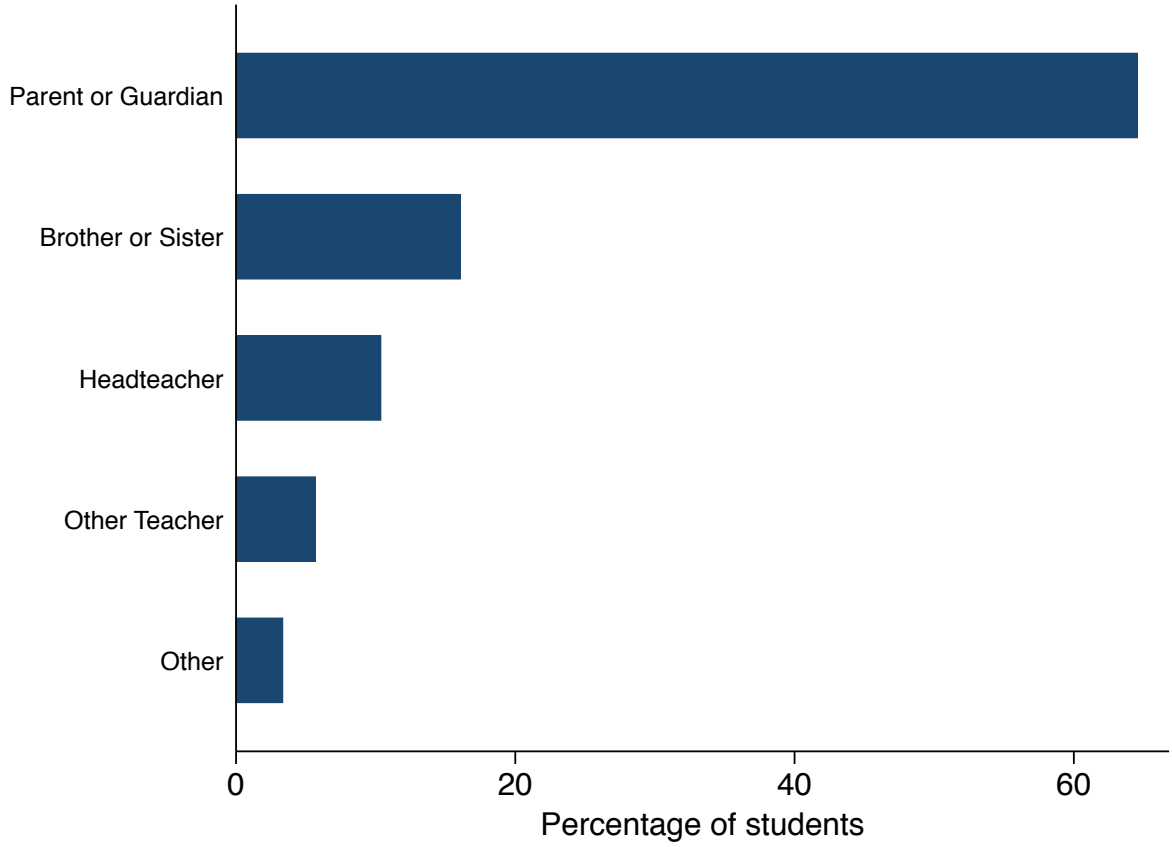


Figure 2: Most helpful decision maker

Senior High School Information Booklet

Senior high school choices are important but many students choose schools they do not know much about and are then dissatisfied with their admissions outcomes. Making careful choices is one of the best ways to have a good senior high school experience.

How it works:

You will be selecting four choices from second cycle schools of different options. Each option contains a different set of schools.

OPTIONS:

Options 1, 2 & 3: Public Senior High Schools
Option 4: Public Technical/Vocational Institutions
Option 5: Private Senior High Schools + Private Technical/Vocational Institutions

You must:

1. **Choose four different schools.**
2. **Select a programme and an accommodation for each choice.**
3. **Remember that your choices:**
   - Can include **up to four Option 1** schools
   - Can include **up to four Option 4 or 5** schools
   - Can include **up to two Option 2** schools
   - Can include **up to one Option 3** school

How to make good senior high school choices:

1. What is important to you and your family?

- **Staying close to home?** Only select schools in your region or district. If you want to stay within 16km of your JHS, use the CATCHMENT AREA OPTION.
- **Single sex or mixed?** Some schools are mixed and some are girls or boys only.
- **Boarding or day?** Some schools offer both options but some offer only one.
- **Programme type?** Be sure to choose schools that offer your programme of interest.

2. What was your raw BECE score (out of 600) on your mock exams?

- **Use the worksheet** in this booklet to calculate it.
- Be sure to choose **at least one school** where you have a good chance of being admitted.

3. Pick schools you would actually like to attend!

- You can only list four choices, and most students **do not** get placed in their first choice, so **every choice is important.**

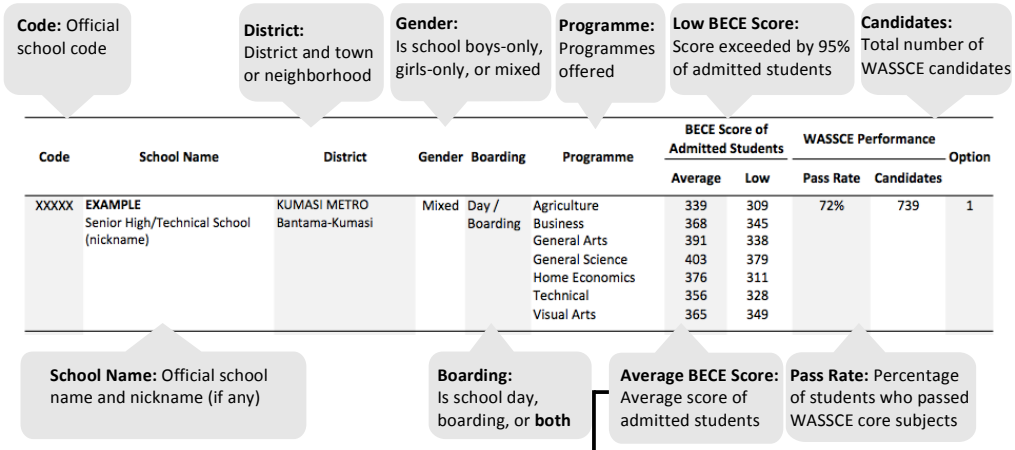
4. List your choices in order of preference.

GUIDE
Guidance and Information for Improved Decisions in Education

Figure 3: Booklet Introduction

How to use this booklet:

This booklet contains information on all senior high schools and technical/vocational institutes in **Ashanti region**, to inform you about your local options. You are free to select other schools outside this region if you would like.



A NOTE ON BECE SCORES

These scores from students admitted in the last three years give you a rough guide of how likely you are to be admitted. **If your BECE score is far below the low score**, you have a small chance. **If your score is close to or above the average**, you have a high chance. These **scores change every year**, so even getting a BECE score above last year's scores cannot guarantee your admission, but gives a guide of what to expect.

WASSCE Performance is also based on candidates from the last three years (2013 to 2015).

Figure 4: Sample Booklet Page

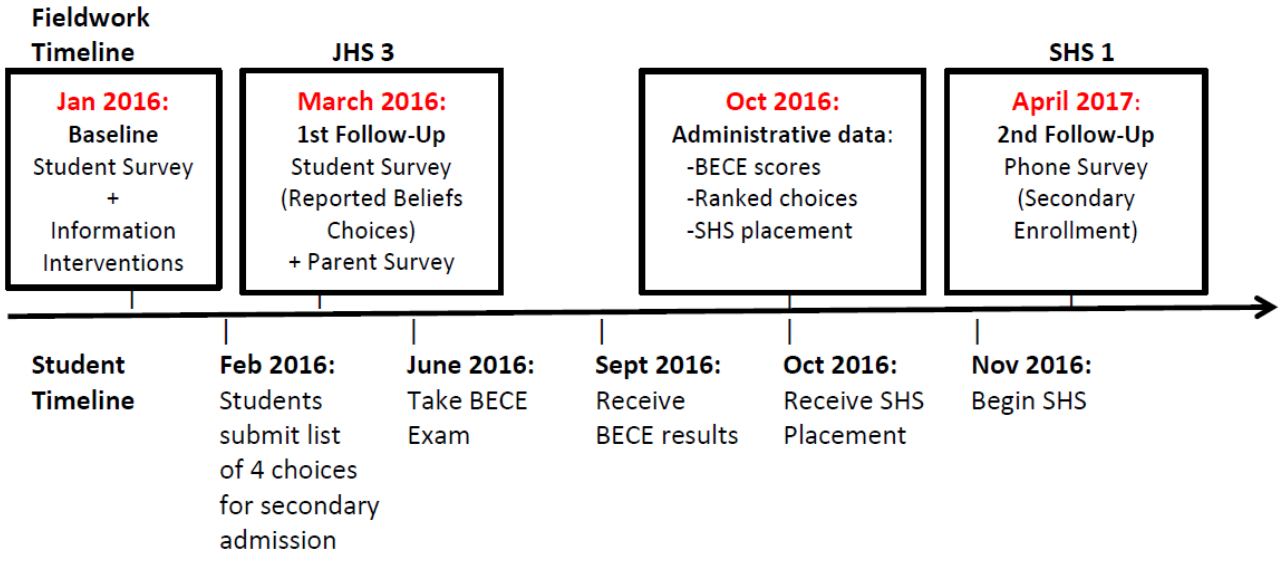


Figure 5: Study timeline

Table 1: Baseline Balance

	Student Info (1)	Parent Info (2)	Control (3)	p-value diff (1) vs (3) (4)	p-value diff (2) vs (3) (5)
Age	15.93	15.81	15.81	0.13	0.13
	(1.44)	(1.41)	(1.43)		
Days Absent	1.65	1.76	1.69	0.51	0.80
	(3.22)	(3.29)	(3.41)		
Taken Mock BECE	0.50	0.49	0.51	0.95	0.78
	(0.50)	(0.50)	(0.50)		
Expected BECE	11.60	11.55	11.57	0.87	0.91
	(4.77)	(4.82)	(4.81)		
Believes CSSPS Fair	0.61	0.60	0.58	0.74	0.38
	(0.49)	(0.49)	(0.49)		
Low Income	0.27	0.26	0.26	0.77	0.76
	(0.44)	(0.44)	(0.44)		
Father Educated Beyond JHS	0.39	0.43	0.41	0.06	0.49
	(0.49)	(0.50)	(0.49)		
Mother Educated Beyond JHS	0.23	0.24	0.23	0.41	0.86
	(0.42)	(0.43)	(0.42)		
Father completed no school	0.12	0.10	0.12	0.28	0.93
	(0.32)	(0.30)	(0.32)		
Mother completed no school	0.17	0.15	0.16	0.28	0.59
	(0.38)	(0.36)	(0.37)		
Observations	3622	3545	3631		

Notes: p-values of differences based on clustering at the level of JSS.

Table 2: Intervention Take-up

	Seen Booklet (1)	Seen Video (2)
Student Info	0.139***	0.781***
	(0.017)	(0.018)
Parent Info	0.151***	0.763***
	(0.017)	(0.020)
Student = Parent p-value	0.138	0.362
Observations	11716	11686
R^2	0.102	0.592
Control Group Mean	0.821	0.140

Note: All outcomes in this table are from the first follow-up survey. These outcomes are based on student self-reports of whether they had seen a booklet/video about the SHS application process. Each column represents one regression, which controls for gender and includes JHS district FEs. All estimates are clustered at the JSS level.

Table 3: Information Source

	Self-reported source of information				
	Booklet	Radio/TV/Newspaper	Internet	Other people	Other
	(1)	(2)	(3)	(4)	(5)
Student Info	0.168***	-0.060***	-0.033**	-0.051***	-0.008*
	(0.021)	(0.018)	(0.017)	(0.013)	(0.005)
Parent Info	0.176***	-0.044***	-0.014	-0.034***	-0.012***
	(0.020)	(0.016)	(0.017)	(0.013)	(0.004)
Student = Parent p-value	0.729	0.364	0.280	0.164	0.327
Observations	11701	11701	11701	11700	11701
R^2	0.057	0.020	0.037	0.027	0.011
Control Group Mean	0.212	0.681	0.344	0.198	0.032

Note: All outcomes in this table are from the first follow-up survey. These outcomes are in response to a question of students regarding where they obtained information about the SHS academic quality of secondary schools. Each column represents one regression, which controls for gender and includes JHS district FEs. All estimates are clustered at the JSS level.

Table 4: Effort and Aspirations

	Reported absences last term	Present at 1st follow-up	Aspire SHS or higher	Aspire university	Think CSSPS Fair
	(1)	(2)	(3)	(4)	(5)
Student Info	-0.053	0.005	-0.000	-0.015	0.050*
	(0.133)	(0.013)	(0.008)	(0.018)	(0.030)
Parent Info	0.057	0.015	0.010	-0.003	0.033
	(0.140)	(0.010)	(0.008)	(0.017)	(0.029)
Student = Parent p-value	0.408	0.181	0.192	0.471	0.557
Observations	11652	10339	9564	9564	11693
R^2	0.019	0.027	0.027	0.070	0.068
Control Group Mean	1.952	0.983	0.928	0.535	0.532

Notes: All outcomes in this table are from the first follow-up survey. *Reported absences last term* is the number of days a student reported he or she was absent last term. *Present at 1st follow-up* is an indicator for whether he or she was in school to respond to the 1st follow-up survey. *Aspire SHS or higher* and *Aspire university* are based on a question about the level of schooling they hope to complete: JHS, Technical/Vocational, SHS, Nursing/Teaching School, Polytechnic, or University. *Think CSSPS Fair* is an indicator for whether the student reported that they thought the process of assigning schools was fair. Each column represents one regression, which controls for gender and includes JHS district FEs. All estimates are clustered at the JSS level.

Table 5: The School Choice Process

	Guess BECE score (all subjects)	Reported parent would help choose
	(1)	(2)
Student Info	-1.437***	0.049***
	(0.555)	(0.014)
Parent Info	-0.613	0.057***
	(0.587)	(0.014)
Student = Parent p-value	0.166	0.534
Observations	11734	11471
R^2	0.029	0.019
Control Group Mean	73.316	0.752

Notes: All outcomes in this table are from the first follow-up survey. *Guess BECE score (all subjects)* is a the student's average anticipated BECE score. *Reported parent would help choose* is an indicator for whether the student listed a parent in response to: "Who helped or will help you to select your choices?" Respondents could select as many as they wanted. [XXX - include notes about distribution of BECE to put these in context] Each column represents one regression, which controls for gender and includes JHS district FEs. All estimates are clustered at the JSS level.

Table 6: Stated Preferences

	Most important factor in selecting schools				
	Admissions Chance	Academic Quality	Single-sex	Distance	Cost
	(1)	(2)	(3)	(4)	(5)
Student Info	0.031***	0.004	0.003	0.035***	-0.005
	(0.008)	(0.020)	(0.003)	(0.007)	(0.009)
Parent Info	0.010*	0.009	0.001	0.039***	-0.010
	(0.005)	(0.019)	(0.003)	(0.007)	(0.008)
Student = Parent p-value	0.020	0.805	0.465	0.679	0.524
Observations	11704	11704	11704	11704	11704
R^2	0.014	0.037	0.006	0.017	0.011
Control Group Mean	0.029	0.539	0.012	0.047	0.079
	Teacher quality or School Reputation or Facilities	Religious Affiliation	Family Member Attended	How Affect Future Success	Discipline
	(1)	(2)	(3)	(4)	(5)
Student Info	-0.015	-0.004	0.002	-0.036***	-0.007
	(0.009)	(0.004)	(0.003)	(0.010)	(0.005)
Parent Info	-0.019**	-0.004	-0.001	-0.010	-0.008*
	(0.009)	(0.004)	(0.003)	(0.011)	(0.005)
Student = Parent p-value	0.614	0.990	0.389	0.008	0.834
Observations	11704	11704	11704	11704	11704
R^2	0.020	0.005	0.005	0.015	0.009
Control Group Mean	0.092	0.017	0.016	0.114	0.036

Notes: All outcomes in this table are from the first follow-up survey. These are responses to: "What is the most important factor you think about when selecting schools." The options were: Distance from home; Cost; Chances of being admitted; Academic performance of the school; (any of) Teacher quality, Reputation of the school, Facilities and resources; Boys or girls only; Religious affiliation; Family member attended; How it might affect my future success; Discipline or behavior of past students. Each column represents one regression, which controls for gender and includes JHS district FEs. All estimates are clustered at the JSS level.

Table 7: Characteristics of Application Choices

	Applied only Ashanti	Applied any Ashanti	1st Choice SSCE Pass Rate	1st Choice BECE mean	2nd Choice BECE mean	3rd Choice BECE mean	4th Choice BECE mean	Own BECE score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Student Info	0.038***	0.012**	-0.732	-0.016	-0.032	-0.042	-0.052*	-0.017
	(0.013)	(0.006)	(0.915)	(0.030)	(0.026)	(0.027)	(0.030)	(0.079)
Parent Info	0.042***	0.016**	0.014	-0.028	-0.053**	-0.057**	-0.048*	-0.043
	(0.013)	(0.006)	(0.873)	(0.027)	(0.024)	(0.025)	(0.028)	(0.073)
Student = Parent p-value	0.783	0.493	0.416	0.688	0.403	0.571	0.884	0.718
Observations	43078	43078	41571	38010	38290	38558	38863	41999
R^2	0.083	0.016	0.107	0.178	0.177	0.172	0.184	0.120
Control Group Mean	0.733	0.928	66.131	0.717	0.555	0.470	0.371	0.000

Notes: *Applied only Ashanti* is an indicator for whether all of the schools to which the student applied are in Ashanti, while *Applied any Ashanti* is an indicator for whether any were in Ashanti. *1st Choice SSCE Pass Rate* is the 2013 SSCE Pass rate of their first choice. Columns 4-7 represent the mean incoming BECE score in the booklet of their 1st-4th choice schools in 2013. *Own BECE score* is the student's BECE score. Each column represents one regression, which controls for gender and includes JHS district FEs. [XXX - include notes about distribution of BECE to put these in context] All estimates are clustered at the JSS level.

Table 8: Academic Performance of Application Choices

	Mean SSCE Pass Rate All SHS Applied	1st Choice Value Added	Value Added All SHS Applied
	(1)	(2)	(3)
Student Info	-0.502	-0.240	-0.051
	(0.784)	(0.449)	(0.334)
Parent Info	-0.510	0.095	-0.005
	(0.730)	(0.423)	(0.313)
Student = Parent p-value	0.992	0.446	0.890
Observations	42953	36900	40992
R^2	0.188	0.001	0.004
Control Group Mean	58.984	0.048	0.041

Notes: *Mean SSCE Pass Rate All SHS Applied* is the average SSCE pass rate among all schools to which they applied. *1st Choice Value Added* is the value-added score (residual of regression of SSCE pass rate on BECE mean and 5th percentile and district) of their first choice school. *Value Added All SHS Applied* is the average value-added score across all schools to which they applied. Each column represents one regression, which controls for gender and includes JHS district FEs. All estimates are clustered at the JSS level.

Table 9: Application Strategies

	Ranked choices in order by BECE mean score	Ranked choices in order by BECE 5th percentile	All same type	All same program	1st Choice popularity	1st Choice popular (0/1)
	(1)	(2)	(3)	(4)	(5)	(6)
Student Info	0.009	0.001	0.019	0.012	142.165**	0.024***
	(0.006)	(0.005)	(0.015)	(0.018)	(65.645)	(0.008)
Parent Info	-0.000	0.006	-0.010	0.008	211.653***	0.021**
	(0.006)	(0.005)	(0.016)	(0.018)	(62.580)	(0.009)
Student = Parent p-value	0.119	0.326	0.057	0.782	0.274	0.707
Observations	39957	40005	43078	43078	43078	43078
R^2	0.009	0.009	0.048	0.027	0.043	0.031
Control Group Mean	0.102	0.082	0.661	0.580	2447.066	0.858

Notes: *Ranked choices in order by BECE mean score* is whether the student ranked all four choices in order based on mean BECE scores in the booklet. *Ranked choices in order by BECE 5th percentile* is whether the student ranked all four choices in order based on the 5th percentile BECE scores in the booklet. *All same type* is an indicator for all schools to which they applied being of the same Day/Boarding type. *All same program* is an indicator for applying to all the same program within each school. *1st Choice popularity* is how many people in our sample applied to the student's 1st choice (for any of their choices). *1st Choice popular (0/1)* is an indicator for applying to a school to which at least 500 people applied (for any of their choices). Each column represents one regression, which controls for gender and includes JHS district FEs. All estimates are clustered at the JSS level.

Table 10: Admissions

	Placed Any School (1)	Placed Any Choice (2)	Placed 3rd Or Higher (3)	Placed 2nd Or Higher (4)	Placed 1st Choice (5)	Placed Ashanti (6)
Student Info	0.009	0.006	0.000	-0.000	-0.000	0.016**
	(0.018)	(0.020)	(0.019)	(0.017)	(0.014)	(0.008)
Parent Info	0.009	0.023	0.023	0.010	-0.000	0.025***
	(0.017)	(0.020)	(0.019)	(0.018)	(0.014)	(0.008)
Student = Parent p-value	0.977	0.425	0.238	0.567	0.988	0.244
Observations	43078	43078	43078	43078	43078	39006
R^2	0.347	0.189	0.184	0.163	0.121	0.041
Control Group Mean	0.836	0.520	0.433	0.331	0.196	0.891

Notes: Each outcome variable is an indicator for whether the student was placed at all, placed in any of their four ranked choices, placed in their 3rd or higher, 2nd or higher, or 1st choices, and placed in Ashanti. Each column represents one regression, which controls for gender and includes JHS district FEs. All estimates are clustered at the JSS level.

Table 11: Admissions Continued

	Assigned SHS BECE mean (1)	Assigned SHS BECE 5th percentile (2)	Assigned SHS SSCEpass rate (3)	Value added (4)	SSCE pass rate below 25% (5)
Student Info	-0.066*	-0.065*	-0.474	0.942*	0.003
	(0.037)	(0.038)	(0.890)	(0.567)	(0.007)
Parent Info	-0.090**	-0.086**	0.112	1.592***	-0.008
	(0.036)	(0.037)	(0.899)	(0.540)	(0.006)
Student = Parent p-value	0.499	0.578	0.471	0.222	0.097
Observations	19763	19763	30305	19309	43078
R^2	0.133	0.111	0.053	0.002	0.024
Control Group Mean	0.157	-0.695	49.314	-0.864	0.072

Notes: *Assigned SHS BECE mean* is the booklet BECE mean for their assigned school. *Assigned SHS BECE 5th percentile* is the booklet BECE 5th percentile for their assigned school. *Assigned SHS SSCE pass rate* is the SSCE pass rate reported in the booklet for their assigned school. Value added is the residual from a regression of the booklet SSCE pass rate on the booklet mean BECE, 5th percentile BECE, and district of the student's assigned program. *SSCE pass rate below 25%* is an indicator for being assigned to a school with an SSCE pass rate below 25%. Each column represents one regression, which controls for gender and includes JHS district FEs. All estimates are clustered at the JSS level.

Table 12: Matriculation

	Currently attending SHS (1)	Started on time if attending (2)	Attending assigned SHS (3)	Attending SHS in Ashanti (4)
Student Info	-0.010	-0.006	0.010	-0.010
	(0.023)	(0.025)	(0.019)	(0.024)
Parent Info	-0.025	-0.027	0.007	-0.017
	(0.022)	(0.026)	(0.019)	(0.023)
Student = Parent p-value	0.507	0.438	0.899	0.771
Observations	7829	4100	7658	7829
R^2	0.063	0.086	0.030	0.067
Control Group Mean	0.600	0.490	0.287	0.517

Notes: *Currently attending SHS* is an indicator for reporting that they are currently in school at the time of the second follow-up. *Started on time if attending* is an indicator for whether the student reported having started SHS by October 2016 if they are attending at all. *Attending assigned SHS* is an indicator for whether the student reported that they were attending the school to which they were assigned at the second follow-up. *Attending SHS in Ashanti* is an indicator for whether they are currently attending SHS in Ashanti. Each column represents one regression, which controls for gender and includes JHS district FEs. All estimates are clustered at the JSS level.