Technical Report

WHAT SCHOOLS DO FAMILIES WANT (AND WHY)?

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What Schools Do Families Want (and Why)? School Demand and Information Before and After the New Orleans Post-Katrina School Reforms

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Abstract: Policymakers have been trying for decades to improve schools through market-based policies. While these have met with mixed results, no city had ever adopted a comprehensive market school system until New Orleans did in the wake of Hurricane Katrina. Attendance zones were eliminated, parents were given the opportunity to choose among essentially all publicly funded schools, and school management was turned over charter management organizations that offered differentiated services. We leverage these changes to understand the demand and preferences for specific schooling services and how they may have changed as a result of the market reforms. Contrary to the large literature based on stated preferences, our analysis of revealed preferences suggests that the role of extracurricular activities and indirect costs such as distance are, collectively, at least as large as academic quality. Also, while all New Orleans families gained greater access to schools with higher test scores, the lowest-income families have weaker preferences for academic outcomes and are more constrained in their ability to choose the highest-performing schools. The somewhat limited influence of academics in family decisions helps explain several puzzles from prior research, including why the competitive effects of market-based school reforms on student test scores have been mixed. The evidence also illustrates the role of information in school choice. The demand for easily measured school characteristics is highest in transition grades such as kindergarten when families have less private information. Public policies also influenced the information available to all parents and these too may have influenced demand.

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Introduction

The rapid expansion of market-based accountability is one of the significant national and international trends in education policy in the past several decades (Ladd & Fiske, 2001; Plank & Sykes, 2003; Wolf & Macedo, 2004; Harris & Witte, 2011; Hart & Figlio, 2014). For more than a century, children in the United States have attended schools based on where they live and pressure to improve has been limited to school board elections, inter-district housing decisions, and informal parent lobbying (Friedman, 1962; Tiebout, 1956; Chubb & Moe, 1990). This traditional model is increasingly being set aside with charter schools, vouchers, and choice among traditional public schools within and across districts. Rather than voting at the ballot box, markets allow families to vote with their feet at a lower cost, select the schools they prefer without moving households, and, in theory, increase competition that "lifts all boats" (Friedman, 1962; Hoxby, 2002). This theory and related policies have growing bipartisan support among U.S. political leaders (Berman, 2014) that is likely to only increase with recent Congressional returns (Camera, 2014).

Whether competition works in practice, and generates measureable effects on student outcomes, depends in part on the demand for schooling. Past evidence on school demand and preferences, with a few exceptions, is based on parents' stated preferences.[1] This is problematic given strong evidence that inconsequential reports of preferences are misleading (Hausman, 2012) and that the conditions under which stated preferences should equal revealed preferences (e.g., incentive compatibility) are unlikely to hold in practice (Carson & Groves, 2007). Instead, respondents are subject to "social desirability bias" and tell interviewers what they think they

[1] For studies of stated preferences see: Armor and Peiser (1998), Vanourek et al. (1998), Greene et al. (1997), Kleitz et al. (2000), Glazerman (1997), Bayer, Ferreira and McMillan (2004), and Jochim et al. (2014). Hastings, Kane, & Staiger (2010) is an exception that focuses on revealed preferences. Schneider et al. (1998) and Rothstein (2006) also study revealed preferences for schools with particular student characteristics.

want to hear (Paulhis, 1991; Tourangeau & Deutsch, 2004), and people sometimes give different answers depending on the wording of questions (Kling et al. 2012). "Put simply, what people say is different form what they do" (Hausman, 2012, p.44).

We study revealed preferences and the demand for schooling in arguably the most competitive school market ever developed in the United States, created by four major policy changes. First, in the wake of Hurricane Katrina, state and local agencies eliminated school attendance zones in New Orleans so that, in principle, the city's students can now attend any public school they choose regardless of their home address. This transformed the schooling market so that only 14 percent of children attend the school nearest their home, and the distance to school attended increased by almost two miles.[2]

In a second policy shift, almost all the schools in New Orleans are now charter schools that have autonomy to operate more independently of government rules and union contracts, and this has led to horizontal product differentiation (Hotelling, 1929; Dixit and Stiglitz, 1977; Spence, 1976; Berry, 1994; Glomm, Harris, & Lo, 2005). For example, in 2013, there were six schools given a letter grade of A by the state and five schools given an F grade, 41 schools had band and football, but 20 lacked one or the other, and 39 elementary schools offered extended school days and free after-care, but 11 did not. The vast majority of these schools were required to provide transportation from anywhere in the city, and none were allowed to charge tuition. Not only do parents have more freedom to choose, but they apparently have a wide variety of options to choose from. By studying New Orleans, we can therefore estimate preferences for a broader range of school characteristics than prior studies of revealed school preferences (see

[2] Source: Authors' calculations. Pre-Katrina, 47 percent attended the school they were zoned for. The change in miles to school is a difference-in-difference where the first difference is the change in distance to school attended and the second difference is the distance to the nearest school. This latter adjustment is necessary because there were fewer schools post-Katrina, which increased the minimum distance to school.

especially Hastings, Kane, & Staiger, 2010), informing our understanding of the full effects of market-based school reforms.[3]

Beginning in 2012, a third policy change occurred. Most families wishing to have their children attend a public school had to participate in a centralized matching system based on the work of Alvin Roth (1982). Through this "OneApp" system, families rank schools in order of preference and that information is fed into a computer algorithm that assigns students to schools in a way that is intended to maximize a stylized social welfare function. The design of the OneApp system, and the fact that it is formally strategy-proof (Abdulkadiroglu, Pathak, & Roth, 2005; Abdulkadiroglu, 2009), facilitates identification of the revealed preferences for specific school characteristics.

Our analysis leverages both the OneApp ranking data and the considerable product differentiation that has arisen in New Orleans. The results suggest that while New Orleans families do prefer schools that generate stronger academic outcomes, they also prefer extracurricular activities and their choices are strongly influenced by indirect costs such as transportation and child care. Sports, music, and other extracurricular programs are highly valued relative to measured academic outcomes at the high school level.

In addition to efficiency-based arguments, a key part of the debate about school choice is whether it will reduce achievement gaps by income and race (Howell & Peterson, 2006). We find, however, that academics are over-shadowed by indirect costs and extracurriculars among the lowest-income families. While these families prefer academically stronger schools over weaker ones (other things equal), their low incomes pose constraints in transportation and child

[3] Nathanson, Corcoran, & Baker-Smith (2013) also provide descriptive information on the academic outcomes of schools that families select based on data in New York City, but they do not compare the role of various factors in school choices as in the present analysis.

care costs. Also, even after accounting for indirect costs, low-income families have stronger preferences than other families for non-academic elements of the school experience such as football and band. This helps explain the finding of Hastings, Kane & Staiger (2010) that low-income parents have weaker demand for academic outcomes than higher-income families and reinforces the argument that giving choice to those families who cannot easily access private schools and high-spending school districts still might not have much influence on the equity of academic outcomes (Levin, 1998).

A second factor affecting demand, in addition to family income, is information. Families have much less information about schools during the transition grades, i.e., when students first become school age (kindergarten) and when they begin high school. We estimate the demand for schooling at each grade and show that measureable school characteristics play a noticeably larger role in the transition grades compared to adjacent grades. While families subsequently learn about schools after students enroll and can theoretically adjust to poor initial choices, the cost of switching schools means that initial poor decisions due to limited information partially persist into the future.

The availability of information is also influenced by public policies, and these too changed after the hurricane. As part of this fourth policy shift, a non-profit organization began producing and disseminating an extensive guide to public schools, the New Orleans Parents' Guide to Public Schools. Later, in 2012, the state government switched from numeric indices to more intuitive letter grades for school academic performance, replaced decentralized enrollment processes with the centralized OneApp, and added the letter grades to the OneApp application form, greatly increasing their visibility to parents. Letter grades have been shown elsewhere to have a significant influence on the housing market through capitalization of measured school quality (Figlio & Lucas, 2004).

From an information standpoint, this second set of interventions was more focused than the first. The *Parents' Guide* provided families with information about almost every conceivable school characteristic; to the degree that families prefer a wide variety of characteristics and are equally well informed about them, providing information about all those characteristics might have little influence on the *relative* influence of each characteristic. The later OneApp/letter grade policies, in contrast, focused on a single academic measure, therefore, we might expect an increase in the role of that measure on demand. Our results, though only suggestive, are consistent with this theory. The demand for academic quality did not increase (and may have decreased) with the broad-based Parents' Guide and other reforms, but did increase after the OneApp and school letter grades.

These findings inform the design and effects of choice policies and help explain several puzzles from prior research on schooling markets. Among all the studies that have examined the competitive effects of charter schools and vouchers on traditional public schools, about half find evidence of such effects on student test scores (Gill & Booker, 2008).[4] One possible explanation for these mixed findings is that families prefer outcomes other than those captured by test scores, so that even genuine competitive effects are not observed.

The next section outlines our discrete choice model and estimation procedures (rank-ordered, conditional, and mixed logit). After explaining our many data sources, we present

[4] None of the studies in the Gill & Booker (2008) review finds a negative effect of competitive on test scores. Other studies have examined the effects of competition within the traditional public schooling market and these too are mixed (Borland & Howsen, 1992; Hoxby, 2000; Belfield & Levin, 2002; Hanushek & Rivkin, 2003; Rothstein, 2007). Another literature uses calibrated simulation models to understand the effects of choice policies (Epple & Romano, 1998, 2002; Nechyba, 1999, 2000, 2003).

results regarding average demand, heterogeneity by family income, demand by grade and information availability, and exploratory evidence of the effects of information-based policy changes. Since most prior evidence on the topic is based on stated preferences, we also briefly compare stated and revealed preferences. Finally, we conclude with discussion about how findings influence the interpretation for the vast literature on schooling markets.

Model and Methods

The analysis of ranking data begins with some of the basic elements of standard discrete choice models. The alternatives to be ranked are mutually exclusive and finite. Families (indexed by *n*) rank schools to maximize utility, which depends on the attributes of the school X_j and a random utility component ε_{nj} such that the expected utility of the *j*th school is:

$$U_{nj} = f(X_j, \varepsilon_{nj}) \tag{1}$$

The random component ε_{nj} follows an iid extreme value distribution so that $\varepsilon_n^* = \varepsilon_{nj} - \varepsilon_{nk}$ follows a logistic distribution for all schools $j = 1 \ldots J$ (McFadden, 1984; Hausman & Ruud, 1984; Train, 2009).

The probability of observing the rank ordering $r \equiv (r_1, \ldots, r_J)$ for a given individual *n* is the following product of probabilities:

$$P\left(r|X_j, \beta\right) = \left(e^{X_1\beta} / \textstyle\sum_{j=1}^{J} e^{X_j\beta}\right) \cap \ldots \cap \left(e^{X_{J-1}\beta} / \left(e^{X_{J-1}\beta} + e^{X_J\beta}\right)\right) \tag{2}$$

The probability of observing school *j*=1 as the top-ranked school is represented in the first term. The next term is the probability of observing school *j*=2 as the second-ranked school, conditional on *j*=1 being top-ranked, and so on until the last term where there are only two options left. (The order of the subscript numbers here is arbitrary because any school can be top-ranked, not just j=1.) The log-likelihood takes the general form: $LL(\beta) = \sum_N \ln\,(P(\cdot))$ where N is the total number of individuals. The model is solved for β via maximum likelihood estimation (MLE) using the first order conditions. This general rank-ordered logit is common when examining stated preferences for consumer goods such as transportation options (e.g., Bhat, 1998; Erdem, 1996). The New Orleans school system is one of the rare market settings where markets clear via a coordinated matching process in which consumers rank their preferred options.

Under the assumption that individuals can choose any option they wish, the β vector represents the influence of each factor on demand. Some of these are school characteristics and we describe these as preference or taste parameters. In other cases, such as distance to school and after-school care, the variables capture indirect costs and other factors. One reason for accounting for indicators of indirect cost is to avoid an omitted variables problem when studying preferences. This approach also facilitates analysis of the relative importance of preferences and indirect costs in decision-making, especially when studying demand by family income.

As in standard logit, the rank-ordered logit requires the Independence of Irrelevant Alternatives (IIA) assumption. This assumption is least likely to hold when an option within a given pair is similar to one outside the given pair, as in the classic red bus/blue bus example.[5] The IIA assumption is possibly less problematic in analysis of schools because even if two schools had identical programs and academic quality, which is never the case in our data, they

[5] Briefly, when a given pair (e.g., driving a car versus taking a blue bus) is examined, the ratio of the probability of choosing a given option depends only on the characteristics of those two options. However, if it is also possible take a red bus, this would most likely reduce the probability of taking the blue bus far more than it would the probability of driving. This violates IIA.

would essentially always differ on distance and other continuous variables, so that all schools are relevant alternatives.

Nevertheless, we also estimate a mixed logit, which relaxes IIA and treats the parameters of interest as random for each student (again, indexed by *n*). Using Train's (2009) notation, the probability of an individual selecting a given option is first simulated as follows:

$$P\left(r|X_j,\theta\right) = \int P\left(r|X_j,\beta\right) f(\beta|\theta) d\beta \tag{3}$$

where $f(\beta|\theta)$ is the mixing function and θ represents the parameters describing the distribution of the parameters of interest (β). Since (3) generally has no closed form solution, this is approximated by taking draws from the assumed distribution using simulation maximum likelihood estimation (SMLE) and these simulated probabilities are then entered into the log likelihood. As we show below, the results are generally robust when imposing IIA. The fact that the taste parameters take on a distribution, each with its own variance, also means we can test how varied preferences are across families and how these variances differ across a wide range of school characteristics.

Beyond the IIA assumption, the main assumption in all the models is that there are no omitted variables. In the post-Katrina analyses, the threat may be relatively small because we have an extremely rich data set of school characteristics and the fact that we can identify family with multiple siblings allows us to create proxies for unobservables.

Families might also sort themselves into neighborhoods so that they are closer to their preferred options, which would also introduce bias. However, there are reasons to expect the degree of sorting to be limited.[6] In short, by leveraging the OneApp ranking system, the rank-ordered logit estimation plausibly yields unbiased estimates of the demand function.

Data

We study the demand for schooling among New Orleans' families who are considering public schools, including preferences for academic and non-academic factors as well as the indirect costs families incur in the schooling process. The main outcomes are families' school rankings and assignments in 2013 as well as actual enrollments in 2004 (pre-Katrina) and 2011 (post-Katrina).[7] The covariates are measures of school characteristics timed to reflect the information parents had available at the time they were making the given school decision. Since school usually starts in the fall, this means we use the information available the prior spring of the same calendar year.

The school rankings come from the city's OneApp school application system, in which parents rank schools and this information is used to assign students to schools. Any parent interested in having their children attend a school in the OneApp had an incentive to fill out the application.[8] In assigning students to schools, the OneApp gives priority to students currently enrolled in the school, students with siblings in the same school, and those living within the

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[6] There are several reasons to expect limited sorting of families by school location: (a) compared with traditional attendance zone systems where housing location determines schooling options, the utility gain from sorting in a choice-based system is much lower; (b) for parents who work, distance to work represents a much larger cost than distance to school (at least in the schools that provide bus transportation) and is therefore more likely to affect housing decisions; (c) all our analyses suggest that parents value complex combinations of school characteristics, making sorting by specific school characteristics less feasible; and (d) many school locations were in flux during the period under analysis with plans to move from one location to another, creating uncertainty about where preferred schools will be located.

[7] When referring to school years, we use the year the school year starts, e.g., the 2004-05 school year is referred to as 2004.

[8] There are multiple rounds of the OneApp for families who are not satisfied with the assigned school in the first round. We use only the first round because this likely to be a more valid reflection of preferences.

schools' (large) geographic catchment areas.[9] Unlike the small number of other cities using this type of centralized enrollment matching system, especially Boston, the New Orleans OneApp is strategy-proof (Abdulkadiroglu, Pathak, & Roth, 2005; Abdulkadiroglu, 2009).

With rankings data, it is common to have explicit rankings for the top choices while other options are left unranked. This arises in our data as well for several reasons. First, the OneApp system only allows eight schools to be ranked.[10] Second, some families may have only been willing to accept only a few public schools because they considered schools outside the OneApp system as their main alternatives. Third, among those families who already had a child in a OneApp school, families who wanted their children to return to that school the following year filled out a different section of the OneApp that did not involve ranking schools. In each of these cases, the rank-ordered logit randomly assigns a preference ranking for those unranked cases. In cases where families only indicate they want to return to their original school, that school is listed as top-ranked and the others are left unranked and are treated in the way described above. Beginning in 2012, the OneApp became the primary mechanism for assigning students. The data used in this analysis are from 2013.

Prior to the OneApp, we can only observe actual school enrollments. These data are available for almost all public school students for the 2004 and 2011 school years. The enrollment data include the home address of the student and the name of the school they attended.[11] There are some schools that provided incomplete enrollment information and in some

[9] There were only six such catchment areas in the entire city, averaging about 60 square miles, therefore they are unlikely to play much of a role.
[10] In cases where families do not include their current school in their rankings, the OneApp system automatically adds this school as the last ranked school (e.g., ranked 9^{th} if the family provided eight ranked schools).
[11] These data were collected by a consulting firm contracted to carry out enrollment projections for the city. The data were anonymized and provided with consent from OPSB.

situations information either had to be imputed or, in a few cases, schools had to be dropped completely.[12]

Our primary measure of academic outcomes is the School Performance Score (SPS) assigned by the state of Louisiana (in accordance with federal rules) to the vast majority of publicly funded schools.[13] The SPS is based on the average test score levels of students; in high schools, the test scores are combined with data about high school graduation rates. For many years the SPS was translated into a "star" rating system, but this was replaced by letter grades A-F in 2012. Since both the numeric score and the star/letter grade were publicly available we approach the analysis in two different ways, using the actual star/letter grade and re-scaling the SPS so that a one-unit increase is approximately equal to a one star/letter-grade increase.[14] Student achievement growth was not included as part of the SPS calculation (Harris, 2014) and therefore the measures are not very accurate indicators of how much learning is taking place in the schools (Harris, 2011). Nevertheless, the SPS provides a widely disseminated and accepted signal of schools' academic quality.

[12] In 2004, two statewide charter schools were dropped since neither was overseen by OPSB or the RSD; six magnet schools were dropped from the analysis. In 2011, 15 public schools used data from 2010 since new data were not collected. There are seven schools that were dropped because they were "statewide" charters or classified as "alternative schools." In both 2004 and 2011, we drop six selective admissions schools to better match the 2013 OneApp sample, which does not include selective admissions schools. Nineteen schools are excluded from the OneApp (including all six "A" schools) and they are therefore not included in the analysis.

[13] We use a lagged SPS score since this is the SPS that was visible to parents when making their schooling decisions. For example, during the spring of 2013, parents choose the schools their children will start in fall of 2013, but they only see the SPS that is based on 2012 test scores. For newer schools, when the lagged score is unavailable, we used the current SPS score. In some situations the "new" school is a school that has been taken over by a charter management organization. In this case it would also be possible to use the historic SPS scores under the prior regime. Some results are sensitive to using this method, but they appear to be outliers and not in line with other robustness checks, nor results when these schools are dropped altogether. In 2013, there were two new schools that had no SPS information in 2012 or 2013. These schools are excluded from the analysis.

[14] This SPS re-scaling is complicated by the fact that the number of SPS points required to make the next letter grade varies across letter grades. In particular, the highest and lowest grades (A and F) encompass a wider range of SPS scores. However, since A and F grades are rare, the more relevant ranges are B-D and in these cases the ranges are relatively equal at around 15 SPS points in 2013 and 20 SPS points in the earlier years; these are the scale factors we used. Also, note that we used the SPS score the school received for the *previous* school year, released each October. Some schools do not have SPS scores in these years due to being recently opened. In this case, the SPS score is imputed using their SPS score for the following year. We have run robustness checks on which SPS letter grade is used in the regressions instead and find similar results.

For the two post-Katrina samples only, the *Parents' Guide* was produced annually by a local non-profit organization and provides detailed school-reported information[15] about availability of football and other sports, band and other extracurricular activities, school schedules, and other measures.[16] For elementary schools we also indicate whether the schools offer extended school days or after-school care (free or paid).

Using home and school addresses, we calculated the linear distance between each home and every school that serves the relevant school grade. The role of distance may be non-linear, however. In particular, families might think of the nearest school as the "default" no matter how close it is (Thaler & Bernatzi, 2004). The default is more obvious in the pre-Katrina years when the school district automatically assigned students to their zoned schools.

We also measure whether school locations are "in flux" in the sense that the *Parents' Guide* says they may be moving to a new location in the near future or if they have just recently moved location. This is relevant both for understanding the role of distance, but also the general desire for certainty and stability.

The quality of buildings varies considerably due both to the differences in flooding damage and the fact that some buildings were much older before the storm. With substantial funding from the federal government, the city embarked on a large school construction and renovation initiative. We therefore created a variable equal to zero for schools that were only

[15] While these data were reported by the schools, the producers of the *Parents' Guide* did carry out some of their own validity checks. In 2013, there are three elementary schools and four high schools without Parents' Guide information and they are therefore dropped from most analyses. These are mostly specialized or alternative schools, which are very rarely actively chosen by parents.

[16] We use the 2011 and 2013 editions of the *Parents' Guide*. Since it was not available until 2007, we cannot use this for the pre-Katrina sample. Some schools specifically list out every program while other include a few and then state "student groups" or "other activities." For these schools the number listed may be smaller than the actual number offered. To account for this we ran robustness checks in which we include an indicator variable for whether schools mentioned student groups and other activities among their extracurricular offerings in the Parents' Guide. These results are available upon request.

modestly renovated, equal to one for schools with large renovations, and equal to two for each of the six brand new buildings. It is difficult to distinguish the role of building quality from being "in flux," however. The meaning of the in flux variable is clearly different when the school will be moving to a new building versus an older one that received less post-Katrina building funds.

We include a measure of school size for several reasons: (a) some families may prefer the more personal environment of small schools and others may prefer large schools because of the possibility of finding a group of friends to fit in with; (b) some extracurricular activities, such as band and football, require large numbers of student participants; and (c) there are some economies of scale to school size that affect the quality and quantity of services provided (Harris, 2007). To the degree that (a) holds, the omission of school size would bias estimates for the other variables correlated with it. However, if school size matters because of (b) or (c), then omitting it would yield less biased estimates of programs subject to economies of scale because school size would absorb some of the role of these activities. Since we cannot distinguish among these roles for schools size, we run the models both ways. Schools vary in the number of grades they offer therefore we rely mostly on a measure of the average size of each grade.

Since the student-level data do not contain individual student or family demographic data, we substitute block group characteristics from the Census, especially average median household income. These are from the 2000 Census and the 2007-2011 American Community Survey respectively and are used in the analyses of preference heterogeneity. We considered additional variables but were limited by data and other factors.[17]

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[17] Given the role of race found by Schneider and Buckley (2002), we could have done the same type of analysis based on the racial demographics of schools. However, more than 90 percent of students are racial/ethic minorities. We also considered adding a measure of neighborhood safety, but in exploring this option with local educators, they argued that the safety of the neighborhood was generally disconnected from the safety within schools.

Our samples include roughly 54,000 students in 2004, 37,000 students in 2011, and 28,000 in 2013. These compare with publicly reported actual public school enrollments of 66,372, 42,030, and 44,791, respectively (Cowen Institute, 2014). The analyses for the first two years (2004 and 2011) are therefore a near census of all public schools and students. Nineteen schools (mostly run by OPSB) did not participate in the OneApp in 2013, explaining the lower sample size in that case.[18] Since all the selective admissions schools in the city were also in OPSB, this means the average academic ability of students in this analysis is below the city average.

Tables 1A and 1B provides descriptive statistics for the school characteristics. Here, and in all subsequent tables, elementary and middle school students are combined together because there are essentially no schools with traditional middle school grade structures in the city, while high schools are treated separately. For schools whose grades cut across elementary/middle and high school grades, we split the school based on the specific grades students are applying to (e.g., in a school with grades 7-12, grades 7-8 are included as a school in the elementary analysis and 9-12 are included as a high school.

Table 1A provides information about the school characteristics in elementary school. The average elementary school offered about three different sports and six extracurricular programs, and were given an SPS score of 78.7. Nearly 70 percent of them had an extended school day, with 24 percent offering free aftercare and 20 percent offering paid aftercare. Table 1B shows similar characteristics for high schools. Nearly 90 percent of high schools offered some combination of band and football, and two-thirds of the current high schools have names similar to schools that existed pre-Katrina (we denote this as a "legacy school").

[18] Families interested in non-OneApp public schools in 2013 had to apply for admission directly to the schools of interest and these applications are not available to us.

[TABLE 1]

There is some variance in all the program offerings listed and apparently much more than in traditional public schools. But to identify the role of a given program it is still necessary for the offerings to be partially uncorrelated. We are specifically concerned about bundling, in which service A is always offered if and only if service B is offered. This makes it impossible to isolate preferences for either A or B. Bundling is a common practice in markets and occurs for two main reasons goods are jointly produced and therefore less costly when bundled or they are complementary in consumption (Adams & Yellen, 1976).[19]

Football and band are complementary in consumption and come closest to perfect bundling in this case. There are no schools that have football but not band. Narrowly speaking, we can identify the role of band because there is one school that has band and no football, but this one band program could be atypical (e.g., they might offer band but not marching band, or they may be very small programs).[20] In the analysis, our preferred specification has a variable equal to one when either band or football is offered. This approach requires the fewest assumptions but also provides the least separation in preferences for the two programs.[21] The appendix provides school-by-school breakdown of almost all the school characteristics. We have nearly complete data on all schools in both the OneApp and enrollment samples.[22]

[19] A third possible reason is that, in the presence of imperfect information, firms may try to differentiate themselves by offering combinations of services that raise the profile of their brands. For example, a school that wants to be known for its academics may offer a wide array of programs that are seen as preferable to academically minded students, even if they are not jointly produced or complementary in consumption. Also, Nalebuff (2004) shows that in an oligopolistic environment, bundling can be an effective deterrent to market entry.
[20] It is also worth noting that there is only one high school with a new building and one high school without a parent group.
[21] If programs are bundled because they are complementary in consumption, then creating this either/or variable is necessary because separating them would violate the assumption of additive separability.
[22] This is only reported for schools that have no missing information. Very few schools are missing extracurricular information due to them not being listed in the Parent's Guide. These are mostly specialized or alternative schools in

Results

Our analysis leverages the considerable product differentiation in New Orleans public schools after the post-Katrina school reforms and family school rankings that are used to assign students to schools. In addition to the indirect cost variables (distance, sibling choices, and school schedules), we divide the taste parameters into categories based on academics (as measured by SPS) and extracurriculars (sports, arts, etc.).

We begin by reporting average preferences for both sets of covariates for elementary and high schools separately, and then examine heterogeneity by family income. Analyses of the effects of major policy changes on school demand in the city follow. A comparison of the revealed preference analyses with stated preferences for survey data highlight both the limitations of stated preferences and the potential value of combining the two types of analysis.

Average Revealed Preferences from *OneApp* School Rankings

Table 2 reports odds ratios and robust standard errors from a variety of specifications. The first column is our baseline model with the rank-ordered logit, using all the ranking information available. Column (2) examines preferences related to the top-ranked school (conditional logit). Since the conditional and rank-ordered logits results are very similar, we proceed with the rank-ordered logit only,[23] adding a "nearest school" indicator (column 3), squared terms for distance and SPS (column 4), and a separate indicator for schools that have

which very few families voluntarily apply. There are also two schools missing because they do not have an SPS score.

[23] Recall that families who wanted to keep their current school were allowed that automatically and they did not have to rank schools. These cases are included in the analysis by making the current school the top-ranked one and leaving the others unranked, as in a conditional logit. Since we have only the top-ranked school for most families, this is one explanation why the results are so similar between the conditional and rank-ordered logit.

band but not football (column 5).[24] These first five columns include a measure of school size (the number of students per grade), while column (6) drops this measure. Given the above issues with identification, we conclude that parents prefer certain characteristics only when the results are generally robust across specifications.

As predicted, parents have strong preferences for particular school characteristics such as measured school performance and distance. To put the odds ratios in perspective, consider the coefficients (averaged across specifications) for elementary schools. Increasing the SPS by the equivalent of one letter grade on the A-F scale increases the odds of a school being top-ranked by about 30 percent.[25] Increasing driving distance by one mile reduces the odds of ranking a school highest by about 40 percent. Taken together, this means that one letter grade is equivalent to three-quarters of a mile in driving distance.[26] The results are nearly identical when we replace the re-scaled SPS with the actual letter grade (available upon request).

Even controlling for distance, parents are more likely to send their children to the nearest school. This suggests that some families view the nearest school as the default choice, even when there is another viable school option only slightly farther away. This is also reflected in the squared term on distance. Small changes in SPS matter less in the lower range (e.g., where F letter grades are given) compared to higher levels. (Non-linear and interaction terms are difficult to interpret in a logit, but do generally reflect the basic structure of the non-linearity in this case.)

[24] In this specification, the coefficient on band/football captures preferences for schools that have band and football and the coefficient on "band only" measures preferences for schools with band only.

[25] Though the rank-ordered logit considers the entire set of rankings and not just the top ranking, this language might be confusing. However, recall that the probability of each set of rankings is sequential (see equation (2)), so this language is both accurate and simple.

[26] The basis for this calculation is not obvious from looking at the table because the absolute difference of the odds ratio from unity has different meaning for coefficients above and below unity. The comparison of distance and SPS in the text is based on a second set of estimates in which we reverse-coded distance so that longer distances show up as lower values.

[TABLE 2]

We are especially interested in the role of extracurriculars and indirect costs, which prior studies of revealed preferences have not been able to address. Football and band are particularly popular in New Orleans,[27] so it is not surprising that families prefer high schools with these programs. Having either band or football increases the odds of making a high school top-ranked by about 20 percent, about the same as a half mile of driving distance, though the bundling makes it difficult to isolate their respective roles. Other sports also matter in high school: adding a single sport increases the odds of making a school top-ranked by about 9 percent.

One important difference between the elementary and high school results is that older children are better informed about their abilities and have more advanced skills that can develop further with more intensive and specialized programs (Brown, 1992). Older children are also nearing college age when their academic outcomes such as test scores become more important for college admissions. This would seem to partly explain why preferences for SPS and band/football, as well as other sports, are stronger at the high school level.[28] We expected to see the same pattern with other extracurriculars as well, but families seem to pay little attention or even avoid these programs. Our inability to measure the quality of these programs is likely part of the explanation, but this may also mean simply that sports and band are the most important non-academic factors.

[27] The New Orleans Saints professional football team is the second-most locally popular professional team in the nation in any major sport and, as a share of the population, more players in the National Football League (NFL) are from Louisiana than any other state (Vangilder, 2013). Among states with a professional football team, it also has the strongest fan support for college football (Irwin & Quealy, 2014); this is noteworthy given that college and professional sports compete with one another for fans. Similarly, music plays a major role in the social life of New Orleans because of Mardi Gras. This is arguably the city's most important holiday with schools, colleges, and other non-tourist businesses closed down. The parades are prestigious and high schools are often compensated for having their marching bands participate.

[28] As further evidence of this, note that high schools are much more likely to orient their entire schools around specialized academic programs such as the arts or math and science. No elementary schools in New Orleans market themselves that way.

Indirect costs appear to play a non-trivial role in the rankings.[29] In addition to transportation, parents are legally required to provide adult supervision to young children. Parents can meet this responsibility by sending their younger children to schools that provide extended school days and school years or after-school care (paid or unpaid).[30] The results reinforce this theory as extended day and after-care are consistently important to elementary families.[31]

Families appear to value schools with a long tradition or "legacy" in the city, dating to the pre-Katrina years. This could be because families want to continue traditions, sending children to the schools that parents or other family members attended. Alternatively, this could reflect limited information: though the schools now have new operators in the post-Katrina period, they may perceive that having the same name means that is has programs and qualities similar to prior years. The role of legacy status seems especially important in high school, perhaps because adults in New Orleans tend to identify themselves by the high school they attended.[32]

Elementary school rankings are lower when schools are "in flux" (i.e., have recently changed locations and/or have plans to do so in the near future), although the role of this factor

[29] The coefficient on distance may not reflect indirect costs only. For example, parents may want their children to attend schools with other children they know in their own neighborhoods.

[30] Another possible interpretation is that extended day reflects interest in extended time on academics that are not measured by the SPS. However, this alternative interpretation is contradicted by the later results for preferences by income and by the fact that the sibling variable also captures unobservable academic characteristics.

[31] Preferences for weekend classes and extended school years are weaker. At the high school level, families seem to strongly prefer not having weekend classes. This could be because the students themselves are playing a role in school choices as they get older, and we would expect few high school students to actively pursue weekend time in school. A stronger role of older students in school choices might also help explain why extracurriculars are more important in high school.

[32] This is based on anecdotal audience. It is also consistent with the fact that high school is the last educational institution most adults in New Orleans typically complete. We could not find academic articles on the subject. Also, note that one reason families might prefer legacy schools is that the new schools may only re-use the legacy name if it had a good reputation pre-Katrina. That is, the use of legacy names may involve self-selection by school operators.

seems small in magnitude compared with the others. The estimates of the role of new and refurbished school buildings are erratic in both elementary and high school, due in part to the fact that some of the schools recently moved to new buildings, creating collinearity. When we drop the in flux variable, the preferences for new buildings becomes stronger in high school.

In addition to distance, parents give extremely high rankings to schools for one child when a sibling already attends the same school. Having two children in two different schools, for example, would be costly to parents who would then have to go to two different schools for parent-teacher conferences and keep track of two sets of rules, policies, schedules, and practices. The sibling schools seem to matter more at the elementary level, perhaps because younger children have less specialized interests and are more vulnerable. An older sibling can walk younger children to the bus stop[33] and "watch out" for them at school.

The extreme magnitudes of the sibling coefficients, however, largely reflect the structure of the data rather than actual preferences. First, the OneApp only allows families to indicate which schools siblings attend for the top eight schools. For all the other possible schools, it is implicitly assumed that there are no siblings, which automatically makes the sibling variable a strong predictor of rankings, independent of actual preferences. Second, the sibling coefficients likely capture school unobservables. That is, if there is an unobserved factor that led parents to select a school for one child, that same characteristic likely affects the ranking for the other sibling, regardless of the indirect costs. While this leads to an upward bias in the sibling coefficient (as an estimate of the actual desire to have children in the same schools), it increases the validity of the other coefficients and reduces concern about omitted variables bias. The

[33] For children under the age of nine, parents are legally required to escort their children to and from bus stops or to have an older sibling or designated adult do so.

availability of the sibling (and other) variables is a significant advantage over the prior study that examine only distance and academics (Hastings, Kane, & Staiger, 2010).

To gauge the relative roles played by academics, extracurriculars, and indirect cost categories, we considered hypothetical combinations of school characteristics and then calculated the increase in odds ratios associated with these sets and the total increase in odds from each group of characteristics. Given the non-linear link function of the logit, this cannot be done simply by adding the odds ratios together. Instead, we calculated the probability of giving the top ranking to a specific school under each scenario, and subtracted them.[34]

For example, for high school #1, having a legacy status and band/football would increase the odds of giving a school the top ranking (average odds ratios: 1.4, 1.25, respectively, in Table 2). In contrast, high school #2 has neither a legacy status nor band/football. But if high school #1 has a C grade and high school #2 has a B grade (average SPS odds ratio: 1.4), then this would partially offset the high school #1 advantage, but this is not enough to make up for high school #1 and its legacy status and sports teams.[35] The probability of selecting high school #1 in this situation is one-point higher than for high school #2.

At the elementary level, suppose school #1 is across the street and has free after-school care and a school grade of C, while elementary school #2 is two miles away with a traditional school calendar and a letter grade B. In this scenario, the probability of selecting elementary school #1 is four points higher than #2, despite the lower letter grade.[36] And these are not

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[34] Specifically, we used the "margins" command in Stata to calculate the $X\beta$ portion for each scenario (evaluating all other characteristics at their means), then calculated the probability under each scenario and subtracted.
[35] This assumes that the schools are otherwise identical.
[36] Again, averaging across the columns in Table 2A, increasing distance (average odds ratio: 0.7) by two miles and not having after-care (average odds ratio: 1.1) reduces the odds of choosing school #2 by 70 percent. This is partially

extreme examples. They omit a variety of other non-academic factors that would make it even less likely that students choose schools with high grades.

Given the large role for the sibling variable, we carried out several robustness checks. Column (1) of Table 3 re-displays the same column from Table 2. Column (2) drops the sibling variable. This has only a small influence on the results, suggesting that the unobservable information available to families is either limited or weakly correlated with observable measures. The theories about the large role of the sibling variable suggest, however, that the entire structure of demand may differ based on whether there are similar-age siblings. Therefore columns (3) and (4) separate the samples into sibling and non-sibling families.[37] The results are again generally similar with a few notable and perhaps predictable exceptions: The indirect cost factors of distance and extended day/after-care matter less to families with siblings, perhaps because these families are less concerned about distance when an older sibling can watch out for a younger one. For the same reason, extended days might matter less to families when there are siblings because the siblings can commute together home or to alternative child care arrangements.

[TABLE 3]

SPS and band/football matter more for families with siblings than those without siblings. This may reflect the fact that the unobservable qualities of schools, which families with siblings can more easily identify, are positively correlated with band/football and SPS, biasing the earlier

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offset by a higher letter grade (average SPS odds ratio: 1.3), but not enough to make up for the indirect cost considerations.

[37] Students are only included if the sibling box was checked for one of the siblings for at least one school and there are several reasons why multi-children families would not do so. In addition to the fact that some siblings may be too far apart in age to be in the same school, parents would only check the OneApp sibling box if the family wants a child to switch schools (recall that when a family wants a child to stay in the same school, they need not rank any schools and this means not checking the sibling box). If the family wants only one child to switch, we include the rankings for both children since this will flag both students as siblings. (For purposes here, first-time kindergartners or other students just considering entering a OneApp school are considered "switchers.")

band/football odds ratio downward. Alternatively, this could mean that families with siblings have different preferences for these factors, though this seems somewhat unlikely since the pattern is not coherent; the increase in the SPS suggests a stronger preference for academics while the increase in the band/football coefficient suggests a relatively weaker academic preference.

These results suggest that family utility is influenced by a wide variety of school factors. Though they prefer schools with strong academic performance, New Orleans public school families with high school students have strong preferences for specialized extracurricular activities. Also, even without direct tuition payments, families with elementary students apparently incur non-trivial costs that keep them from choosing the schools they perceive to be academically strongest. These results are consistent with other findings in New Orleans that schools respond to choice and competition through marketing and adding additional types of programs rather than efforts to improve academic quality (Jabbar, forthcoming).

Preference Heterogeneity and Mixed Logit

The results are robust to relaxing the IIA assumption with the mixed logit (Table 4).[38] The estimates are less precise because they impose fewer assumptions, yielding a few cases where coefficients become insignificant, but the coefficients are of a similar magnitude. In only one case is a coefficient statistically significant and of opposite sign in the mixed logit.[39]

[TABLE 4]

[38] Standard errors are unadjusted in the mixed logit analysis because coefficients are treated as random components. We assume the taste parameters are distributed joint normal. Also, this analysis uses only the top choice, so that it is conditional mixed logit.

[39] The results for parent groups are inconsistent between conditional and mixed logit at the elementary level, which was also somewhat erratic in Table 2. The main reason is probably that only two schools do not have parent groups.

The mixed logit allows us to estimate the variance in individual preferences as a test for whether underlying preferences vary in the population. With horizontal product differentiation, we expect that some people receive positive utility from some characteristics while others receive negative utility from the same characteristics. If the standard deviation is "large" relative to the coefficient estimate, this is evidence that the population is split on whether the trait adds or reduces utility.

The standard deviation on the SPS and band/football coefficients are roughly double in size at the high school level compared with the elementary level. This is consistent with at least two different theories. First, if parents are driving school decisions for younger students, then the preference heterogeneity of the students is not reflected in the elementary grade coefficients; that is, only part of the family preference heterogeneity shows up in the rankings at the elementary level. Second, student and family preference may become truly more varied as students get older and they learn more about their skills and interests. Research suggests, for example, that as students progress to higher grades they become more realistic about their prospects for college (Cook et al., 1996; Trusty, 2000). In that case, we would expect the demand for academics to be higher among those expecting college and perhaps the opposite for students who expect to either drop out or stop their formal education after high school graduation. In earlier grades, students and families alike are more uncertain about future academic prospects (Brown, 1992).

While preferences do seem to vary here, and this suggests some theories about why this occurs (e.g., why preference variation is wider at the high school level for some school characteristics), there are other hypotheses about heterogeneity that we can more directly test. We turn next to the role of indirect costs and the reasons why we expect differences in demand by family income.

Preference Heterogeneity by Family Income

One of the main arguments for family school choice such as that in New Orleans, and other programs such as vouchers, is that traditional school districts are inequitable. Low-income families are more constrained in their ability to attend private schools or move to neighborhoods that have the schools they prefer, and this contributes to educational achievement gaps (Peterson & Howell, 2006). However, parental choice might not lead socioeconomically disadvantaged families to choose academically stronger schools. If more advantaged families make "better" choices, or still have more viable options, then disadvantaged families may still end up relatively worse off.

We hypothesize two main reasons why low-income families might have different preferences. First, adults with low incomes tend to have lower education levels themselves, which may reflect weaker revealed preferences for academics. Second, since low-income students tend to have lower test scores, families may perceive that their children will be more comfortable and/or successful if their classmates are more similar academically.[40]

Even among parents with the same schooling preferences, there are three reasons to expect lower-income families to have weaker *demand* for academics. Diminishing marginal utility from income means that any indirect costs that involve financial expenditures yield greater utility losses for low-income families, making them less willing to incur those costs (e.g., child

[40] Most research on the topic suggests that low-performing peers are academically better off with higher-performing peers, though there are non-linearities (Hoxby & Weingarth, 2005; Harris, 2010). In particular, some research on classroom peer effects posits that having classmates with dramatically higher achievement reduces achievement at the low-end of the distribution; also, there may be advantages to being in a somewhat lower-performing school in order to be relatively high in the achievement distribution.

care and transportation).[41] Compounding this effect, some of the family inputs in the education production function are part of the household production and utility functions. In particular, low-income families are less likely to own automobiles that are used for many purposes and this increases the marginal cost to families of sending their children to schools further away.[42]

Finally, school choices might differ because low-income families are less well informed about the true characteristics of schools. With lower levels of education, they may be less able to process the information they receive. Also, if they really do have weaker preferences for education, they would be less willing to incur the cost of information gathering (e.g., visiting schools, attending school fairs, and talking with neighbors who have direct and recent school experiences). All of this may be reinforced by social networks, in which people tend to associate with and gather information from others like themselves. More broadly, people with lower levels of education seem to be more efficient consumers, making decisions more in line with their preferences (Wolfe & Haveman, 2002).

Almost all of the above theories point in the same direction: compared with academic performance, extracurriculars and indirect costs should play a relatively larger role for low-income families relative to other families.[43] To test this, we estimate the baseline model from

[41] These costs may be non-trivial. For example, a school with one extra hour of class time per day and 200 days per year would save a family $2,000 per year in child care costs (assuming an hourly price of $10 per hour). Since these costs are being paid out of school revenues, this also means schools have fewer resources for academics and other activities. Running counter to the theory low-income families will have higher demand is the fact that, almost by definition, they have a lower opportunity cost of providing child care themselves; however, under general conditions the price effect still dominates and low-income families should have higher demand for school-based child care.

[42] This arises because of the fixed costs of owning automobiles, including insurance and some types of repairs.

[43] The way in which these phenomena play out among low-income families is likely to depend on the number of parents and guardians at home and how many of them are working. Some low-income adults do not work, work limited hours, and/or rely on government assistance. In these families, parents can contribute their own time to the schooling process without a loss in income. However, low-income adults who work full-time are likely to have less flexible and non-standard work hours where devoting time to their children's schooling could result in the loss of the job and income. Also, many families are low-income in part because they have single parents who are the sole wage

Table 2, separately by block group income terciles where the bottom tercile has the lowest neighborhood average median income.[44] The right-hand column of Table 4 displays the test statistics for the differences between the lowest and highest income groups.[45]

The results are consistent with our predictions. The lowest-income families with elementary-age children have weaker preferences for SPS. The indirect costs also affect their choices more: they rank higher those schools with free after-school care and extended days (though only the former is significant at conventional levels), and they rank the nearest school higher than the highest income groups (available upon request).[46] Low-income families also have weaker preferences than higher-income groups for paid after-school care.

[TABLE 5]

The same basic patterns emerge in high school. The lowest-income families still have weaker preferences for SPS, but the magnitude of the difference is smaller. The lowest-income group has much stronger preferences for band/football.[47] The differences in most of the other school characteristics are statistically insignificant, consistent with the earlier mixed logit results showing less overall variance in demand in those factors.

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earners, which may compound some of the above influences. Unfortunately, we cannot measure marital status or employment in our data.

[44] It is important to recognize that families in the New Orleans public school sector have very low incomes compared with the average population. The vast majority of students is eligible for free or reduced price lunches. So, the "lowest income" group here has very low incomes and the "highest income" group is typically just middle class. The median income for the lowest, middle, and highest income are: $6,500-$23,365, $23,427-$36,154, and $36,613-$250,001, respectively.

[45] One complicating factor in any subgroup analysis within a logit framework is the assumption that the variance of random utility component is the same across groups (Allison, 1999). In effect, this means we have to assume that the variance of unobservables, which shows up in the residual, are the same across income categories. While this assumption only applies to the variance of the unobservables, and seems plausible, it is still possible that this biases the estimated difference between groups.

[46] In addition to transportation costs, national research shows that low-income families tend to be more socially isolated (Anderson, 1990; Rankin & Quain, 2000; Tigges, Brown, & Green, 1998; Wilson, 1987), so they may simply feel less comfortable sending their children to other parts of the city.

One additional explanation for these findings, beyond the above theories, has to do with our measure of academics. The lowest-income families might define "academics" in a way not reflected in the SPS, making their preferences appear weaker than they really are. For example, low-income might be more inclined toward specialized academic programs in arts or science. We provide evidence against this theory in the later analysis of stated preferences. Either way, however, this would not explain why the lowest-income families have stronger preferences for band/football, holding SPS constant.

The weaker demand for SPS and strong consideration of extracurriculars and indirect costs among low-income families is all the more striking given the setting and data limitations. Our reliance on block group income information adds measurement error that likely attenuates differences between the groups. Also, the range of incomes within the sample is relatively narrow, with the high-income families bypassing the public school market for private schools or attending selective admissions public schools that are omitted from the analysis. Therefore the differences in demand by income are probably even greater than what we report. In short, these results suggest that school choice may help improve the academic outcomes of low-income students, but not as much as simple theories might predict.

Private Information and School Demand

While we separate the entire analysis by elementary/middle and high school, there are reasons to expect differences across specific grades within these categories. Effects at transition grades such as kindergarten and ninth grade may be especially telling about demand because these are the grades where families have the least information about their choice sets, making easily observed factors from the *Parents' Guide*, play a larger role. In contrast, when a student is in third grade, the family is likely to have more private information about the current school from personal experience, and about other schools from talking with other parents.

The effect of this type of learning on measured demand will depend on how much families learn, how different their new information is from prior information, supply constraints, and switching costs. In a new school, parents and students have to learn new policies and put in the effort to develop new relationships with other students, parents, teachers, and administrators. The influence of these switching costs is intertwined with what families learn during the transition grades. They might, for example, learn a great deal of new information, but still leave their rankings unchanged because the switching costs are larger than the potential utility gains (specifically, so that the present discounted value of the expected utility gain from switching is smaller than the one-time switching cost).

Results by grade can be seen in Figures 1A-1I based on the model specification in column (1) of Table 2.[48] Each figure represents the odds-ratio from 13 different rank-ordered logit coefficients, one for each grade, K-12. The results are consistent with what our theory predicts. Factors that are easily observed and important on average according to prior results—SPS, new buildings, and legacy schools—all see spikes in kindergarten and 9th grade relative to adjacent grades.[49] There are no clear patterns for extended day; after-school care seems more important around 6th grade for reasons we cannot explain.

[48] Since these are cross-section data, the results for each grade pertain to different students (and different families to a lesser degree). Therefore we must assume either that there are no differential trends in preferences across grades or that the differentials exist, but are smooth across grades. For example, there could be a faster upward trend in preferences for SPS between kindergarten and 1st grade, but this does not bias the results if the differential is the same between 1st and 2nd grade. The discontinuity would still be evident.

[49] Comparisons across Kindergarten and 1st grade and across 8th and 9th grade and 9th and 10th grade are available in Appendix Table 2. Preferences for all school characteristics are significantly different from 8th to 9th grade. From 9th to 10th grade the following characteristics are significantly different: distance, SPS, weekend classes, "in flux" school, new building, total extracurriculars, band/football, and grade enrollment. From kindergarten to first grade

In high school, there is a spike in band/football in 9th grade. This diminishes quickly and reverses direction in 10th grade. The upward spike is easy to understand since competitive football begins in 9th grade, but the downward spike afterwards requires more explanation. It could be that many boys plan to play football but do not make the team or they play infrequently, leading some to prefer other schools in 10th grade. This would also explain why preferences for other extracurriculars, which are less competitive, are smoother across grades. This might also help explain why students are more willing to accept weekend classes toward the end of high school.

Preferences for weekend classes become strongly negative in 9th grade. This may reflect the fact that students are more involved in schooling decisions as they get older. The desire to avoid weekend classes is not as strong in later high school grades. Anecdotally, many of these courses are intended to prepare students for college and students may be more willing to accept them as they get closer to the end of high school. Also, students who drop out of high school (usually after grade 9) are probably least academically inclined and drop out of the sample.[50]

Distance has a fairly consistent role from kindergarten through grade 4, then diminishes in grade 5 and again in grade 9. This is consistent with the theory that parents want to be in closer proximity to their younger children, but are less concerned about this as their children become more independent and demand more in their academic and extracurricular programs.

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each of the following are significantly different: SPS, sibling, extended day, legacy school, new building, and band/football.

[50] Dropouts might also partially explain the decline in band/football if dropouts are more likely to choose schools based on band/football, which seems plausible. We cannot identify dropouts in our data.

Policy, Information, and Demand

The above analyses are made possible by the distinctive New Orleans school policies, especially the OneApp system for assigning students to schools. Since these (and other) policies were adopted relatively recently, we can also carry out longitudinal analyses to provide exploratory evidence about the effects of policies on demand. After discussing the recent policy changes in more detail, we compare demand before and after each major policy shift, using school enrollment data (rather than rankings) from the years 2004, 2011, and 2013. While the intent is to identify causal policy effects, the analysis here is meant only to be suggestive since we have no control group to account for general time trends affecting all districts.

Louisiana, like all states, is subject to federal rules, including the *No Child Left Behind* law that was passed in 2001 and implemented soon after. Therefore, prior to Katrina, New Orleans public school students took standardized tests in grades 3 to 11. While the precise formula has changed, student test scores have been used to calculate the SPS since 2002 and throughout the entire period under study here. After the storm, however, low-SPS schools were moved out of OPSB on the basis of SPS and the RSD made the SPS the primary basis for deciding which schools to close or reorganize. Six schools (almost 10 percent of the total) were closed in this way between 2011 and 2013, all of which received considerable media attention. This might have led schools and families alike to focus more on the test. Indeed, there is also some evidence that New Orleans educators focused more on the high-stakes test in their instruction in the post-Katrina period (Arce-Trigatti, Harris, and Weixler, forthcoming). On the other hand, the *Parents' Guide* was first published in 2009 and this provided parents with a great deal of new information, not only about SPS but a host of school characteristics. The predicted change in the role of SPS in school choices from pre- to post-Katrina is therefore unclear.

A second set of reforms went into effect around 2012. At that point, the SPS was translated into letter grades and the OneApp choice system went into effect. In addition to centralizing choice, and introducing the assignment algorithm, the OneApp provides families with particular information about their options. Specifically, for 2013 school applications, the school letter grade was highlighted within the OneApp form itself. We therefore expect the role of SPS to increase between 2011 and 2013.[51]

The main challenge to testing this hypothesis is that we do not have ranking data in 2011 and therefore compare the two years with enrollment as the dependent variable (conditional logit). This means, unlike analysis of rankings, the estimated coefficients reflect both demand and supply. This should bias downwards the taste coefficients on preferred characteristics or even reverse their directions; that is, the characteristics of schools that are in high demand should lead to over-subscription in the schools that have those characteristics, making the number of students assigned/enrolled in a school lower than the number who wish to be there. This is what we find. The 2013 enrollment-based results in Table 6 have odds ratios closer to unity for both SPS and extracurriculars in both grade levels.

For the purpose of testing the change in demand then, it is necessary to assume that the supply-side factors such as selected admissions and "cream-skimming" are constant across years. In theory, this is plausible for the 2011-2013 comparison, given the short time span and the apparent stability in other aspects of the school system over that period. Comparing 2011 to 2013 in Table 6, there is a statistically significant, but apparently small, increase in the demand for SPS in elementary schools, though the SPS results are similar across the two high school years.

[51] Another possible method of identifying the information effects on school choice would be to utilize the sharp discontinuity in the assignment of letter grades using the SPS score. We carried out a regression discontinuity analysis but found that there are too few schools near the grade cutoff scores to identify an effect. These results are available upon request.

The indirect costs (distance) also seem to play a larger role in 2013. It is not clear why this would be since the New Orleans population changed very little in this short time frame.[52]

[TABLE 6]

The comparison with 2004 (pre-Katrina) is also important because of the unprecedented market-based reforms that took place after the storm. Comparing 2004 and 2011 in Table 7, we find that the SPS odds ratio is much larger in the pre-Katrina period, but this is most likely due to changes on the supply side (congestion). Anecdotally, New Orleans schools were almost uniformly under-subscribed in the pre-Katrina period, so it may be that the absence of supply constraints, combined with the extensive informal choice system operating at that time, actually made it easier for parents to get into relatively high SPS schools.[53] Also, there was apparently less variance in measured school characteristics across schools pre-Katrina, except in the SPS where the variance remained the same. If SPS was the only basis for product differentiation, then its measured importance would appear higher pre-Katrina even if preferences, information, and supply constraints were unchanged.

[TABLE 7]

More predictable is the fact that distance seems much more important in the pre-Katrina period. In additional specifications, we also added a variable indicating whether the school was the zoned school in 2004 and the nearest school in 2011 (see appendix). Both the zoned and

[52] There are some additional methodological issues here separate from the possible changes in the supply side. Recall that the 2013 year does not include all public schools in the city because not all schools participated in the OneApp. In particular, selective admissions schools have their own separate admissions system therefore, to maintain comparability, we estimate with all schools except selective admissions in 2011 (shown in Table 6) and a more comparable sample that drops OPSB schools in 2011 (in the appendix). The results are substantively the same between these two and we therefore report only the most complete samples. The same issue applies later to the 2004 analysis.
[53] This explanation only makes sense if the highest performing schools also set lower capacity levels in 2011.

nearest indicators strongly predict enrollment, though the coefficients are predictably larger in 2004 when zones were the driving force behind enrollment decisions.

Comparing the results in Table 6 and Table 7 allow us to see how estimates of SPS and distance may be biased by the exclusion of other school characteristics. The role of SPS increases noticeably in the elementary grades when fewer covariates are included. This reinforces a general theme of this study that the role of academics in school demand, while still certainly strong, is less than prior research has suggested. This is important because many of the prior studies are limited in the number of school characteristics they can observe. Table 7 mimics Hastings, Kane & Staiger (2010) and estimates a model like Table 6 with only distance and SPS.[54] It is worth noting that since we are only able to examine the 2004 school year with these limited characteristics, the results in Table 7 are subject to the same omitted variable bias. However, if the bias is consistent across years then the comparison across years would still be valid.[55]

Overall, while it is difficult to draw conclusions about the effects of the immediate post-Katrina reforms, and all the analyses on policy effects are exploratory, the effects of the OneApp and letter grades are consistent with what theory predicts and robust to variations in the model specification. The comparison of the two sets of 2013 results, based on enrollment and ranking data, also highlight the influence of supply constraints when examining the outcomes of choices and the importance of using OneApp rankings.

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[54] One other difference is that they include information on race, which we omit because there is so little school-level variance within our sample (and we cannot identify race at the individual student level).

[55] In addition to omitted variables and reliance on enrollment rather than rankings already mentioned, there are the following concerns: (a) the population changed after Katrina and the new population might have different preferences; (b) in the pre-Katrina period, the "active choosing" families were likely to include only those with the largest gap between actual and potential utility; and (c) the results are not robust to replacing the SPS by the letter grade and stars.

Revealed versus Stated Preferences

The vast majority of studies on school preferences, including two recent ones of New Orleans (Cowen Institute, 2013; Jochim et al. 2014) are based on stated preferences and tend to find that academic factors are most important to families. In this section, we consider how our results compare with prior studies and provide a head-to-head comparison using survey data from New Orleans parents from the same time period as the 2011 revealed preference analysis.

Our stated preference data come from a survey of 349 adults conducted by a third party (Cowen Institute, 2011). While it is a relatively small group, it was intended to be a random sample, representative of the city population. In addition to a rich set of measureable family characteristics, respondents were asked about the importance of a variety of school characteristics on a 5-point Likert scale (1=Not important at all, 5=Very important).[56] Descriptive statistics are in Table 8.

In prior studies, parents report that academics are most important. This is also what we find in our New Orleans' parent surveys and both results seemingly contradict the revealed preference analyses based on OneApp from the same time period. Also, in the surveys, parents of children in F schools rate this factor only slightly below those in A schools.[57] Preference heterogeneity by income in the survey analysis also yields contradictory findings. In contrast to our revealed preference analysis, the lowest-income and highest-income families report similar preferences for academic performance. The results by income for other school characteristics, however, are similar between the stated and revealed preferences analyses. For example,

[56] The sampling frame for the survey was all households in the city with available phone numbers. There is certainly some bias based on who has a phone and who is likely to answer and respond to the survey. No information is available about response rates or whether the sample is representative of the city as a whole.
[57] The difference is marginally statistically significant at $p<.10$, though seemingly small in magnitude.

distance/transportation, sports, and extracuriculars still appear more important to low-income families.[58]

These patterns of similarities and discrepancies between the revealed and stated preference analyses might be partly explained by three related factors. First, parents may exaggerate their preference for academics because of "social desirability bias." Second, research suggests that social desirability bias is strongest among less educated populations who are likely to have lower incomes (Bernstein, Chadha, & Montjoy, 2001; Heerwig & McCabe, 2009; Silver, Anderson, & Abramson, 1986). Since "academics" might be reasonably thought of as socially desirable, this could explain why the discrepancies between revealed and stated preferences are most evident for this one characteristic. Third, the surveys are of parents rather than students therefore, at the high school level, we would expect the role of academics to be larger in the surveys, especially at the high school level where students are probably more involved in school decisions.[59]

Despite the obvious flaws with stated preferences, there are two ways that the surveys help us go beyond the revealed preference analysis. First, we had posed various theories for why low-income families might have weaker preferences for academic outcomes as measured by SPS, but we could not clearly distinguish in the revealed preference analysis between weaker preferences for academics and differences in the ways different families might define and measure this concept. If the lowest-income families defined these terms differently, we would expect to see more discrepancies between the stated and revealed preference analysis, but, as noted above, the results only differ on academics. Therefore, for the revealed preference results

[58] We attempted to line up the income levels of the two groups as closely as possible. See earlier note.
[59] Also, the surveys ask parents to report how "important" different school characteristics are, but their responses may reflect what school characteristics are rare, not how important the factor is to parents.

to be due to different definitions of academics, it would have to be the case that this is the only measure that low-income families define differently. In any event, this example highlights the ways in which stated preferences may serve as useful complementary evidence for interpreting revealed preference results.

Conclusion

If we had had only typical data sets with stated preferences, we too would have concluded that academics are most important. Moreover, if we had data only on a traditional school district, the lack of variation would have made it impossible to estimate demand for most of the characteristics we considered. New Orleans presents a unique opportunity to understand schooling markets.

Our revealed preference analysis in this market-based system paints a different and richer picture than prior studies. While academics clearly matter, extracurriculars and indirect costs seem at least as important. This is especially true for low-income families. In addition to being more reliant on schools to cover the cost of transportation and child care, these families seem to have weaker preferences for academics. Since low-income families tend to have lower education levels, the weaker preference for academics is perhaps not surprising. These parents may not have experienced a strong academic environment themselves and may therefore have weaker preferences for academics generally.

Information is also important and subject to policy influence. The large differences in the roles of observable school factors suggest that the available information varies widely through each child's school career. Public policies pertaining to letter grades can improve information and increase the focus on academic factors, especially in decisions about transition grades where information is typically scarce. The effects of information will also vary by the age of students. Consistent with prior evidence (Valant, 2014), the wide variance in preferences for academics and band/football at the high school level, as well as weak preferences for weekend classes, all suggest that students play a larger role in school choices as they get older.

These findings may help explain a variety of puzzles in the economics of education. First, the fact that parents have preferences for a wide variety of factors, and incur indirect costs, means that even when schools do compete, they do not do so mainly on academics. Instead, school leaders may have to re-allocate resources away from academics to pay for after-school care and other non-academic services. This would help explain why about half the studies on the topic find no effect of competition on student test scores (Gill & Booker, 2008).

Second, this could explain the growing achievement gap between low- and high-income students (Reardon, 2011). While government funding has become more equalized over time by income (Baker, Sciarra, & Farrie, 2012), there may be more pressure in low-income areas to use these resources for non-academic purposes.

Third, these results may also help explain why charter schools, despite having uneven effects on test scores (Angrist et al., 2011; Center for Research on Education Outcomes, 2013), seem more effective in getting students to high school graduation and into college (e.g., Zimmer et al. 2009; Deming et al., 2014). In a competitive market, we expect schools to give families what they want, and if they do, then it is also reasonable to expect students to wish to persist and continue on with additional formal education.

Fourth, the traditional government district system has long been criticized for providing too many services (perhaps with lower-quality), especially in high schools (Chubb & Moe, 1990). Yet this may be a reasonable government response to market pressure given that families want a wide variety of school characteristics. It is not obvious that having product differentiation between schools, as in New Orleans, rather than within schools as in traditional high schools, is the best path to meet demand. Analogously, this is the difference between going to a specialty restaurant and a cafeteria. In a cafeteria, the quality is usually modest, but the options are many for those who do not know what they want, while in specialty restaurants, the options are few and the quality is higher. Whether differentiation should be between or within schools depends in part on how certain students are about their interests and how much they want to specialize (Brown, 1992). Either way, this complicates the argument that competitive markets generate "more choice."

These findings partly reflect the distinctive features of schooling, especially in the United States. Students have to get to school every weekday (and sometimes weekends), making transportation costs more important than in other markets. Schooling also plays the dual role of developing human capital and providing child care that allows parents to work outside the home, which makes school schedules important. That much is true in every country. But in much of the rest of the world, third party organizations provide most extracurricular activities (e.g., club teams for soccer).[60] In the U.S., charter and traditional schools alike are expected to provide these extra services, changing the basis of competition between schools.

[60] There appears to be a relatively limited research literature on this topic, but we did find other evidence. Even excluding sports, more than 93 percent of U.S. high schools offer each of the following: publications, performing arts, sports, student government, and clubs focus on professions. Participation is high among low- and high-income groups alike (National Center for Education Statistics, 1995), though there is some evidence that they are less common in schools serving more disadvantaged populations. In comparison to other countries, U.S. secondary schools place a much greater focus on extracurriculars, though these tend to focus more on sports and less on critical thinking skills. In Japan, the most common extracurriculars include chess, calligraphy, and computer programming. More generally, in Asian nations, the competition over college entrance exams is so intense that there is little time for extracurricular activities in high school. In Finland and Germany, extracurriculars are emphasized less overall than the U.S. and are focused more narrowly on art and music. This is not because they are uninterested in sports. In fact, in Germany, more than three-quarters of students play organized sports, but these are organized through non-school clubs, i.e., not bundled with schooling.

Some of these findings may be distinctive to New Orleans, a city dominated by low incomes, Mardi Gras, music, and football. In other cities, band and football are probably less important, but these may be replaced with some other locally popular mix of extracurriculars. Football is popular throughout the southern states, while in the north basketball is the sport of choice. In the northeast, it might be lacrosse. The conclusions here are not about football and band per se, but about non-academic programs that are also important to American students. Given that extracurricular activities and indirect costs matter more in low-incomes areas like New Orleans, however, it is reasonable to expect that academics will be more important in the average city.

As far back as Friedman (1962), one of the main arguments for school choice and competitive markets has been the potential reduction in the achievement gaps. If choice policies were limited to low-income urban areas, and if competition improves schools, then this would both increase efficiency and reduce achievement gaps between cities and suburbs; indirectly, this would also mean reducing gaps between minorities and low-income groups on the one hand and between white and higher-income groups on the other. However, if low-income families do indeed have weaker preferences for academics, or if schools cream-skim in ways that lead to concentration of high-income students in higher quality schools, school choice could increase achievement gaps *within* cities.

Finally, these results inform debates about the appropriate mix of market-based and government-based accountability. With growing concern about of over-reliance on high-stakes testing, these results suggest that market reforms may be a useful corrective. Parents do not focus narrowly on test scores the way policymakers do. This suggests that some mixture of government-based and market-based policies may yield an optimal focus on academic outcomes. It is difficult to say what the optimal mix of policies might be, but getting there is more likely when recognizing the complexities of the market and the way parents behave as consumers.

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Appendix Table 1A: Elementary School Characteristics

	SPS Score	Extended Day	Free Aftercare	Paid Aftercare	Weekend Classes	Extended Year	Legacy School	In "Flux"	New Building	Parent Group	Total Sports	Total Extra-curriculars	Band or Football	Football	Other Music	Grade Enrollment
Arise Academy	78.6	1	0	0	0	0	0	0	0	1	0	4	0	0	0	55.00
Dr. Martin Luther King	98.5	0	0	0.68	1	0	1	1	0	1	4	11	1	0	3	58.46
KIPP McDonogh 15	91.5	1	0	0	0.43	0	1	1	0	1	1.73	3	0.43	0.43	0	85.00
ReNEW: Batiste	63.3	1	1	0	0	0	0	0	0	1	1	6	1	0	1	73.56
Cohen College Prep	83.5	1	0	0	1	0	1	1	0	1	7	5	1	0	0	71.57
Lawrence D. Crocker	64.8	1	0	0	0	0	1	0	2	1	1	0	0	0	0	44.17
E. P. Harney	71.2	0	0	0	0	0	1	0	0	1	3	7	1	0	2	41.44
James M. Singleton	73.6	1	1	0	0	0	1	0	0	1	3	4	1	0	1	71.56
KIPP Central City Primary	88.5	1	0	0	0	0	0	0	0	1	0	0	0	0	0	102.20
KIPP Central City Academy	106.4	1	0	0	0	0	0	0	2	1	6	7	1	1	0	101.75
ReNEW: SciTech Academy	67	1	1	0	0	0	0	0	0	1	3	5	1	0	1	75.78
Sylvanie Williams	81.9	1	1	0	0	0	0	0	0	1	3	0	1	1	0	59.50
Andrew H. Wilson	77.9	0	0	1	1	0	1	0	1	1	2	2	1	0	0	68.33
Benjamin Banneker	74.7	1	0	0	0	0	1	1	0	0	1	2	0	0	0	44.89
Samuel J. Green	81	1	0	1	0	1	1	0	0	1	8	15	1	0	2	56.56
KIPP Believe College Prep	112.9	1	0	0	1	0	0	1	0	1	5	3	1	1	0	88.14
Lafayette Academy	93.4	1	0	1	0	1	1	0	0	0	2	6	1	0	0	104.00
Sophie B. Wright	78.9	1	0	0	0	0	1	1	0	1	5	9	1	1	1	68.43
A.P. Tureaud	75.9	1	0	0	0	0	1	0	0	0	0	0	0	0	0	35.14
Esperanza	68	0	0	1	0	0	0	0	0	0	6	4	1	1	1	51.11
John Dibert	73.8	1	0	1	0	0	1	1	2	1	5	8	1	0	1	52.56
Langston Hughes Academy	87	1	1	0	0	0	1	0	2	1	6	6	1	0	0	71.67
Joseph A. Craig	61.1	0	0	0	1	0	1	0	0	1	5	4	1	0	2	41.67
McDonogh #28	67.8	1	0	0	0	0	1	0	0	1	3	13	0	0	1	46.56
McDonogh #42	54.8	0	0	0	0	0	1	1	0	1	0	0	0	0	0	49.44
Medard H. Nelson	79.9	0	1	0	0	0	1	0	0	1	3	4	1	0	0	54.89
Morris Jeff	84.6	0	0	1	0	0	1	1	0	1	0	3	0	0	0	51.67
P.A. Capdau	75.8	1	0	0	0	0	1	1	0	1	2	11	1	0	0	43.78
Success Prep. Academy	65.6	1	1	0	1	0	0	0	0	1	4	5	0	0	0	50.75
Akili Academy	96.2	1	0	0	0	0	0	1	1	1	2	9	1	0	0	55.00
Fannie C. Williams	75.2	0	1	0	1	0	1	0	2	1	3	4	1	0	1	60.78
Arthur Ashe	82	1	0	1	0	0	1	0	2	1	7	11	0	0	1	53.89
Gentilly Terrace	74.9	1	0	0	0	0	1	0	0	1	2	7	1	0	1	49.44
Schaumburg	71.8	1	1	0	0	0	1	1	0	0	5	10	1	1	0	62.11
Mary D. Coghill	79.5	1	0	0	0	0	1	0	2	1	1	1	0	0	0	66.11
Miller-McCoy	71	1	0	0	0	0	0	0	0	1	5	8	1	1	0	48.00
Mildred Osborne	62.4	1	0	0	0	0	1	0	2	1	0	5	0	0	0	46.14
Dolores T. Aaron	68.9	1	1	0	0	0	0	1	2	1	2	3	0	0	1	75.89
Dwight D. Eisenhower	81.7	0	0	1	0	0	1	0	0	1	7	3	1	1	1	66.33
Harriet Tubman	66.6	1	0	0	0	0	1	0	0	1	5	8	1	1	1	57.56
Martin Behrman	107.1	0	1	0	0	0	1	0	0	1	5	10	1	0	1	79.11
McDonogh #32	63.3	1	0	0	1	0	1	0	0	1	7	3	1	1	0	48.00
Paul B. Habans	77.9	1	0	0	0	0	1	0	0	0	6	8	0	0	1	50.29
William J. Fischer	72.3	0	1	0	1	0	1	0	0	1	8	14	1	1	2	73.89
Lagniappe Academies	58.6	1	0	0	1	0	0	0	0	1	2	8	0	0	1	21.50
Benjamin Franklin Elem.	108.5	0	0	1	0	0	1	0	0	1	0	12	0	0	1	77.56
Mahalia Jackson	103.8	0	0	0	0	0	1	0	0	0	0	1	0	0	0	36.00
Mary Bethune	111.9	1	0	0	0	0	1	0	0	1	0	3	0	0	1	54.29
McDonogh #35	97.8	0	0	0	0	0	1	1	0	1	8	7	1	1	2	142.50
Eleanor McMain	109	0	0	0	0	0	1	0	0	1	6	5	1	1	0	127.17

Notes: Most school charactersitics are from the 2013 edition of the *New Orleans Parents' Guide to Public Schools* . Displayed values are school level averages based on the eligible student population in each school. In most cases this is uniform, but in some situations published program offerings may differ across grade level. SPS score is from 2011 when available. When missing SPS is imputed using 2012. Schools with missing data are not presented.

Appendix Table 1B: High School Characteristics

	SPS Score	Weekend Classes	Legacy School	In "Flux"	New Building	Parent Group	Total Sports	Total Extra-curriculars	Football	Band Only	Other Music	Grade Enrollment
Dr. Martin Luther King	98.5	1	1	1	0	1	4	11	0	1	3	58.46
G.W. Carver	46.4	0	1	0	0	0	5	2	1	0	0	83.00
KIPP Renaissance	85.3	1	0	1	0	1	6	7	1	0	0	95.00
Cohen College Prep	83.5	1	1	1	0	1	7	12	1	0	1	71.57
Sophie B. Wright	78.9	0	1	1	0	1	5	9	1	0	1	68.43
Joseph S. Clark	55.8	0	1	0	0	1	9	9	1	0	1	102.75
John McDonogh	29.9	0	1	0	0	1	7	3	1	0	0	94.50
Lake Area New Tech	97.9	0	1	0	2	1	3	3	0	0	0	162.50
Miller-McCoy Academy	71	0	0	0	0	1	5	8	1	0	0	48.00
Sci Academy	111.8	0	0	0	0	1	6	10	1	0	1	90.50
Algiers Tech Academy	85.5	1	0	0	0	1	4	3	0	0	0	57.75
O.P. Walker	108.9	0	1	1	0	1	8	14	1	0	4	221.00
McDonogh #35	97.8	0	1	1	0	1	8	7	1	0	2	142.50
Eleanor McMain	109	0	1	0	0	1	6	5	1	0	0	127.17
Sarah T. Reed	47.6	0	1	0	0	1	7	4	1	0	0	129.50

Notes: Most school charactersitics are from the 2013 edition of the *New Orleans Parents' Guide to Public Schools* . Displayed values are school level averages based on the eligible student population in each school. In most cases this is uniform, but in some situations published program offerings may differ across grade level. SPS score is from 2011 when available. When missing SPS is imputed using 2012. Schools with missing data are not presented.

Appendix Table 2: Preferences by Grade (2013-14 Rank-Ordered Logit)

	K	1st	T-stat K vs 1st	8th	9th	10th	T-stat 8th vs 9th	T-stat 9th vs 10th
Distance	0.707***	0.690***	1.30	0.765***	0.913***	0.875***	13.37	2.98
	(0.009)	(0.008)		(0.008)	(0.007)	(0.010)		
SPS Score	1.531***	1.278***	5.78	1.343***	2.031***	1.251***	10.6	13.87
	(0.034)	(0.030)		(0.042)	(0.049)	(0.032)		
Sibling	42.870***	23.468***	3.44	12.745***	6.147***	3.386***	3.11	2.00
	(5.191)	(2.936)		(1.478)	(1.252)	(0.736)		
Extended Day	0.960	1.134**	2.91	1.048	-	-		
	(0.051)	(0.062)		(0.062)				
Aftercare (Free)	0.934	1.041	1.16	0.861***	-	-		
	(0.053)	(0.061)		(0.047)				
Aftercare (Paid)	1.574***	1.657***	1.05	1.225***	-	-		
	(0.092)	(0.106)		(0.085)				
Weekend Classes	1.067	1.066	0.12	0.875**	0.495***	0.802**	6.73	3.93
	(0.050)	(0.056)		(0.047)	(0.032)	(0.083)		
Extended Year	0.564***	0.719***		0.887	-	-		
	(0.060)	(0.083)		(0.108)				
Legacy School	1.327***	1.003	4.27	0.965	1.672***	1.497***	6.75	1.00
	(0.061)	(0.048)		(0.053)	(0.101)	(0.139)		
School "in flux"	0.896**	0.910**	0.12	1.053	1.743***	1.328***	6.05	2.40
	(0.040)	(0.042)		(0.053)	(0.116)	(0.122)		
New Building	1.067**	0.957	2.76	0.871***	1.920***	0.914	6.95	4.48
	(0.031)	(0.028)		(0.028)	(0.210)	(0.114)		
Parent Group	0.885**	0.987		1.048	-	-		
	(0.054)	(0.063)		(0.086)				
Total Sports	0.957***	0.951***	0.74	0.984	1.087***	1.047	3.51	0.91
	(0.011)	(0.011)		(0.011)	(0.028)	(0.034)		
Total Extracurriculars	1.018***	1.008	0.85	0.998	0.903***	1.018	6.72	5.64
	(0.005)	(0.007)		(0.008)	(0.011)	(0.018)		
Band/Football	0.935	1.130**	3.38	1.094	3.375***	0.873	5.61	4.72
	(0.044)	(0.057)		(0.073)	(0.639)	(0.188)		
Music (non-band)	0.972	1.010	1.11	0.927**	0.762***	0.692***	3.91	1.42
	(0.028)	(0.032)		(0.032)	(0.028)	(0.039)		
Grade Enrollment	1.015***	1.014***	0.19	1.009***	0.995***	1.009***	8.41	8.85
	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)		
N	96756.000	121968.000		88844.000	21970.000	22919.000		

Notes: All columns are from rank-ordered logit regressionsparentheses. T-statistics are from pooled regressions where the school characteristics are interacted with grade indicator variables. The absolute value of the t-statitic on each multiplicative interaction is presented. Exponentiated coefficients, robust standard errors in parentheses.

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 1A: Elementary School Characteristics

	# Schools	Mean	Std Dev	Min	Max
Distance	53	5.008	1.002	3.736	8.815
SPS (Scaled)	53	5.249	1.164	1.820	7.527
SPS (Score)	53	78.736	17.461	27.300	112.900
Sibling	53	0.002	0.001	0.000	0.007
Extended Day	50	0.680	0.471	0	1
Aftercare (Free)	50	0.240	0.431	0	1
Aftercare (Paid)	50	0.194	0.394	0	1
Weekend Classes	50	0.209	0.404	0	1
Extended Year	50	0.040	0.198	0	1
Legacy School	53	0.717	0.455	0	1
School "In Flux"	53	0.264	0.445	0	1
New Building	53	0.377	0.765	0	2
Parent Group	50	0.860	0.351	0	1
Total Sports	50	3.415	2.535	0	8
Total Extracurriculars	50	5.740	3.859	0	15
Band/Football	50	0.629	0.483	0	1
Band Only	50	0.360	0.485	0	1
Music (non-band)	50	0.620	0.753	0	3
Grade Enrollment	53	71.694	28.873	30	171

Sources: 2013 edition of the *New Orleans Parents' Guide to Public Schools* ; Louisiana Department of Education; Recovery School District

Table 1B: High School Characteristics

	# Schools	Mean	Std Dev	Min	Max
Distance	21	5.3723	1.1461	3.8952	7.7018
SPS (Scaled)	19	4.9077	1.904	1.82	7.4533
SPS (Score)	19	73.616	28.56	27.3	111.8
Sibling	21	0.0019	0.0013	0.0003	0.005
Weekend Classes	17	0.2353	0.4372	0	1
Legacy School	21	0.6667	0.483	0	1
School "In Flux"	21	0.381	0.4976	0	1
New Building	21	0.0952	0.4364	0	2
Parent Group	17	0.9412	0.2425	0	1
Total Sports	17	6.0588	1.5996	3	9
Total Extracurriculars	17	7.4118	3.5717	2	14
Band/Football	17	0.8824	0.3321	0	1
Band Only	17	0.0588	0.2425	0	1
Music (non-band)	17	0.8235	1.1851	0	4
Grade Enrollment	21	118.46	72.586	30	294.67

Sources: 2013 edition of the *New Orleans Parents' Guide to Public Schools* ; Louisiana Department of Education; Recovery School District

Table 2A: Estimates of School Choice Parameters (2013-2014)

	Elementary/Middle School Students					
	Rank Ordered Logit	Conditional Logit	Nearest School Dummy	Quadratic	Band & Football	No Enrollment
Distance	0.715***	0.693***	0.760***	0.507***	0.716***	0.716***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
Distance Squared	-	-	-	1.035***	-	-
				(0.001)		
Nearest School	-	-	2.343***	-	-	-
			(0.059)			
SPS Score	1.312***	1.258***	1.312***	0.517***	1.317***	1.480***
	(0.011)	(0.012)	(0.011)	(0.040)	(0.011)	(0.011)
SPS Score Squared	-	-	-	1.083***	-	-
				(0.007)		
Sibling	22.717***	21.729***	22.886***	21.800***	22.730***	23.281***
	(0.913)	(1.241)	(0.924)	(0.904)	(0.915)	(0.927)
Extended Day	1.067***	1.078***	1.064***	1.107***	1.066***	1.032*
	(0.020)	(0.024)	(0.020)	(0.020)	(0.020)	(0.019)
Aftercare (Free)	1.024	1.162***	1.020	1.095***	1.045**	1.127***
	(0.018)	(0.023)	(0.018)	(0.020)	(0.020)	(0.020)
Aftercare (Paid)	1.533***	1.760***	1.460***	1.555***	1.533***	1.510***
	(0.031)	(0.042)	(0.029)	(0.033)	(0.031)	(0.031)
Weekend Classes	1.025	1.036*	1.043**	1.033*	1.022	0.978
	(0.017)	(0.021)	(0.018)	(0.017)	(0.017)	(0.017)
Extended Year	0.732***	0.753***	0.727***	0.742***	0.773***	1.084**
	(0.028)	(0.036)	(0.029)	(0.028)	(0.032)	(0.037)
Legacy School	1.075***	0.945***	1.085***	1.109***	1.085***	1.017
	(0.018)	(0.018)	(0.018)	(0.019)	(0.018)	(0.016)
School "in flux"	0.917***	0.902***	0.929***	0.972*	0.918***	0.967**
	(0.014)	(0.017)	(0.014)	(0.014)	(0.014)	(0.015)
New Building	0.990	0.973**	1.002	1.043***	1.002	0.993
	(0.010)	(0.011)	(0.010)	(0.010)	(0.011)	(0.010)
Parent Group	0.958*	1.055**	0.988	0.932***	0.973	1.046**
	(0.021)	(0.028)	(0.022)	(0.021)	(0.022)	(0.021)
Total Sports	0.959***	0.972***	0.956***	0.955***	0.951***	0.979***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Total Extracurriculars	1.015***	1.010***	1.019***	1.014***	1.016***	1.000
	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Band/Football	1.038**	0.974	1.044**	1.071***	1.112***	1.044**
	(0.018)	(0.020)	(0.019)	(0.019)	(0.030)	(0.018)
Band Only	-	-	-	-	0.922***	-
					(0.022)	
Music (non-band)	0.987	0.978*	0.976**	1.016	0.998	0.967***
	(0.010)	(0.012)	(0.010)	(0.011)	(0.011)	(0.010)
Grade Enrollment	1.012***	1.011***	1.012***	1.012***	1.012***	-
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
N	912,919	848,450	912,919	912,919	912,919	912,919

Notes: All columns except except the column labeled "Conditional Logit" are from rank-ordered logit regressions. Exponentiated coefficients are displayed, robust standard errors are in parentheses.
*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 2B: Estimates of School Choice Parameters (2013-2014)

High School Students

	Rank Ordered Logit	Conditional Logit	Nearest School Dummy	Quadratic	Band & Football	No Enrollment	T-Stat Elementary vs High School
Distance	0.887***	0.870***	0.925***	0.679***	0.887***	0.891***	33.09
	(0.005)	(0.005)	(0.005)	(0.009)	(0.005)	(0.005)	
Distance Squared	-	-	-	1.024***	-	-	
				(0.001)			
Nearest School	-	-	1.872***	-	-	-	
			(0.086)				
SPS Score	1.455***	1.335***	1.469***	1.266***	1.444***	1.539***	6.94
	(0.018)	(0.018)	(0.018)	(0.110)	(0.019)	(0.016)	
SPS Score Squared	-	-	-	1.014	-	-	
				(0.009)			
Sibling	5.052***	6.314***	4.884***	4.614***	5.112***	5.060***	11.25
	(0.644)	(1.031)	(0.622)	(0.583)	(0.654)	(0.639)	
Extended Day	-	-	-	-	-	-	
Aftercare (Free)	-	-	-	-	-	-	
Aftercare (Paid)	-	-	-	-	-	-	
Weekend Classes	0.657***	0.753***	0.673***	0.681***	0.376***	0.612***	9.02
	(0.030)	(0.048)	(0.031)	(0.033)	(0.055)	(0.027)	
Extended Year	-	-	-	-	-	-	
Legacy School	1.444***	1.302***	1.499***	1.371***	1.278***	1.490***	6.77
	(0.058)	(0.067)	(0.059)	(0.053)	(0.066)	(0.061)	
School "in flux"	1.486***	1.390***	1.416***	1.458***	2.277***	1.434***	10.89
	(0.062)	(0.076)	(0.060)	(0.086)	(0.261)	(0.057)	
New Building	1.021	0.906	1.111*	1.143**	0.707***	1.257***	0.53
	(0.060)	(0.065)	(0.065)	(0.066)	(0.075)	(0.067)	
Parent Group	1.262**	1.363**	1.173	1.165	0.793	1.113	2.37
	(0.144)	(0.174)	(0.134)	(0.135)	(0.131)	(0.127)	
Total Sports	1.058***	1.054***	1.087***	1.075***	1.160***	1.145***	6.23
	(0.016)	(0.020)	(0.017)	(0.017)	(0.032)	(0.013)	
Total Extracurriculars	0.966***	0.991	0.957***	0.957***	1.047**	0.952***	6.11
	(0.008)	(0.010)	(0.008)	(0.008)	(0.022)	(0.007)	
Band/Football	1.292**	1.168	1.353***	1.247*	0.463***	1.219*	2.12
	(0.131)	(0.149)	(0.136)	(0.142)	(0.126)	(0.124)	
Band Only	-	-	-	-	4.038***	-	
					(1.395)		
Music (non-band)	0.752***	0.726***	0.785***	0.804***	0.491***	0.823***	10.09
	(0.019)	(0.024)	(0.020)	(0.023)	(0.053)	(0.018)	
Grade Enrollment	1.005***	1.008***	1.004***	1.004***	1.008***	-	10.94
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)		
N	89,904	79,894	89,904	89,904	89,904	89,904	

Notes: All columns except except the column labeled "Conditional Logit" are from rank-ordered logit regressions. T-statistic is estimated by pooling the elementary and high school students into a single rank-ordered logit regression and interacting each variable with a high school indicator variable. The reported t-statistic is the t-statitic on this multiplicative interaction term. Exponentiated coefficients are displayed, robust standard errors are in parentheses.
*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 3: Preferences for School Choice - Siblings and non-Siblings (2013-14)

	Elementary/Middle School Students				*High School Students*			
	Full Sample				Full Sample			
	W/ Sibling Indicator	W/O Sibling Indicator	Sibling Only Subsample	No Sibling Subsample	W/ Sibling Indicator	W/O Sibling Indicator	Sibling Only Subsample	No Sibling Subsample
Distance	0.715***	0.710***	0.735***	0.703***	0.887***	0.886***	0.932***	0.873***
	(0.003)	(0.003)	(0.007)	(0.003)	(0.005)	(0.005)	(0.010)	(0.005)
SPS Score	1.312***	1.282***	1.284***	1.284***	1.455***	1.450***	1.847***	1.368***
	(0.011)	(0.011)	(0.022)	(0.012)	(0.018)	(0.018)	(0.053)	(0.019)
Sibling	22.717***	-	-	-	5.052***	-	-	-
	(0.913)				(0.644)			
Extended Day	1.067***	1.086***	0.984	1.120***	-	-	-	-
	(0.020)	(0.020)	(0.038)	(0.023)				
Aftercare (Free)	1.024	1.036**	0.819***	1.108***	-	-	-	-
	(0.018)	(0.018)	(0.032)	(0.022)				
Aftercare (Paid)	1.533***	1.532***	1.093**	1.682***	-	-	-	-
	(0.031)	(0.031)	(0.046)	(0.038)				
Weekend Classes	1.025	1.034**	1.068*	1.030	0.657***	0.658***	0.584***	0.668***
	(0.017)	(0.017)	(0.037)	(0.019)	(0.030)	(0.030)	(0.052)	(0.036)
Extended Year	0.732***	0.727***	0.617***	0.763***	-	-	-	-
	(0.028)	(0.028)	(0.051)	(0.033)				
Legacy School	1.075***	1.086***	1.350***	1.027	1.444***	1.448***	1.497***	1.439***
	(0.018)	(0.017)	(0.047)	(0.018)	(0.058)	(0.058)	(0.117)	(0.068)
School "in flux"	0.917***	0.923***	0.962	0.913***	1.486***	1.481***	1.578***	1.488***
	(0.014)	(0.014)	(0.032)	(0.016)	(0.062)	(0.061)	(0.137)	(0.071)
New Building	0.990	0.972***	1.058***	0.953***	1.021	1.019	2.033***	0.852**
	(0.010)	(0.009)	(0.022)	(0.010)	(0.060)	(0.060)	(0.281)	(0.055)
Parent Group	0.958*	0.959**	0.833***	0.993	1.262**	1.277**	0.651	1.385***
	(0.021)	(0.020)	(0.039)	(0.024)	(0.144)	(0.146)	(0.228)	(0.168)
Total Sports	0.959***	0.961***	0.937***	0.966***	1.058***	1.058***	1.156***	1.042**
	(0.004)	(0.004)	(0.009)	(0.004)	(0.016)	(0.016)	(0.039)	(0.018)
Total Extracurriculars	1.015***	1.016***	1.050***	1.007***	0.966***	0.966***	0.898***	0.986
	(0.002)	(0.002)	(0.005)	(0.002)	(0.008)	(0.008)	(0.015)	(0.009)
Band/Football	1.038**	1.027	1.116***	1.006	1.292**	1.282**	2.560***	1.030
	(0.018)	(0.018)	(0.042)	(0.019)	(0.131)	(0.131)	(0.588)	(0.118)
Music (non-band)	0.987	0.983*	0.975	0.984	0.752***	0.753***	0.826***	0.729***
	(0.010)	(0.010)	(0.022)	(0.012)	(0.019)	(0.019)	(0.040)	(0.021)
Grade Enrollment	1.012***	1.013***	1.019***	1.011***	1.005***	1.005***	0.996***	1.007***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
N	912,919	912,919	109,819	803,100	89,904	89,904	10,191	79,713

Notes: Estimates from rank-ordered logit regressions. Exponentiated coefficients, robust standard errors in parentheses.

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 4: Conditional vs Mixed Logit Comparison (2013-14 Top Ranked School)

	Elementary/Middle School Students			*High School Students*		
	Conditional	Mixed		Conditional	Mixed	
	Beta	Beta	Std Dev	Beta	Beta	Std Dev
Distance	0.715***	0.610***	1.532***	0.892***	0.739***	1.572***
	(0.003)	(0.004)	(0.013)	(0.004)	(0.010)	(0.036)
SPS Score	1.269***	1.202***	0.605***	1.443***	1.681***	1.446***
	(0.011)	(0.014)	(0.016)	(0.015)	(0.056)	(0.071)
Sibling	41.506***	23.051***	8.992***	4.354***	7.083***	0.223
	(2.656)	(2.635)	(3.955)	(0.582)	(2.020)	(0.244)
Extended Day	1.115***	1.200***	0.692*	-	-	-
	(0.021)	(0.037)	(0.132)			
Aftercare (Free)	1.100***	1.247***	1.291	-	-	-
	(0.020)	(0.039)	(0.282)			
Aftercare (Paid)	1.609***	1.890***	0.939	-	-	-
	(0.033)	(0.050)	(0.101)			
Weekend Classes	1.017	1.021	0.845	0.643***	0.588***	0.786
	(0.017)	(0.025)	(0.110)	(0.030)	(0.046)	(0.187)
Extended Year	0.746***	0.793***	0.975	-	-	-
	(0.029)	(0.038)	(0.125)			
Legacy School	1.141***	1.076	0.658*	1.410***	26.279***	123.609***
	(0.019)	(0.053)	(0.149)	(0.056)	(10.196)	(60.094)
School "in flux"	0.932***	0.944***	0.988	1.567***	1.876***	1.177
	(0.015)	(0.017)	(0.104)	(0.066)	(0.163)	(0.482)
New Building	0.971***	0.999	0.924	1.042	1.281**	1.012
	(0.010)	(0.013)	(0.062)	(0.059)	(0.124)	(0.189)
Parent Group	0.944***	1.093***	0.879	1.408***	1.134	0.991
	(0.021)	(0.032)	(0.087)	(0.164)	(0.161)	(0.578)
Total Sports	0.953***	0.950***	0.996	1.069***	1.183***	0.895
	(0.004)	(0.004)	(0.011)	(0.015)	(0.024)	(0.064)
Total Extracurriculars	1.016***	1.013***	1.016	0.971***	1.012	0.977*
	(0.002)	(0.003)	(0.011)	(0.008)	(0.013)	(0.014)
Band/Football	1.050***	1.041*	1.083	1.206*	1.212	1.485**
	(0.019)	(0.023)	(0.128)	(0.124)	(0.210)	(0.288)
Music (non-band)	0.998	0.976*	0.953	0.764***	0.657***	0.958
	(0.011)	(0.014)	(0.051)	(0.019)	(0.035)	(0.038)
Grade Enrollment	1.009***	1.010***	0.999	1.003***	1.002***	1.000
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
N	912,919	848,450		89,904	79,894	

Notes: Estimates based on conditional and mixed logit analysis where the dependent variable is top ranked school. Mixed Logit standard deviation estimates are from the same regression as the estimates of beta. Exponentiated coefficients, robust standard errors in parentheses.

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 5A: Preference Heterogeneity by Family Income (2013-14 Rank Ordered Logit)

	Elementary/Middle School Students			
	Bottom Tercile	Middle Tercile	Top Tercile	T-Stat Top vs Bottom
Distance	0.703***	0.732***	0.706***	0.36
	(0.006)	(0.006)	(0.005)	
SPS Score	1.229***	1.289***	1.497***	8.33
	(0.020)	(0.022)	(0.025)	
Sibling	21.613***	25.570***	19.333***	0.97
	(1.411)	(2.044)	(1.825)	
Extended Day	1.132***	1.038	1.068*	1.11
	(0.040)	(0.038)	(0.041)	
Aftercare (Free)	1.139***	0.942	1.002	2.52
	(0.040)	(0.035)	(0.037)	
Aftercare (Paid)	1.432***	1.346***	2.052***	6.41
	(0.055)	(0.055)	(0.084)	
Weekend Classes	1.132***	1.024	0.852***	5.93
	(0.036)	(0.036)	(0.030)	
Extended Year	1.001	0.734***	0.552***	5.45
	(0.075)	(0.059)	(0.044)	
Legacy School	0.942*	1.110***	1.314***	7.09
	(0.029)	(0.037)	(0.046)	
School "in flux"	1.067**	0.907***	0.844***	5.47
	(0.032)	(0.028)	(0.026)	
New Building	1.017	1.063***	0.938***	2.91
	(0.020)	(0.020)	(0.019)	
Parent Group	0.869***	0.806***	1.194***	5.22
	(0.036)	(0.036)	(0.054)	
Total Sports	0.944***	0.936***	0.961***	1.65
	(0.007)	(0.008)	(0.007)	
Total Extracurriculars	1.003	1.019***	1.027***	3.8
	(0.004)	(0.004)	(0.004)	
Band/Football	0.941*	1.060	1.153***	4.11
	(0.031)	(0.039)	(0.043)	
Music (Non-Band)	1.109***	1.050**	0.830***	9.67
	(0.023)	(0.022)	(0.018)	
Grade Enrollment	1.011***	1.015***	1.011***	0.51
	(0.001)	(0.001)	(0.001)	
N	239,872	225,755	231,786	

Notes: All columns are from rank-ordered logit regressions. Income is defined as the median blockgroup income based on data from the 2007-2011 American Community Survey. Terciles are based on the population in the sample. T-statistic is from a pooled regression across all income terciles where all characteristics are interacted with indicator variables for middle and top tercile indicator variables. The reported t-statistic is from the multiplicative interaction with the top tercile indicator variable. Exponentiated coefficients are displayed, robust standard errors are in parentheses.

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 5B: Preference Heterogeneity by Family Income (2013-14 Rank Ordered Logit)

	High School Students			
	Bottom Tercile	Middle Tercile	Top Tercile	T-Stat Top vs Bottom
Distance	0.875***	0.900***	0.898***	1.76
	(0.010)	(0.009)	(0.009)	
SPS Score	1.414***	1.498***	1.495***	1.61
	(0.034)	(0.035)	(0.037)	
Sibling	5.623***	4.529***	4.574***	0.63
	(0.881)	(1.329)	(1.329)	
Extended Day	-	-	-	
Aftercare (Free)	-	-	-	
Aftercare (Paid)	-	-	-	
Weekend Classes	0.857	0.674***	0.504***	3.95
	(0.084)	(0.058)	(0.046)	
Extended Year	-	-	-	
Legacy School	1.389***	1.435***	1.446***	0.35
	(0.112)	(0.113)	(0.119)	
School "in flux"	1.244***	1.378***	1.787***	3.1
	(0.105)	(0.112)	(0.144)	
New Building	1.605***	1.208	0.836	3.93
	(0.192)	(0.149)	(0.096)	
Parent Group	0.938	1.857**	1.639**	
	(0.190)	(0.466)	(0.413)	
Total Sports	1.196***	1.030	1.018	3.79
	(0.035)	(0.031)	(0.032)	
Total Extracurriculars	0.959***	0.947***	0.963**	0.18
	(0.014)	(0.015)	(0.016)	
Band/Football	1.775***	2.341***	0.937	2.22
	(0.368)	(0.511)	(0.188)	
Music (Non-Band)	0.816***	0.780***	0.718***	1.82
	(0.040)	(0.037)	(0.036)	
Grade Enrollment	1.001	1.005***	1.005***	2.21
	(0.001)	(0.001)	(0.001)	
N	22,137	24,764	23,427	

Notes: All columns are from rank-ordered logit regressions. Income is defined as the median blockgroup income based on data from the 2007-2011 American Community Survey. Terciles are based on the population in the sample. T-statistic is from a pooled regression across all income terciles where all characteristics are interacted with indicator variables for middle and top tercile indicator variables. The reported t-statistic is from the multiplicative interaction with the top tercile indicator variable. Exponentiated coefficients are displayed, robust standard errors are in parentheses.

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 6: Full School Characteristic Comparisons 2011-12 vs 2013-14 Conditional Logit

	Elementay/Middle School Students			*High School Students*		
	2011-12	2013-14	T-Stat Difference	2011-12	2013-14	T-Stat Difference
Distance	0.692***	0.685***	1.98	0.818***	0.870***	7.2
	(0.003)	(0.003)		(0.005)	(0.005)	
SPS Score	1.061***	1.145***	5.47	1.278***	1.216***	2.42
	(0.010)	(0.012)		(0.019)	(0.017)	
Extended Day	0.961**	1.184***	7.65	-	-	
	(0.016)	(0.026)				
Aftercare (Free)	1.165***	1.267***	3.22	-	-	
	(0.019)	(0.025)				
Aftercare (Paid)	1.550***	1.752***	3.66	-	-	
	(0.035)	(0.043)				
Weekend Classes	1.599***	1.032	15.2	1.050	0.738***	4.3
	(0.034)	(0.020)		(0.052)	(0.049)	
Extended Year	1.047	0.956	1.11	-	-	
	(0.072)	(0.043)				
Legacy School	0.959**	1.119***	5.68	1.989***	0.988	10.48
	(0.018)	(0.022)		(0.084)	(0.051)	
School "in flux"	0.777***	1.052***	9.36	1.091**	1.544***	4.84
	(0.021)	(0.019)		(0.047)	(0.089)	
New Building	1.087***	0.923***	9.9	1.246***	1.030	2.49
	(0.013)	(0.010)		(0.033)	(0.074)	
Parent Group	0.958**	1.084***	4.03	0.605***	1.091	4.53
	(0.017)	(0.027)		(0.020)	(0.138)	
Total Sports	1.064***	1.000	10.56	1.137***	1.098***	1.73
	(0.004)	(0.004)		(0.008)	(0.021)	
Total Extracurriculars	1.028***	0.992***	8.9	0.994	1.029***	2.9
	(0.003)	(0.003)		(0.006)	(0.011)	
Band/Football	0.960**	1.004	1.7	1.733***	0.842	5.34
	(0.016)	(0.020)		(0.080)	(0.107)	
Music (Non-Band)	0.969**	0.973**	0.22	0.907***	0.710***	5.71
	(0.014)	(0.013)		(0.021)	(0.026)	
Grade Enrollment	1.005***	1.007***	3.71	1.005***	1.009***	4.8
	(0.000)	(0.001)		(0.000)	(0.001)	
N	1,093,721	808,885		193,554	76,259	

Notes: All columns are from conditional logit regressions. 2011-12 estimates are based on student enrollment and exclude selective admission and magnet schools. T-statistics are from a pooled regressions where 2011 and 2013 estimates are combined and school charactersitics are interacted with a 2011 indicator variable. The t-statistic is the absolute value of the t-statistic on the multiplicative interaction term. 2013-2014 estimates are based on assigned school from the OneApp lottery. School characteristic data are from the 2011 and 2013 *New Orleans Parents' Guide to Public Schools* . Exponentiated coefficients are displayed, robust standard errors are in parentheses.

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 7: Comparison of Preferences Across Years (2004-05, 2011-12, and 2013-14 Conditional Logit)

	Elementary/Middle School Students		
	2004-05 Enrollment	2011-12 Enrollment	2013-14 Assigned
Distance	0.367***	0.701***	0.688***
	(0.003)	(0.003)	(0.003)
SPS Score	1.236***	1.125***	1.266***
	(0.006)	(0.007)	(0.009)
N	2,994,178	1,348,005	851,136
	High School Students		
	2004-05 Enrollment	2011-12 Enrollment	2013-14 Assigned
Distance	0.487***	0.821***	0.872***
	(0.006)	(0.004)	(0.005)
SPS Score	1.289***	1.253***	1.309***
	(0.016)	(0.011)	(0.011)
N	210,861	256,420	103,391

Notes: All columns are from conditional logit regressions. 2004-05 and 2011-12 estimates are based on student enrollment and exclude selective admission and magnet schools. 2013-2014 estimates are based on assigned school from the OneApp lottery. Testing that preferences for distance are the same in all pairwise years rejects the null with a P-value<0.00 in each case. The same is true for preferences over SPS Scores.

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 8: Stated Preferences of School Characteristics

		Preferences by Income				Preferences by School Type		
	Full Sample	Less than 25,000	25,000 to 49,999	Greater than 50,000		Elementary/ Middle School	High School	
Academic Performance	4.58	4.69	4.54	4.64		4.60	4.62	
Close to your Home	3.38	3.49	3.41	3.01	**	3.52	2.73	***
Close to your Work	2.56	2.85	2.47	2.14	**	2.74	1.66	***
Safety or Discipline Policies	4.42	4.72	4.42	4.14	***	4.45	4.42	
Special Academic Programs Offered (i.e. science and tech.)	3.67	3.37	4.00	4.01	***	3.55	3.95	***
Availability of Sports and Extracurricular Activities	3.57	3.80	3.54	3.17	***	3.52	3.62	
Availability of After Care or Extended Day	2.68	3.01	2.19	2.38	***	3.01	1.34	***
Recommendation from Family or Friends	3.56	3.94	3.43	3.18	***	3.74	2.88	***
Other children Attend or Used to Attend	3.21	3.71	3.06	2.91	***	3.47	2.41	***
The teachers, principal and school staff	4.46	4.64	4.44	4.39	**	4.52	4.40	
Availability of Transportation	3.47	4.20	3.07	2.59	***	3.57	3.00	***
Number of Respondents	349	143	81	76		254	73	

Notes: Data are from a 2011 survey of New Orleans public school parents. Means are reported to the question "How important were the following in your deicion to enroll your child in this school: Very Important (5) Somewhat important (4) Neither important or unimportant (4) Not too important (2) Not Important at all (1)." Stars represent significance based on a regression where the dependent variable is the characteristic of interest and the independent variables are dummy variables indicating the category. For preferences by Income, the test is whether the poorest group have significantly different preferences from the least poor group.
*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Figure 1A: Preferences for Distance by Grade

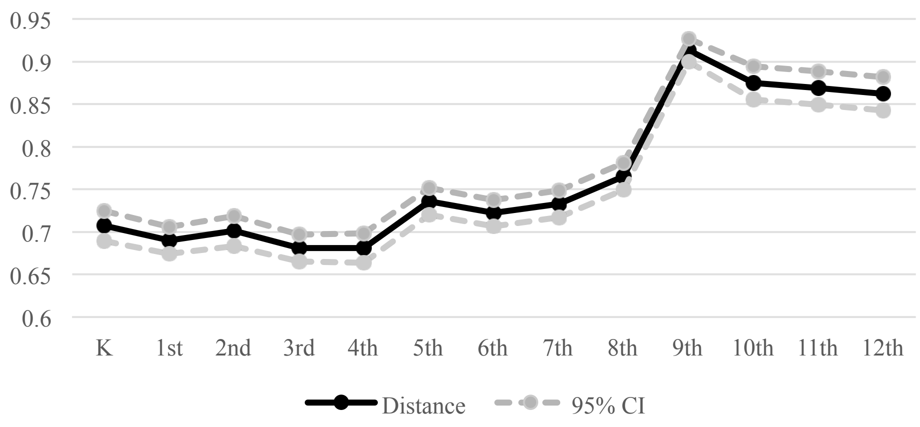


Figure 1B: Preferences for SPS Score by Grade

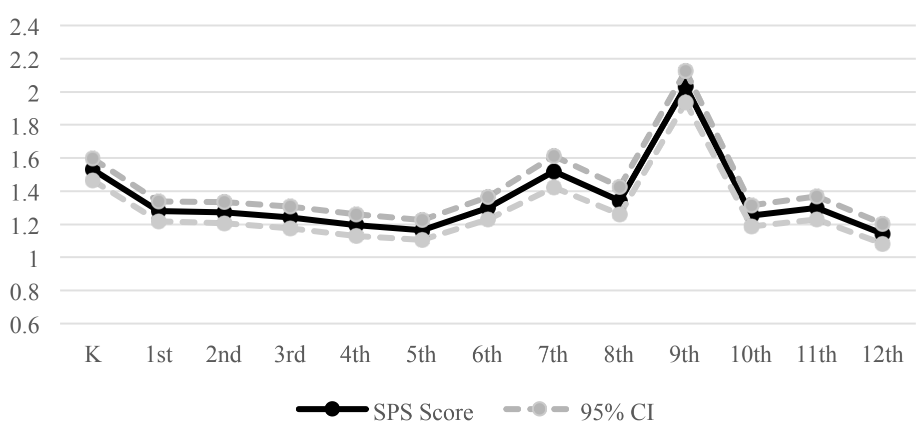


Figure1C: Preferences for Extended Day by Grade

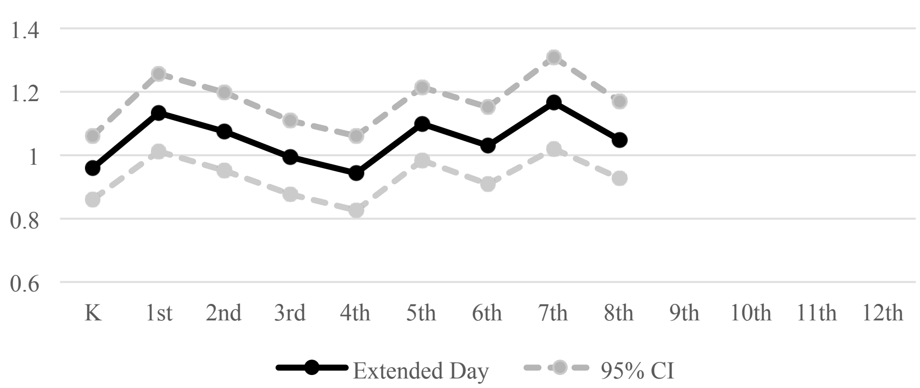


Figure 1D: Preferences for Free Aftercare by Grade

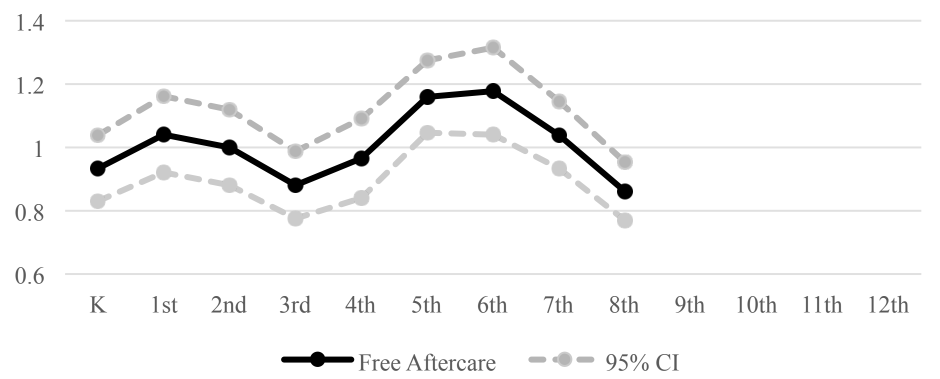


Figure 1E: Preferences for Weekend Classes by Grade

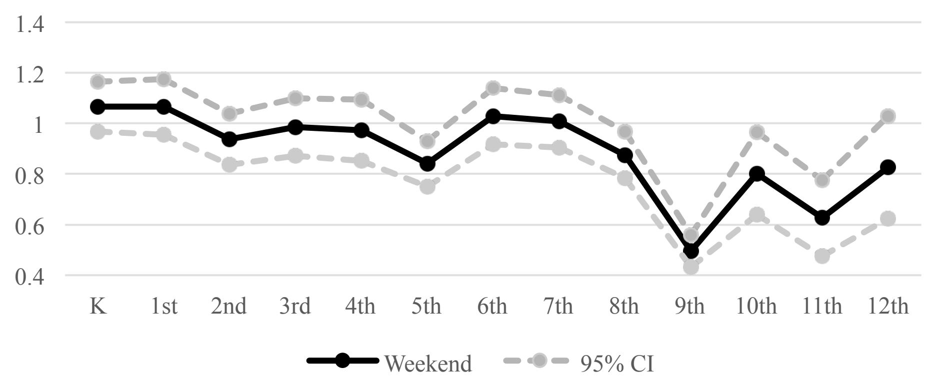
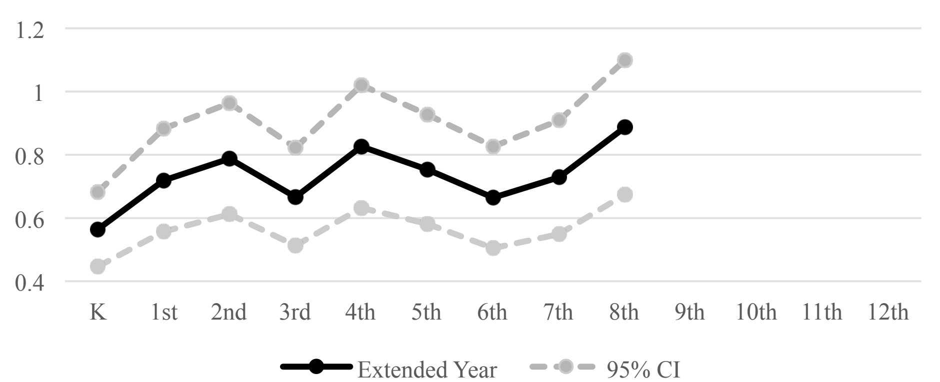


Figure 1F: Preferences for Extended Year by Grade



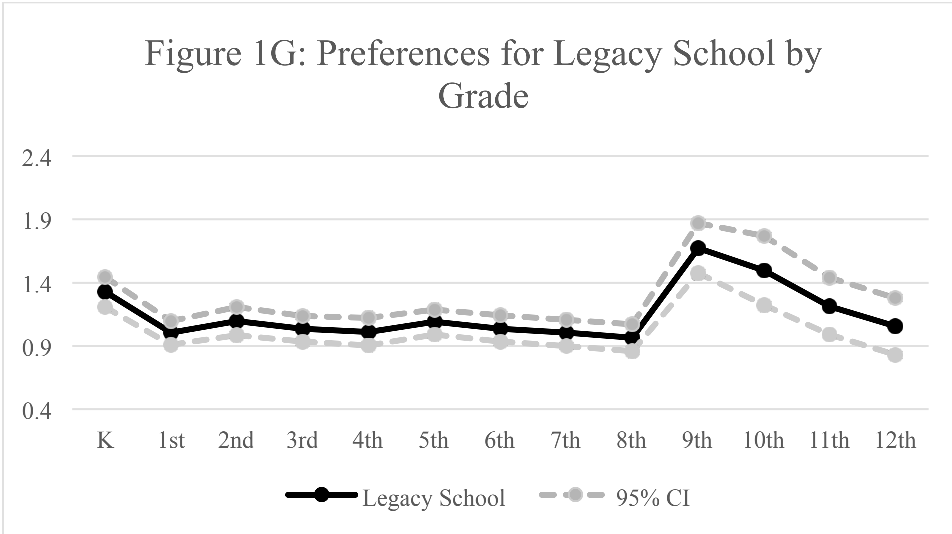


Figure 1G: Preferences for Legacy School by Grade
2.4
1.9
1.4
0.9
0.4
K
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
Legacy School
95% CI

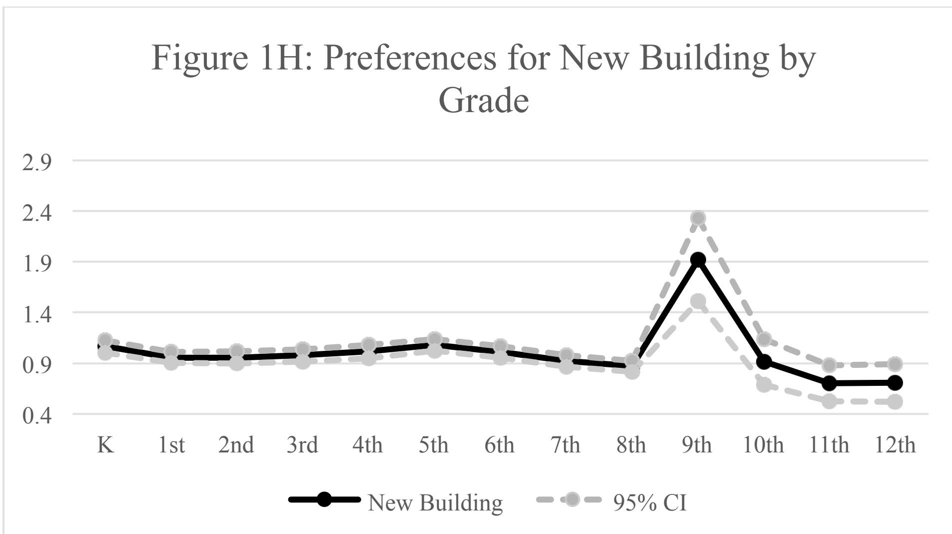


Figure 1H: Preferences for New Building by Grade
2.9
2.4
1.9
1.4
0.9
0.4
K
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
New Building
95% CI

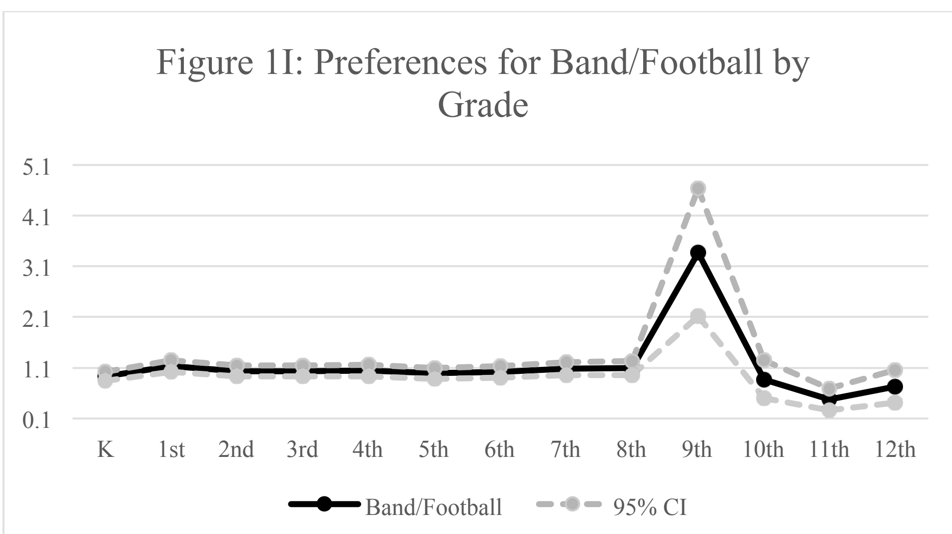


Figure 1I: Preferences for Band/Football by Grade
5.1
4.1
3.1
2.1
1.1
0.1
K
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
Band/Football
95% CI