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Essays on the Demand for Education in Low-Income Countries

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Essays on the Demand for Education in Low-Income Countries

by

Stephanie Marie Bonds

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Committee in charge:

Professor Edward Miguel, Chair
Professor Frederico Finan
Professor Christopher Walters
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Abstract

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Education is an important input to human capital accumulation that has substantial positive effects on economic, health, and social outcomes. While large gains have been made in improving access to education in low-income countries in recent decades, there are several key areas for improvement. First, while primary school enrollment has improved, secondary school enrollment and completion continues to lag behind. Second, low-income and vulnerable households still face access barriers to educational resources. Third, disparities in educational access have worsened due to the recent worldwide school closures associated with the Covid-19 pandemic. In my dissertation, I study these areas by conducting field experiments in low-income settings. I shed light on access challenges in three different settings: secondary school transition, early childhood education, and Covid-19 related school closures.

My first chapter is titled *Information, Student-Parent Communication, and Secondary School Choice: Experimental Evidence from Kenya* and examines challenges associated with the transition from primary school to secondary school, and secondary school completion in Kenya. Secondary school dropout rates are high in low-income countries, and information gaps about school characteristics may be an important contributing factor. If school choices are made with imperfect information, households may choose schools that are too expensive, not a good fit academically, or too costly to commute to, increasing the likelihood of the students dropping out. These information gaps may be further exacerbated when students and parents fail to communicate before making high stakes schooling decisions. I study the importance of these information and communication gaps in the transition from primary to secondary school using a field experiment with 3,000 Kenyan students and their parents. The intervention consisted of an informational meeting for 8th graders before they applied to secondary school, and randomly varied whether the parent participated in the meeting for a facilitated conversation with the student. I find that informational meetings with students led them to apply to more commutable schools without compromising school quality. Moreover, including the parents in these meetings improved parental knowledge about costs

and led to better alignment of school preferences between the students and their parents. This ultimately led students to enroll in lower cost schools, generating meaningful savings, particularly for low income households.

My second chapter, titled *Promoting Child Reading in Kenya: Estimating the Demand for Storybooks* is coauthored with Edward Miguel, Joan Hamory, and Michael Walker, and examines demand for early childhood reading materials in Kenya. Reading with young children is believed to be an especially important investment in human capital; however, many households in western Kenya lack reading materials for young children, and are unaware of the benefits of early reading. In this paper, we estimate the demand for storybooks amongst 1,000 Kenyan households with children aged 3 to 6 years old. The intervention involved highlighting the benefits of early childhood reading to parents and offering them the chance to buy children's reading books at a subsidized price, where the subsidized price was randomized across three levels. We found that demand for reading materials was very high (97% overall), and downward sloping with price. The willingness to pay for storybooks was higher in urban areas, but did not differ by household income levels or gender of child. These findings highlight that lack of access to educational materials may play an important role in explaining low early-childhood human capital investment in Kenya.

Finally, my third chapter, titled *Learning from Home during the Covid-19 School Closures: Evidence from Kenya* examines how access to schooling in low-income contexts has been impacted during the Covid-19 pandemic, and the consequences for educational outcomes. The pandemic-related school closures have affected 1.5 billion students across almost 170 countries. Students in low-income countries were particularly impacted since schools were less likely to be able to shift to remote teaching technologies. I surveyed a sample of 3,000 Kenyan primary school students to measure student learning at home and parent involvement in their learning to shed light on differential effects of school closures by several demographic characteristics. I find that students from more educated and higher income households received significantly more help from parents with their schoolwork and were more likely to be exempted from chores so that they could study. However, there is no evidence suggesting differences in at-home learning environment across child gender. Taken together, my findings suggest that while gender gaps in schooling access may be closing at the primary school level, there may still be significant gaps in equality by socio-economic status that are particularly exacerbated during out of school periods such as Covid-19.

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I dedicate this dissertation to my parents, Nancy and Tim Bonds, who were my first teachers and have been a source of unconditional love, support, and inspiration throughout this journey, and to my sisters, Michelle and Christine, whose love and friendship have shaped the person I am today.

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Carolyne Nekesa, Noah Mambo, John Kudoyi, Connie Otwani, and Stephen Omare, and all the enumerators at REMIT-Kenya. I learned so much from each of them, and will never forget the days of traveling in the matatu to all the Busia County primary schools. Thank you to the wonderful KLPS field team at Innovations for Poverty Action, especially Eric Ochieng, Ronald Mandela, and Esther Isokat, for their work on data collection activities for Chapter 2. I am grateful to Eric Ochieng for all his support and advice during the course of my Ph.D., and feel lucky to have him as both a colleague and friend. Thank you to Andrew Atitwa for helping me with my very first pilot, back when my budget just allowed for riding to schools on a motorcycle and he was both enumerator and driver!

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Chapter 1

Information, Student-Parent Communication, and Secondary School Choice: Experimental Evidence from Kenya

1.1 Introduction

While primary school completion rates in low-income countries have improved in recent decades, secondary school completion rates remain low (Inoue et al. (2015)). In Kenya, for example, while 80 percent of students finish primary school, less than 45 percent complete secondary school[1] (Kenya DHS (2015)). Secondary school completion is a key education milestone that unlocks access to a range of employment opportunities, and can have substantial positive effects on economic, health, and social outcomes (Duflo, Dupas and Kremer (2021), Ozier (2016)).

When applying to secondary schools, lack of information about school characteristics can lead households to choose schools that are poor matches - i.e., not a good fit academically, too costly to commute to, or more expensive than initially anticipated, increasing the likelihood of students dropping out. Existing research has explored information gaps about school quality and selectivity in school choice processes (Hastings and Weinstein (2007), Bobba and Frisancho (2016*b*), Ajayi, Friedman and Lucas (2017), Ajayi, Friedman and Lucas (2020)) and the effects of targeting information towards student versus their parents (Ajayi, Friedman and Lucas (2017), Ajayi, Friedman and Lucas (2020)). However, there is little, if any, evidence that sheds light on the role of student-parent communication in the decision-making process. Conceptually, this is important because information gaps may be worsened by failures of communication between students and parents, which could lead students, for

[1] This is computed among individuals aged 20-24 in Kenya.

example, to misunderstand parents' budget constraints and apply to schools that are too expensive for them to attend.

This paper studies whether providing information and promoting student-parent communication about schooling options can improve secondary schooling choice, using a field experiment with 3,000 Kenyan students and their parents. I introduce an intervention that randomized individual informational meetings to 8th grade students across 183 schools at the key juncture when students are applying to secondary school. To examine the impact of addressing student-parent communication gaps, I further randomly varied whether parents were included in the meeting for a facilitated conversation about school choices: in one treatment arm, teachers met one-on-one with students, and in the second treatment arm, teachers met with students *and* their parents. In a third control arm (status quo), students and parents were interviewed, but received no meetings.

The transition from primary to secondary school in Kenya starts at the beginning of 8th grade[2]. Students first fill in an application which requires them to choose 11 secondary schools out of several hundred options that vary in performance, location, and cost. Students then take an entrance exam, where the score is used to determine admission to secondary school. Once students receive admission offers, parents choose which school, if any, the student will attend. There are two types of information gaps that could negatively affect school choice in this process: first, students make their application choices with incomplete information about school characteristics such as performance, location, and cost. Survey evidence from the study sample confirms this – only 17 percent of students and 5 percent of parents could accurately state the number of schools to which students are allowed to apply, and only 40 percent of parents knew the costs of schools (within a 100 USD range[3]). Additionally, when students were asked about their preferred day schools, only 19 percent of students choices were commutable[4]. Second, although parents make the final schooling decision and pay for school fees, many students do not communicate with their parents before submitting their application - on average, parents knew only one-third of the schools to which their children applied, which could lead students to choose schools that are infeasible for the parents. Since students can only apply to a limited number of schools, and are locked into these choices early on, these information and communication gaps are costly.

To address these gaps, I designed an informational intervention based on detailed piloting and in collaboration with the Busia County Department of Education. The information provided included maps showing the location of secondary schools along with information about distance to school, school fees, and average academic performance. Each meeting was led by a trained enumerator under supervision of the school teacher. For meetings where parents were included, the enumerator additionally facilitated a conversation about the school choices between the student and the parent. To estimate the effect of the meetings on key socio-economic and educational outcomes, I collected a rich array of student and parent

[2]The process is the same in many other countries in Sub-Saharan Africa.

[3]School fees range from 100 USD per year to 500 USD per year.

[4]Commutable is defined as 7km or less each way from home.

survey data on knowledge, preferences, and enrollment at three points in time over the application cycle[5]. I then linked this survey data to administrative records on final application choices, attendance, and test scores in order to measure the effects of the intervention on key educational outcomes of interest.

The experiment generated four main findings which, when taken together, indicate that improving knowledge and promoting parent-child communication leads students to make better schooling choices. First, I find that the informational meetings improved objective knowledge about the application process and schooling costs, confirming that the intervention successfully addressed informational gaps for students and parents – student and parent knowledge about the number of schools they need to select in the application increased by about 60 and 33 percentage points respectively. Additionally, parent knowledge about school costs increased by 23 percentage points over a control mean of 40 percent.

Second, the informational meetings led to more alignment[6] between stated preferences of students and parents. Informational meetings where the parent was included improved student knowledge about parent preferences for schools, and parent knowledge about student preferences by 11 and 12 percentage points respectively. Furthermore, following the meeting, alignment of student and parent school choices increased by 15 percentage points over a control mean of 25 percent. This alignment reflects shifts from both students and parents towards each other.

Third, I find that the meetings led students to prefer and apply to more commutable schools in both treatment groups: there was a 40-45 percent increase in the proportion of students that apply to day schools that are within a 7 km radius of students house. Conditional on selecting these lower cost sub-county day schools, treatment students are no more likely to enroll in a more commutable school. However, lower income households are 24 percent more likely than the control to attend a school within a 7km radius from home. Importantly, these distance savings come at no cost to performance of the school, as measured by average test score.

Fourth, when the parent attends the meeting, students ultimately intend to enroll in lower cost schools. Students in Group 2 (parent included in meeting) pay 19 USD less in tuition each year overall (18 percent of average monthly earnings in the sample), driven by a shift into local day schools. This is even larger for below median income households who save 29 USD per year. Considering that parents must pay secondary school fees across several years for all of their children, these cost-savings over time can be substantial.

This paper adds to an active body of research on school choice in both high and low income country contexts. Existing research shows that information gaps in school choice systems are large and persistent, and can lead students to make sub-optimal schooling choices.(Ajayi (2013), Ajayi, Friedman and Lucas (2017), Ajayi, Friedman and Lucas (2020), Bobba and Frisancho (2016*a*), Lucas and Mbiti (2012), Walters (2018), Hastings and Wein-

[5]The application cycle is normally 1 year, but lasted for 1.5 years due to the Covid-19 school closures.

[6]Alignment is measured as the proportion of schools that match between the parents preference list and students preference lists. The outcome is constructed in this way, since schools are selected from non-overlapping choice categories.

stein (2007), Lai, Sadoulet and de Janvry (2009), Kapor, Neilson and Zimmerman (2020)) Further, there is evidence that these gaps might be larger for marginalized groups such as girls and students and from low socio-economic backgrounds (Lai, Sadoulet and de Janvry (2009), Lucas and Mbiti (2012)). Much of the experimental evidence so far has focused on misalignment on the dimension of performance and provided information on either school quality (Ajayi, Friedman and Lucas (2017), Hastings and Weinstein (2007)) or student ability (Bobba and Frisancho (2016*a*), Franco (2019), Dizon-Ross (2019)). Moreover, experimental interventions that have targeted information towards parents have found mixed results on eventual schooling outcomes. My study is the first, to my knowledge, to bring parent and student together in an informational meeting to discuss preferences and estimate the impact on individual knowledge, preferences, and eventual choice.

This research suggests that informational meetings with students and parents about secondary school choices addresses information and communication gaps during the secondary school process, and leads to students enrolling in lower cost schools. Teacher meetings are low cost and potentially very scalable since informational content such as maps can be generated and distributed across schools. Following the completion of the study, we intend to work with the Busia County Department of Education to disseminate this information more widely. In future work, I plan to track academic outcomes for the students in my sample to study how making a more informed school choice can impact secondary school academic achievement and eventual secondary school completion.

The remainder of the paper is structured as follows: Section 1.2 provides an overview of the empirical setting, Section 1.3 outlines a simple theoretical framework, Section 1.4 discusses the experimental design, sample, and data, Section 1.5 presents the main empirical results, Section 1.6 structurally estimates preferences in a rank-ordered logit framework, and Section 1.7 concludes.

1.2 Context

In the following section I first describe the secondary school application process in Kenya, and then discuss why these informational gaps in the secondary school sector persist.

1.2.1 Secondary School Application Process

To study how information sharing can improve schooling choices and eventual educational outcomes, I turn to a low-income context in western Kenya. The secondary school selection process consists of four periods. First, students submit their applications to secondary school. Second, students take the secondary school entrance exam - the score on which is used to determine admission to secondary school. Third, students receive admissions offers to school, and finally students enroll in school. There are two types of information gaps that could negatively affect school choice in this process: first, students make their application choices with incomplete information about school characteristics such as performance, location, and

cost. Second, although parents make the final schooling decision and pay for school fees, many students do not communicate with their parents before submitting their application. Since students can only apply to a limited number of schools, and are locked into these choices early on, these information and communication gaps are costly.

Applications

At the beginning of Grade 8, students in Kenya apply for admission to secondary school by selecting 11 schools across four mutually exclusive categories (national, extra county, county, and sub-county)[7]. These categories vary in terms of selection criteria and costs[8]. National schools are the most prestigious schools in the country, but they are also the most expensive (500 USD per year) and the most selective, typically requiring 400 marks or higher on the secondary school entrance exam. Schools decrease in selectivity and cost moving to extra county and county schools (400 to 500 USD per year). The most accessible schools are sub-county day schools, which have no official admissions cutoffs and are the most affordable at 100 USD per year. While national, extra county, and county schools are typically boarding schools, sub-county schools are day schools where students commute back and forth from home each day. Students who select a sub-county school that is too far from home may have trouble attending school every day or drop out entirely. Figure 1.1 shows the locations of secondary schools in the study area. It is important to note that while national schools are typically higher performing, there is a lot of variation in the performance of sub-county day schools (Figure 1.3), and many of them can out-perform county schools or even sub-county schools. There is also considerable variation in distances to sub-county day school (Figure 1.2).

When selecting schools for their secondary school application, students view a 300 page document that lists Kenyan schools in each of the four tiers, and contains basic information such as school name and category of school. Importantly, this document does not contain any information about the school location, performance, admission cut-off or cost. Students are asked to discuss their schooling preferences with their parents at home, and return to school ready to select their schools. In practice, we find evidence that many students do not communicate with their parents in advance of submitting their application. At baseline, parents and their children only know 30 percent of each others schooling choices, even after the application had been submitted.

[7]Extra county schools were formerly known as provincial schools. In the past, students selected only 10 schools (4 national, 2 extra county, 2 county, and 2 sub-county).

[8]Each tier of schools has their own admissions "cutoff", which is the minimum test score needed to receive an offer from that school. In general, national schools require 400 marks and above, extra county schools require 350 marks and above, and county schools require 250 marks and above. There is no minimum requirement for attending a sub-county day school, but students with lower test scores will have lower priority for their first choice sub-county schools. School performance can vary both within school tier and across school tier.

Entrance Exam

At the end of the Grade 8 school year, students take the Kenya Certificate of Primary Education (KCPE) exam, which is used to determine admission to secondary school. Based on their performance on the KCPE exam and the schools that students selected on their application, students are assigned to secondary schools and receive admissions offers. They can receive up to one official offer, and they will ultimately choose which school to attend out of their set of offers.

Admission Offers

Students are assigned admission offers[9] to schools based on (1) their performance on the entrance exam and (2) county-level quotas. National schools are filled first by selecting the top performing students in each sub-county in each gender.[10] Next, extra-county schools are filled, with some slots reserved for the host county and sub-counties[11]. Under the government's 100% transition policy, everyone is guaranteed admission to at least one school. If a student doesn't receive an offer at any of the schools they applied to, they will be assigned to an under-subscribed sub-county school. Students can also choose to leave the public system and attend a private school, though these are typically more expensive and lower performing (only 1% of the sample eventually joins a private school).

The structure of this application process can lead to errors in two ways: first, students must apply to schools 11 months before they take the entrance exam that determines their placement and with limited information about the quality, selectivity, and cost of the school choices themselves. Second, the student fills out the application in school without their parents, so parents' financial capabilities and preferences for schools are not necessarily reflected. Since students can only apply to 11 schools, any mistakes are costly – students who fail to obtain admission to one of the schools to which they applied can still attend an under-subscribed sub-county school or private school, but would miss the opportunity to attend any schools that were more preferred.

[9] Assignment of students to secondary schools is now fully computerized as of 2021. This is different than previous years where the head teachers at each school would convene in Nairobi to select students for their schools.

[10] The formula for assignment of students to national schools is Sub-county Quota={Sub-county KCPE candidature of a given gender/ National KCPE candidature of given gender} X Available Vacancies in the National school. The top 5 performing candidates of either gender in each sub-county will be considered for placement to the national schools they selected. Candidates who scored 400 marks and above will be placed in national schools of their choice where possible. Where a candidate fails to be selected into a national school, they will be considered for placement in an extra county school of their choice. Candidates who score below 400 marks will be selected using quotas and cutoff marks to any of their national school choices by order of preference, where possible. The cut off mark of 280 will be used to fill the remaining vacancies in national schools.

[11] Selection of candidates to extra-county schools will be based on the ratio of 15:35:50, where, 15% is reserved for the host sub-county, 35% for the host county, and 50% is reserved for other counties.

All factors considered, there is substantial room for improving choices by promoting information and communication in the school selection strategy. For example, a high performing student where cost is a major barrier should try to apply to the highest performing schools that are commutable from their house. Unfortunately, many students lack knowledge of schooling characteristics and instead apply to schools that are a poor match based on their location, willingness and ability to pay, and academic ability.

1.2.2 Persistence of Informational Gaps

At the time of the application, the primary source of information for secondary school options are the students' primary schools. Primary schools are supposed to have a record of all secondary schools that students can apply to, which should be updated regularly from the centralized education department in Nairobi. However, information at schools is often outdated, and performance data is not publicly available. At baseline, we asked teachers to identify the top performing schools and bottom performing schools in their sub-county: on average, teachers accurately identified only 1.65 out of 5 top performing schools and 1.84 out of 5 bottom performing schools in their own sub-county.

Rapid growth in the secondary school sector, coupled with a lack of information transmission from the capital to rural areas, has led these informational gaps to persist. First, Kenya has a dynamic secondary school sector, with the number of secondary schools nearly doubling in the last decade from 4,379 in 2006 to 8,259 in 2016 (KNEC). Second, the expansion of rural electrification has changed the quality of schools and transportation infrastructure changing relative distances.

1.3 Theoretical Framework

In this section, I outline a simple theoretical framework for understanding the sequence of events in the secondary school application process, and how information and parent-student communication gaps may constrain the choice set.

1.3.1 Student and Parent Preferences

Let I be the set of all households with a student transitioning to secondary school, and J represent the set of all secondary schooling options. The student ($k = s$) and parents ($k = p$) in household $i \in I$ have preferences over each school $j \in J$, with utility weights on distance of school from household, quality of school, cost of school and other school characteristics. Their utility function is given by:

$$U_{ij}^k = \omega_D^k \cdot D_{ij} + \omega_Q^k \cdot Q_j + \omega_C^k \cdot C_j + \sum_{x \in X} \omega_x^k \cdot x_j + \epsilon_{ij} \tag{1.1}$$

where D_{ij} is distance to school j from household i, C_j is cost of school, Q_j is quality of school, X_j is a vector of other school characteristics, and the ω^k's are the weights on each component for $k \in (s, p)$. Student and parent weights may differ - for example, students may value distance to school ($\omega_D^s > \omega_D^p$) more than parents, while parents may place a higher weight on cost ($\omega_C^s < \omega_C^p$).

Together, the household's total utility is a linear combination of student and parents utilities, given by:

$$U_{ij} = \gamma U_{ij}^s + (1 - \gamma) U_{ij}^p \tag{1.2}$$

1.3.2 Application Process

The secondary school application sequence of events consists of three periods (Walters (2018)): in $t = 1$, students submit their application portfolio, A_i. In $t = 2$, students receive a set of offers $\mathcal{O}$ from schools in their submitted application portfolio, A_i. Third, parents decide which school their child will enroll in based on the available set of offers ($t = 3$).

Enrollment

At the time of enrollment ($t = 3$), parents decide whether or not their child will enroll in school and maximize total household preferences with respect to the students offer set $\mathcal{O}(Z_{ij}) = \{j : Z_{ij} = 1\} \bigcup 0$ where Z_{ij} is an indicator for student i receiving an offer at school j and 0 is the outside option of attending no school or private school.

Parent's optimal school choice at the enrollment stage for student i is the school, j, in the student's offer set, $\mathcal{O}(Z_i)$ that maximizes household utility:

$$S_i^* = _{\{j \in \{\mathcal{O}(Z_i)\}} U_{ij} \tag{1.3}$$

Student Application Choice

In period 1(t=1) student submits an application portfolio to schools.

$$A_i^s = \sum [p_{ij} E[U_{ij}^s]] \tag{1.4}$$

where p_{ij} is the probability of receiving an offer for student i at school j and $E[U_{ij}^s]$ is student i's expected utility at school j.
Each application portfolio A_i^s generates an offer set $\mathcal{O}(Z_i)|A_i^s$, which parents use to make their enrollment choice $S_i \in \{\mathcal{O}(Z_i)|A_i^s\}$

To summarize, the sequence of events is as follows:

Step 1: Student submits application portfolio A_i^s

Step 2: Each student application portfolio A_i^s generates an offer set $\mathcal{O}(Z_i)|A_i^s$.

Step 3: Given the offer set, parent chooses $S_i \in \{\mathcal{O}(Z_i)|A_i^s \bigcup 0\}$ with associated student and parent utilities $U_c(S_i)$ and $U_p(S_i)$

Predictions about Student-Parent Choices

- Suppose that with communication, student knows that parent will make final decision and submits an application portfolio A_i^{s*} (considering parents choice) that yields an offer set $\mathcal{O}(Z_i)|A_i^{s*}$ and corresponding parent choice (S_i^*)
- Without communication, student submits an application portfolio that only considers her own preferences (A_i^s) that yields an offer set $\mathcal{O}(Z_i)|A_i^s$ and corresponding parent choice (S_i)
- $U(S^*) > U(S)$: that is, student utility will be higher when they submit an initial application that takes into account parental preferences by expanding the offer set to include schools the parent would actually consider.

1.4 Experimental Design

The first part of this section introduces the study intervention and treatment groups. Next, I describe the randomization into treatment groups and balance checks. Finally, I provide information on the timeline and data collected at different stages of the experiment.

1.4.1 Treatments: Student-Teacher & Student-Teacher-Parent Meetings

I introduce an intervention that provided individual informational meetings to 8th grade students at the key time before their secondary school applications were due. The meeting was conducted with each students' class teacher and the intervention randomly varied who participated in the meeting: in one treatment arm (**Group 1**), teachers met one-on-one with students, and in the second treatment arm (**Group 2**) teachers met with students *and* their parent/ guardian.

Based on detailed piloting and in collaboration with the Busia County Department of Education, I designed an informational intervention that bridged these gaps. The information provided in the meetings included maps showing the location of secondary schools along with information about distance to school, school fees, and average academic performance. Each meeting was led by a trained enumerator and under supervision of the school teacher. For meetings where parents were included, the enumerator facilitated a conversation about the school choices between the student and the parent.

The control arm (**Group 3**) received no meetings. Group 1 allows us to estimate the effect of directly providing information to students. Group 2 allows us to examine the added effect of opening the communication channel between students and their parents.

Information on secondary school characteristics (including school location, cost, performance, and admissions cut-offs) was compiled and organized in the form of maps to be presented to meeting participants in both treatment arms. Participants viewed two maps: the first was a map showing all the boarding schools [12] in Busia County to which any students could apply. The second was a a map of the student's home Sub-County showing the local sub-county day schools that the students could walk to from home (see Appendix A.3). As part of the intervention, the survey enumerator highlighted the three nearest day schools to the student's home primary school. Following the informational portion of the meeting, the teacher and meeting participants (that is, student in Group 1 and both parent and student in Group 2) were given time to discuss their secondary school preferences.

- **Control:** Status Quo. Students and parents surveyed and given list of secondary schools, but did not participate in any information meetings.
- **Group 1: Student-Teacher Meeting**: Students and parents surveyed and given list of secondary schools. Additionally, students participate in an informational meeting with class teachers. Maps with the location, costs, performance, and category of schools were presented to students.
- **Group 2: Student-Teacher-Parent Meeting**: Students and parents surveyed and given list of secondary schools. Additionally, students **and** their parents participate in an informational meeting with class teachers. Maps with the location, costs, performance, and category of schools were presented to students **and** their parents.

1.4.2 School Randomization, Pupil Selection, and Sample Statistics

Treatment was randomized at the primary school level so that every treatment student attending the same school participated in the same meeting group. In total, I randomly selected 183 schools across 5 Busia County sub-counties to be part of the study[13]. Randomization into treatment groups is stratified by sub-county of school and mean KCPE test score of school in the previous year (above or below the Busia County mean test score). During the launch of the study, surveyors randomly selected 20 students (10 boys and 10 girls) from each selected school registrar using an in-field random number generator. The final sample who agreed to participate and attended the baseline interview is 2,952 8th grade students and their parents.

[12]These county boarding schools include National, Extra County, and County schools. Since boarding schools are typically single-gender only, we use separate maps for girls and boys that show the maps relevant for their gender only.

[13]There are 7 sub-counties in Busia County. I originally intended to include schools from all 7 of Busia County sub-counties, but due to the Covid-19 school closures in March of 2020 we ended our intervention earlier than planned and only surveyed a random subset of 5 of the 7 subcounties.

Sample summary statistics indicate that roughly half (52 percent) of students are female, and 66 percent of parents are female[14]. The average household income is 106 USD per month and the median education of parent is less than primary school - 51 percent of parents had less than a primary school education, while the remaining 49 percent completed primary school or higher. These baseline demographic characteristics are balanced across treatment group (see Table A.1.1).

1.4.3 Experimental Timeline and Data Collection

Below, I detail the timeline of the experiment implementation and the main data collection activities. I combine student and parent survey data collected at three points of time with administrative data on final application choices.

Jan '20 - Mar '20	Baseline, Intervention, Follow-up Survey 1: (i) baseline student and parent surveys; (ii) intervention: student-teacher and student-teacher-parent informational meetings with 2,952 student-parent pairs across 183 schools; (iii) student and parent follow up survey 1
May '20 - Jul '20	Follow-up Survey 2: follow up data on secondary school plans and parental confidence as part of Covid-19 educational module
Mar '21 - Apr '21	Administrative Data: link with student administrative data on final application choices, primary school test score, and primary school enrollment
Aug '21 - Oct '21	Follow-up Survey 3: student survey on secondary school admissions offers and enrollment decisions

- *Follow-Up Survey 1*: The first follow-up survey - conducted immediately after the intervention - assessed the effect of the meetings on student and parent knowledge, beliefs, and preferences. First, a set of knowledge questions were administered to both students and their parents assessing their knowledge about the application process (number of schools student could apply to, total points of the KCPE exam, and admissions cut-offs of each category of each school). A set of questions also assessed parental knowledge of costs in each group. Rank-ordered schooling preferences were elicited in all three groups from both students and their parents: respondents were able to view school lists in all three groups. Preferences were elicited privately (students and parents were interviewed separately, and the students' teacher is not present.) In both the student and parent surveys, we not only elicited own schooling preferences, but also second-order beliefs about the other's preferences. This allows us to examine how the intervention changed schooling preferences. Comparing student and parent

[14]Students were asked to bring the parent that is responsible for helping with schooling decisions.

preference lists allows us to measure the extent to which student and parent preferences are aligned.

- *Follow-Up Survey 2*: During the Covid-19 school closures, I administered a follow-up survey to assess student and parent school plans and confidence about helping student with their schooling choices.
- *Administrative Data*: I link student and parent survey responses with administrative data collected from each school on final application choices in March of 2021 as well as student test score and attendance. This allows me to characterize student application choice and compare with survey preferences.
- *Follow-Up Survey 3*: Finally, I collect survey data on the admissions offers that students received, as well as their final enrollment decisions beginning in August of 2021 when the student joined secondary schools.
- *GPS Coordinates*: The survey team geocoded Busia County primary and secondary schools in order to measure distance to school.

Future follow-ups will measure attendance and performance in the enrolled school in order to assess longer run student-school match and secondary school retention.

1.5 Main Results

In this section I report my main empirical results, with a focus on the effect of the intervention on key educational outcomes of interest. The estimation strategy uses intention-to-treat (ITT) estimates of treatment group assignment on the outcomes of interest. The main specification will be the following equation:

$$Y_i = \alpha + \beta_1 T_{1i} + \beta_2 T_{2i} + X_j'\theta + \epsilon_{ij} \tag{1.5}$$

where Y_i is the outcome of interest, T_{1i} and T_{2i} are treatment indicators corresponding to Treatment Groups 1 and 2, respectively. X_j is a vector of the variables used for sample stratification, including: sub-county of school and primary school KCPE score (above or below mean) of school[15]. Standard errors are clustered at the school level.

Using the survey data, I first examine student and parent knowledge and preference alignment, and characterize preferences along the dimensions of distance and performance. Second, I turn to administrative data collected from each primary school to characterize final application choices along the same dimensions. Finally, I use survey data to examine final enrollment choices. I examine heterogeneity along three pre-specified dimensions: household income (below or above median), education status of parent (below or above median), and

[15]KCPE score for each primary school is obtained from administrative data records from the Busia County Department of Education.

gender of child. I highlight heterogeneity by income and education in this section, where I see significant differences. I do not observe significant differences by gender of child for any of the outcomes. All heterogeneity tables are shown in Appendix A.4.

1.5.1 Student and Parent Knowledge (Survey)

The intervention improved student and parent knowledge about schooling choices along several key dimensions. First, I examine parental knowledge of costs of schools for each of the four schooling tiers (Table 1.1, Panel A)[16]. Control group knowledge of costs are low, particularly for the higher tier schools, with only 23 percent of parents correctly stating the cost of National schools within a 100 dollar range (1/2 of mean costs). The parent meeting (Group 2) significantly improved parental knowledge of costs across all four categories (ranging from 19 to 30 percentage points), and doubled knowledge of national school costs.

Second, I examine student and parent knowledge about the overall application process using three outcomes: (i) the number of schools to which the student can apply; (ii) the number of total points on the KCPE entrance exam; and (iii) a means effect index that includes these two measures as well as knowledge about the cut-off marks for each category of school (Table 1.1, Panel B). Only 17 percent of control students and 5 percent of control parents could accurately state the number of schools to which the student was allowed to apply; however, treatment improved knowledge in both groups by a large 58 to 62 percentage points and including the parent in the meeting improved parent knowledge by 33 percentage points. Similarly, the treatment significantly increased knowledge about the necessary exam scores (15 percentage points for students, and 21 percentage points for parents) and the overall knowledge index for both student and parents.

1.5.2 Student and Parent School Preferences (Survey)

I use the survey data collected immediately after the intervention to measure student and parent preferences for schools. I first examine preferences for overall category of school (that is, national, extra county, county, or subcounty). Second, I use these preference lists to measure student and parent knowledge about *eachother's* choices; that is, I ask parents to list which schools they believe their child wants to apply to and students to list which schools they believe their parent wants them to apply to. Comparing these lists across student and parent allows me to examine the extent to which students and parents learn about each others preferences during the meeting. Third, I measure parental confidence about their ability to support their child's schooling and perceptions of the likelihood that their child will join secondary school. Fourth, I characterize student and parent preference lists along the dimensions of distance and performance (as measured by average test score). Finally, I evaluate whether the parent meeting leads students and their parents to align on schooling

[16]Responses are considered correct if the respondent answers correctly within a 100 USD range.

preferences by comparing the extent to which student and parent preference lists match across groups. I discuss each of these results below.

Preferences for Schooling Tiers

Examining the extent to which the meeting intervention impacted student and parent preferences for category of school, I find that attending the meeting shifted schooling tier preferences downwards, particularly when the parent was present in the meeting (Group 2). Nearly one-half (45 percent) of control parents prefer their child to attend an expensive national school, 19 percent of control parents prefer their child to attend a local sub-county school, and 16 percent of control parents prefer a school in each of the middle categories (extra county and county, respectively) (Table 1.2, Panel A). Attending the informational meeting (Group 2), leads parents to shift their preferences downwards to lower categories of schools. There is a significant 5.2 percentage point decrease in the proportion of parents who prefer their child to attend a national school, with preferences shifting towards extra county (significant 4.6 percentage point increase) and county (insignificant 2 percentage point increase).

Over one-half (54 percent) of control students prefer to attend a national school, but in contrast to the parents, only 11 percent of control students prefer to go to a local sub-county school. 22 percent and 14 percent prefer to attend an extra county or county school, respectively (Table 1.2, Panel B). Attending the informational meeting shifted student preferences for schooling category in both groups, but the level and direction of shifts differed depending on whether or not the parent was present in the meeting. In Group 1 (student-only) students shifted towards extra county schools (3.8 percentage point increase) from all other categories. When the parent was present in the meeting (Group 2), there was a large and statistically significant shift away from national schools (7 percentage points), and towards extra county (4.4 percentage points) and also county schools (2.4 percentage points). This parallels the results from the parents, suggesting that parental presence in the meeting may influence the child's preferences (or vice versa).

Student and Parent Alignment of Preferences

The effect of including parents in decision-making may depend on the degree of alignment between parent and student preferences and learning about each others preferences. In addition to measuring student and parent's own preferences, I elicit student and parent second-order beliefs about each others' preferences; that is, parents are asked to list their child's preferred choices and students are asked to list their parents preferred choices. I first elicit preferences for the full set of 11 schools, and then elicit preferences for the Busia only categories (county and sub-county).

Attending the meeting improved both student and parent knowledge about each others schooling preferences. In the control group only about one-third of students and parents know each others preferences, however the student-teacher-parent meeting that includes all parties leads to a 11 and 12 percentage point increase in knowledge about eachothers preferences

(Table 1.3, Columns 1 and 2). The effect is even larger (21 percentage points over a baseline of 33 and 36 percent) when I restrict the set of schools to the local county and subcounty category of schools only (Table 1.3, Columns 3 and 4).

To understand the relative importance of each party in the decision making process, I examine how much students' preferences shift towards parents and vice versa after they learn about each other's preferences. In the control group, 25 percent of parent and student's choices align. This increased by 15 percentage points for all schools, and 17 percentage points for local Sub-County Schools, statistically significant at the 1% level, after parents and children attended the meeting (Table 1.3, Columns 5 and 6). There is evidence that both students shift towards parents and parents shift towards students (more so for local schools).

Parent Confidence and Secondary School Plans

Six months after the intervention, I elicit parent confidence about their ability to support their child's schooling in a phone survey conducted during the Covid-19 school closures. I construct a mean effects index of three self-efficacy questions[17], including "confidence in motivating child to try hard in schooll","confidence in ability to support child's learning at home", and "confidence in ability to make choices about child's schooling". Results show that attending the meeting (Group 2) leads to a positive and significant increase in the overall parent confidence index (Table 1.4, Column 1), driven by an increase in their confidence with helping their child with school choices. Confidence increases more for lower educated parents (Table 1.4, Column 4), suggesting that the information may particularly aid disadvantaged households. I also examine parents perceptions of the likelihood that their child will join secondary school. Similarly, I construct a means effect index ranging from 1 (very unlikely to join) to 4 (very likely to join). I find that overall, the meeting leads to a positive and significant increase in parents' perception of the likelihood that their child joins secondary school (Table 1.4, Column 6), with larger gains for below-median educated households (Table 1.4, Column 9). Taken together, this evidence suggests that facilitated meetings with students, teachers, *and* parents may be effective in better equipping parents to make schooling decisions for their children, particularly for disadvantaged households.

Student and Parent Preferences: Cost and Distance

I next turn to examining preferences for specific schools within each category and characterize schools by distance from home primary school and performance (as measured by average test score). I find that the meeting intervention increases student and parent preferences for closer schools and increases student preferences for higher performing schools. I examine the impact of treatment on distance of student and parent sub-county school preferences using two different outcomes (Table 1.5). First, I define commutability as the schools within a 7 km

[17]Respondents are asked to answer from 1 to 4, where 4 is the highest (very confident) and 1 is the lowest (not confident).

radius from their primary school, and examine whether student select commutable schools. Second, I estimate average distances from home primary school using GPS coordinates.

In the control group, only 19 percent of students choose all commutable schools. Baseline parental preferences for commutability are slightly higher, with 28 percent of parents choosing all commutable schools. The average distance of schools chosen is 6.77 km for control students and 5.35 km for control parents. I find that treatment significantly increased the likelihood of choosing commutable schools for all treatment groups. Students were 15 to 16 percentage points more likely to select all commutable schools – nearly double that of the control. Consistent with the commutability results, treatment students chose a set of schools that were 1.1 to 1.3 km closer on average. There is a weaker increase in commutability for parents preferences, with a statistically significant 9 percentage point increase in the proportion of parents who choose all commutable schools. There is not a significant effect on average GPS distance for parents who attend the meeting (Group 2).

Second, I examine whether the meeting treatment changes the average performance of preferred schools, where performance is measured as the average test score at each secondary school in the previous year. While one might expect students to have a preference for higher performing schools, it's possible that when choosing schools, students trade off between proximity and performance. Results show that student who attend the student-only informational meeting select a 7.8 percentage points higher share of above-median performing schools (from a control base of 61 percent). The results are similar when the parent attends the meeting, with a statistically significant 8.7 percentage point increase in the share of schools that are above median A.1.4. While control parents select a similar share of above-median schools as students, there is no significant effect of attending the meeting (Group 2) on parent preference for performance. This suggests that either that parents have a lower preference for performance or that performance is less salient for parents. Taking all these results together, attending the meeting leads students to select schools that are more commutable and higher performing, and weakly leads parents to more choose more commutable schools (with no change in performance).

1.5.3 Student Application Choices (Admin Data)

In order to examine how these preferences translate into actual schooling choices, I link the survey responses with administrative data on students' final application choices (measured 12 months after the intervention). Despite the long time frame between the intervention and application deadline due to the Covid-19 school closures, treatment students in both groups choose more commutable subcounty day schools, at no cost to quality of the school. There is a positive and significant 9.3 percentage point effect on proportion of treatment students that choose all commutable schools for Group 1 and a positive 8.3 percentage point effect for Group 2 (Table 1.5, Columns 3). Students also choose closer schools as measured by GPS distance, though these effects are not statistically significant (Table 1.5, Columns 6).

1.5.4 Student Enrollment

Finally, I turn to the final survey conducted before the start of the secondary school year to measure intended student enrollment in school. At the time of the survey, 81 percent of students had enrolled or intended to enroll in secondary school, with no significant differences across treatment group. Of these students, 2 percent intended to enroll in National school, 12 percent in Extra County school, 11 percent in County school, and 54 percent in a subcounty school (Table 1.6). 1 percent of students left the public school system and enrolled in an outside private school.

Students who participated in the parent meeting group (Group 2) were significantly more likely to enroll in a lower cost subcounty day school (6.2 percentage points), shifting out of the higher three tiers. This parallels the pattern seen in the elicited preference lists where students shift out of the higher tier schools when the parent is in the meeting.

This shift carries through to the school fees paid. Students in Group 2 (parent group) ultimately intended to enroll in schools that were 19 USD less in tuition each year overall (Table 1.7). This is even larger for below median income households who will enroll in schools costing 29 USD per year. These cost reductions are meaningful, particularly for low socio-economic status households. The average monthly earnings in the sample is 106 USD per household; thus the 19 USD average cost saved is equivalent to 18 percent of household income and the 29 USD for below median households is equivalent to 27 percent of monthly income. Considering that parents must pay school fees for 4 years for each child and have 4.12 children on average, this can yield up to 445 USD overall cost savings (more than 4 months of average income.)

Conditional on selecting these lower cost sub-county day school, treatment students are no more likely to enroll in a more commutable school overall. However, lower income households are 13 percentage points more likely to enroll in a school within the 7km radius (Table 1.8, Column 2). There are no significant differences in commutability by education status of the household or gender.

1.5.5 Alternative Mechanisms

Taken together, the results above indicate that the mechanisms through which the meeting intervention affects outcomes is through improving knowledge (Groups 1 and 2) and increasing communication between students and their parents (Group 2). In this section, I examine and rule out three alternative mechanisms that might be driving the results: (i) changes in effort effort in preparing for the KCPE exam; (ii) time spent discussing with parent outside of the meeting; and (iii) differences in budgeting for secondary school.

Effort

First, one might expect that the meeting intervention could lead treatment students to allocate differential effort to preparing for secondary school. This could occur if, for example,

knowledge about school characteristics or communication with parents leads students to become more or less confident in their ability to attend particular schools or their parent's support for their preferred choices. I rule out effort as a mechanism in two ways. First, I test whether treatment and control students have different scores on the KCPE exam. Second, I test whether treatment and control students differentially attend secondary school leading up to the exam. In both measures, I find no differences across groups in exam scores or attendance, suggesting that the treatment does not lead to differential effort across group, along these dimensions (Table A.1.9).

Discussion

Second, I test whether students and their parents discuss schooling choices more outside of the meeting across group. I ask students and their parents how many times they discuss the school choices in a typical week leading up to the application deadline and find that are no significant differences by treatment group (Table A.1.10).

Budgeting

Finally, I test whether there is evidence that parents in treatment groups budget for schools differently as a result of the meeting. In particular, I regress the amount of money budgeted for child's school on actual cost of school and the interaction between cost of school and treatment status. I find that there is a 0.57 correlation between actual cost of school and budgeted costs, but there is no significant differences for the parent meeting group (Group 2) suggesting that the meeting doesn't lead parents to budget differently for secondary school. (Table A.1.11).

1.6 Estimating Preference Parameters

1.6.1 Student Preferences

Returning to the utility framework, let U_{ij} denote student i's utility from enrolling in school j, where $\mathcal{J} = \{1, 2, ...J\}$ is the set of available schools. I focus on the set of subcounty day schools, which is the relevant set of schools for most students in the sample. Students submit rank-ordered choice lists for subcounty schools $R_i = (R_{i1}, R_{i2})'$ where the school ranked first on a student's list is

$$R_{i1} =_{j \in \mathcal{J}} U_{ij} \tag{1.6}$$

and the school ranked second is:

$$R_{i2} =_{j \in \mathcal{J} \setminus \{R_{i1}\}} U_{ij} \tag{1.7}$$

Following Abdulkadiroğlu et al. (2020), I summarize student preferences by fitting random utility models, where student i's utility from enrolling in school j is:

$$U_{ij} = \delta_j + \gamma_{ij} D_{ij} + \epsilon_{ij} \tag{1.8}$$

The parameter δ_j is the mean utility of school j (capturing all characteristics of the school, including cost and quality) and γ_{ij} is student (dis)utility of distance. Unobserved tastes ϵ_{ij} are modeled as independent extreme value type I distributions.

The conditional likelihood of the rank list R_i implied by the logit model is:

$$\mathcal{L}(R_i | X_i, D_i) = \prod_{k=1}^{l(i)} \frac{\exp(\delta_j + \gamma_{ij} D_{ij})}{\sum_{j \in \mathcal{J} \setminus \{R_{i1}\}} \exp(\delta_k + \gamma_{ik} D_{ik})} \tag{1.9}$$

1.6.2 Treatment Effects on Schooling Choices

Reduced form results suggest that students apply to closer sub-county day schools, at no cost to the quality of the school and that students ultimately enroll in lower cost and closer sub-county schools at the same level of quality. However, treatment and control students may have differential preferences for secondary school characteristics beyond these measured characteristics of distance, cost, and performance.

I test whether treatment and control students have different preferences for schools by fitting a rank-ordered logit model with secondary school fixed effects. For student application choices, I estimate (i) a restricted model that includes secondary school fixed effects and distance (Equation 1.10), and (ii) an unrestricted model that interacts school fixed effects and distance with treatment status (Equation 1.11).

$$U_{ij} = \delta_j + \gamma_{ij} D_{ij} + \epsilon_{ij} \tag{1.10}$$

$$U_{ij} = \delta_j + \lambda_j \times T_i + \gamma_{ij} D_{ij} + \phi_{ij} D_{ij} \times T_i + \epsilon_{ij} \tag{1.11}$$

I then compare the model fit for both application choices and enrollment choices using a Likelihood Ratio Test (Equation 1.12), with 81 degrees of freedom, finding that we can reject the null hypotheses that the two models are the same for student application (Table 1.9).

$$\lambda_{\text{LR}} = -2[\ell(\theta_0) - \ell(\hat{\theta})] \tag{1.12}$$

1.6.3 Performance vs Distance to School

When selecting subcounty day schools, students face trade-offs between two observable parameters: distance to school and quality (performance) of school. To assess student relative valuations of distance and performance and how this varies across treatment group, I estimate parameters on performance and distance in the following model in each treatment group:

$$U_{ij} = \beta_1 P_j + \beta_2 D_{ij} + \epsilon_{ij} \tag{1.13}$$

P_j is average test score of each secondary school (out of a 12 point scale) and D_{ij} is distance from student i to school j, measured using GPS distance from home primary school to secondary school.

The conditional likelihood of the rank list R_i implied by the logit model is now:

$$\mathcal{L} = \prod_{k=1}^{l(i)} \frac{\exp(\beta_1 P_j + \beta_2 D_{ij})}{\sum_{j \in \mathcal{J} \setminus \{R_{i1}\}} \exp(\beta_1 P_j + \beta_2 D_{ij})} \tag{1.14}$$

The preference parameters on the logit estimation indicate that students have a significant dislike for distance across all three groups (although the differences are not statistically significant) and a preference for performance. Students in Group 2 have a higher relative utility for performance. Taking the ratio between coefficients ($-\beta_2/\beta_1$) allows for the estimation of trade-offs between distance and performance across groups (e.g. the valuation of performance in distance units). Performance is measured as the average test score of each secondary school, standardized to scale from 1 (F) to 12 (A) where each point difference represents a one grade shift (e.g. from a B+ to an A-). (Table 1.9) indicates that the control group (Group 3) is willing to trade off 0.4 points per km traveled, Group 1 trades off 0.41 points per km traveled, and Group 2 is willing to trade off 0.35 points per km traveled, suggesting that Group 2 values performance more relative to distance when compared to Group 1 and 2.

The point estimates are not statistically significant across treatment groups. This is consistent with the reduced form estimates for GPS distance (Table 1.5) and performance (Table A.1.6) of schools in the final application. Taken together with the result from the log likelihood test, this suggests that treatment students make different choices, but that these choices cannot be fully explained by characteristics such as performance and distance alone. Future work will explore the characteristics of these preference parameters.

1.7 Conclusion and Policy Implications

Choosing the right secondary school can greatly influence the likelihood of secondary school completion. Information gaps about school characteristics can lead households to choose

schools that are too expensive, not a good fit academically, or too costly to commute to, increasing the likelihood of students dropping out. These information gaps may be further exacerbated when students and parents fail to communicate about school choices before making high stakes schooling decisions. This paper studies whether providing information and promoting student-parent communication about schooling options can improve secondary schooling choice, using a field experiment with 3,000 Kenyan students and their parents. The intervention randomized individual informational meetings for 8th grade students across 183 schools, further randomizing whether parents were included in the meeting for a facilitated conversation about school choices. The informational meetings involved a detailed guided discussion about characteristics of available secondary school options including school fees, commuting distances and school quality. Results show that the informational meetings led students to apply (and enroll in the case of low-income students) to more commutable secondary schools. Including the parent in the meeting led parents to learn about costs and students to ultimately enroll in lower cost schools, generating to meaningful savings.

These findings suggest that informational meetings with facilitated conversations between students and their parents can be an effective way to address information and communication gaps affecting secondary school choice in low-income settings. Such interventions can be easily employed by education authorities at scale – the meetings I conducted were very low-cost, short[18], and can potentially be scaled by teachers as part of the school curriculum going forward. Therefore, they can be an important channel to improve educational outcomes in low-income countries going forward. In future work, I plan to track secondary school performance, attendance, and eventual graduation in my sample to study whether the meetings affected longer run measures of student-school match. Tracking attendance will be key for assessing whether the initial cost-savings leads to a lower likelihood of dropping out of secondary school, and how this varies by gender and socio-economic status.

[18]Roughly 20 minutes each.

1.8 Main Tables and Figures

Table 1.1: Parent Knowledge about Tuition Costs

	Panel A: Parent Knowledge about Tuition Costs				
	(1) National Cost	(2) Extra County Cost	(3) County Cost	(4) Sub-County Cost	(5) Mean Cost
Group 2: Student and Parent Meeting	.3***	.19***	.22***	.19***	.23***
	(.02)	(.03)	(.03)	(.03)	(.02)
Group 1: Student Meeting	-.0014	.0076	.00016	.013	.0048
	(.02)	(.02)	(.02)	(.03)	(.02)
Control Mean	.23	.33	.43	.61	.40
F-test p-val ($\beta_1 \neq \beta_2$)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
N	2952	2952	2952	2952	2952

	Panel B: Student and Parent Knowledge about Application Process					
	Share Correct No. Schools		Share Correct Exam Marks		Knowledge Index (SD units)	
	(1) Student	(2) Parent	(3) Student	(4) Parent	(5) Student	(6) Parent
Group 2: Student and Parent Meeting	.58***	.33***	.15***	.21***	1.6***	1.2***
	(.03)	(.02)	(.02)	(.02)	(.09)	(.07)
Group 1: Student Meeting	.62***	-.0034	.15***	.025	1.7***	.028
	(.03)	(.01)	(.02)	(.02)	(.08)	(.05)
Control Mean	.17	.05	.79	.58	.00	.00
F-test p-val ($\beta_1 \neq \beta_2$)	.2	<0.001	.84	<0.001	.21	<0.001
N	2952	2952	2952	2940	2952	2952

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for sample stratification: sub-county of school and primary school average test score (above or below the Busia County mean). Standard errors are clustered at the primary school level.

Table 1.2: Student and Parent Preferences for School Category

	Panel A: Parent Preferences across School Tiers			
	(1) National	(2) Extra County	(3) County	(4) Sub-County
Group 2: Student and Parent Meeting	-.052**	.046**	.02	-.026
	(.03)	(.02)	(.02)	(.02)
Group 1: Student Meeting	-.024	.013	-.0096	.014
	(.02)	(.02)	(.02)	(.02)
Control Mean	.45	.16	.16	.19
F-test p-val ($\beta_1 \neq \beta_2$)	.29	.11	.14	.05
Number Observations	2952	2952	2952	2952
	Panel B: Student Preferences across School Tiers			
	(1) National	(2) Extra County	(3) County	(4) Sub-County
Group 2: Student and Parent Meeting	-.07**	.044**	.024	-.0077
	(.03)	(.02)	(.02)	(.02)
Group 1: Student Meeting	-.019	.038*	-.016	-.012
	(.03)	(.02)	(.02)	(.02)
Control Mean	.54	.22	.14	.11
F-test p-val ($\beta_1 \neq \beta_2$)	.087	.77	.018	.75
N	2952	2952	2952	2952

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for sample stratification: sub-county of school and primary school average test score (above or below the Busia County mean). Standard errors are clustered at the primary school level.

Table 1.3: Student and Parent Alignment of Preferences

	Knowledge of Preferences All Schools		Knowledge of Preferences Busia Schools		Parent - Child Alignment	
	(1) Child	(2) Parent	(3) Child	(4) Parent	(5) All	(6) Busia
Group 2: Student and Parent Meeting	.11***	.12***	.21***	.21***	.15***	.17***
	(.02)	(.01)	(.02)	(.02)	(.01)	(.01)
Group 1: Student Meeting	.012	-.016	.005	-.03*	.014	.0075
	(.01)	(.01)	(.02)	(.02)	(.01)	(.01)
Control Mean	.31	.28	.36	.33	.25	.36
F-test p-val ($\beta_1 \neq \beta_2$)	<.001	<.001	<.001	<.001	<.001	<.001
N	2952	2952	2952	2952	2952	2952

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for sample stratification: sub-county of school and primary school average test score (above or below the Busia County mean). Standard errors are clustered at the primary school level.

Table 1.4: Parental Attitudes Towards Schooling

	Parental Confidence					Join Secondary				
	(1) Overall	(2) Below Med Income	(3) Above Med Income	(4) Below Med Educ	(5) Above Med Educ	(6) Overall	(7) Below Med Income	(8) Above Med Income	(9) Below Med Educ	(10) Above Med Educ
Group 2: Student and Parent Meeting	.092**	.1	.035	.19***	-.022	.099**	.13*	.083	.22***	.0055
	(.04)	(.07)	(.06)	(.06)	(.07)	(.05)	(.07)	(.07)	(.07)	(.06)
Group 1: Student Meeting	.044	.079	-.028	.086	-.023	.047	.034	.07	.078	.054
	(.05)	(.07)	(.07)	(.06)	(.07)	(.04)	(.07)	(.06)	(.07)	(.05)
Control Mean	-.01	-.06	.06	-.07	.10	-.01	-.08	.04	-.09	.09
F-test p-val ($\beta_1 \neq \beta_2$)	.27	.77	.38	.085	.98	.23	.2	.84	.044	.44
N	2861	1135	1306	1341	1279	2858	1133	1305	1338	1279

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for sample stratification: sub-county of school and primary school average test score (above or below the Busia County mean). Standard errors are clustered at the primary school level.

Table 1.5: Distance to School

	Commutable			GPS Distance		
	(1) Student Survey	(2) Parent Survey	(3) Final Admin	(4) Student Survey	(5) Parent Survey	(6) Final Admin
Group 2: Student and Parent Meeting	.16***	.09*	.083	-1.3***	-.5*	-.2
	(.04)	(.05)	(.05)	(.32)	(.29)	(.82)
Group 1: Student Meeting	.15***	.054	.093*	-1.1***	-.29	.003
	(.04)	(.04)	(.06)	(.32)	(.29)	(.73)
Control Mean	.19	.28	.21	6.77	5.35	6.46
F-test p-val ($\beta_1 \neq \beta_2$)	.75	.47	.87	.63	.33	.81
N	2928	2825	2903	2862	2767	2831

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for sample stratification: sub-county of school and primary school average test score (above or below the Busia County mean). Standard errors are clustered at the primary school level.

Table 1.6: Category of Enrollment

	(1) National Enroll	(2) Extra County Enroll	(3) County Enroll	(4) Subcounty Enroll	(5) Private Enroll	(6) Total Enroll
Group 2: Student and Parent Meeting	-.0052	-.02	-.016	.062**	.0012	.017
	(.01)	(.01)	(.01)	(.03)	(.00)	(.02)
Group 1: Student Meeting	.0033	.0033	-.031**	.042	-.0027	.011
	(.01)	(.02)	(.02)	(.03)	(.00)	(.02)
Control Mean	.02	.12	.11	.54	.01	.81
F-test p-val ($\beta_1 \neq \beta_2$)	.37	.14	.27	.46	.27	.79
N	2952	2952	2952	2952	2952	2952

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for sample stratification: sub-county of school and primary school average test score (above or below the Busia County mean). Standard errors are clustered at the primary school level.

Table 1.7: School Fees of Enrolled School

	Fees of Enrolled School		
	(1) Overall Sample	(2) Below Med Income	(3) Above Med Income
Group 2: Student and Parent Meeting	-19**	-29**	-5.4
	(8.42)	(12.04)	(11.67)
Group 1: Student Meeting	-9.4	-16	-4.3
	(9.74)	(12.71)	(12.04)
Control Mean	187.62	202.55	175.20
F-test p-val ($\beta_1 \neq \beta_2$)	.31	.22	.93
N	2344	904	1097

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for sample stratification: sub-county of school and primary school average test score (above or below the Busia County mean). Standard errors are clustered at the primary school level.

Table 1.8: Distance to Enrolled School

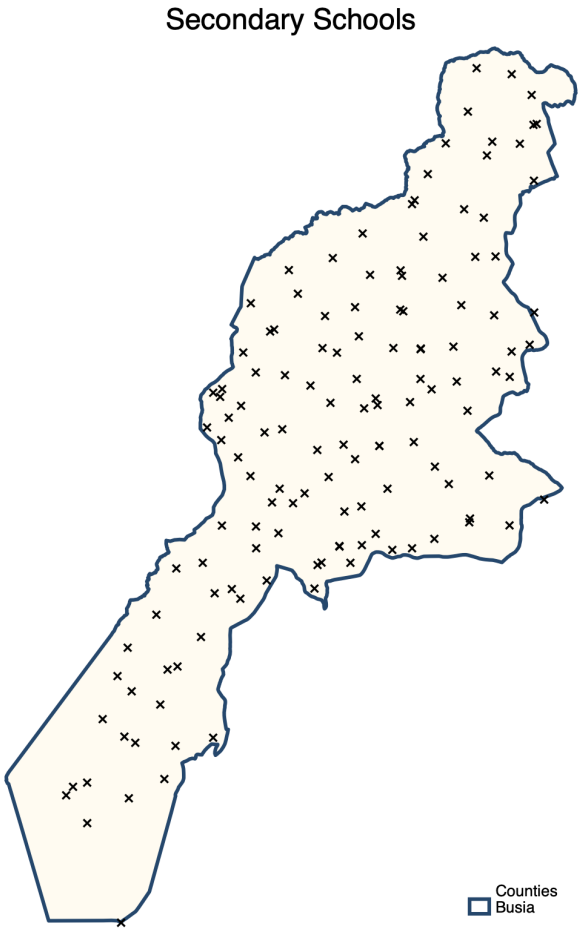
	Commutable			GPS Distance		
	(1) Overall Sample	(2) Below Med Income	(3) Above Med Income	(4) Overall Sample	(5) Below Med Income	(6) Above Med Income
Group 2: Student and Parent Meeting	.0039	.13**	-.083	-.12	-.65	.43
	(.05)	(.06)	(.06)	(.41)	(.47)	(.46)
Group 1: Student Meeting	.025	.11*	-.055	.21	-.36	.9**
	(.04)	(.06)	(.05)	(.38)	(.50)	(.41)
Control Mean	.60	.54	.65	4.65	5.00	4.26
F-test p-val ($\beta_1 \neq \beta_2$)	.66	.78	.64	.29	.46	.29
N	1695	699	754	1655	684	733

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for sample stratification: sub-county of school and primary school average test score (above or below the Busia County mean). Standard errors are clustered at the primary school level.

Table 1.9: Preference Parameters

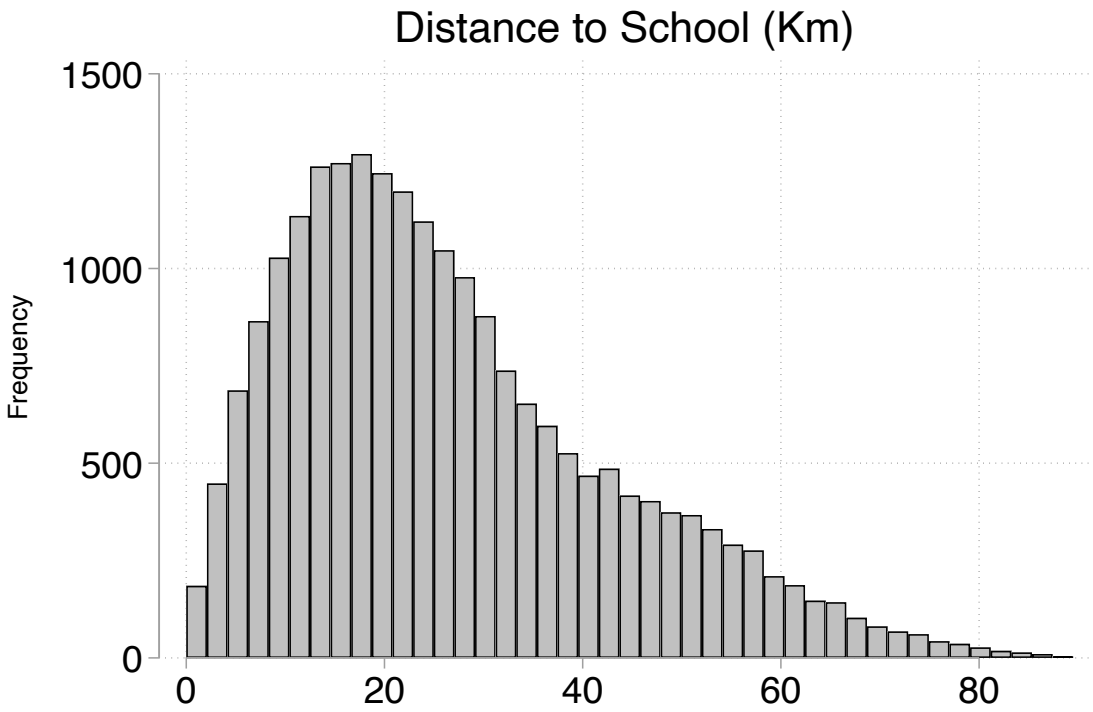
	Panel A: Likelihood Ratio Test		
	χ^2	Prob $> \chi^2$	
Application	2242.74	< 0.001	
N (schools)	80		
	Panel B: Logit Model Coefficients		
	Group 1	Group2	Group3
Distance	-.24***	-.25***	-.25***
	(.005)	(.005)	(.005)
Performance	.58***	.7***	.62***
	(.043)	(.038)	(.05)
N	2899	2899	2899
Ratios ($-\frac{\beta_2}{\beta_1}$)	0.41 pt/km	0.35 pt/km	0.4 pt/km

Figure 1.1: Secondary Schools in Busia County



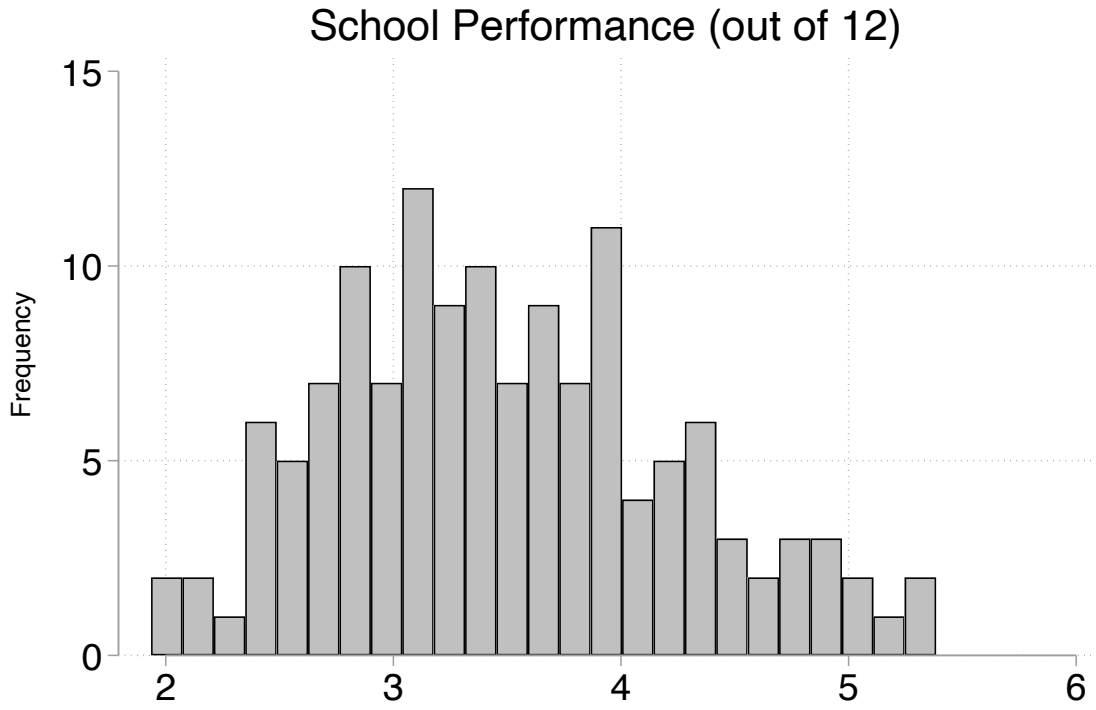
Notes: This figure plots the secondary school choices in Busia County.

Figure 1.2: Density Function: Distance to School



Notes: This figure plots the distribution of distance between home primary school and each subcounty and county secondary school in Busia County in kilometers.

Figure 1.3: Density Function: School Performance



Notes: This figure plots the distribution of performance of each between home primary school and each subcounty secondary school. Units are a standardized score from 1 to 12 representing the grade range from an F to an A. Each one point is interpreted as a one grade shift - e.g. from a B+ to an A-.

Chapter 2

Promoting Child Reading in Kenya: Estimating the Demand for Storybooks

2.1 Introduction

Reading with young children is believed to be an especially important investment in human capital, preparing children for literacy and teaching them the importance of learning (Curenton and Justice (2008), Gove and Cvelich (2011), Walker et al. (1994), Zhang (2006). However, many households in western Kenya lack reading materials for young children, and are unaware of the benefits of early reading even if they do have age appropriate books on hand.

In this paper, we estimate the demand for storybooks amongst 1,000 Kenyan households with children aged 3 to 6 years old from the Kenya Life Panel Survey (KLPS sample). The intervention involved highlighting the benefits of early childhood reading to parents and offering them the chance to buy children's reading books at a subsidized price, where the subsidized price was randomized across three levels. We found that demand for reading materials was very high (97% overall), and downward sloping with price. Willingness to pay for storybooks was higher in urban areas, but did not differ by household income levels or gender of parent or child. These findings suggest that lack of access to relevant educational materials may play an important role in explaining lower early-childhood human capital investment in Kenya.

The KLPS-4 data collection was conducted across two representative waves. The storybook experiment in the first wave focused on eliciting demand for storybooks and measuring effects of reading encouragement on reading practices and investment in education; the storybook experiment in the second wave focused on measuring effects of reading encouragement on reading practices, investment in education, and performance on vocabulary assessments. This chapter focuses on estimating the demand for storybooks. Separate ongoing work will

estimate storybook effects, pooled across the two waves.

The remainder of the paper is structured as follows: Section 2.2 provides an overview of the sample and context, Section 2.3 discusses the experimental design, Section 2.4 presents the main empirical results, and Section 2.5 concludes.

2.2 Sample and Context

The sample for this study is part of the Kenya Life Panel Survey (KLPS): a longitudinal dataset that contains educational, health, nutritional, demographic, labor market, and other information for nearly 10,000 Kenyan adults, spanning from their time in primary school up through early adulthood. The KLPS sample comprises individuals who participated in one of two previous randomized NGO programs: one which provided deworming medication to primary school students during 1998–2003 (known as the Primary School Deworming Program, or PSDP; Miguel and Kremer (2004)) and one which provided merit scholarships to upper primary school girls in 2001 and 2002 (known as the Girls' Scholarship Program, or GSP; Kremer, Miguel and Thornton (2009)). An approximately 20% subset of these individuals also participated in the vocational training and cash grants programs during 2009-2014 (Hicks et al. (2013)).

The fourth round of the KLPS data collection effort (KLPS-4) was conducted between 2017 and 2022 and focused on the subsets of the KLPS sample who participated in the PSDP or the vocational training and cash grants interventions. The KLPS-4 data collection consisted of two separate activities. First, the E+ Module survey data collection gathered detailed economic information on KLPS (adult) respondents. The second data collection activity included administration of the I Module, PC Module, and a series of child assessments in order to collect information on a wide variety of outcomes for KLPS (adult) respondents as well as a subset of their children aged 3-9 (KLPS-Kids) and the primary caregivers (PCs) of these children. For both these activities, data was collected in two representative waves [1].

The sample for the reading promotion intervention is a subset of those participating in the KLPS-Kids modules. The KLPS-Kids modules were designed to capture information on children aged 2.5 to 8.5 years old as of the date of launch of the survey wave.[2] Up to one eligible child per age group was selected per KLPS parent for inclusion in the KLPS-Kids

[1]Wave 1 of the KLPS-Kids activity launched in September 2018 and ran through March 2020; Wave 2 of the KLPS-Kids activity launched in June 2021 and ran through December 2021

[2]For example, Wave 1 was launched in September 2018, and children who were 2.5 to 8.5 years old as of September 2018 are included in the wave 1 eligibility sample. For the purposes of the KLPS-Kids activity, we define two age groups: pre-school aged children (aged 3 years to 5 years 11 months old, or 36-71 months old) and school-aged children (aged 6 years to 8 years 11 months old, or 72-107 months old). Age group distinctions were made in part to align with the transition from pre-school and kindergarten to primary school between ages 5 and 7, and in part to align with the appropriate ages corresponding to our battery of assessments.

sample. In cases in which the adult has more than two children within an age group, children to be interviewed were randomly chosen by the survey software (SurveyCTO)[3].

While the intervention aimed to promote child reading among all young children of a KLPS parent, and intervention materials were not child-specific, for the purposes of administering the intervention, tracking, and assessment, we designated a specific storybook child for eligible KLPS parents. The eligible sample for the reading promotion intervention in Wave 1 of KLPS-4 is the sub-sample of KLPS parents with at least one sampled child between 2.5 years and 6 years of age at the time of Wave 1 survey launch (September 2018). In cases where a KLPS parent had more than one sampled child in this age range, we designated the 3 to 5 year old child as the storybook child. The intervention was administered as part of the PC Module to the Primary Caregiver associated with the storybook child, and was framed around promoting reading for all 3 to 6 year old children.

This storybook experiment was conducted across the two KLPS waves: Wave 1 of the RCT was designed to (a) elicit demand for storybooks and (b) estimate the impacts of a reading encouragement on reading practices and human capital investment, and Wave 2 estimates the impact on reading practice, human capital investment, and vocabulary.

2.3 Experimental Design

The first parts of this section introduce the child reading promotion intervention and then treatment groups. Next, we describe the randomization into treatment groups and balance checks. Finally, we provide information on the timeline and data collected.

2.3.1 Child Reading Promotion Intervention

Our experiment consisted of three treatment groups and one control group. In Treatment Groups 1 and 2, caregivers were offered a small amount of cash plus the opportunity to purchase a subsidized storybook. In Treatment Group 3, the caregiver was offered a free storybook (full subsidy). All three treatment groups also received an informational script and poster, as well as an SMS reminder message described above. The fourth group was the control group, which received no storybook offer, informational materials, or SMS reminder message.

The child reading promotion intervention content is summarized below:

- A small cash grant (up to KES 300 (approximately USD 3.00) and an offer to purchase a subsidized storybook at a randomly-selected price OR an offer of a free storybook;

[3]We refer to children who are included in the KLPS-Kids sample based on the above eligibility criteria and sampling methodology as sampled children. These sampled children and their primary caregivers were later contacted for participation in the KLPS-Kids data collection activity. This data collection activity consisted of (1) administering age-appropriate assessments to each child to measure cognitive and non-cognitive abilities and (2) administering a Primary Caregiver Module (PC Module) to the child's primary caregiver.

- An informational script on the benefits of reading to small children and strategies for doing so;
- A poster summarizing the informational script;
- An SMS reminder message to encourage reading sent an average of 3 months after the intervention.

The storybooks offered in the intervention were printed by Oxford University Press – East Africa, and included short stories with animations appropriate for young children aged 3 to 6. We offered six different storybooks that were selected based on pilot work and focus group discussions with enumerators. Two of the books were in English and the remaining four were in Kiswahili. These books can be purchased at textbook stores in larger urban areas or cities, including Busia Town, Kisumu, or Nairobi. Please see Appendix B.2 for the script, poster, and SMS reminder message. The instructions in the script were specifically tailored to account for the possibility that some parents may not be literate, and focused on the ways that parents can encourage familiarity with and love for books by creating stories based on the pictures, and engaging children with questions about the story. The poster included drawings of parents reading to their children, and summarized the key points of the information script. It also served as a later reminder for parents to continue reading to their children.

For both Treatment Groups 1 and 2, caregivers were first informed that they had been randomly selected to receive the monetary gift. The survey enumerator then provided information on the benefits of reading, and presented an opportunity to purchase the storybooks at a randomly-selected subsidized price[4].

The four groups are summarized in the table below:

Table 2.1: Intervention

	Group 1	**Group 2**	**Group 3**	**Control**
KES 150 + 1 Book Offer (1/3 H, 1/3 M, 1/3 L)	X			
KES 300 + 2 Book Offer (1/3 H, 1/3 M, 1/3 L)		X		
Free Book			X	
Poster and Informational Script	X	X	X	
SMS Reminder Message	X	X	X	

[4]Both Treatment Group 1 and 2 received the cash and opportunity to purchase a subsidized storybook in advance of the informational script and poster. Our main measure of demand was thus elicited in advance of the informational intervention. If the respondent changed their mind and decided to purchase or accept a storybook after hearing the information, we allowed them to purchase or accept, and recorded the book title.

2.3.2 Eliciting Demand through Randomized Subsidies

In **Treatment Group 1**, caregivers were given KES 150 (approximately USD 1.50) with an offer to purchase up to one storybook at a randomly-selected subsidized price. In **Treatment Group 2**, caregivers were given KES 300 (approximately USD 3.00) with an offer to purchase up to two storybooks, each at a subsidized price[5]. In **Treatment Group 3**, the final book price is KES 0, a 100 percent (full) subsidy.

The market price of a storybook is KES 195 (approximately USD 1.95). In both Treatment Groups 1 and 2, one of three subsidy levels were randomly offered: Low Subsidy (Subgroup L), Medium Subsidy (Subgroup M), or High Subsidy (Subgroup H). In Subgroup L, the final book price is KES 150, which is about a 25 percent subsidy. In Subgroup M, the final book price is KES 100, about a 50 percent subsidy. In Subgroup H, the final book price is KES 50, about a 75 percent subsidy. These subsidy levels are randomly assigned, and each caregiver had an equal chance of receiving each subsidy level. The caregiver received any funds not used to purchase the book via M-Pesa within 10 days after the survey.

2.3.3 Randomization and Data Collection

Assignment to treatment groups was done as follows: the full sample of KLPS Wave 1 adults were assigned to one of the four groups (three treatment groups and one control group)[6]. Randomization was stratified by three adult characteristics: PSDP or GSP group[7], grade in school at baseline, and gender.

At the time of the I Module survey, enumerators determined whether KLPS respondents had children eligible for the KLPS-Kids activity. For those with eligible children, sampled children were selected and information was collected about their primary caregivers. From this, the storybook child was determined, and the appropriate child reading promotion intervention for the KLPS parent's treatment assignment was implemented as part of the PC Module for the corresponding primary caregiver.

KLPS-4 serves as a baseline for the child reading promotion intervention. Immediately before the intervention, a detailed Primary Caregiver Module was administered to each primary caregiver. This module asked detailed questions about the KLPS child, primary caregiver, and household environment. Particular sections include: caregiver characteristics, child health and development, child sleep patterns, home environment, and a child strengths and difficulties questionnaire.

[5]We restricted the number of books a caregiver can purchase so that they can fund the entire purchase with the cash we give to them.

[6]Assignment to treatment groups was done this way because children were not identified until the time of the I-module survey

[7]There are three PSDP/ GSP groups used for stratification: i) PSDP treatment (Groups 1 and 2), ii) PSDP control (Group 3), iii) GSP sample.

2.4 Results

In this section we report our main empirical specification and results as specified in our pre-analysis plan (Miguel, Walker and Hicks (2019)), with a focus on the effect of the intervention on take-up of storybooks. Next we explore complementarities with other human capital interventions and heterogeneity by household characteristics. The following sections highlight key results.

2.4.1 Main Empirical Specification

The estimation strategy uses intention-to-treat (ITT) estimates of treatment group assignment on the outcomes of interest.

First, we look at the binary take-up decision for storybooks. We will estimate the following regression specification for Treatment Groups 1, 2 and 3:

$$Y_i = \alpha + \beta_1 T_i^H + \beta_2 T_i^M + \beta_3 T_i^L + X_i'\lambda + \epsilon_i \tag{2.1}$$

where Y_i is an indicator variable reflecting the take-up decision of household i, T_i^H, T_i^M, and T_i^L indicate whether the KLPS respondent i was randomly assigned to the high, medium, or low subsidy arm, respectively, β_1, β_2, β_3 capture the subsidy impacts on take-up relative to take-up of the fully subsidized storybook for Treatment Group 3 (free book). Our main specification includes a vector of control variables, X_i, containing the variables used for stratification during storybook treatment randomization: PSDP or GSP treatment group, gender of KLPS parent, and baseline (1998) grade of KLPS parent. We also include an indicator for PSDP or GSP program participation, gender of interviewer; months elapsed since the start of the survey wave; and an indicator for inclusion in the vocational education/ cash grant sample as well as treatment groups within the intervention.

Second, we look at take-up in terms of the number of storybooks purchased as a function of the subsidy level in Treatment Group 2. We restrict attention to Treatment Group 2 as it is the only group with the opportunity to purchase more than one storybook. We estimate:

$$Y_i = \alpha + \gamma_1 T_i^M + \gamma_2 T_i^L + X_i'\lambda + \epsilon_i \tag{2.2}$$

where Y_i is an indicator variable reflecting the number of storybooks purchased (Group 2 only), T_i^M and T_i^L indicate whether the KLPS respondent i was randomly assigned to the medium or low subsidy arm, respectively, X_i is a vector of containing the variables used for stratification during storybook treatment randomization and other controls (same as described in Equation 2.1 above).

2.4.2 Demand for Storybooks

We examine two main outcomes in our demand analysis. The first is the binary decision to purchase or accept a storybook, pooled across all groups[8]. The second is the number of

[8]Purchase in the case of Groups 1 and 2 and accept in the case of Group 3

storybooks purchased (from 0 to 2), examined for Treatment Group 2 only.

First, we examine average take-up across group. Results indicate that there is a high demand for storybooks in the sample. Overall demand is 97 percent across all three groups, with 95 percent of Group 1 purchasing a storybook, 93 percent of Group 2 purchasing at least one storybook, and 100 percent of Group 3 accepting a free storybook (Table 2.2)[9].

Demand is downward sloping with price. First, Figure 2.1, Panel A plots average demand across subsidy level – including both the decision to purchase or accept any book (Groups 1-3) and the decision to purchase two books (Group 2 only). 99 percent of households purchase at least one book at the highest subsidy level with a price of 50 Kenyan shillings (pooled across Groups 1 and 2), 92 percent purchase at the medium subsidy with a price of 100 Kenyan shillings, and 91 percent purchase at the lowest subsidy with a price of 150 Kenyan shillings. Second, we plot the proportion of Group 2 that purchase two books at each subsidy level. 93 percent purchase two books at the highest subsidy level, 86 percent purchase two books at the medium subsidy level, and 72 percent purchase two books at the lowest subsidy level, confirming that demand falls as the price increases. Figure 2.1, Panel B plots heterogeneity by urban status of residence with "urban" defined as living in Nairobi, Mombasa, or Kampala. Results indicate that demand is much higher for urban households.

Turning to the estimating equations (Equation 2.1 and Equation 2.2), we examine take-up in our regression framework with the binary take-up indicator and number of books as the outcome variables. Paralleling the descriptive results, Columns 1 and 2 of Table 2.3 indicate that demand decreases with price. Column 1 indicates that take-up is lower by 11 percentage points for medium subsidy and 12 percentage points for the low subsidy group, relative to a free storybook. Similarly, number of books purchases is 18 percentage points lower for the medium subsidy and 32 percentage points lower for the low subsidy groups relative to the high subsidy group. Columns 3 and 4 plot interactions with urban status of residence. Column 3 indicates that demand is higher for urban households, paralleling the descriptive results in Figure 2.1. Table B.1.1 shows the same regression specification with weights taking into account the two-stage tracking strategy of KLPS. Magnitudes and significance are similar in specifications with and without weights.

Next, we explore whether there are complementarities between human capital interventions previously provided to KLPS respondents and the demand they (or the primary caregivers of their children) have for storybooks. We estimate a specification interacting treatment status with PSDP treatment status (Table B.1.2) and another specification interacting treatment status with vocational education or SCY treatment status (Table B.1.3.) There does not appear to be significant heterogeneity by PSDP, Voced, or SCY treatment status.

Beyond heterogeneity by urban status discussed in Section 2.4.2 above, we also prespecified heterogeneity by median income, child gender, gender of parent, and number of

[9]In Group 1, 100 percent of the high subsidy group, 94 percent of the medium subsidy group, and 92 percent of the low subsidy group purchase a storybook, respectively. Similarly, in Group 2, 97 percent of the high subsidy group, 91 percent of the medium subsidy group, and 90 percent of the low subsidy group elect to purchase a storybook

children in household. There are no statistically significant differences in demand by these characteristics, as shown in Tables B.1.4, B.1.5, B.1.6, and B.1.7.

2.5 Conclusion

On average, demand for storybooks is high and downward sloping, with highest demand among the urban areas. The information provided in the intervention may inform households of the value of reading to young children. An alternative mechanism is that households value storybooks, but most households are unable to access them in their rural places of residence. Thus the intervention bridges this gap by not only offering households books and information about reading, but also by increasing the supply of storybooks available to households.

Ongoing work in this sample follows up with these households to assess the effectiveness of access to early-childhood reading materials on reading practices and school attendance of children of school going age. We further plan to estimate effects on outcomes of interest including child reading motivation and cognitive ability, and parental self efficacy.

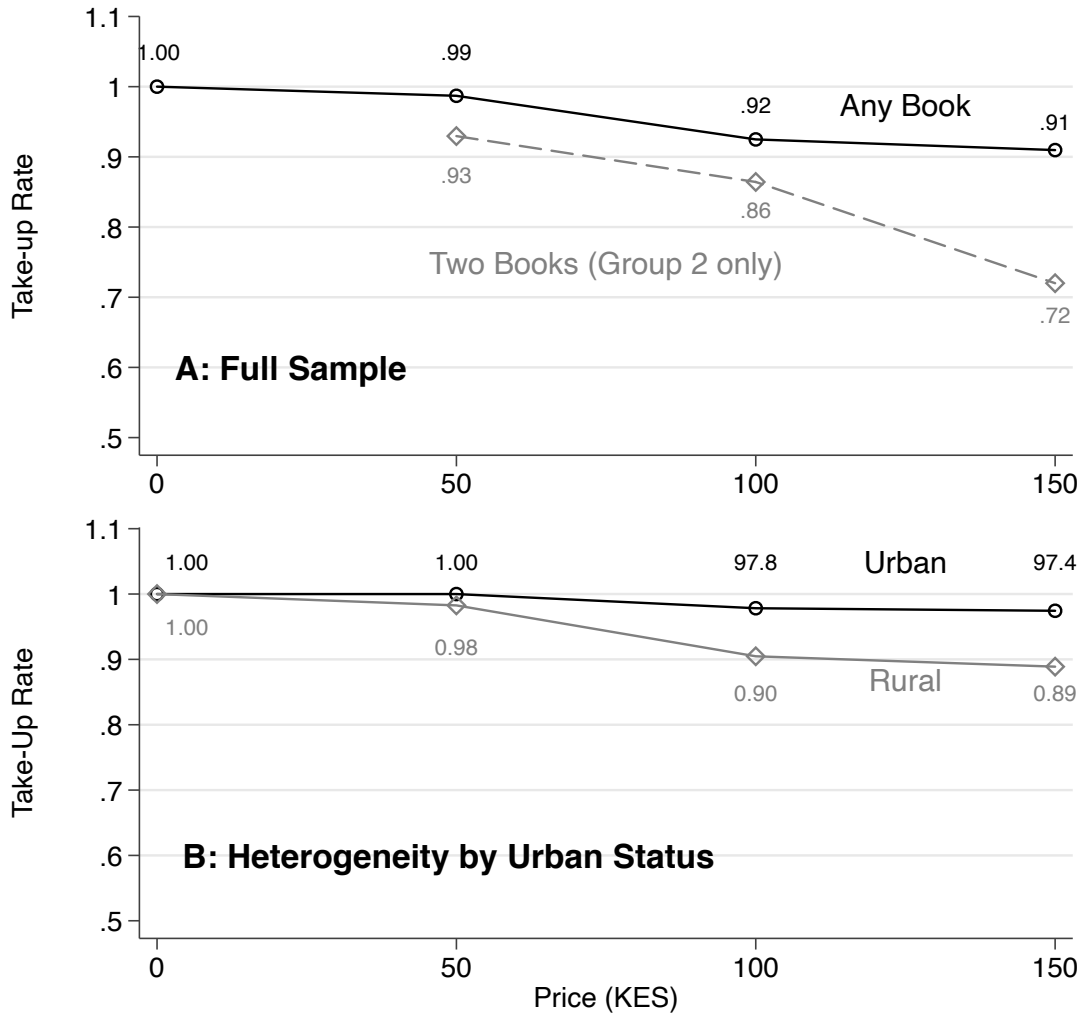
2.6 Main Tables and Figures

Table 2.2: Take-Up Proportion by Subsidy Level

	Mean	SD	Min	Max	Obs
Group 1					
Total	0.95	0.22	0.0	1.0	248
High Subsidy	1.00	0.00	1.0	1.0	81
Medium Subsidy	0.94	0.24	0.0	1.0	84
Low Subsidy	0.92	0.28	0.0	1.0	83
Group 2					
Total	0.93	0.26	0.0	1.0	245
High Subsidy	0.97	0.16	0.0	1.0	73
Medium Subsidy	0.91	0.29	0.0	1.0	89
Low Subsidy	0.90	0.30	0.0	1.0	83
Group 3					
Total	1.00	0.00	1.0	1.0	479
Overall Take-Up	**0.97**	**0.17**	**0.0**	**1.0**	**972**

Notes: This table plots take up summary statistics by storybook group and subsidy level, where take-up is defined as the binary decision to purchase or accept at least one book.

Figure 2.1: Storybook Demand



Notes: Panel A of this figure visually displays demand by plotting (i) the binary take-up decision as a function of storybook price for Treatment Groups 1, 2 and 3 (Any Book) and (ii) whether or not respondent took up two books in Treatment Group 2. Panel B plots heterogeneity by urban status, with urban defined as those living in Nairobi, Mombasa, or Kampala.

Table 2.3: Storybook Take-Up

	(1) Take-Up	(2) # Books	(3) Take-Up	(4) # Books
High Subsidy (Price = KES 50)	-.049		-.051	
	(.04)		(.04)	
Medium Subsidy (Price = KES 100)	-.11***	-.18**	-.13***	-.19*
	(.04)	(.09)	(.04)	(.11)
Low Subsidy (Price = KES 150)	-.12***	-.32***	-.14***	-.27**
	(.04)	(.09)	(.04)	(.11)
Urban			-.003	.12
			(.00)	(.08)
Urban x High Subsidy			.022	
			(.01)	
Urban x Med Subsidy			.078**	.03
			(.03)	(.17)
Urban x Low Subsidy			.088**	-.17
			(.04)	(.18)
Weights	None	None	None	None
F-test for Subsidy Level Terms (p-value)	.00021	.0015	.0099	.37
Number Observations	972	245	965	242
Sample	Group 1-3	Group 2	Groups 1-3	Group 2

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for stratification during storybook treatment randomization: PSDP or GSP treatment group, gender of KLPS parent, and baseline (1998) grade of KLPS parent. We also include an indicator for PSDP or GSP program participation, gender of interviewer; months elapsed since the start of the survey wave; and an indicator for inclusion in the vocational education / cash grant sample as well as treatment groups within the intervention. Standard errors are clustered at the 1998 school level.

Chapter 3

Learning from Home during the Covid-19 School Closures: Evidence from Kenya

The Covid-19 pandemic has had serious implications for education. Many countries across the world shut down schools completely for extended periods of time. School closures have impacted 1.5 billion students across almost 170 countries[1]. Students in low-income countries were particularly impacted since schools were less likely to be able to shift to remote teaching technologies.

There could be considerable variation of impacts within low-income countries too – students from richer households could be impacted less because they may have more access to remote learning opportunities through internet-connected devices. This could potentially widen the learning gap between rich and poor students. Also, female students could potentially be impacted more if they are disproportionately burdened with household chores or childcare responsibilities, further widening gender disparities.

In this paper, I study the differential effects of school closures in low-income countries on student learning by household demographics, and shed light on the possible mechanisms involved. I do this using data from a detailed household survey of nearly 3,000 8th grade students and their parents in Kenya, during the period of Covid-19 school closures in the country.

Schools in Kenya were closed for half of the 2020 school year, with out of school periods ranging from 5 to 8 months depending on students' grade[2]. Despite a number of government initiatives to encourage studying at home during the lockdown, it was unclear the extent to which students from lower socio-economic status households would have a home environment conducive for learning. As part of an ongoing study on education and the transition from primary to secondary school (Bonds (2020)), the study team administered a phone survey to a

[1] https://en.unesco.org/covid19/educationresponse

[2] Grade 4, Grade 8, and Grade 12 only remained closed for 5 months as students had to prepare for their end year exams, while the remaining grades stayed closed for 8 months.

sample of 2,973 8th graders and their parents, randomly sampled from Busia County primary schools. This survey collected detailed data on learning from home, parental involvement in learning, and parental confidence in helping their child's learning during the period of school closures.

First, I find differences in studying at home and parental investment in education by household income and educational status. Students from more educated and higher income households received significantly more help from parents with their schoolwork and were more likely to be exempted from chores so that they could study. However, there is no evidence suggesting differences in at-home learning environment across child gender. If anything, female students were more likely to attend tuition lessons and classes at school (although the sample of students to attend classes at school is small to begin with). Taken together, these results suggest that while gender gaps in schooling access may be closing at the primary school level, there may still be significant gaps in equality by socio-economic status that are particularly exacerbated during out of school periods such as Covid-19.

3.1 Sample and Background

3.1.1 Sample

The Covid-19 follow-up phone survey was conducted with an existing sample of Grade 8 students and their parents, that were randomly selected from 183 primary schools in Busia County. Between May and July of 2020 the study team followed up with 2,973 student-parent pairs (96.6% of the baseline sample). The interview assessed student learning at home, study materials used, parental investment in schooling, and overall household economic status.

The study sample is generally rural and low income, with low levels of parental educational attainment. On average, households earned 80 USD in the month prior to the survey. Less than half of parents in the sample completed primary school, and 17 percent completed secondary school. Although Covid-19 infections were relatively low in the region during the survey period, in-person business and other activities were restricted. 77 percent of respondents report food security concerns, and skip 2.5 to 3 meals per week. 81 percent of the sample has electricity at home, including via solar or a generator.

Kenyan schools closed in mid-March of 2020 and remained closed for nearly the rest of the school year, opening in October 2020 for 4th, 8th, and 12th graders and in January 2021 for the remaining grades. Although schools were officially closed, a small number of schools continued to hold formal classes. A more common substitute for formal classes were tuition lessons held at parents or teachers home, in which a teacher provided classes or review sessions for students for a small fee (ranging from approximately 1 to 2 USD per 2 hour session). Many students instead opted to self-study from home – using either materials and books provided by their school or free education technology (EdTech) resources provided by the Kenyan government to promote learning from home. The free EdTech resources included lessons on radio, television, and YouTube as well as free online textbooks and other

electronic materials on a website called "Kenya Education Cloud". Safaricom, a mobile service provider, and Eneza Education partnered to offer SMS (text message) lessons– free for the first 2 months.

3.2 Results

The focus of this analysis is measuring 1) student access to learning at home and 2) parental involvement in their child's learning during the Covid-19 school closures and how these outcomes correlate with demographic characteristics including household income, parental education, child age, and child baseline school performance. The following sections highlight key results.

3.2.1 Student Learning at Home

I analyze four measures of student learning at home: the number of days (in the last 7 days) that student studied at home, number of days student attended tuition classes at a teacher or parent's house[3], and number of days student attended classes at school. Finally, I examine a binary indicator for whether or not the student used at least one of the available EdTech platforms at home in the last 7 days [4].

Students reported studying at home most days of the week, spending an average of 5.4 out of 7 days studying (Table 3.1 Column 1). Students with higher baseline performance and more educated parents are significantly more likely to study at home: a one standard deviation increase in baseline test score is associated with 0.14 additional days of studying and each additional year of parental education is associated with a small but statistically significant increase of 0.016 days of home studying. Students reported attending tuition lessons and formal classes at school substantially less than self-studying, spending an average of 0.8 days per week at tuition classes and 0.16 days at school per week (Table 3.1 Columns 2 and 3). Students from higher income households were significantly more likely to attend tuition classes: each additional 100 USD of income is associated with 0.12 additional days of classes per week; however there was no difference in attending classes at school by income. Girls were significantly more likely to attend classes at school (0.07 additional days per week) during the lockdown period than boys, though the magnitude is small.

Finally, 67 percent of students used at least one of the EdTech platforms to study at home in the 7 days preceding the survey. Better off households were more likely to access these platforms during the lockdown – households with electricity from at least one source (generator, battery, or Kenya power connection) were 16 percentage points more likely to access an EdTech platform.

[3]Tuition classes are classes offered by teachers or parents outside of school for a fee, similar to tutoring in the U.S. While students may attend tuition at any point of the school year, it is especially popular during holidays or other school breaks.

[4]This includes lessons via radio, television, mobile/internet, or SMS.

3.2.2 Parent Involvement in Child Learning

I analyze four measures of parental involvement in their child's learning (Table 3.2): number of days (in the last 7 days) that parents helped child with their schoolwork, the number of days parents exempted child from household chores so that they could focus on their studies, the number of days that parent discussed school or learning with their child, and parents' assessment of the likelihood that their child will join secondary school in the next academic year.

First, results show that more advantaged parents directly assisted with their child's learning: on average, an additional 100 USD in monthly household income is correlated with an additional 0.065 days of parents helping their child with schoolwork and each additional year of parental education corresponded to an additional 0.1 days helping their child with schoolwork (Table 3.2, Column 1). Wealthier households were also much more likely to exempt their children from chores so that they could focus on studies. There is some suggestive evidence that lower educated households help their children in other ways – there is a negative correlation between parental education and exempting children from chores to focus on schoolwork (Table 3.2, Column 2).

While there aren't differences in parental gender for most outcomes, female parents are significantly more likely to discuss school choices with their child (holding constant gender of child) (Table 3.2, Column 2).

Turning to parental likelihood of allowing their child to join secondary school, the analysis indicates that wealthier and more educated households are more likely to have their child join secondary school. There are no differences in likelihood of joining secondary school by parent gender or child gender.

3.2.3 Parental Confidence in Helping with Child's Learning

Finally, I examine the determinants of parent confidence in supporting their child's learning at home using the parental self-efficacy scale (Table 3.3). I examine three raw measures as well as an overall means effects index of the three measures. These raw measures include parents confidence in motivating their child in school, parents confidence in supporting child's home learning, and parents confidence in making choices about child's schooling. Higher income parents are significantly more likely to report confidence in supporting child's learning at home and making choices about child's schooling (Columns 2 and 3) and higher educated parents are more confident in supporting child home learning. There are no reported differences in confidence in motivating child in school across income group or education status.

3.3 Discussion and Conclusion

Results from the study suggest that children from higher income and higher educated households had more access to learning opportunities during the period of school closures – in-

cluding having the opportunity to attend tuition classes and accessing the available EdTech platforms (due to having electricity). Parents from higher income and more educated households were also more likely to help their children with their schoolwork, were more confident that their child would join secondary school, and were more confident in supporting their child's learning at home. This inequality in access could further widen inequality in educational outcomes across socio-economic groups.

I do not find evidence for that claim that female students in this context are disadvantaged relative to males. However, it is important to note that girls in Kenya may face other challenges during the period of school closures, such as increased pregnancies and domestic violence[5], and so it will be important to assess a wide range of outcomes and follow these students over time in order to examine the broader consequences of the school closure on access to education.

[5]https://www.reuters.com/article/us-health-coronavirus-teenage-pregnancie/teenage-pregnancies-rise-in-parts-of-kenya-as-lockdown-shuts-schools-idUSKBN27W11H

3.4 Tables and Figures

Table 3.1: Child Learning at Home

	# of Days in Last 7 Days			
	(1) Home Study	(2) Tuition Classes	(3) Classes at School	(4) EdTech Platform
Child Female	.037	.095	.07**	.011
	(.07)	(.07)	(.03)	(.02)
Monthly Household Income (USD)	.006	.12***	.012	.0031
	(.03)	(.04)	(.02)	(.01)
Parent Education (Yrs)	.016*	-.0078	-.006	-.00085
	(.01)	(.01)	(.00)	(.00)
Any Electricity	-.026	.15*	.036	.16***
	(.08)	(.09)	(.04)	(.02)
Child Age	-.0077	-.026	.03*	-.0018
	(.02)	(.02)	(.02)	(.01)
Child Test Score (SD units)	.14***	-.01	.017	-.0088
	(.04)	(.04)	(.02)	(.01)
Mean	5.40	.80	.16	.67
N	2602	2602	2602	2432

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). The outcome variables include the number of days (in the last 7 days) that student studied at home, number of days student attended tuition classes at a teacher or parent's house, and number of days student attended classes at school. Income is reported as monthly total household income in US Dollars, and is in 100 USD units for coefficient readability. Specifications include sub-county of school fixed effects. Standard errors are clustered at the primary school level.

Table 3.2: Parental Involvement

	# of Days (Last 7 days)			
	(1) Helped with Schoolwork	(2) Exempted from Chores	(3) Discuss Schooling	(4) Join Sec School
Child Female	.069	-.12	.0014	-.0042
	(.09)	(.10)	(.09)	(.04)
Parent Female	.062	-.015	.23**	-.018
	(.09)	(.11)	(.09)	(.04)
Monthly Household Income (USD)	.065*	.25***	.062	.06***
	(.04)	(.05)	(.04)	(.01)
Parent Education (Yrs)	.1***	-.043**	-.0051	.013**
	(.01)	(.02)	(.02)	(.01)
Child Age	-.058**	-.023	-.065*	.0052
	(.03)	(.04)	(.04)	(.01)
Child Test Score (SD units)	-.0037	-.026	-.021	.014
	(.04)	(.06)	(.05)	(.02)
Mean	1.82	2.59	3.27	.00
N	2600	2601	2601	2600

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). The outcome variables include number of days (in the last 7 days) that parents helped child with their schoolwork, the number of days parents exempted child from household chores so that they could focus on their studies, the number of days that parent discussed school or learning with their child, and parents' assessment of the likelihood that their child will join secondary school in the next academic year. Income is reported as monthly total household income in US Dollars, and is in 100 USD units for coefficient readability. Specifications include sub-county of school fixed effects. Standard errors are clustered at the primary school level.

Table 3.3: Parental Confidence

	Confidence Scale			
	(1) Motivate Child in School	(2) Support Child's Home Learning	(3) Make choices about child's schooling	(4) Confidence Index
Child Female	-.01	.044	.07*	.047
	(.04)	(.04)	(.04)	(.04)
Parent Female	-.021	-.012	-.027	-.027
	(.05)	(.04)	(.04)	(.04)
Monthly Household Income (USD)	.013	.064***	.041**	.053***
	(.02)	(.02)	(.02)	(.02)
Parent Education (Yrs)	.0073	.012**	.00028	.0089
	(.01)	(.01)	(.01)	(.01)
Child Age	-.012	.0098	.025*	.01
	(.01)	(.01)	(.01)	(.01)
Child Test Score (SD units)	.016	-.025	.0034	-.0023
	(.02)	(.02)	(.02)	(.02)
Mean	-.00	.00	-.00	-.00
N	2602	2602	2602	2602

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). The three raw measures include parents confidence in motivating their child in school, parents confidence in supporting child's home learning, and parents confidence in making choices about child's schooling. Column 4 is a means effects index of Columns 1 through 3. Income is reported as monthly total household income in US Dollars, and is in 100 USD units for coefficient readability. Specifications also include sub-county of school fixed effects. Standard errors are clustered at the primary school level.

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Appendix A

Information, Student-Parent Communication, and Secondary School Choice – Appendices

A.1 Additional Tables

Table A.1.1: Balance of Baseline Demographics Across Treatment Group

Variable	(1) Treatment 1 (T1)	(2) Treatment 2 (T2)	(3) Control (C)
Child Female	0.54	0.50	0.50
	(0.50)	(0.50)	(0.50)
Parent Female	0.66	0.64	0.67
	(0.47)	(0.48)	(0.47)
Household Income (USD)	108.99	104.22	106.92
	(334.44)	(362.36)	(401.41)
Educ < Primary	0.50	0.51	0.52
	(0.50)	(0.50)	(0.50)
Child Age	15.44	15.51	15.51
	(1.57)	(1.48)	(1.58)
Observations	974	906	1,072

Table A.1.2: Strict Preference Match

	(1) Strict Match All Schools	(2) Strict Match Busia Only
Group 1: Student Meeting	.014	.0074
	(.01)	(.01)
Group 2: Student and Parent Meeting	.12***	.1***
	(.01)	(.01)
Control Mean	.20	.23
F-test p-val ($\beta_1 \neq \beta_2$)	1.1e-15	2.3e-11
N	2952	2952

Table A.1.3: Survey Preferences: Commutability of School

	All Commutable		One Commutable		GPS Distance (km)	
	(1) Student	(2) Parent	(3) Student	(4) Parent	(5) Student	(6) Parent
Group 1: Student Meeting	.15***	.054	.16***	.062**	-1.1***	-.29
	(.04)	(.04)	(.03)	(.03)	(.32)	(.29)
Group 2: Student and Parent Meeting	.16***	.09*	.1**	.016	-1.3***	-.5*
	(.04)	(.05)	(.04)	(.04)	(.32)	(.29)
Control Mean	.19	.28	.66	.79	6.77	5.35
F-test p-val ($\beta_1 \neq \beta_2$)	.75	.47	.47	.47	.63	.33
N	2928	2825	2928	2825	2862	2767

Table A.1.4: Survey Preferences: Performance of School

	School Above Median	
	(1) Student	(2) Parent
Group 1: Student Meeting	.078***	.0069
	(.03)	(.04)
Group 2: Student and Parent Meeting	.087***	.019
	(.03)	(.04)
Control Mean	.61	.62
F-test p-val ($\beta_1 \neq \beta_2$)	.8	.74
N	2952	2952

Table A.1.5: Final Application: Commutability of School

	All Commutable	One Commutable	GPS Distance
	(1)	(2)	(3)
Group 1 (Student)	.094*	.069	-.27
	(.06)	(.05)	(.79)
Group 2 (Student & Parent)	.084	.035	-.24
	(.05)	(.06)	(.87)
Control Mean	.21	.72	6.46
F-test p-val ($\beta_1 \neq \beta_2$)	.87	.55	.97
N	2903	2903	2831

Table A.1.6: Final Application: Performance of School

	School Above Median
	(1) Student
Group 1: Student Meeting	.014 (.04)
Group 2: Student and Parent Meeting	.053 (.04)
Control Mean	.62
F-test p-val ($\beta_1 \neq \beta_2$)	.36
N	2903

Table A.1.7: Tier of Offers

	(1) National Offer	(2) Extra County Offer	(3) County Offer	(4) Subcounty Offer
Group 1: Student Meeting	.011 (.01)	.00094 (.02)	-.006 (.02)	-.0075 (.03)
Group 2: Student and Parent Meeting	.0049 (.01)	-.014 (.02)	-.0064 (.02)	.011 (.03)
Control Mean	.02	.16	.22	.64
F-test p-val ($\beta_1 \neq \beta_2$)	.52	.39	.99	.57
N	2952	2952	2952	2952

Table A.1.8: Performance of Enrolled School

	Median Performance at Enrolled School				
	(1) Overall	(2) Below Med Income	(3) Above Med income	(4) Below Med Educ	(5) Above Med Educ
Group 1: Student Meeting	-.011 (.05)	.011 (.05)	.0062 (.06)	-.032 (.06)	.0047 (.06)
Group 2: Student and Parent Meeting	-.021 (.05)	-.035 (.06)	.019 (.06)	-.057 (.06)	.038 (.06)
Control Mean	.67	.66	.67	.66	.66
F-test p-val ($\beta_1 \neq \beta_2$)	.84	.47	.83	.71	.56
N	1611	666	713	822	647

Table A.1.9: Student Effort

	(1) Test Score	(2) Number of Days (Last 5 days)
Group 1: Student Meeting	.049 (.06)	-.0011 (.05)
Group 2: Student and Parent Meeting	.049 (.07)	-.029 (.05)
Control Mean	-.00	4.79
F-test p-val ($\beta_1 \neq \beta_2$)	1	.61
N	2746	2770

Table A.1.10: Student-Parent Discussion After Meeting

	(1) Discuss
Group 1: Student Meeting	.095 (.07)
Group 2: Student and Parent Meeting	-.066 (.07)
Control Mean	2.32
F-test p-val ($\beta_1 \neq \beta_2$)	.012
N	2823

Table A.1.11: Budgeting

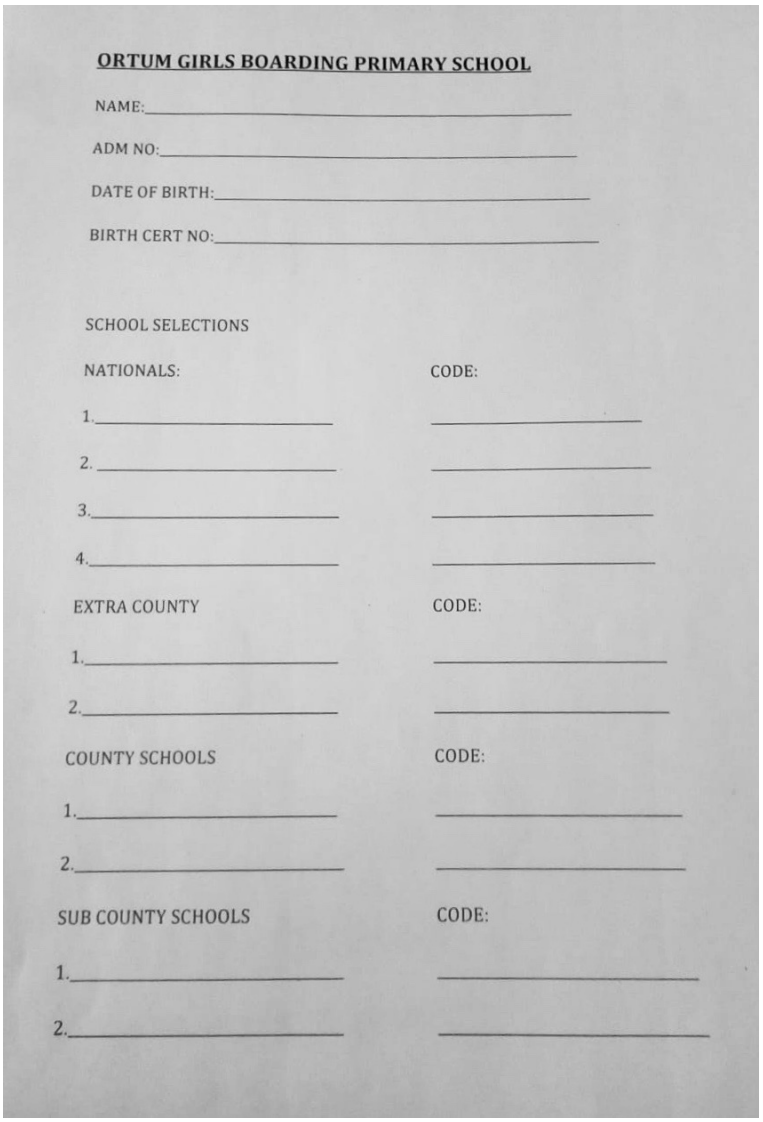
	(1) Budgeted Fees
Actual School Fees	.57*** (.03)
School Fees x Group 1 (Student)	.069* (.04)
School Fees x Group 2 (Student & Parent)	.016 (.03)
Control Mean	.85
F-test p-val ($\beta_1 \neq \beta_2$)	.16
N	2319

A.2 School Selection Materials

Figure A.2.1: Secondary School Choice List

KENYA NATIONAL EXAMINATIONS COUNCIL

		School Code & Name		Category	Type	Cluster
C1	138	01101101	DR.AGGREY HIGH SCHOOL	Extra County	Boys	C1
	139	01101201	ST. MARY'S HIGH SCHOOL LUSHANGONYI	Extra County	Boys	C1
	140	01114102	MURRAY GIRLS' HIGH SCHOOL	Extra County	Girls	C1
	141	01114301	MWASERE GIRLS' SECONDARY SCHOOL	Extra County	Girls	C1
	142	01115101	VOI SECONDARY SCHOOL	Extra County	Boys	C1
	143	02127102	MAZERAS HIGH SCHOOL	Extra County	Boys	C1
	144	04107101	MALINDI HIGH SCHOOL	Extra County	Boys	C1
	145	04122103	KOMBENI GIRLS SECONDARY SCHOOL	Extra County	Girls	C1
	146	04122105	RIBE GIRLS SECONDARY SCHOOL	Extra County	Girls	C1
	147	04129201	LUTSANGANI BOYS SECONDARY SCHOOL	Extra County	Boys	C1
	148	06130101	LAMU BOYS SECONDARY SCHOOL	Extra County	Boys	C1
	149	07214101	NYAHURURU HIGH SCHOOL	Extra County	Boys	C1
	150	07215202	WANJOHI SECONDARY SCHOOL	Extra County	Girls	C1
	151	07216101	NJABINI BOYS HIGH SCHOOL	Extra County	Boys	C1
	152	07216108	MT KINANGOP GIRLS' SECONDARY SCHOOL	Extra County	Girls	C1
	153	08202001	NYERI HIGH SCHOOL	Extra County	Boys	C1
	154	08202007	GIAKANJA SECONDARY SCHOOL	Extra County	Boys	C1
	155	08210201	NAROMORU GIRLS SECONDARY SCHOOL	Extra County	Girls	C1
	156	08217101	KANJURI HIGH SCHOOL	Extra County	Boys	C1
	157	08217202	KIRIMARA HIGH SCHOOL	Extra County	Boys	C1
	158	08218102	TUMUTUMU GIRLS' HIGH SCHOOL	Extra County	Girls	C1
	159	08219101	SOUTH TETU GIRLS' HIGH SCHOOL	Extra County	Girls	C1
	160	08219103	ST BONAVENTURE,KAHETI BOYS HIGH SCHOOL	Extra County	Boys	C1
	161	08220301	ST. BAKHITA GATARAGWA GIRLS HIGH SCHOOL	Extra County	Girls	C1
	162	08221301	KANGUBIRI GIRLS HIGH SCHOOL	Extra County	Girls	C1
	163	08237001	KARIMA BOYS' HIGH SCHOOL	Extra County	Boys	C1
	164	08237002	OUR LADY OF FATIMA CHINGA GIRLS SECONDARY SCHOOL	Extra County	Girls	C1



ORTUM GIRLS BOARDING PRIMARY SCHOOL

NAME:_____

ADM NO:_____

DATE OF BIRTH:_____

BIRTH CERT NO:_____

SCHOOL SELECTIONS

NATIONALS:	CODE:
1._____	_____
2._____	_____
3._____	_____
4._____	_____
EXTRA COUNTY	CODE:
1._____	_____
2._____	_____
COUNTY SCHOOLS	CODE:
1._____	_____
2._____	_____
SUB COUNTY SCHOOLS	CODE:
1._____	_____
2._____	_____

Figure A.2.2: Example School Choice Form

A.3 Intervention Materials

Figure A.3.1: Busia County Map: Girls

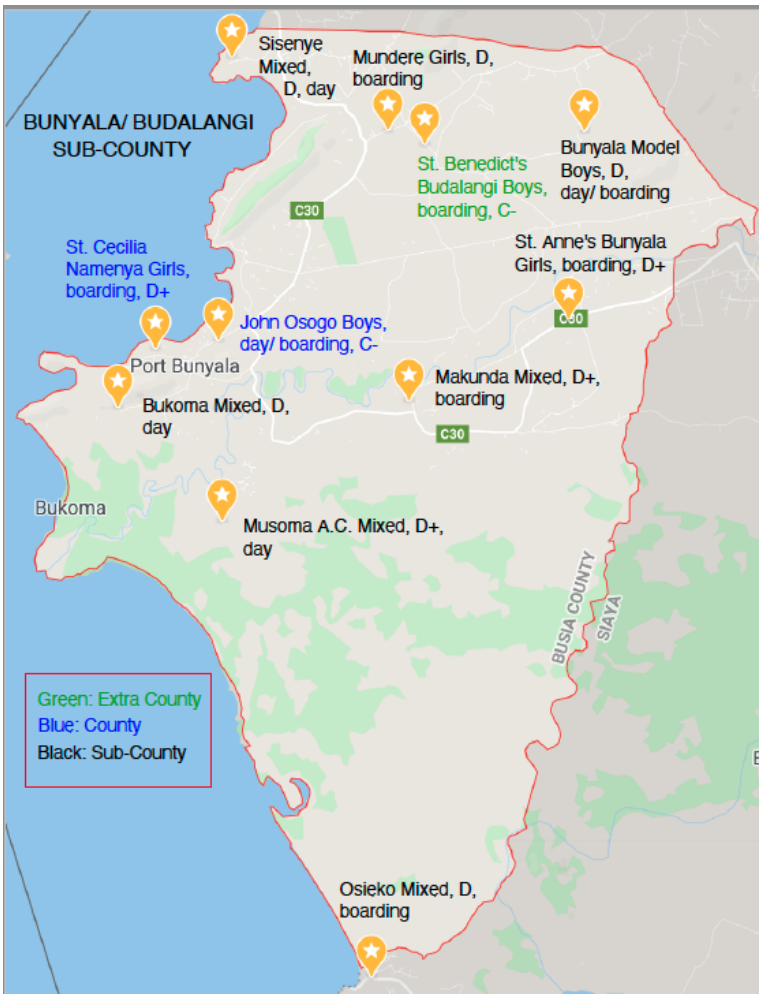


Figure A.3.2: Example Sub-County Map: Bunyala Sub-County

A.4 Heterogeneity by Income, Education Level, and Child Gender

Table A.4.1: Parent Knowledge about Tuition Costs by Income Group

	Parent Knowledge about Tuition Costs			
	(1) National Cost	(2) Extra County Cost	(3) County Cost	(4) Sub-County Cost
Group 1: Student Meeting	-.0094	.014	-.036	.04
	(.03)	(.03)	(.04)	(.04)
Group 2: Student and Parent Meeting	.28***	.15***	.21***	.25***
	(.04)	(.04)	(.04)	(.03)
Above Med Income	.045	.075**	.058*	.079**
	(.03)	(.03)	(.03)	(.04)
Group 1 x Above Med Income	.0057	.0031	.053	-.022
	(.04)	(.04)	(.05)	(.05)
Group 2 x Above Med Income	.092*	.084*	.022	-.085*
	(.05)	(.05)	(.05)	(.04)
Control Mean	.23	.33	.43	.61
F-test p-val ($\beta_1 \neq \beta_2$)	.054	.081	.56	.18
N	2523	2523	2523	2523

Table A.4.2: Parent Knowledge about Tuition Costs by Education Group

	Parent Knowledge about Tuition Costs			
	(1) National Cost	(2) Extra County Cost	(3) County Cost	(4) Sub-County Cost
Group 1: Student Meeting	-.0046	.026	.0095	.038
	(.03)	(.04)	(.03)	(.04)
Group 2: Student and Parent Meeting	.31***	.2***	.22***	.19***
	(.04)	(.04)	(.03)	(.03)
Educ < Primary	-.096***	-.1***	-.14***	-.027
	(.03)	(.03)	(.03)	(.03)
Group 1 x Educ < Primary	-.0024	-.026	-.0049	-.044
	(.04)	(.05)	(.05)	(.05)
Group 2 x Educ < Primary	-.0051	.013	-.0023	-.01
	(.05)	(.05)	(.04)	(.04)
Control Mean	.23	.33	.43	.61
F-test p-val ($\beta_1 \neq \beta_2$)	.96	.46	.95	.44
N	2695	2695	2695	2695

Table A.4.3: Parent Knowledge about Tuition Costs by Child Gender

	Parent Knowledge about Tuition Costs			
	(1) National Cost	(2) Extra County Cost	(3) County Cost	(4) Sub-County Cost
Group 1: Student Meeting	.0034	-.036	-.011	-.0053
	(.03)	(.03)	(.03)	(.04)
Group 2: Student and Parent Meeting	.33***	.18***	.19***	.19***
	(.03)	(.03)	(.03)	(.03)
Child Female	.03	-.034	.0018	-.014
	(.02)	(.03)	(.03)	(.03)
Group 1 x Child Female	-.011	.086**	.025	.029
	(.03)	(.04)	(.05)	(.04)
Group 2 x Child Female	-.055	.029	.045	.0044
	(.04)	(.04)	(.04)	(.04)
Control Mean	.23	.33	.43	.61
F-test p-val ($\beta_1 \neq \beta_2$)	.31	.17	.66	.58
N	2952	2952	2952	2952

Table A.4.4: Knowledge Indices by Income Group

	Share Correct No. Schools		Share Correct Exam Marks		Knowledge Index (SD units)	
	(1) Student	(2) Parent	(3) Student	(4) Parent	(5) Student	(6) Parent
Group 1: Student Meeting	.59***	-.012	.15***	.017	1.6***	-.01
	(.04)	(.02)	(.03)	(.04)	(.09)	(.07)
Group 2: Student and Parent Meeting	.56***	.26***	.14***	.21***	1.5***	1.1***
	(.04)	(.03)	(.03)	(.03)	(.09)	(.09)
Above Med Income	-.026	-.008	.0023	.18***	-.073	.23***
	(.02)	(.01)	(.03)	(.03)	(.06)	(.06)
Group 1 x Above Med Income	.062*	.0097	-.00014	-.0015	.19**	.055
	(.04)	(.02)	(.03)	(.05)	(.09)	(.10)
Group 2 x Above Med Income	.041	.12***	.021	-.016	.21**	.26**
	(.04)	(.04)	(.03)	(.05)	(.09)	(.13)
Control Mean	.17	.05	.79	.58	.00	-.01
F-test p-val ($\beta_1 \neq \beta_2$)	.59	.0083	.38	.76	.84	.11
N	2523	2523	2523	2523	2523	2523

Table A.4.5: Knowledge Indices by Education Group

	Share Correct No. Schools		Share Correct Exam Marks		Knowledge Index (SD units)	
	(1) Student	(2) Parent	(3) Student	(4) Parent	(5) Student	(6) Parent
Group 1: Student Meeting	.59***	-.00091	.13***	.056**	1.6***	.086
	(.04)	(.02)	(.02)	(.03)	(.08)	(.06)
Group 2: Student and Parent Meeting	.53***	.43***	.13***	.13***	1.5***	1.3***
	(.03)	(.03)	(.02)	(.02)	(.08)	(.08)
Educ < Primary	-.029	-.015	-.055**	-.35***	-.2***	-.52***
	(.03)	(.01)	(.02)	(.03)	(.07)	(.06)
Group 1 x Educ < Primary	.049	-.0013	.023	-.07	.14	-.14
	(.04)	(.02)	(.03)	(.05)	(.09)	(.09)
Group 2 x Educ < Primary	.06	-.14***	.045*	.14***	.18**	-.19
	(.04)	(.03)	(.03)	(.04)	(.08)	(.12)
Control Mean	.17	.05	.79	.58	.00	-.01
F-test p-val ($\beta_1 \neq \beta_2$)	.78	.00014	.24	1.3e-06	.67	.69
N	2695	2695	2695	2695	2695	2695

Table A.4.6: Knowledge Indices by Child Gender

	Share Correct No. Schools		Share Correct Exam Marks		Knowledge Index (SD units)	
	(1) Student	(2) Parent	(3) Student	(4) Parent	(5) Student	(6) Parent
Group 1: Student Meeting	.59***	-.0023	.12***	.035	1.6***	-.023
	(.04)	(.02)	(.02)	(.03)	(.08)	(.06)
Group 2: Student and Parent Meeting	.56***	.37***	.14***	.18***	1.6***	1.2***
	(.03)	(.03)	(.02)	(.03)	(.09)	(.10)
Child Female	-.011	.00067	-.043	-.033	-.022	-.12**
	(.02)	(.01)	(.03)	(.03)	(.07)	(.05)
Group 1 x Child Female	.047	-.0026	.047	-.014	.083	.092
	(.04)	(.02)	(.03)	(.04)	(.09)	(.08)
Group 2 x Child Female	.027	-.079**	.027	.066*	-.02	-.03
	(.04)	(.03)	(.03)	(.04)	(.10)	(.11)
Control Mean	.17	.05	.79	.58	.00	-.01
F-test p-val ($\beta_1 \neq \beta_2$)	.61	.013	.32	.065	.22	.29
N	2952	2952	2952	2940	2952	2952

Table A.4.7: Parent-Child Knowledge of Preferences by Income Group

	Child		Parent	
	(1)	(2)	(3)	(4)
	Beliefs	Beliefs - Local	Beliefs	Beliefs- Local
Above Med Income	.013	.0017	.027*	.026
	(.01)	(.02)	(.01)	(.02)
Group 1: Student	-.016	-.03	-.038*	-.048*
Meeting	(.02)	(.02)	(.02)	(.03)
Group 2: Student and	.069***	.16***	.1***	.19***
Parent Meeting	(.02)	(.02)	(.02)	(.02)
Group 1 x Above Med	.039*	.053**	.034	.028
Income	(.02)	(.03)	(.02)	(.03)
Group 2 x Above Med	.078***	.096***	.027	.038
Income	(.02)	(.03)	(.02)	(.03)
Control Mean	.31	.36	.28	.33
F-test p-val ($\beta_1 \neq \beta_2$)	.000071	9.3e-12	9.5e-10	1.3e-14
N	2523	2523	2523	2523

Table A.4.8: Parent-Child Knowledge of Preferences by Education Group

	Child		Parent	
	(1)	(2)	(3)	(4)
	Beliefs	Beliefs - Local	Beliefs	Beliefs- Local
Educ < Primary	-.027**	-.015	-.027*	-.016
	(.01)	(.01)	(.01)	(.02)
Group 1: Student	.027	.025	-.009	-.024
Meeting	(.02)	(.02)	(.02)	(.02)
Group 2: Student and	.13***	.24***	.12***	.23***
Parent Meeting	(.02)	(.02)	(.02)	(.02)
Group 1 x Educ <	-.032	-.038*	-.016	-.0081
Primary	(.02)	(.02)	(.02)	(.03)
Group 2 x Educ <	-.028	-.041*	.0073	-.019
Primary	(.02)	(.02)	(.02)	(.03)
Control Mean	.31	.36	.28	.33
F-test p-val ($\beta_1 \neq \beta_2$)	3.3e-06	7.2e-16	3.4e-10	1.7e-22
N	2695	2695	2695	2695

Table A.4.9: Parent-Child Knowledge of Preferences by Child Gender

	Child		Parent	
	(1)	(2)	(3)	(4)
	Beliefs	Beliefs - Local	Beliefs	Beliefs- Local
Child Female	.0036	.014	.011	.01
	(.01)	(.02)	(.01)	(.02)
Group 1: Student	.027*	.022	-.015	-.022
Meeting	(.01)	(.02)	(.02)	(.02)
Group 2: Student and	.13***	.23***	.13***	.22***
Parent Meeting	(.02)	(.02)	(.02)	(.02)
Group 1 x Child	-.028	-.031	-.0038	-.016
Female	(.02)	(.02)	(.02)	(.02)
Group 2 x Child	-.03	-.038	-.02	-.018
Female	(.02)	(.03)	(.02)	(.03)
Control Mean	.31	.36	.28	.33
F-test p-val ($\beta_1 \neq \beta_2$)	2.2e-07	5.0e-19	9.0e-13	1.2e-22
N	2952	2952	2952	2952

Table A.4.10: Parent-Child Preference Alignment by Income Group

	(1) Parent-Child Match	(2) Parent-Child Match - Local
Above Med Income	.035***	.029*
	(.01)	(.02)
Group 1: Student	.0028	.0011
Meeting	(.01)	(.02)
Group 2: Student and	.11***	.15***
Parent Meeting	(.02)	(.02)
Group 1 x Above Med	.014	.0067
Income	(.02)	(.02)
Group 2 x Above Med	.067***	.058**
Income	(.02)	(.03)
Control Mean	.25	.36
F-test p-val ($\beta_1 \neq \beta_2$)	1.1e-09	5.5e-10
N	2523	2523

Table A.4.11: Parent-Child Preference Alignment by Education Group

	(1) Parent-Child Match	(2) Parent-Child Match - Local
Educ < Primary	-.045***	-.037**
	(.01)	(.01)
Group 1: Student Meeting	.027**	.028*
	(.01)	(.02)
Group 2: Student and Parent Meeting	.17***	.18***
	(.02)	(.02)
Group 1 x Educ < Primary	-.023	-.036*
	(.02)	(.02)
Group 2 x Educ < Primary	-.045**	-.0058
	(.02)	(.02)
Control Mean	.25	.36
F-test p-val ($\beta_1 \neq \beta_2$)	2.8e-13	4.9e-12
N	2695	2695

Table A.4.12: Parent-Child Preference Alignment by Education Group

	(1) Parent-Child Match	(2) Parent-Child Match - Local
Child Female	-.0041	-.0048
	(.01)	(.02)
Group 1: Student Meeting	.0093	.0041
	(.01)	(.02)
Group 2: Student and Parent Meeting	.15***	.18***
	(.01)	(.02)
Group 1 x Child Female	.009	.0073
	(.02)	(.02)
Group 2 x Child Female	-.0062	-.0091
	(.02)	(.03)
Control Mean	.25	.36
F-test p-val ($\beta_1 \neq \beta_2$)	1.8e-16	1.3e-15
N	2952	2952

Table A.4.13: Survey Preferences: Commutability of School by Income Group

	All Commutable		One Commutable		GPS Distance (km)	
	(1) Student	(2) Parent	(3) Student	(4) Parent	(5) Student	(6) Parent
Group 1: Student Meeting	.17***	.072	.17***	.066*	-1.3***	-.28
	(.05)	(.05)	(.04)	(.04)	(.41)	(.32)
Group 2: Student and Parent Meeting	.19***	.12**	.13***	.056	-1.5***	-.41
	(.05)	(.05)	(.05)	(.04)	(.38)	(.30)
Group 1 x Above Med Income	-.041	-.037	-.028	-.0095	.45	-.025
	(.04)	(.04)	(.04)	(.04)	(.34)	(.26)
Group 2 x Above Med Income	-.028	-.028	-.054	-.07*	.44	-.12
	(.04)	(.05)	(.04)	(.04)	(.31)	(.28)
Above Med Income	.0076	.018	.035	.036	-.48**	.045
	(.02)	(.03)	(.03)	(.03)	(.24)	(.18)
Control Mean	.19	.28	.66	.79	6.77	5.35
F-test p-val ($\beta_1 \neq \beta_2$)	.76	.85	.47	.12	.97	.74
N	2511	2449	2511	2449	2452	2398

Table A.4.14: Survey Preferences: Commutability of School by Education Group

	All Commutable		One Commutable		GPS Distance (km)	
	(1) Student	(2) Parent	(3) Student	(4) Parent	(5) Student	(6) Parent
Group 1: Student Meeting	.15***	.021	.13***	.063*	-.96***	-.12
	(.04)	(.05)	(.04)	(.04)	(.34)	(.32)
Group 2: Student and Parent Meeting	.16***	.026	.078*	.0025	-1.1***	-.18
	(.04)	(.05)	(.05)	(.04)	(.37)	(.34)
Group 1 x Educ < Primary	-.015	.068	.042	-.002	-.3	-.31
	(.04)	(.04)	(.04)	(.04)	(.33)	(.26)
Group 2 x Educ < Primary	.0064	.11**	.038	.019	-.48	-.72**
	(.04)	(.05)	(.04)	(.04)	(.34)	(.30)
Educ < Primary	.018	-.085***	-.019	-.015	-.00088	.34
	(.03)	(.03)	(.03)	(.03)	(.25)	(.21)
Control Mean	.19	.28	.66	.79	6.77	5.35
F-test p-val ($\beta_1 \neq \beta_2$)	.64	.42	.91	.58	.56	.13
N	2679	2606	2679	2606	2617	2552

Table A.4.15: Survey Preferences: Commutability of School by Child Gender

	All Commutable		One Commutable		GPS Distance (km)	
	(1) Student	(2) Parent	(3) Student	(4) Parent	(5) Student	(6) Parent
Group 1: Student Meeting	.11***	.055	.18***	.061	-1.1***	-.19
	(.04)	(.05)	(.04)	(.04)	(.37)	(.29)
Group 2: Student and Parent Meeting	.17***	.12**	.12**	.026	-1.4***	-.64**
	(.05)	(.05)	(.05)	(.05)	(.39)	(.30)
Group 1 x Child Female	.063*	-.0018	-.038	.0013	-.043	-.17
	(.04)	(.04)	(.05)	(.04)	(.39)	(.28)
Group 2 x Child Female	-.019	-.057	-.038	-.02	.19	.27
	(.04)	(.05)	(.05)	(.04)	(.37)	(.31)
Child Female	-.022	.0024	.04	-.0089	-.41	-.084
	(.02)	(.03)	(.04)	(.03)	(.31)	(.20)
Control Mean	.19	.28	.66	.79	6.77	5.35
F-test p-val ($\beta_1 \neq \beta_2$)	.058	.3	1	.59	.45	.14
N	2928	2825	2928	2825	2862	2767

Table A.4.16: Survey Preferences: Performance of School by Income Group

	Child	Parent
	(1) Above Median Performance	(2) Above Median Performance
Group 1: Student Meeting	.08**	.035
	(.03)	(.04)
Group 2: Student and Parent Meeting	.064*	.011
	(.04)	(.04)
Above Med Income	-.032*	.042*
	(.02)	(.02)
Group 1 x Above Med Income	.0037	-.036
	(.03)	(.04)
Group 2 x Above Med Income	.043	.018
	(.03)	(.03)
Control Mean	.61	.62
F-test p-val ($\beta_1 \neq \beta_2$)	.69	.56
N	2523	2523

Table A.4.17: Survey Preferences: Performance of School by Education Group

	Child	Parent
	(1) Above Median Performance	(2) Above Median Performance
Group 1: Student Meeting	.097***	-.0035
	(.03)	(.04)
Group 2: Student and Parent Meeting	.13***	.013
	(.03)	(.04)
Educ < Primary	.031	-.073***
	(.02)	(.02)
Group 1 x Educ < Primary	-.044	.021
	(.03)	(.03)
Group 2 x Educ < Primary	-.073**	.015
	(.03)	(.03)
Control Mean	.61	.62
F-test p-val ($\beta_1 \neq \beta_2$)	.28	.67
N	2695	2695

Table A.4.18: Survey Preferences: Performance of School by Child Gender

	Child	Parent
	(1) Above Median Performance	(2) Above Median Performance
Group 1: Student Meeting	.098***	.019
	(.03)	(.04)
Group 2: Student and Parent Meeting	.09**	-.00068
	(.04)	(.04)
Child Female	.043*	-.0072
	(.02)	(.02)
Group 1 x Child Female	-.038	-.018
	(.03)	(.03)
Group 2 x Child Female	-.016	.029
	(.03)	(.04)
Control Mean	.61	.62
F-test p-val ($\beta_1 \neq \beta_2$)	.83	.63
N	2952	2952

Table A.4.19: Final Application: Commutability of Schoo by Income Group

	All Commutable		GPS Distance
	(1)	(2)	(3)
Group 1: Student Meeting	.11*	.077	-.15
	(.06)	(.06)	(.80)
Group 2: Student and Parent Meeting	.086	.053	-.36
	(.06)	(.06)	(.85)
Group 1 x Above Med Income	-.034	-.036	.46
	(.04)	(.04)	(.53)
Group 2 x Above Med Income	.0054	-.042	.56
	(.04)	(.04)	(.59)
Above Med Income	.00056	.019	-.22
	(.02)	(.03)	(.33)
Control Mean	.21	.72	6.46
F-test p-val ($\beta_1 \neq \beta_2$)	.4	.9	.88
N	2482	2482	2420

Table A.4.20: Final Application: Commutability of School by Education Group

	All Commutable		GPS Distance
	(1)	(2)	(3)
Group 1: Student Meeting	.073 (.06)	.057 (.06)	.14 (.81)
Group 2: Student and Parent Meeting	.079 (.05)	.048 (.06)	-.052 (.91)
Group 1 x Educ < Primary	.041 (.05)	.0046 (.04)	-.25 (.57)
Group 2 x Educ < Primary	.0092 (.05)	-.044 (.05)	-.21 (.57)
Educ < Primary	-.0039 (.03)	.021 (.04)	-.00013 (.42)
Control Mean	.21	.72	6.46
F-test p-val ($\beta_1 \neq \beta_2$)	.52	.25	.94
N	2649	2649	2584

Table A.4.21: Final Application: Commutability of School by Child Gender

	All Commutable		GPS Distance
	(1)	(2)	(3)
Group 1: Student Meeting	.11**	.06	-.078
	(.06)	(.06)	(.73)
Group 2: Student and Parent Meeting	.12**	.05	.1
	(.05)	(.06)	(.82)
Group 1 x Child Female	-.043	-.0012	.13
	(.05)	(.05)	(.54)
Group 2 x Child Female	-.082*	-.039	-.59
	(.04)	(.04)	(.43)
Child Female	.046	.011	.25
	(.03)	(.03)	(.37)
Control Mean	.21	.72	6.46
F-test p-val ($\beta_1 \neq \beta_2$)	.4	.35	.096
N	2903	2903	2831

Table A.4.22: Final Application: Performance of School by Income Group

	(1) Above Median Performance
Above Med Income	-.016
	(.02)
Group 1: Student Meeting	.017
	(.04)
Group 2: Student and Parent Meeting	.04
	(.04)
Group 1 x Above Med Income	-.0045
	(.03)
Group 2 x Above Med Income	.031
	(.03)
Control Mean	.62
F-test p-val ($\beta_1 \neq \beta_2$)	.3
N	2482

Table A.4.23: Final Application: Performance of School by Education Group

	(1) Above Median Performance
Educ < Primary	.0072
	(.03)
Group 1: Student Meeting	.034
	(.04)
Group 2: Student and Parent Meeting	.078*
	(.04)
Group 1 x Educ < Primary	-.023
	(.04)
Group 2 x Educ < Primary	-.033
	(.04)
Control Mean	.62
F-test p-val ($\beta_1 \neq \beta_2$)	.78
N	2649

Table A.4.24: Final Application: Performance of School by Child Gender

	(1) Above Median Performance
Child Female	-.0021
	(.02)
Group 1: Student Meeting	.018
	(.04)
Group 2: Student and Parent Meeting	.026
	(.05)
Group 1 x Child Female	-.0075
	(.04)
Group 2 x Child Female	.053
	(.03)
Control Mean	.62
F-test p-val ($\beta_1 \neq \beta_2$)	.098
N	2903

Table A.4.25: Final Application: Performance of School by Income

	(1) below Median (day schools)	(2) below Median (day schools)
Group 1: Student Meeting	.0089 (.06)	-.04 (.05)
Group 2: Student and Parent Meeting	.019 (.06)	-.0025 (.04)
Below Med Income	-.0077 (.04)	-.023 (.03)
Group 1 x Below Med Income	-.0041 (.06)	.014 (.05)
Group 2 x Below Med Income	-.055 (.06)	-.041 (.05)
Control Mean	.67	.67
F-test p-val ($\beta_1 \neq \beta_2$)	.42	.33
N	1379	1974

Table A.4.26: Final Application: Performance of School by Education

	(1) below Median (day schools)	(2) below Median (day schools)
Group 1: Student	.0067	-.02
Meeting	(.06)	(.05)
Group 2: Student and	.035	.055
Parent Meeting	(.06)	(.05)
Educ < Primary	.01	.044
	(.05)	(.03)
Group 1 x Educ <	-.04	-.043
Primary	(.07)	(.05)
Group 2 x Educ <	-.091	-.13**
Primary	(.07)	(.06)
Control Mean	.67	.67
F-test p-val ($\beta_1 \neq \beta_2$)	.48	.14
N	1469	2125

Table A.4.27: Final Application: Performance of School by Child Gender

	(1) below Median (day schools)	(2) below Median (day schools)
Group 1: Student Meeting	-.0056	-.045
	(.05)	(.04)
Group 2: Student and Parent Meeting	-.067	-.052
	(.06)	(.04)
Child Female	-.05	-.072**
	(.04)	(.03)
Group 1 x Child Female	-.0078	.024
	(.06)	(.05)
Group 2 x Child Female	.091	.067
	(.06)	(.05)
Control Mean	.67	.67
F-test p-val ($\beta_1 \neq \beta_2$)	.088	.45
N	1611	2313

Table A.4.28: Final Application: School Fees by Child Gender

	(1) School Cost
Group 1: Student Meeting	-20*
	(11.59)
Group 2: Student and Parent Meeting	-18*
	(10.92)
Child Female	-14
	(9.22)
Group 1 x Child Female	20
	(14.74)
Group 2 x Child Female	-1.7
	(15.08)
Control Mean	197.77
F-test p-val ($\beta_1 \neq \beta_2$)	.19
N	2344

Appendix B

Promoting Child Reading in Kenya: Estimating the Demand for Storybooks – Appendices

B.1 Appendix Tables and Figures

Table B.1.1: Storybook Take-Up (weighted)

	(1) Take-Up	(2) # Books	(3) Take-Up	(4) # Books
High Subsidy (Price = KES 50)	-.04		-.044	
	(.03)		(.04)	
Medium Subsidy (Price = KES 100)	-.095**	-.18**	-.11**	-.17
	(.04)	(.08)	(.05)	(.11)
Low Subsidy (Price = KES 150)	-.11**	-.33***	-.13***	-.27***
	(.04)	(.09)	(.05)	(.10)
Urban			-.0052	.12*
			(.00)	(.07)
Urban x High Subsidy			.021*	
			(.01)	
Urban x Med Subsidy			.069*	-.047
			(.04)	(.18)
Urban x Low Subsidy			.078**	-.21
			(.04)	(.18)
Weights	Intensive	Intensive	Intensive	Intensive
F-test for Subsidy Level Terms (p-value)	.0012	.00026	.024	.3
Number Observations	972	245	965	242
Sample	Group 1-3	Group 2	Groups 1-3	Group 2

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for stratification during storybook treatment randomization: PSDP or GSP treatment group, gender of KLPS parent, and baseline (1998) grade of KLPS parent. We also include an indicator for PSDP or GSP program participation, gender of interviewer; months elapsed since the start of the survey wave; and an indicator for inclusion in the vocational education / cash grant sample as well as treatment groups within the intervention. Specifications with weights take into account the two-stage tracking strategy of KLPS-Kids data collection. Standard errors are clustered at the 1998 school level.

Table B.1.2: Take-Up: Interactions with PSDP

	(1) Take-Up	(2) # Books	(3) Take-Up	(4) # Books
PSDP Treatment	-.0055	-.012	.18	.068
	(.01)	(.01)	(.13)	(.14)
High Subsidy x PSDP	.0065	.022		
	(.01)	(.02)		
Medium Subsidy x PSDP	-.043	-.02	-.047	-.078
	(.05)	(.03)	(.25)	(.23)
Low Subsidy x PSDP	.011	.052	-.16	-.07
	(.06)	(.06)	(.27)	(.23)
High Subsidy (Price = KES 50)	-.01	-.023		
	(.01)	(.01)		
Medium Subsidy (Price = KES 100)	-.045	-.032	-.26	-.21
	(.04)	(.02)	(.21)	(.17)
Low Subsidy (Price = KES 150)	-.11**	-.13**	-.51***	-.64***
	(.04)	(.06)	(.19)	(.15)
Weights	None	PSDP	None	PSDP
F-test Joint Significance P value	.8	.36	.55	.96
Number Observations	557	557	138	138
Sample	Group 1-3	Group 1-3	Group 2	Group 2

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for stratification during storybook treatment randomization: gender of KLPS parent, and baseline grade (1998) of KLPS parent. We also include a vector of controls used either to stratify the original PSDP sample, or in the sampling of the KLPS sample, as well as other key controls used in Baird et al. (2016, 2017). This vector comprises an indicator for gender of interviewer; month of interview fixed effects; the total density of primary school children in a 6 km radius around the parents' PSDP school in 1998; an indicator for inclusion in the vocational education / cash grant sample; indicator for geographic zone of parent's school in 1998; population of parent's school in 1998; indicator for participation in deworming cost-sharing in 2001 (Kremer and Miguel 2007); and average 1996 test score of parent's PSDP school. Specifications with weights include survey weights to maintain initial (baseline PSDP) population representativeness. We also take into account both the sampling for the KLPS and the two-stage tracking strategy of KLPS-Kids data collection. Standard errors are clustered at the 1998 school level.

Table B.1.3: Take-Up: Interactions with VocEd

	(1) Take-Up	(2) # Books	(3) Take-Up	(4) # Books
Voced Voucher Treatment	9.1e-17 (.00)	6.2e-17 (.)	-.18 (.25)	-.088 (.18)
High Subsidy x Voced	-.0067 (.05)	.009 (.03)		
Medium Subsidy x Voced	.0066 (.05)	.041 (.05)	.21 (.32)	.25 (.27)
Low Subsidy x Voced	-.055 (.06)	-.028 (.03)	.12 (.35)	-.012 (.27)
SCY Treatment	4.0e-16 (.00)	-6.6e-17 (.00)	-.43* (.24)	-.27 (.18)
High Subsidy x SCY	-.065 (.05)	-.042 (.03)		
Medium Subsidy x SCY	-.066 (.05)	-.063 (.05)	.09 (.32)	.0048 (.26)
Low Subsidy x SCY	.047 (.06)	.022 (.03)	.36 (.35)	.24 (.27)
High Subsidy (Price = KES 50)	.0037 (.03)	-.005 (.02)		
Medium Subsidy (Price = KES 100)	-.0023 (.02)	-.021 (.03)	-.11 (.19)	-.15 (.17)
Low Subsidy (Price = KES 150)	-.056* (.03)	-.028* (.02)	-.33 (.22)	-.25 (.19)
Weights	None	Intensive	None	Intensive
F-test Joint Significance P value (VocEd)	.94	.7	.9	.77
F-test Joint Significance P value (SCY)	.34	.41	.13	.25
Number Observations	364	364	90	90
Sample	Group 1-3	Group 1-3	Group 2	Group 2

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for stratification during the reading promotion randomization: PSDP/ GSP treatment group, gender of KLPS parent and baseline grade of KLPS parent. We also include an indicator for PSDP or GSP program participation, gender of interviewer and months elapsed since the start of the survey wave. Standard errors are clustered at the 1998 school level.

Table B.1.4: Take-Up: Heterogeneity by Earnings

	(1) Take-Up	(2) # Books	(3) Take-Up	(4) # Books
Above Median Earnings	.00012	.001	.036	-.045
	(.01)	(.01)	(.10)	(.10)
Above Median Earnings x High Subsidy	.00028	-.00015		
	(.01)	(.01)		
Above Median Earnings x Med Subsidy	.061	.034	.009	.1
	(.05)	(.04)	(.18)	(.15)
Above Median Earnings x Low Subsidy	.0081	.037	.39*	.55**
	(.06)	(.07)	(.22)	(.22)
High Subsidy (Price = KES 50)	-.013	-.021		
	(.04)	(.04)		
Medium Subsidy (Price = KES 100)	-.11**	-.089*	-.24**	-.22**
	(.05)	(.05)	(.12)	(.10)
Low Subsidy (Price = KES 150)	-.12*	-.15*	-.7***	-.81***
	(.07)	(.09)	(.17)	(.18)
Weights	None	Intensive	None	Intensive
Number Observations				
Sample	555	555	138	138
sample	Groups 1-3	Groups 1-3	Group 2	Group 2

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for stratification during storybook treatment randomization: PSDP or GSP treatment group, gender of KLPS parent, and baseline (1998) grade of KLPS parent. We also include an indicator for PSDP or GSP program participation, gender of interviewer; months elapsed since the start of the survey wave; and an indicator for inclusion in the vocational education / cash grant sample as well as treatment groups within the intervention. Specifications with weights take into account the two-stage tracking strategy of KLPS-Kids data collection. Standard errors are clustered at the 1998 school level.

Table B.1.5: Take-Up: Heterogeneity by Gender of Child

	(1) Take-Up	(2) # Books	(3) Take-Up	(4) # Books
Child Female	-.0013	-.00081	-.04	-.016
	(.00)	(.00)	(.10)	(.09)
Child Female x High Subsidy	-.015	-.0075		
	(.01)	(.01)		
Child Female x Med Subsidy	-.025	-.034	-.18	-.11
	(.04)	(.04)	(.18)	(.17)
Child Female x Low Subsidy	-.028	-.062	.21	.15
	(.04)	(.05)	(.17)	(.17)
High Subsidy (Price = KES 50)	-.04	-.032		
	(.03)	(.03)		
Medium Subsidy (Price = KES 100)	-.096**	-.076**	-.11	-.13
	(.04)	(.04)	(.11)	(.10)
Low Subsidy (Price = KES 150)	-.11**	-.077*	-.43***	-.41***
	(.05)	(.04)	(.12)	(.12)
Weights	None	Intensive	None	Intensive
Number Observations	972	972	245	245
Sample	Groups 1-3	Groups 1-3	Group 2	Group 2

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for stratification during storybook treatment randomization: PSDP or GSP treatment group, gender of KLPS parent, and baseline (1998) grade of KLPS parent. We also include an indicator for PSDP or GSP program participation, gender of interviewer; months elapsed since the start of the survey wave; and an indicator for inclusion in the vocational education / cash grant sample as well as treatment groups within the intervention. Specifications with weights take into account the two-stage tracking strategy of KLPS-Kids data collection. Standard errors are clustered at the 1998 school level.

Table B.1.6: Take-Up: Heterogeneity by Gender of Parent

	(1) Take-Up	(2) # Books	(3) Take-Up	(4) # Books
FR Female	.001	.0017	-.027	-.028
	(.00)	(.00)	(.11)	(.09)
Female x High Subsidy	.0074	.0026		
	(.02)	(.01)		
Female x Med Subsidy	.03	.036	.16	.17
	(.04)	(.04)	(.18)	(.18)
Female x Low Subsidy	-.0063	.0097	-.17	-.18
	(.05)	(.05)	(.18)	(.18)
High Subsidy (Price = KES 50)	-.054	-.041		
	(.04)	(.04)		
Medium Subsidy (Price = KES 100)	-.13**	-.11**	-.27*	-.26**
	(.05)	(.05)	(.14)	(.13)
Low Subsidy (Price = KES 150)	-.12***	-.12**	-.22*	-.23**
	(.04)	(.05)	(.13)	(.12)
Weights	None	Intensive	None	Intensive
Number Observations	972	972	245	245
Sample	Groups 1-3	Groups 1-3	Group 2	Group 2

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for stratification during storybook treatment randomization: PSDP or GSP treatment group, gender of KLPS parent, and baseline (1998) grade of KLPS parent. We also include an indicator for PSDP or GSP program participation, gender of interviewer; months elapsed since the start of the survey wave; and an indicator for inclusion in the vocational education / cash grant sample as well as treatment groups within the intervention. Specifications with weights take into account the two-stage tracking strategy of KLPS-Kids data collection. Standard errors are clustered at the 1998 school level.

Table B.1.7: Take-Up: Heterogeneity by Number of Children in Household

	(1) Take-Up	(2) # Books	(3) Take-Up	(4) # Books
Number of Children	.0002	.00085	.046	.052*
	(.00)	(.00)	(.04)	(.03)
Number of Children x High Subsidy	.0014	.0012		
	(.01)	(.00)		
Number of Children x Med Subsidy	-.0025	.0016	-.067	-.049
	(.01)	(.01)	(.05)	(.04)
Number of Children x Low Subsidy	-.001	.0066	-.052	-.024
	(.01)	(.01)	(.05)	(.05)
High Subsidy (Price = KES 50)	-.051	-.045		
	(.04)	(.04)		
Medium Subsidy (Price = KES 100)	-.079	-.08	.076	.033
	(.05)	(.05)	(.17)	(.15)
Low Subsidy (Price = KES 150)	-.13**	-.14**	-.22	-.34*
	(.05)	(.07)	(.17)	(.18)
Weights	None	Intensive	None	Intensive
Number Observations	816	816	206	206
Sample	Groups 1-3	Groups 1-3	Group 2	Group 2

Notes: Standard errors in parentheses, * (p<.10), ** (p<.05), *** (p<.01). Specifications control for the variables used for stratification during storybook treatment randomization: PSDP or GSP treatment group, gender of KLPS parent, and baseline (1998) grade of KLPS parent. We also include an indicator for PSDP or GSP program participation, gender of interviewer; months elapsed since the start of the survey wave; and an indicator for inclusion in the vocational education / cash grant sample as well as treatment groups within the intervention. Specifications with weights take into account the two-stage tracking strategy of KLPS-Kids data collection. Standard errors are clustered at the 1998 school level.

B.2 Storybook Intervention Materials

Information Script A

Please put storybooks away for the Information Script. Keep the respondent engaged during the information script by making eye contact and using a dynamic voice. Read out loud. Now I would like to give you some information about reading with your children. Research has shown that reading to your young children, especially those who are not yet reading themselves, can help them love books and love learning. It also gives you and your children something special to do together. Try to read with your children every day - even 10 or 15 minutes is good. Pick a time when your children are not tired or hungry, and when you can give them your full attention. When reading together, you can sit side-by-side or with your children on your lap.

When you read the story, point to the words as your read. Stop and talk about the words, and point to where the words are in the picture. Even if you cannot read yourself, you can still use the pictures to create your own story. If some of your children know a word, let them sound it out. Listen to your children and encourage them to talk about the story. Make the experience interactive by asking them questions about the story. For example: "What do you see here in this picture?", "Where have you seen these things before?", "What is this person feeling?", "Why do they feel that way?", "What is this person doing?", "Who is your favorite character?".

When your children respond, repeat what your children say and add more details. Connect what is happening in the story to previous experiences for your children. It is normal for your children to want to read the story over and over again, so be patient. When you have fun, your children will have fun too! Books are precious, so you should keep this storybook in the house and make sure your children treat it with care. If you like this storybook, you can get more storybooks just like this at your nearest bookstore. If you have a smart phone or tablet you can also download stories for free by visiting the African Storybook website. Here is a poster with a link to the African Storybook website and some information about reading, that you can hang on your wall as a reminder. Give respondent poster. To summarize:

- Remember to read with your children every day! Reading will help them to love learning.
- Even 10 to 15 minutes is good.
- Ask your children questions about the story, and point to where the words are in the picture.

Information Script B

Please put storybooks away for the Information Script. Keep the respondent engaged during the information script by making eye contact and using a dynamic voice. Read out loud. We would like to give you some information about reading with your children just for your reference. Research has shown that reading to your young children, especially those who are not yet reading themselves, can help them love books and love learning. It also gives you and your children something special to do together. Try to read with your children every day - even 10 or 15 minutes is good. Pick a time when your children are not tired or hungry, and when you can give them your full attention. When reading together, you can sit side-by-side or with your children on your lap.

When you read a storybook, point to the words as your read. Stop and talk about the words, and point to where the words are in the picture. Even if you cannot read yourself, you can still use the pictures to create your own story. If some of your children know a word, let them sound it out. Listen to your children and encourage them to talk about the story. Make the experience interactive by asking them questions about the story. For example: "What do you see here in this picture?", "Where have you seen these things before?", "What is this person feeling?", "Why do they feel that way?", "What is this person doing?", "Who is your favorite character?". When your children respond, repeat what your children say and add more details. Connect what is happening in the story to previous experiences for your children. It is normal for your children to want to read a story over and over again, so be patient. When you have fun, your children will have fun too!

Books are precious, so you should keep any storybooks in the house and make sure your children treat them with care. If you decide to purchase a storybook later, you can get other storybooks just like these at your nearest bookstore. If you have a smart phone or tablet you can also download stories for free by visiting the African Storybook website. Here is a poster with a link to the African Storybook website and some information about reading, that you can hang on your wall as a reminder. Give respondent poster.

To summarize:

- Remember to read with your children every day! Reading will help them to love learning.
- Even 10 to 15 minutes is good.
- Ask your children questions about the story, and point to where the words are in the picture.

Figure B.2.1: Intervention Poster

English Translation: "Remember to read with your children today. Reading with your children helps them love learning. Ask your children questions about the story: When? Where? Who? How? What? Point to where the words are in the picture Even 10 to 15 minutes is good"

SMS Reminder Text

"Habari! Huu ni ujumbe wa bure kutoka IPA. Tafadhali usijibu. Tungependa kukukumbusha kusoma pamoja na watoto wako leo. Kusoma pamoja na watoto wako huwasaidia kupenda masomo. Hata dakika 10 hadi 15 ni nzuri!" English Translation: "Hello! This is a free message from IPA. Please do not respond. We would like to remind you to read with your children today. Reading together with your children helps them love learning. Even 10 or 15 minutes is good!"