

## The Importance of Information Targeting for School Choice<sup>†</sup>

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While school choice programs are common, researchers and policymakers know little about the underlying decision-making processes and the transfer of information across agents. Researchers typically model the household as a unitary decision maker, yet the preferences and information sets of students and their guardians can differ widely.<sup>1</sup> Knowing who ultimately decides and how the information available to each agent affects the decision has crucial implications for the optimal design of school choice systems, policies to increase participation in such schemes, and the most effective information dissemination strategies. The key barriers to understanding the choice process and the role of information are a lack of data and the endogenous allocation of information. In this study we focus on Ghana, a country with universal senior high school choice. Our study experimentally varied the provision of information about school quality, admissions standards, and application strategies to students and their guardians to observe changes in behaviors and the decision maker's identity.

In Ghana, and elsewhere, tremendous scope exists to improve students' schooling choices,

and thus outcomes, through enhanced information access. First, poorly informed choices lead to inefficient and expensive ex post sorting and suboptimal matching. Second, even high-ability students make choice errors, and these errors are more common among marginalized groups (Lai, Sadoulet, and de Janvry 2009 in Beijing; Lucas and Mbiti 2012 in Kenya; Ajayi 2013 in Ghana). Third, in settings with optional school choice, low-income or low-education households can be excluded entirely (Walters 2014).

Directly involving guardians in the choice process can further reduce these inefficiencies and improve student outcomes. Previous research that sought to inform both parents and students targeted students and then encouraged them to share the information with their parents (Dinkelman and Martinez 2014 on higher education financing in Chile) or only targeted students as parents proved too difficult to reach directly (Hoxby and Turner 2013 on university applications in the United States). Giustinelli (2016) modeled the decision process based on survey and choice information, but did not experimentally vary information provision. We build on these studies by randomizing whether guardians were direct recipients of information. Further, we are one of the few studies to directly interview guardians, the notable exception being Banerjee et al. (2010).

To test the effect of information access and targeting, we created an information booklet and video that we delivered in school-based information sessions. We tested the effects through a 900-school randomized controlled trial in which we randomly assigned each junior high school in the sample to one of three arms: information session for students, separate information sessions for students and guardians, and a control group.

Based on data collected from a survey of guardians, our intervention increased the likelihood that guardians reported helping with, having the final vote in, and being the only decision maker in the selection process. In addition,

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<sup>1</sup>In our sample, 93 percent of guardian respondents were parents. We use the more inclusive category of guardian to account for alternative household structures.

specifically targeting guardians led to significantly larger changes for most outcomes. This involvement is borne out in their information set, as guardians from schools in which they were specifically targeted were more likely to know the order of the schools their child listed.

Our findings build on earlier work examining school choice decisions and the importance of the decision maker. Our paper is the first to test for changes in behaviors and the identity of the decision maker, uncovering the mechanisms behind observed school choices.

### I. Background and Setting

Ghana is a country with universal senior high school choice, admissions based on stated preferences and test scores, and limited knowledge among students of crucial school characteristics (Ajayi 2013). At the end of grade 9, students apply to four senior high schools through a centralized system that admits students to at most one school based on their choices and test scores. This is the only official avenue through which students apply to senior high schools that follow the national curriculum.<sup>2</sup> Most students in government junior high schools have limited information about senior high schools even though parents and students state that admission probability and historical performance are important considerations in their choice. This information deficit is particularly acute among otherwise marginalized students (Ajayi 2013). As an indication of both the information deficit prior to selection and its costs, about 40 percent of students who complete senior high school do so in a school other than the one to which they were initially assigned.

### II. Conceptual Framework and Empirical Strategy

Nonrandom allocation of information has limited researchers' ability to identify the effect of information on guardian and student involvement in the school choice process. To address this, we created an information intervention for ninth grade students and randomly assigned

it, at the school level, across 900 government schools in the Ashanti region of Ghana. During the information session, students in treatment groups 1 and 2 received a booklet we created with information about application strategies and the quality and admissions criteria of all senior high schools in the region, watched a video we created that dramatized and explained the school selection process, and participated in a question and answer period with a trained enumerator.<sup>3</sup> For schools in treatment group 2, in addition to the student session, guardians were also invited to the school to attend a session where the same video was screened and a question and answer period occurred. A third group received no intervention and served as the control.

To identify the overall effect of the intervention, we estimate the following equation:

$$(1) \quad Y_{is} = \alpha + \beta T_s + \mathbf{X}'_{is} \gamma + \varepsilon_{is},$$

where  $Y_{is}$  is the outcome for individual  $i$  in school  $s$ ,  $T_s$  is an indicator equal to 1 if school  $s$  was a treatment school (initially combining both treatments 1 and 2), and  $\mathbf{X}'_{is}$  is a vector of control variables including dummy variables for district, the gender of the respondent, the gender of the student, and whether the home language was Twi.<sup>4</sup> The error terms are allowed to be correlated within a school but are assumed to be uncorrelated across schools. The primary coefficient of interest is  $\beta$ , the effect of the two information arms on outcomes.

In additional estimations, we augment this equation by replacing our treatment indicator with separate indicators for treatment 1 (students only) and treatment 2 (students and guardians) to separately identify the effects of each treatment.

For our outcomes of interest, we first test whether guardians of students in treatment schools were more likely to have seen an information booklet or an informational video on the school selection process. Then we test whether

<sup>3</sup>The video presented a story of students participating in the school selection process and included guidance about optimal application strategies (e.g., including a reach, a match, and a safety school, and not ranking more selective schools below less selective schools) and how to use the booklet to learn more about senior high schools.

<sup>4</sup>We include whether Twi was spoken at home as a covariate since the information sessions occurred in a mixture of Twi and English.

<sup>2</sup>All public schools and most private schools follow this curriculum. A separate admissions process occurs for the small private school sector that follows an international curriculum and caters primarily to non-Ghanaian nationals.

the treatment affected self-reported guardian involvement in the process; whether the guardian provided the deciding vote, took others' opinions into account, and was more informed; and whether the intervention changed the guardian's aspirations for the student.

### III. Data

Even though the entire experiment includes 900 schools, for this study we focus on the 450 schools—evenly divided across the three treatment groups—where we conducted student baseline surveys.<sup>5</sup> Prior to the intervention, students provided contact information for their guardians (most often their parents) as well as other adults in their household. We randomly selected a subset of students from each school and, after the intervention and school selection process were complete, attempted to contact their guardians by phone. In cases in which guardians could not be reached after multiple attempts, other adults in the households were contacted and surveyed.<sup>6</sup> We reached 5,272 guardians who answered questions about their beliefs and preferences and the decision-making processes in their households.<sup>7</sup>

We check for differences in time-invariant respondent characteristics to confirm baseline balance.<sup>8</sup> Across all three treatment arms, any differences between the likelihood of the adult respondent being the student's guardian are not statistically significant. Further, within the guardian sample any differences across treatment groups in the age and education level of the guardian and the likelihood of the guardian

being female, the student's parent, having Twi as the home language, being self-employed, self-describing as low income, being responsible for other grade 9 students, and having another child in senior high school are not statistically significant.<sup>9</sup>

### IV. Results

Table 1 presents the effects of treatment status on whether guardians reported having seen a booklet with senior high school information and having seen a video about the school selection process, an estimation of equation (1). All guardians in the guardian information treatment schools were invited to attend the information session, but not all did. The estimates in columns 1 and 3 show that guardians in the two treatment groups were 12 percentage points more likely to report having seen a booklet and 5 percentage points more likely to report having seen a video, a 63 percent and 118 percent increase over the control group, respectively.<sup>10</sup> In columns 2 and 4, we split these results by the two treatment groups. Guardians of students in the student-information-only group were 10 percentage points more likely to have seen the booklet, while those directly targeted were 13 percentage points more likely to have seen it. The difference between these two coefficients is not statistically significant, which is reasonable as students were instructed to take the booklet home for study. Further, consistent with the design, the student-information-only treatment did not noticeably increase the likelihood that guardians reported having seen the video. Those targeted by the guardian intervention were 9.6 percentage points more likely to have seen the video. For the remaining analysis we provide

<sup>5</sup>In order to separate any effect of priming that might occur from a survey on school choice from the information intervention, we performed the student and guardian surveys in only one half of the study sample. We focus on that half of the sample here. Future research based on administrative data will include the entire 900-school sample.

<sup>6</sup>Despite efforts to contact guardians from each study school, in a small number of schools, no guardians could be reached due to a lack of mobile phone service in extremely rural areas. Our sample consists of guardians from 433 schools—143 information to students only, 146 information to students and guardians, and 144 control.

<sup>7</sup>Overall, 84 percent of the adults contacted were guardians. In this study we focus on guardians. All results are similar if we include other respondents or limit the sample to parents only.

<sup>8</sup>Due to budgetary limitations, we were not able to conduct a full baseline survey of these same individuals.

<sup>9</sup>Online Appendix Table 1 contains the baseline balance estimates for the guardian sample used in the analysis. These estimates are similar for the sample that includes non-guardian respondents, with the one exception that respondents in the student-only information arm are statistically significantly older, by about 0.7 years, than the other two arms. Our treatment effect estimates are robust to controlling for age in all of our regressions.

<sup>10</sup>Guardians in the control group may have seen booklets from the treatment groups, been mistaken, or seen the limited booklets distributed by Ghana Education Services (GES). In addition, some guardians may have seen a GES produced video, which was not widely distributed, that explained the 2005 introduction of the computerized system but not school characteristics or application strategies.

TABLE 1—INFORMATION DELIVERY

	Seen booklet		Seen video	
	(1)	(2)	(3)	(4)
Information treatment	0.116 (0.015)		0.051 (0.008)	
Information to students only		0.103 (0.018)		0.003 (0.007)
Information to students and parents		0.128 (0.017)		0.096 (0.010)
Test of equality of treatment coefficients				
<i>F</i> -statistic		1.56		79.20
<i>p</i> -value		0.21		0.00
Observations	5,272	5,272	5,272	5,272
<i>R</i> <sup>2</sup>	0.04	0.04	0.01	0.03
Control group mean		0.186		0.043

*Notes:* Linear probability models. Additional controls: dummy variables for district, the gender of the respondent, the gender of the student, and whether the home language was Twi. Columns 1 and 2: The dependent variable is an indicator for whether the guardian reported “ever see[ing] a booklet or list of all available secondary schools in Ashanti region.” Columns 3 and 4: the dependent variable is an indicator for whether the guardian reported “ever see[ing] a video about the school selection process.” In columns 1 and 3, we include a single treatment indicator equal to one if the child of the respondent is in either a student information treatment school or a guardian and student information school. In columns 2 and 4, we include a separate indicator for each of the two treatment arms. Standard errors clustered at the school level appear in parentheses.

separate estimates for the two treatments, given their differential effects on these intermediate outcomes.

Table 2 presents the estimated effects of each of the two treatments on guardians’ behaviors and preferences. In columns 1 through 3, we see that the combined student and guardian treatment increased the likelihood of guardians responding that they or another guardian helped with school selection (8.3 percentage points), that a guardian had the final vote (6.8 percentage points), and that a guardian was the sole decision maker (4.6 percentage points). One concern with these findings could be that guardians, having participated in the session, were answering the questions in the way they perceived to be correct but had not changed behavior. This is unlikely for at least two reasons. First, the information sessions did not emphasize that guardians should assist in the school selection process, instead that it should be an informed process. Second, guardians demonstrated that they knew more about the choices their child listed. For column 4 we re-estimate equation (1) with knowing the order of the choices listed as the dependent variable. We find that guardians

were 6.2 percentage points more likely to know the order of the students’ choices, relative to a base of 25 percent among guardians of students in control schools.<sup>11</sup>

These increases in involvement and knowledge are remarkable since only 32 percent of guardians in the guardian-information treatment reported having seen a booklet and 14 percent reported having seen the video. Effects on survey responses of this magnitude suggest a very large treatment on the treated effect and/or spillovers across guardians of students in the same schools. Future research will disentangle these effects.

In column 5 we test whether aspirations changed as a result of the intervention, something we did not specifically target. We find no effect on whether the guardian reported desiring the student to continue schooling to the

<sup>11</sup> In results not presented, we find that none of the effects differ by guardian education level, indicating that our intervention was able to increase participation of the least educated parents.

TABLE 2—INFORMATION USE

	Guardians provide help in selection (1)	Guardians have final vote in selection (2)	Guardians are sole decision makers (3)	Guardian knows order of choices (4)	University aspirations (5)
Information to students only	0.033 (0.023)	0.016 (0.022)	0.016 (0.018)	0.029 (0.023)	0.012 (0.021)
Information to students and parents	0.083 (0.022)	0.068 (0.022)	0.046 (0.018)	0.062 (0.024)	-0.008 (0.021)
Respondent is female	-0.039 (0.014)	-0.041 (0.014)	-0.031 (0.013)	-0.020 (0.013)	-0.122 (0.014)
Student is female	0.007 (0.014)	0.003 (0.014)	0.003 (0.013)	0.001 (0.013)	-0.171 (0.014)
Test of equality of treatment coefficients					
<i>F</i> -statistic	4.78	5.65	2.71	2.04	0.91
<i>p</i> -value	0.03	0.02	0.10	0.15	0.34
Observations	5,272	5,272	5,272	5,272	4,557
<i>R</i> <sup>2</sup>	0.03	0.02	0.01	0.02	0.08
Control group mean	0.47	0.40	0.24	0.25	0.69

Notes: Linear probability models. Additional controls: dummy variables for district and whether the home language was Twi. Column 5: not all respondents provided an answer to this question. Standard errors clustered at the school level appear in parentheses.

university level.<sup>12</sup> Of note in this column is the strong negative correlation between the respondent or student being female and university aspirations. Either person being female, holding the gender of the other fixed, reduces the likelihood of university aspirations by about 15 percentage points.

## V. Discussion and Conclusions

We find that directly including guardians in a simple information intervention increased their awareness of and involvement in the school selection process. Incidentally, we also find evidence of lower reported ambition among female guardians (regardless of the gender of the student) and on behalf of female students (regardless of the gender of the guardian). Our

results suggest that guardians should be targeted directly to increase their involvement in the school choice process. This result has important implications for both mandatory school choice systems, like in Ghana, where the goal is to increase informed decision-making, and optional systems in which participation by all groups is sought.

Future research will study whether increased guardian involvement changed submitted preferences, senior high school matriculation and continuation, and senior high school test scores.

## REFERENCES

- Ajayi, Kehinde F. 2013. "School Choice and Educational Mobility: Lessons from Secondary School Applications in Ghana." Institute for Economic Development Working Paper 259.
- Banerjee, Abhijit V., Rukmini Banerji, Esther Duflo, Rachel Glennerster, and Stuti Khemani. 2010. "Pitfalls of Participatory Programs: Evidence from a Randomized Evaluation in Education in India." *American Economic Journal: Economic Policy* 2 (1): 1–30.
- Dinkelman, Taryn, and Claudia Martinez A. 2014. "Investing in Schooling in Chile: The Role of

<sup>12</sup>The sample size in this column is smaller than in other columns because some respondents answered "don't know." The result is similar if this response is re-coded to be less than university level and the entire sample is included. Aspiring to senior high school might be more likely to be changed by information about senior high schools, but over 96 percent of control group guardians selected an education level of at least senior high school.

- Information about Financial Aid for Higher Education.” *Review of Economics and Statistics* 96 (2): 244–57.
- Giustinelli, Pamela.** 2016. “Group Decision Making with Uncertain Outcomes: Unpacking Child-Parent Choice of the High School Track.” *International Economic Review* 57 (2): 573–602.
- Hoxby, Caroline, and Sarah Turner.** 2013. “Expanding College Opportunities for High-Achieving, Low Income Students.” Stanford Institute for Economic Policy Research Discussion Paper 12-014.
- Lai, Fang, Elisabeth Sadoulet, and Alain de Janvry.** 2009. “The Adverse Effects of Parents’ School Selection Errors on Academic Achievement: Evidence from the Beijing Open Enrollment Program.” *Economics of Education Review* 28 (4): 485–96.
- Lucas, Adrienne M., and Isaac M. Mbiti.** 2012. “The Determinants and Consequences of School Choice Errors in Kenya.” *American Economic Review* 102 (3): 283–88.
- Walters, Christopher R.** 2014. “The Demand for Effective Charter Schools.” National Bureau of Economic Research Working Paper 20640.