Supplemental Appendix to "Identifying the Harm of Manipulable School-Choice Mechanisms"

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In Dur, Hammond, and Morrill (2017), we provided evidence in favor of a novel classification methodology for identifying sincere and sophisticated students in school-choice matching mechanisms. Our approach allowed us to demonstrate support for previously untested claims in the theoretical matching literature regarding the distributional consequences of using a manipulable mechanism. In this appendix, we present additional evidence and robustness checks that complement those in the paper. First, we document the robustness of our analysis. Second, we present additional evidence supporting the classification of students into categories of sincere and sophisticated.

1 Additional Robustness Checks

Our definition of a sophisticated student is one who logs into the application website more than once. Here, we demonstrate that our main results are robust to alternative classifications of who is sophisticated. For all robustness checks, we rerun our tests of Hypotheses 1 and 2, which involve the probability of magnet assignment and the demand of the student's assigned school, respectively.

As in the main text, these robustness checks use data from applications for seats for the 2014-2015 school year, excluding students whose assignment was the result of the 10% lottery (233 students) or was the result of an administrative assignment (176 students for reasons including special educational needs, etc.) and focusing on entry-grade students (next grade of kindergarten, sixth grade, or ninth grade).

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First, we provide results that use an alternative rolling window when determining each student's number of unique visits. A sophisticated student visits more than once, so a different approach for counting unique visits will reclassify some students. Recall that our login data includes a record of every action a student took on the application website, implying that a student who stayed on the page for 15 minutes will appear several times in the server logs for each time she clicked on a link or made an entry. In Dur, Hammond, and Morrill (2017), we use a 30 minute rolling window, such that any activity that occurs within 30 minutes of the most-recent entry is considered a single visit. Further, a rolling window implies that each action within 30 minutes resets the counter for activity of a single visit.

We compare the main results to results using a moderate window (one hour) and a long window (six hours). Our main approach of 30 minutes classifies 63.4% of students as sophisticated, while one hour classifies 60.7% of students as sophisticated and six hours classifies 55.7% of students as sophisticated. Interpreting the differences in these rates tells us, for example, that 2.7% (= 63.4 – 60.7) of students took at least one action on the website that was between 30 minutes and 1 hour from their earlier visits and thus are classified differently depending on a 30 minute versus one hour window (i.e., there is an inclusion relation).

Tables A1 and A2 show magnet assignment and demand results, respectively, when we use a one hour window instead, while Tables A3 and A4 do so for a six hour window. Concerning the probability of magnet assignment, longer windows imply a slightly weaker effect of sophistication of assignment probability relative to 30 minutes. However, none of the three estimates are statistically significantly different from one another. Concerning demand, a one hour window provides results that are smaller and statistically insignificant, while a six hour window provides results that are larger and more precisely estimated. Again though, none of the three estimates are statistically significantly different from one another. We conclude that the definition in the paper is robust for both assignment probability and demand.

Second, instead of a discrete measure for the definition of a sophisticated student, we use a continuous measure where students are classified as sophisticated based on the number of unique visits to the application website (returning to the 30 minute window used in the main results). Given its skew, we transform visits using a log transformation and measure the effect of sophistication with variation in log(visits). Here, students are sophisticated if they logged in twice and "more"

sophisticated if they logged in three times, etc. Tables A5 and A6 show these results. The effect of the log of visits is shown as an elasticity, which is interpreted as the effect on the outcome from a proportional change in the number of visits. Acknowledging the difficulty in comparing these elasticities to the marginal effects in the paper, the effect sizes are similar for magnet assignment and for demand.

Third, similar to the previous robustness check, we transform the student's number of visits to isolate what variation drives our main results. Here, we create a series of categories of visits and estimate the effect of being in each visit category. The omitted group is students who visited only once (who are sincere students in the paper). The four included categories are for students who visited two (23.7%), three (12.1%), four (6.8%), and more than four times (20.8%), respectively. In Tables A7 and A8, the most-frequent visitors are estimated to have the largest effects: 13.9 percentage points higher assignment probability and 0.13 fewer applicants per seat at their assigned school, both of which are statistically significant. For assignment probability, students who visited two, three, or four times are predicted to receive assignment more often than students who visited once, but the effect of having visited four times is quite small. For demand, the estimates for the intermediate categories are estimated with a lot of noise and bounce around from two to three to four visits. However, we conclude that our classification in the paper is robust to the alternative and that the most-frequent website visitors are the group for whom we observe the strongest effects.

Fourth, the classification in the paper simply divides students according to one versus more than one visit. As we have discussed, students can strategize (i.e., respond to their admission probabilities) while logging in only once and not strategize while logging in several times. To check the robustness of our definition to these concerns, we use our discrete classification with one modification: exclude students who logged in only once but whose single login was during the last two days of the two-week application period. The rationale is that the number of current first-choice applicants is a fairly reliable measure of each school's demand near the end of the application period. Any student who logs in near the end of the application period will be able to respond to this information, even if this is their only login. Thus for robustness, we compare multiple-visit students (who are sophisticated students in the paper) to single-visit students, excluding single-visit students who logged in during the last two days of the application period. This approach classifies 32.6% of students as sincere, 63.4% as sophisticated, and excludes 4.0% of students. Table A9

shows that the effect of sophistication on assignment is slightly stronger, while Table A10 shows that the effect on demand is essentially the same.

Fifth, we rerun the main results using the main definition of sophistication separately for each grade level, elementary, middle, and high schools. To compactly show all three sets of results, we use the specification from Column (4) of Tables 3 and 4 in Dur, Hammond, and Morrill (2017) that include all covariates and zip code fixed effects. The sample sizes here become small but we can gain some insight into whether substantial heterogeneity exists in our main results by grade level. Tables A11 and A12 show these results. For assignment probability, the effects are largest for middle school students and are still quite large for high school students, though only statistically significant for middle school. For elementary school, sophistication confers a meaningful advantage but one that cannot be distinguished from zero. We avoid interpreting these differences because of concerns over a multiple hypothesis testing problem (see, e.g., List, Shaikh, and Xu (2016)). For demand, the effects are largest for high school students, though none of the effects are statistically significant. We conclude that some heterogeneity is likely to exist across grade levels but, without a larger sample, it is difficult to test competing hypotheses about how sophistication might matter differentially for kindergarten students relative to middle school students or high school students. Finally note that we also provide grade-level splits of the distribution of unique visits, separately by assignment status, in Figures A1, A2, and A3 (corresponding to Figure 2 in the paper).

In total, the main results in Dur, Hammond, and Morrill (2017) are remarkably robust to these alternative classifications and specifications. The assignment probability results are consistent across a number of robustness checks. The demand results are similar in magnitude to the main results, with some differences in terms of statistical significance among these checks. We interpret this as evidence that the effect size of sophistication on demand is robustly estimated but the precision of these results differs somewhat across specifications.

2 Additional Evidence in Favor of Our Classification

Having supporting our approach for classifying students as sincere or sophisticated, we now present additional evidence. The results in this section are intended to provide additional support for our delineation. We use auxiliary data from application website logins to proxy sophistication.

Given the multitude of explanations for why a student may log in once or more than once, we want to run a battery of tests to find evidence that our classification is picking up important differences across students in terms of whether they respond to their admission probabilities when ranking schools.

To do so, we test two additional hypotheses.

Hypothesis 4. *Sophisticated students will rank more schools on their submitted preference list.*

One aspect of understanding the assignment process is understanding how submitted preferences map into assignment probability. We hypothesize that sophisticated students are more likely to submit a preference list with several schools on it because they have a better sense of how to gain admission to one of their preferred schools.

Table A13 tests Hypothesis 4. Note that, during the period under study, students were allowed to rank at most three schools. We find the list of a sophisticated student has around 1.64 schools on average, while that of a sincere student has around 1.57 schools on average, a difference that is statistical significant. Further, sophisticated students are 4.1 percentage points less likely to list only one school and 3.0 percentage points more likely to submit a list that uses all three slots, both of which are statistically significant. In total, sophisticated students submit longer lists.

Hypothesis 5. *Sincere and sophisticated students will differ in their probabilities of exiting the school system, conditional on not receiving a magnet assignment.*

We expect that sincere and sophisticated students will differ in terms of the frequency with which they exit the school system, perhaps to attend a charter or private school. Further, we hypothesize that the difference in the probability of exit will be more pronounced when the student does *not* receive a magnet assignment. The idea of our classification of students as sincere or sophisticated is that sophisticated students have a better understanding of the assignment process. One way that this understanding may lead sophisticated students to behave differently than sincere students is in terms of their understanding of their outside options (i.e., the schools available to them if they are not assigned to their preferred magnet school(s)). Under this hypothesis, sophisticated students whose applications were unsuccessful will be more likely to exit than unsuccessful sincere students.

One could pose other hypotheses for differential exit rates between sincere and sophisticated students, which suggests that the direction of the effect of sophistication on exits is ambiguous ex

ante. For our purposes, the role of Hypothesis 5 is look for additional evidence that our classification of students as sincere or sophisticated is capturing meaningful differences among students. Few decisions are more meaningful than the decision to exit the school system for a charter, private, or home school, leading us to include this test despite the fact that our ex ante hypothesis here is less closely linked to the theoretical matching literature relative to our other hypotheses.

Several school-choice papers (e.g., Calsamiglia and Güell (2014); He (2012)) have pointed out that it is important to consider students' outside options, specifically, the possibility that students plan to attend a charter or private school if they are unsuccessful in obtaining a seat at their preferred public school. We define an exit by merging the 2013-2014 student-level data, including magnet applications, with 2014-2015 student-level data. Any non-twelfth-grade student who is not matched across the two years is said to have exited, which includes students who enrolled in a charter, private, or home school; students who moved or exited from system for other reasons outside of interest for the current study; and students who are not matched for other reasons including data errors. While we cannot quantify the relative magnitudes of these three sources of exits, we use data on exits from non-magnet-applicants as a baseline for the number of exits that occur generally, then ask how students who participate in the magnet-application process exit differentially from this baseline level.

For this exercise, we use data on whether the student holds a seat in any WCPSS school, which could be their base school, a magnet school, or any other WCPSS school. To think about how many students generally exit the school system in a given year, we look at the transition between the 2013-2014 and 2014-2015 school years and index students by their grade in the latter year. Considering students who did not submit a magnet application, the following percentages exited the school system: 10.7% of the 7,564 non-applicant kindergarteners, 8.7% of the 10,617 non-applicant sixth graders, and 8.8% of the 10,982 non-applicant ninth graders. Note that the interpretation of the 10.7% of exits from rising kindergarteners is that these students registered with the school system but did not in fact attend a WCPSS school in their kindergarten year.

From this baseline level of exits (roughly 11% for primary school students and 9% for secondary school students), Table A14 shows exits by magnet applicants, specifically showing the mean fraction of students who exited the school system from 2013-2014 to 2014-2015. Panel A considers only students who submitted a magnet application but were not assigned to any of their ranked

schools. Panel B considers only students who submitted a magnet application and were assigned to one of their ranked schools. Consistent with Hypothesis 5, the results in Table A14 point to large differences in the propensity to exit between sincere and sophisticated students.

Specifically, relative to sincere students, sophisticated students are 4.7 percentage points more likely to exit the school system if their application is unsuccessful. In percentage terms, sophisticated students are 34.0% more likely to exit, an extremely large effect. Looking separately at the grade-entry years to elementary, middle, and high school, the unsuccessful sophisticated applicants are 2.6, 4.6, and 6.2 percentage points more likely to exit, respectively, relative to unsuccessful sincere applicants. Results separately by grade level are no longer statistically significant but the quantitative magnitudes are meaningful. In Panel B however, sophisticated students are slightly less likely to exit, conditional on receiving magnet assignment. Given what we can observe in the data, only imperfect interpretations of these results are possible in the sense that we cannot identify which students are exiting to attend a charter or private school and which are exiting for other reasons. However, Table A14 presents strong evidence that our proxy for sophistication is segmenting students in a systematic way that captures important differences in how students approach the magnet application process.

The results from these additional tests provide further support for our classification approach of identifying sincere and sophisticated students in school choice.

3 Demand of Sincere and Sophisticated Students

The final exercise in this appendix complements the section of the main paper that analyzes how students change their preference list over the course of the two-week application period. There, we consider students who only ever listed one school as their first choice (non-switchers) relative to students who changed their listed first choice at some point during the application period (switchers). Only the final submitted preferences count for the student's assignment; but, given information shown on the website about each school's demand, switching behavior may reflect a student's response to her admission probabilities. Figures 3, 4, and 5 compare the demand of non-switchers to the initial and final demand of switchers.

Here, we present the demand of sincere students relative to the demand of those sophisticated

students who did not change their ranking. Doing so supports the approach in Dur, Hammond, and Morrill (2017) of comparing switchers to all non-switchers. Specifically, we demonstrate that the discussion would be unchanged if we instead compared switchers to sincere students (who are non-switchers by definition). Figures A4, A5, and A6 present this evidence for elementary, middle, and high schools separately.

Figure A4 shows that non-switching sophisticated students have slightly less demand for the second most overdemanded set of elementary schools and slightly more demand for the third most overdemanded set of schools. These differences are small in absolute terms and very small relative to the differences we see between the initial demand of switchers relative to the final demand of switchers. Likewise, Figures A5 and A6 show essentially no differences of substance. In contrast, the bottom left panels relative to the bottom right panels of Figures 3, 4, and 5 in Dur, Hammond, and Morrill (2017) show substantial changes in demand among switchers as they change their rankings during the application period. We conclude that any presentation of the results in the paper will make the same point: switchers respond to their admission probabilities by moving away from the most overdemanded and most underdemanded schools.

References

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Dur, U., R. G. Hammond, and T. Morrill (2017): "Identifying the Harm of Manipulable School-Choice Mechanisms," *mimeo*.

He, Y. (2012): "Gaming the Boston School Choice Mechanism in Beijing," *mimeo*.

List, J. A., A. M. Shaikh, and Y. Xu (2016): "Multiple Hypothesis Testing In Experimental Economics," Discussion Paper Working Paper No. 21875, National Bureau of Economic Research.

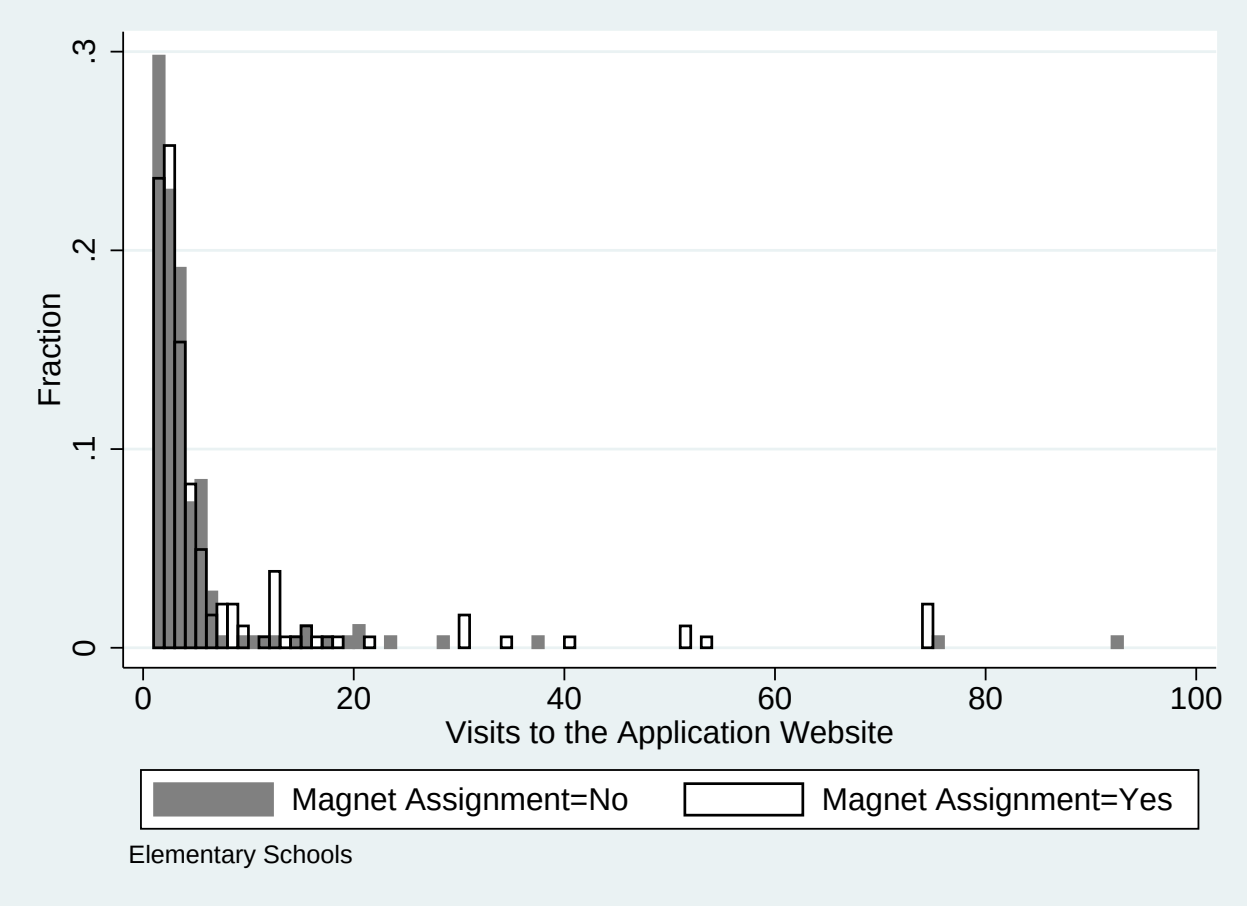

Figure A1: Website Visits by Magnet Assignment for Elementary Schools

Notes: The figure shows the distribution of unique visits to the application website for elementary school students during the selection period of two weeks (January 28 through February 11, 2014), separately for students who were assigned or not assigned to a magnet school. Unique visits are determined using a 30 minute rolling window around each visit and counting all visits within the half-hour as a single, unique visit.

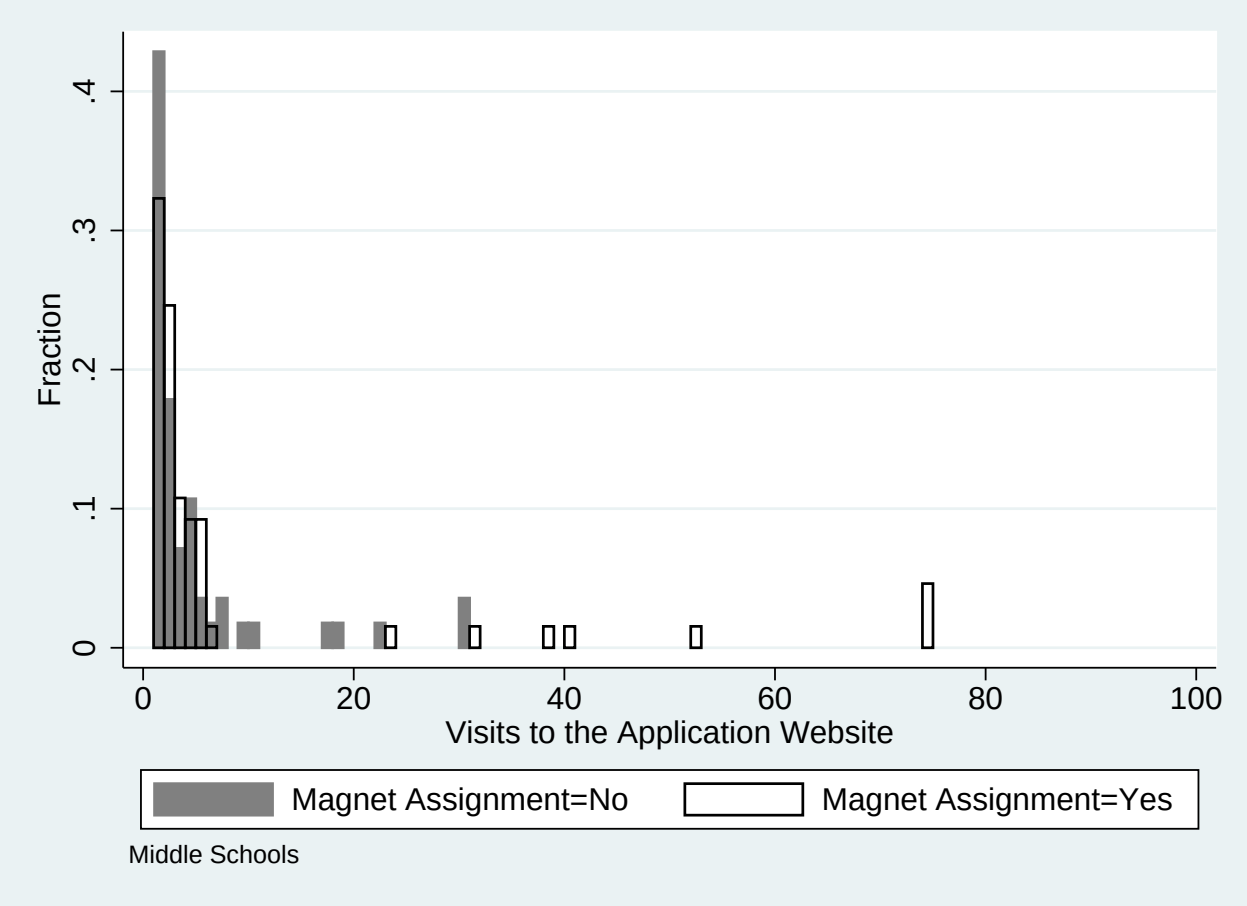

Figure A2: Website Visits by Magnet Assignment for Middle Schools

Notes: The figure shows the distribution of unique visits to the application website for middle school students during the selection period of two weeks (January 28 through February 11, 2014), separately for students who were assigned or not assigned to a magnet school. Unique visits are determined using a 30 minute rolling window around each visit and counting all visits within the half-hour as a single, unique visit.

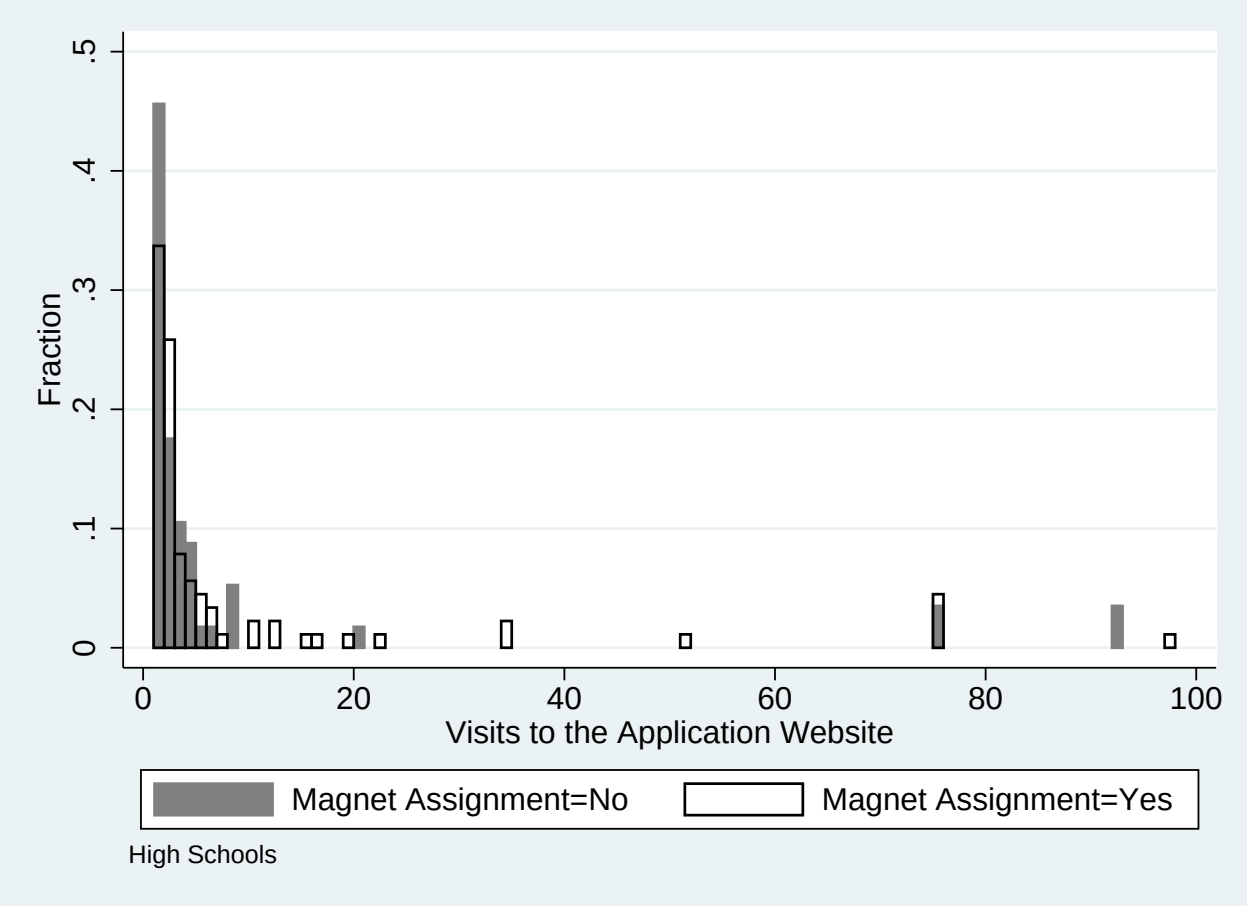

Figure A3: Website Visits by Magnet Assignment for High Schools

Notes: The figure shows the distribution of unique visits to the application website for high school students during the selection period of two weeks (January 28 through February 11, 2014), separately for students who were assigned or not assigned to a magnet school. Unique visits are determined using a 30 minute rolling window around each visit and counting all visits within the half-hour as a single, unique visit.

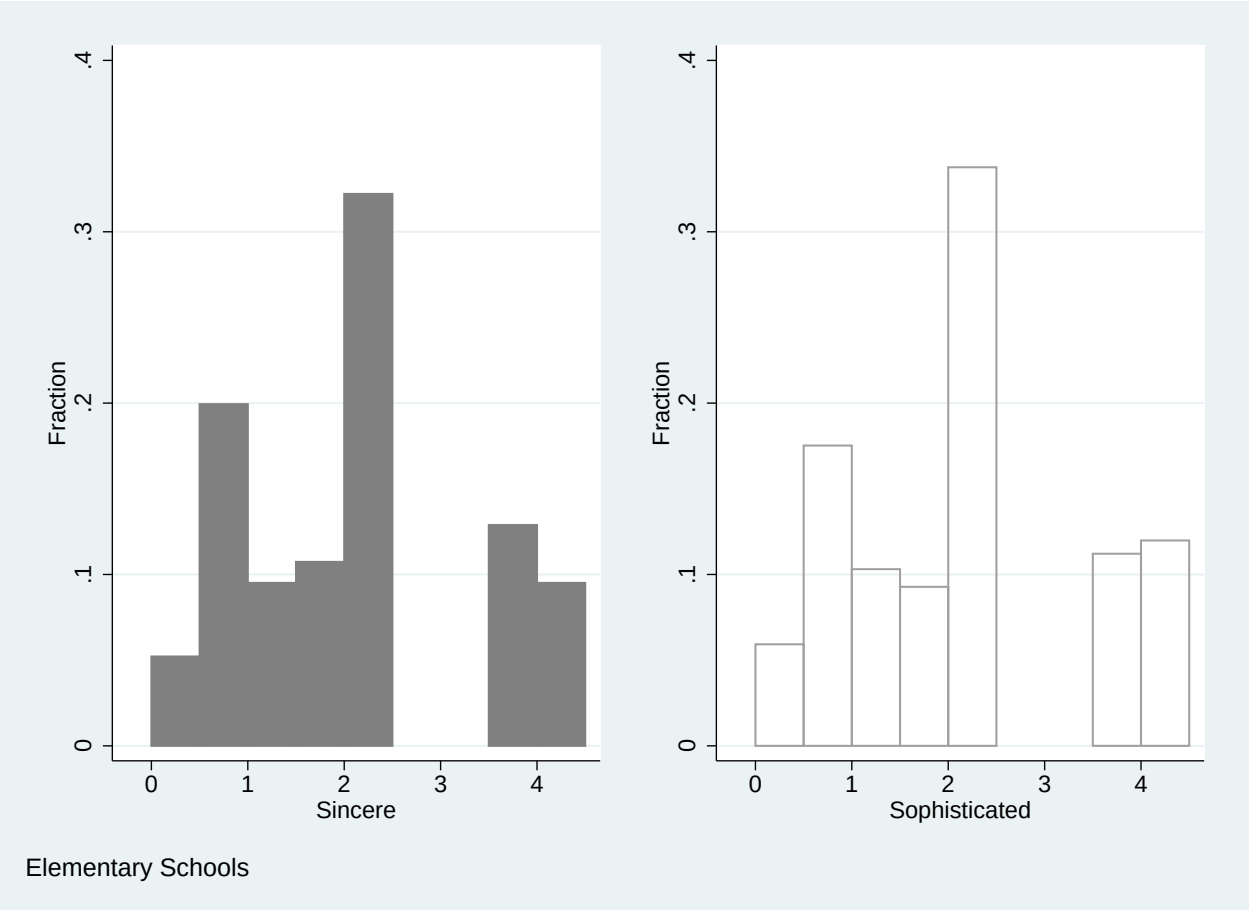

Figure A4: Demand of First-Choice Elementary Schools for Sincere and Non-Switching Sophisticated Students

Notes: The figure shows the demand of first-choice schools for elementary schools, separately for sincere students relative to sophisticated students who did not change their ranking (non-switchers). Schools are plotted in bins along the x-axis according to the degree to which they are overdemanded. The overdemanded ratio reflects the number of applicants who ranked the school as their first choice on their final rankings divided by its capacity (e.g., equals two when there are two first-choice applicants for each seat). The left panel shows the demand of sincere students. The right panel shows the demand of sophisticated students who did not change their ranking (non-switchers). The y-axis shows the fraction of those students demanding the schools in each bin.

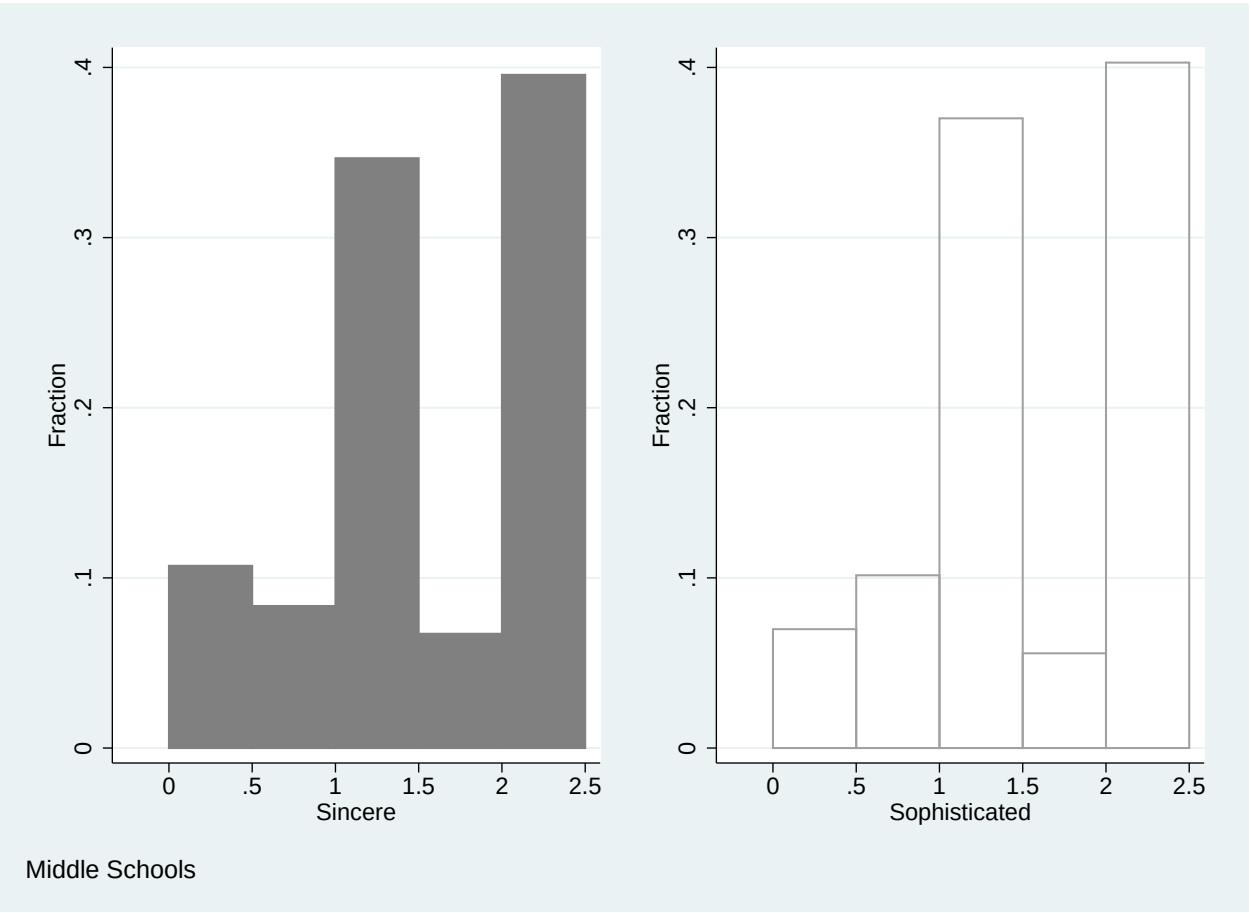

Figure A5: Demand of First-Choice Middle Schools for Sincere and Non-Switching Sophisticated Students

Notes: The figure shows the demand of first-choice schools for middle schools. Schools are plotted in bins along the x-axis according to the degree to which they are overdemanded. The left panel shows the demand of sincere students. The right panel shows the demand of sophisticated students who did not change their ranking (non-switchers). The y-axis shows the fraction of those students demanding the schools in each bin. The notes to Figure A4 provide more detail.

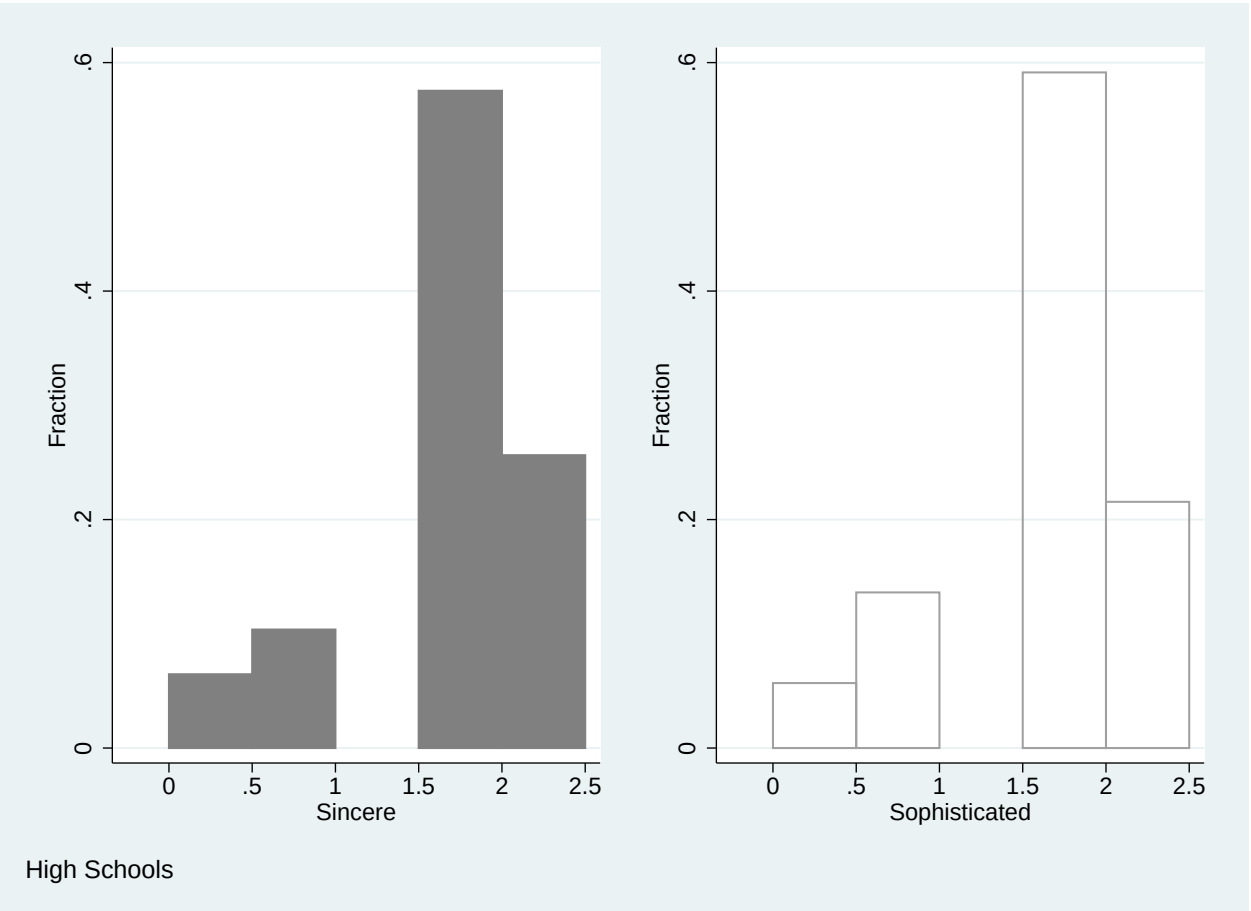

Figure A6: Demand of First-Choice High Schools for Sincere and Non-Switching Sophisticated Students

Notes: The figure shows the demand of first-choice schools for high schools. Schools are plotted in bins along the x-axis according to the degree to which they are overdemanded. The left panel shows the demand of sincere students. The right panel shows the demand of sophisticated students who did not change their ranking (non-switchers). The y-axis shows the fraction of those students demanding the schools in each bin. The notes to Figure A4 provide more detail.

Table A1: Robustness of Assignment Results: One Hour Rolling Window

	(1)	(2)	(3)	(4)
Sophisticated	0.056	0.074	0.079	0.078
	(0.042)	(0.041)*	(0.040)**	(0.038)**
Priority Points		3.348	3.003	3.025
		(0.833)***	(0.810)***	(0.886)***
Middle School		0.044	-0.174	-0.291
		(0.052)	(0.054)***	(0.048)***
High School		0.108	-0.070	-0.076
		(0.048)**	(0.049)	(0.046)
Female			0.008	-0.007
			(0.038)	(0.036)
Asian			0.063	0.154
			(0.061)	(0.062)**
Black			0.323	0.254
			(0.041)***	(0.048)***
Other Race			0.171	0.124
			(0.079)**	(0.073)*
Hispanic			0.152	0.092
			(0.064)**	(0.063)
LEP			0.216	0.183
			(0.077)***	(0.080)**
Gifted			0.351	0.332
			(0.053)***	(0.053)***
Zip Code Fixed Effects	No	No	No	Yes
Observations	627	627	604	598
Log Likelihood	-432.098	-420.704	-371.125	-325.612

Notes: This table replicates the results in Table 3, redefining the window using to define overlapping visits as one hour instead of thirty minutes. Non-guaranteed, priority magnet applicants are shown (i.e., students who have non-zero priority points but who are not guaranteed a seat). The dependent variable in this Probit regression is equal to 1 if the student received a magnet assignment. Marginal effects are shown; the marginal effect of the log of visits is shown as an elasticity. Marginal effects are shown. For this and subsequent tables, robust standard errors are in parentheses; $*$, $**$, and $***$ denote significance at the 10%, 5%, and 1% level, respectively.

Table A2: Robustness of Demand Results: One Hour Rolling Window

	(1)	(2)	(3)	(4)
Sophisticated Student	0.033	0.002	0.002	-0.050
	(0.055)	(0.046)	(0.044)	(0.042)
Priority Points		4.793	4.421	3.918
		(1.132)***	(1.126)***	(1.151)***
Middle School		-0.336	-0.431	-0.319
		(0.063)***	(0.068)***	(0.087)***
High School		-0.471	-0.493	-0.480
		(0.039)***	(0.042)***	(0.054)***
Female Student			0.050	0.045
			(0.046)	(0.047)
Asian Student			0.198	0.050
			(0.089)**	(0.105)
Black Student			-0.067	-0.051
			(0.055)	(0.059)
Other/Multiple Race			-0.130	-0.056
			(0.077)*	(0.071)
Hispanic Student			-0.003	-0.026
			(0.133)	(0.117)
LEP Student			-0.026	0.003
			(0.086)	(0.074)
AG Student			0.221	0.258
			(0.084)***	(0.082)***
Zip Code Fixed Effects	No	No	No	Yes
Observations	328	328	320	320
Adjusted R^2	-0.002	0.270	0.314	0.416

Notes: This table replicates the results in Table 4, redefining the window using to define overlapping visits as one hour instead of thirty minutes. Non-guaranteed, priority students who received a magnet assignment are shown. The dependent variable in this OLS regression is the overdemanded ratio of the student's assigned school, conditional on the student receiving a magnet assignment.

Table A3: Robustness of Assignment Results: Six Hour Rolling Window

	(1)	(2)	(3)	(4)
Sophisticated	0.060	0.076	0.075	0.070
	(0.041)	(0.040)*	(0.038)*	(0.037)*
Priority Points		3.325	2.980	2.976
		(0.831)***	(0.808)***	(0.881)***
Middle School		0.044	-0.173	-0.290
		(0.052)	(0.054)***	(0.048)***
High School		0.109	-0.069	-0.074
		(0.048)**	(0.049)	(0.046)
Female			0.006	-0.008
			(0.038)	(0.036)
Asian			0.064	0.154
			(0.061)	(0.062)**
Black			0.322	0.254
			(0.041)***	(0.047)***
Other Race			0.174	0.128
			(0.079)**	(0.072)*
Hispanic			0.152	0.093
			(0.064)**	(0.063)
LEP			0.211	0.178
			(0.077)***	(0.080)**
Gifted			0.349	0.331
			(0.054)***	(0.053)***
Zip Code Fixed Effects	No	No	No	Yes
Observations	627	627	604	598
Log Likelihood	-431.882	-420.506	-371.211	-325.893

Notes: This table replicates the results in Table 3, redefining the window using to define overlapping visits as six hours instead of thirty minutes. Non-guaranteed, priority magnet applicants are shown (i.e., students who have non-zero priority points but who are not guaranteed a seat). The dependent variable in this Probit regression is equal to 1 if the student received a magnet assignment. Marginal effects are shown; the marginal effect of the log of visits is shown as an elasticity. Marginal effects are shown.

Table A4: Robustness of Demand Results: Six Hour Rolling Window

	(1)	(2)	(3)	(4)
Sophisticated	-0.021	-0.063	-0.073	-0.099
	(0.058)	(0.050)	(0.051)	(0.050)**
Priority Points		4.723	4.352	3.920
		(1.109)***	(1.104)***	(1.148)***
Middle School		-0.340	-0.429	-0.323
		(0.063)***	(0.068)***	(0.085)***
High School		-0.480	-0.502	-0.485
		(0.041)***	(0.044)***	(0.054)***
Female			0.048	0.043
			(0.045)	(0.046)
Asian			0.203	0.053
			(0.089)**	(0.106)
Black			-0.070	-0.052
			(0.055)	(0.058)
Other Race			-0.158	-0.075
			(0.078)**	(0.071)
Hispanic			0.000	-0.024
			(0.133)	(0.115)
LEP			-0.036	-0.001
			(0.090)	(0.077)
Gifted			0.213	0.260
			(0.084)**	(0.081)***
Zip Code Fixed Effects	No	No	No	Yes
Observations	328	328	320	320
Adjusted R^2	-0.003	0.274	0.319	0.423

Notes: This table replicates the results in Table 4, redefining the window using to define overlapping visits as six hours instead of thirty minutes. Non-guaranteed, priority students who received a magnet assignment are shown. The dependent variable in this OLS regression is the overdemanded ratio of the student's assigned school, conditional on the student receiving a magnet assignment.

Table A5: Robustness of Assignment Results: Log(Visits)

	(1)	(2)	(3)	(4)
Log(Visits)	0.048	0.048	0.051	0.051
	(0.018)***	(0.018)***	(0.017)***	(0.016)***
Priority Points		3.288	2.958	3.008
		(0.832)***	(0.810)***	(0.880)***
Middle School		0.040	-0.179	-0.295
		(0.051)	(0.054)***	(0.047)***
High School		0.100	-0.078	-0.082
		(0.048)**	(0.048)	(0.046)*
Female			0.009	-0.004
			(0.038)	(0.036)
Asian			0.050	0.155
			(0.062)	(0.062)**
Black			0.321	0.255
			(0.041)***	(0.047)***
Other Race			0.178	0.137
			(0.079)**	(0.072)*
Hispanic			0.154	0.098
			(0.063)**	(0.062)
LEP			0.209	0.173
			(0.079)***	(0.082)**
Gifted			0.354	0.337
			(0.053)***	(0.053)***
Zip Code Fixed Effects	No	No	No	Yes
Observations	627	627	604	598
Log Likelihood	-429.792	-418.908	-369.191	-323.464

Notes: This table replicates the results in Table 3, redefining the measure of sophistication to use a continuous measure of sophistication where we use a log transformation of the student's number of unique visits to the application website. Non-guaranteed, priority magnet applicants are shown (i.e., students who have non-zero priority points but who are not guaranteed a seat). The dependent variable in this Probit regression is equal to 1 if the student received a magnet assignment. Marginal effects are shown; the marginal effect of the log of visits is shown as an elasticity. Marginal effects are shown.

Table A6: Robustness of Demand Results: Log(Visits)

	(1)	(2)	(3)	(4)
Log(Visits)	-0.019	-0.027	-0.033	-0.061
	(0.024)	(0.020)	(0.020)*	(0.021)***
Priority Points		4.766	4.416	3.889
		(1.121)***	(1.120)***	(1.149)***
Middle School		-0.338	-0.424	-0.318
		(0.063)***	(0.069)***	(0.086)***
High School		-0.474	-0.495	-0.485
		(0.040)***	(0.042)***	(0.053)***
Female			0.048	0.040
			(0.045)	(0.046)
Asian			0.207	0.057
			(0.090)**	(0.104)
Black			-0.066	-0.046
			(0.055)	(0.058)
Other Race			-0.153	-0.082
			(0.078)*	(0.070)
Hispanic			-0.002	-0.031
			(0.134)	(0.116)
LEP			-0.033	0.007
			(0.089)	(0.076)
Gifted			0.207	0.247
			(0.084)**	(0.081)***
Zip Code Fixed Effects	No	No	No	Yes
Observations	328	328	320	320
Adjusted R^2	-0.002	0.273	0.318	0.428

Notes: This table replicates the results in Table 4, redefining the measure of sophistication to use a log transformation of the student's number of unique visits to the application website. Non-guaranteed, priority students who received a magnet assignment are shown. The dependent variable in this OLS regression is the overdemanded ratio of the student's assigned school, conditional on the student receiving a magnet assignment.

Table A7: Robustness of Assignment Results: Visit Categories

	(1)	(2)	(3)	(4)
Visits=2	0.105	0.117	0.103	0.090
	(0.054)*	(0.053)**	(0.053)*	(0.050)*
Visits=3	0.011	0.044	0.054	0.087
	(0.065)	(0.064)	(0.061)	(0.058)
Visits=4	0.043	0.030	0.032	0.014
	(0.079)	(0.079)	(0.076)	(0.065)
Visits>4	0.124	0.139	0.141	0.139
	(0.054)**	(0.053)***	(0.051)***	(0.048)***
Priority Points		3.401	3.097	3.255
		(0.827)***	(0.804)***	(0.877)***
Middle School		0.045	-0.171	-0.287
		(0.052)	(0.055)***	(0.048)***
High School		0.107	-0.069	-0.073
		(0.048)**	(0.049)	(0.046)
Female			0.008	-0.005
			(0.038)	(0.036)
Asian			0.063	0.163
			(0.062)	(0.062)***
Black			0.323	0.259
			(0.041)***	(0.047)***
Other Race			0.178	0.137
			(0.079)**	(0.073)*
Hispanic			0.151	0.095
			(0.063)**	(0.062)
LEP			0.205	0.171
			(0.079)***	(0.081)**
Gifted			0.345	0.326
			(0.055)***	(0.055)***
Zip Code Fixed Effects	No	No	No	Yes
Observations	627	627	604	598
Log Likelihood	-429.291	-417.945	-368.830	-323.188

Notes: This table replicates the results in Table 3, redefining the measure of sophistication to use a categorical measure of sophistication where we use four categories of visits (two, three, four, and more than four visits) relative to students who visited only once. Non-guaranteed, priority magnet applicants are shown. The dependent variable in this Probit regression is equal to 1 if the student received a magnet assignment. Marginal effects are shown.

Table A8: Robustness of Demand Results: Visit Categories

	(1)	(2)	(3)	(4)
Visits=2	-0.001	-0.029	-0.045	-0.070
	(0.072)	(0.070)	(0.075)	(0.071)
Visits=3	0.145	0.074	0.073	0.060
	(0.106)	(0.103)	(0.107)	(0.097)
Visits=4	-0.033	-0.111	-0.083	-0.102
	(0.131)	(0.101)	(0.104)	(0.109)
Visits>4	0.013	-0.019	-0.069	-0.128
	(0.079)	(0.067)	(0.065)	(0.062)**
Priority Points		4.948	4.007	4.067
		(1.337)***	(1.258)***	(1.327)***
Middle School		-0.415	-0.454	-0.300
		(0.059)***	(0.069)***	(0.079)***
High School		-0.364	-0.356	-0.298
		(0.062)***	(0.068)***	(0.083)***
Female			0.018	0.010
			(0.052)	(0.054)
Asian			0.092	-0.038
			(0.103)	(0.114)
Black			-0.103	-0.105
			(0.071)	(0.071)
Other Race			-0.235	-0.131
			(0.089)***	(0.078)*
Hispanic			-0.059	-0.072
			(0.132)	(0.115)
LEP			-0.009	0.028
			(0.103)	(0.087)
Gifted			0.217	0.271
			(0.097)**	(0.093)***
Zip Code Fixed Effects	No	No	No	Yes
Observations	418	418	398	398
Log Likelihood	-369.966	-327.224	-297.261	-252.803

Notes: This table replicates the results in Table 4, redefining the measure of sophistication to use a categorical measure of sophistication where we use four categories of visits (two, three, four, and more than four visits) relative to students who visited only once. Non-guaranteed, priority students who received a magnet assignment are shown. The dependent variable in this OLS regression is the overdemanded ratio of the student's assigned school, conditional on the student receiving a magnet assignment.

Table A9: Robustness of Assignment Results: Exclude Last Two Days

	(1)	(2)	(3)	(4)
Sophisticated	0.112	0.125	0.113	0.107
	(0.046)**	(0.045)***	(0.043)***	(0.042)**
Priority Points		3.497	3.125	3.130
		(0.847)***	(0.825)***	(0.905)***
Middle School		0.060	-0.153	-0.273
		(0.053)	(0.058)***	(0.051)***
High School		0.098	-0.069	-0.075
		(0.050)*	(0.050)	(0.048)
Female			0.011	-0.005
			(0.039)	(0.037)
Asian			0.071	0.149
			(0.062)	(0.064)**
Black			0.309	0.244
			(0.042)***	(0.048)***
Other Race			0.173	0.130
			(0.082)**	(0.074)*
Hispanic			0.170	0.104
			(0.066)***	(0.065)
LEP			0.179	0.143
			(0.085)**	(0.088)
Gifted			0.347	0.334
			(0.057)***	(0.055)***
Zip Code Fixed Effects	No	No	No	Yes
Observations	594	594	571	567
Log Likelihood	-407.548	-396.531	-351.276	-310.337

Notes: This table replicates the results in Table 3, redefining the measure of sophistication to use a discrete measure of sophistication that excludes students who logged in only once but whose single login was during the last two days of the application period. Non-guaranteed, priority magnet applicants are shown. The dependent variable in this Probit regression is equal to 1 if the student received a magnet assignment. Marginal effects are shown.

Table A10: Robustness of Demand Results: Exclude Last Two Days

	(1)	(2)	(3)	(4)
Sophisticated	-0.000	-0.027	-0.042	-0.089
	(0.063)	(0.053)	(0.051)	(0.052)*
Priority Points		4.594	4.298	3.806
		(1.157)***	(1.166)***	(1.194)***
Middle School		-0.329	-0.430	-0.315
		(0.066)***	(0.075)***	(0.093)***
High School		-0.474	-0.491	-0.484
		(0.041)***	(0.044)***	(0.057)***
Female			0.041	0.043
			(0.048)	(0.049)
Asian			0.178	0.018
			(0.093)*	(0.111)
Black			-0.081	-0.060
			(0.057)	(0.060)
Other Race			-0.144	-0.070
			(0.083)*	(0.078)
Hispanic			-0.013	-0.040
			(0.138)	(0.123)
LEP			-0.021	0.016
			(0.092)	(0.078)
Gifted			0.224	0.260
			(0.090)**	(0.088)***
Zip Code Fixed Effects	No	No	No	Yes
Observations	308	308	300	300
Adjusted R^2	-0.003	0.254	0.295	0.397

Notes: This table replicates the results in Table 4, redefining the measure of sophistication to use a discrete measure of sophistication that excludes students who logged in only once but whose single login was during the last two days of the application period. Non-guaranteed, priority students who received a magnet assignment are shown. The dependent variable in this OLS regression is the overdemanded ratio of the student's assigned school, conditional on the student receiving a magnet assignment.

Table A11: Robustness of Assignment Results: Separately By Grade Level

	(1)	(2)	(3)
Sophisticated	0.053	0.110	0.127
	(0.054)	(0.066)*	(0.080)
Priority Points	3.563	8.430	1.965
	(1.341)***	(4.615)*	(4.325)
Female	-0.011	-0.042	-0.107
	(0.046)	(0.065)	(0.079)
Asian	0.224	-0.275	0.107
	(0.071)***	(0.083)***	(0.147)
Black	0.223	0.174	0.470
	(0.068)***	(0.082)**	(0.083)***
Other Race	0.033	0.312	0.123
	(0.088)	(0.102)***	(0.196)
Hispanic	-0.020	-0.155	0.272
	(0.078)	(0.171)	(0.099)***
LEP	0.202	0.388	0.048
	(0.180)	(0.085)***	(0.146)
Gifted		0.581	0.061
		(0.052)***	(0.115)
Zip Code Fixed Effects	Yes	Yes	Yes
Observations	318	116	124
Log Likelihood	-152.752	-42.544	-62.610

Notes: This table replicates the results in Table 3, presenting separate estimation by grade level: elementary, middle, and high school. Non-guaranteed, priority magnet applicants are shown. The dependent variable in this Probit regression is equal to 1 if the student received a magnet assignment. Marginal effects are shown. The results follow Column (4) of Table 3 in the paper.

Table A12: Robustness of Demand Results: Separately By Grade Level

	(1)	(2)	(3)
Sophisticated	-0.045	-0.022	-0.138
	(0.082)	(0.102)	(0.117)
Priority Points	5.859	5.618	4.346
	(1.643)***	(10.061)	(4.998)
Female	-0.006	0.001	0.026
	(0.076)	(0.090)	(0.110)
Asian	0.077	-0.192	-0.325
	(0.158)	(0.168)	(0.170)*
Black	0.012	-0.073	-0.333
	(0.076)	(0.115)	(0.204)
Other Race	-0.165	0.006	-0.342
	(0.109)	(0.103)	(0.192)*
Hispanic	0.003	-0.189	-0.508
	(0.153)	(0.152)	(0.259)*
LEP	0.149	0.216	0.159
	(0.109)	(0.140)	(0.213)
Gifted		0.606	0.077
		(0.091)***	(0.146)
Zip Code Fixed Effects	Yes	Yes	Yes
Observations	206	101	91
Adjusted R^2	0.320	0.289	0.182

Notes: This table replicates the results in Table 4, presenting separate estimation by grade level: elementary, middle, and high school. Non-guaranteed, priority students who received a magnet assignment are shown. The dependent variable in this OLS regression is the overdemanded ratio of the student's assigned school, conditional on the student receiving a magnet assignment. The results follow Column (4) of Table 4 in the paper.

Table A13: Length of Submitted Lists for Sincere and Sophisticated Students

	(1) Number of Choices	(2) One Choice	(3) Two Choices	(4) Three Choices
Sophisticated	1.640	0.584	0.192	0.224
	(0.017)	(0.010)	(0.008)	(0.009)
Sincere	1.569	0.625	0.182	0.194
	(0.021)	(0.013)	(0.010)	(0.011)
Difference	0.071	-0.041	0.010	0.030
	(0.027)***	(0.016)**	(0.013)	(0.014)**
N	3790	3790	3790	3790

Notes: All magnet applicants are shown, along with the length of students' submitted list, relative to a maximum of three choices. We classify students who log in to the WCPSS application website once as sincere and those who log in more than once as sophisticated. Column (1) indicates the average number of choices on students' submitted lists. Columns (2), (3), and (4) indicate the average fraction of students who submitted a list with one, two, three schools, respectively.

Table A14: Fraction of Students Who Exit the School System

Panel A: *Unsuccessful Magnet Applicants*				
	(1) All Levels	(2) Elementary	(3) Middle	(4) High
Sophisticated	0.187	0.204	0.186	0.150
	(0.013)	(0.020)	(0.021)	(0.028)
Sincere	0.139	0.178	0.140	0.088
	(0.016)	(0.031)	(0.025)	(0.027)
Difference	0.047	0.026	0.046	0.062
	(0.021)**	(0.037)	(0.032)	(0.038)
N	1374	540	553	281
Panel B: *Successful Magnet Applicants*				
	(1) All Levels	(2) Elementary	(3) Middle	(4) High
Sophisticated	0.077	0.078	0.071	0.086
	(0.007)	(0.013)	(0.010)	(0.013)
Sincere	0.088	0.063	0.070	0.116
	(0.009)	(0.019)	(0.013)	(0.016)
Difference	-0.011	0.015	0.001	-0.030
	(0.012)	(0.022)	(0.017)	(0.021)
N	2416	609	978	829

Notes: All magnet applicants are shown, along with the mean fraction of students who exited the school system from 2013-2014 to 2014-2015. We define an exit by merging the 2013-2014 student-level data, including magnet applications, with 2014-2015 student-level data. Any non-twelfth-grade student who is not matched across the two years is said to have exited. Panel A considers only students who submitted a magnet application but were not assigned to any of their ranked schools. Panel B considers only students who submitted a magnet application and were assigned to one of their ranked schools.