WorkingPAPER

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Shopping for Schools: Mapping Choice Architecture in the Education Marketplace

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ABSTRACT

If school choice is to work well, consumers need information—as they do in any marketplace—about the alternatives available to them. An emerging source of consumer information in the world of school choice is the universe of school shopping websites. The design choices of these online sites have the potential to have an impact on the effectiveness school choice policies. Behavioral scientists refer to the set of these design decisions as choice architecture. This paper describes the choice architecture of the most prominent school shopping websites at a point in time: September 2017. We selected 14 school shopping websites pertaining to 12 U.S. cities and analyzed the choices that the designers of each site had made. Such choices include the default sort order of schools, the presence and location of a map, the amount of information presented on the main page, the number and types of indicators used to describe schools' performance and offerings, and the accessibility of the sites to non-English speakers and families who lack computers and rely on smart phones. We found a diversity of approaches to presenting school information, which may reflect a lack of consensus on best practices, although it may also reflect the diversity of goals of each site and priorities in each community.

School Shopping Sites as Choice Architecture

School choice has been on the rise in the United States for several years (Grady and Bielick 2010). The growth has come through the expansion of charter schools as well as through the increasing availability of public choice options such as magnet schools, "exam" schools, and district and state open enrollment programs. In addition, public funding for private schools has expanded through scholarships (vouchers), tax credits, and other mechanisms.

If school choice is to work well, consumers need information—as they do in any marketplace—about the alternatives available to them (Schneider et al. 1998; Lubienski 2007). Parents get information through a variety of means, including attending school fairs and visiting schools in person. Schools advertise on city buses and on radio and television. Social networks for sharing information include word of mouth, as Neild documented (2005), and online networks such as Internet forums where parents share information, personal experiences, and even rumors.

An emerging source of consumer information in the world of school choice is the universe of school shopping websites. This marketplace—though still in its early days—has materialized to provide parents with comparative school information. The websites offer many of the features of well-known online retail shopping sites. Some school shopping sites provide a list of schools that users can sort in different ways, with a map showing the locations relative to a user-provided home address. Some allow users to filter alternatives and expand a display or click on links to find more detailed information. Some make it possible to select favorites and compare them side by side. The websites show different types of information using different formats and levels of detail. They can sometimes be linked to application information or a portal for submitting applications to the selected schools. The sources of the information and the providers of the sites vary as well. They can be nonprofit organizations dedicated to promoting school choice, government agencies seeking to streamline the school application process, or technology companies that build products to draw website traffic.

The designs of these online sites have the potential to have an impact on the effectiveness school choice policies. That is because design can influence individual choices and individual choices have collective consequences (Glazerman and Dotter 2017). Also, providing equal access to information can level the playing field. Web designers and their sponsors make myriad decisions about how a website will look, and those decisions can have intentional or unintentional impacts on the user experience and the decisions the users make. The various choices that go into designing a site—favoring distance over academics, for example, or elevating or diminishing the importance of school demographics—can influence the school choices that consumers make by giving greater prominence to certain schools or characteristics of schools. They can also help simplify choices and focus consumers on a more narrow set of options.

Behavioral scientists refer to the set of these design decisions as choice architecture (Johnson et al. 2012). Even if designers give users the option to re-sort the list of schools, click on a button to show more detail or hide detail, or change the look and feel of the site, there is always a default, and defaults can be powerful. For example, Johnson and Goldstein (2003) showed the power of defaults in organ donation, where placing an opt-in provision onto a form

increased organ donations by more than 16 percent. Defaults, as well as other choices, such as the amount of information to present, the format, and the source of data, could all be important to school choice behavior.

This paper

This paper describes the choice architecture of the most prominent school shopping websites at a point in time: September 2017. In the past, researchers have studied the language used in materials distributed to parents in specific locations (Stein and Nagro 2015; Lubienski 2007). Others have conducted experiments by varying the information that parents receive (Hastings and Weinstein 2008) or studied school choosers' Internet search behavior (Schneider and Buckley 2002). However, there has been no systematic review, or even any published review of which we are aware, of school shopping websites and the choices the designers of them make in presenting information to parents. This paper maps out the design choices for a several major urban school choice marketplaces. The details will change as the secondary market for school information grows and evolves, but our goal is to set the stage for future research that will explore the efficacy of different ways to present information to school choosers. Some of the questions we address are the following:

- What are the common design elements?

- How do the sites order the list of schools?

- How much data is shown and what formats are used to represent quantitative data?

- What kinds of functionality do the sites offer in terms of re-sorting, filtering, and comparing schools?

- What content is shown and what content areas receive more or less prominence?

Data

We selected 14 school shopping websites pertaining to 12 U.S. cities (4 on the East Coast, 4 in the Midwest, 2 in the South, one in the Mountain region, and one in the West). For 2 of the cities (Camden and Detroit), we examined 2 websites. Almost all (13) of the 14 sites in this analysis describe charter schools and district schools in a given city; 6 of them also include private schools. Just one was only charter schools. The list of cities and websites is in Table 1.

Table 1.   School shopping sites

City	Link	City	Link
Boston, MA	Choose Boston (charters)	Indianapolis, IN	Enroll Indy
Camden, NJ	Camden Infocards	Memphis, TN	Memphis School Guide
Camden, NJ	Enroll Camden	New Orleans, LA	Enroll NOLA
Chicago, IL	KidsFirst Chicago School Search	Oakland, CA	Oakland School Finder
Denver, CO	Denver SchoolMatch	Philadelphia, PA	Great Philly Schools
Detroit, MI	Great Schools Detroit	St. Louis, MO	STL City Schools Parents Guide
Detroit, MI	Excellent Schools Detroit Scorecard	Washington, DC	My School DC

To select the shopping sites, we first developed a universe by consulting with industry experts who design school shopping sites and searching for school finder tools in cities we know have open enrollment district schools (the ability to select schools outside of neighborhood) or a well-established charter sector. We identified 35 web addresses in this way. We dropped sites that were primarily static (PDF) brochures designed solely to help parents locate in-boundary schools for a given address, included only high schools, or showed only a map with links to school-specific pages. We also excluded statewide sites because most sites are for a city, which might be considered a local educational market (although in some cases the district site is a subsite of a statewide site).

Although this selection process was far-reaching, the sample we developed might not be comprehensive or exhaustive. Therefore, if policymakers find this type of analysis useful, it might be worthwhile in the future to conduct an even more systematic scan. We assessed the sites in September 2017. Some sites might have been updated in subsequent months when new data became available or in anticipation of school shopping for 2018-19. This sample should be regarded as a representation of the diversity of approaches at a particular point in time.

Findings

First, we focus on the origin of the sites—who designed them—to point out that the existence of 14 sites does not mean there are 14 completely independent attempts at representing school choice data. We then describe the look and feel of the sites, which (1) can have an important influence on how well parents can absorb the information, and (2) might place greater or lesser prominence on certain information, thereby influencing parents' decision making. Finally, we focus on the content each website offers about the schools, with special emphasis on academic content.

Who designs the sites?

School shopping sites typically are produced through collaborations between web developers and stakeholders. Stakeholders vary and can sometimes be a bit difficult to identify. They can include city agencies, such as My School DC in Washington, DC and the Denver Public Schools. They can include nonprofits that promote school choice, such as Kids First Chicago or Philadelphia School Partnership, or others such as GreatSchools that use advertising or service subscription models and have school finder sites as part of a larger suite of resources for parents. Two of them—in St. Louis and Memphis—are, according to press reports, the result of efforts by local parents to help other parents. [1]

Web developers include such companies as Tembo, SchoolMint, and GreatSchools. For half (seven) of the sites, we were unable to link the developers to an organization. We could trace some to founders of nonprofits who worked in data analytics or visualization in non-education fields. Nevertheless, some groups of sites have a common look and feel. Companies listed above tailored their sites to the cities, but tend to share design elements. The St. Louis and Memphis

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[1] The sites' information on their designers is available for Memphis at this link: http://memphisschoolguide.org/about-memphis-school-guide/ and for St. Louis as this link: http://blog.stlcityschools.org/launched/

sites, which are nearly identical in layout and functionality, were developed by a volunteer software engineer whose main occupation is real estate data analytics.

**Figure 1.   Who developed the sites?**
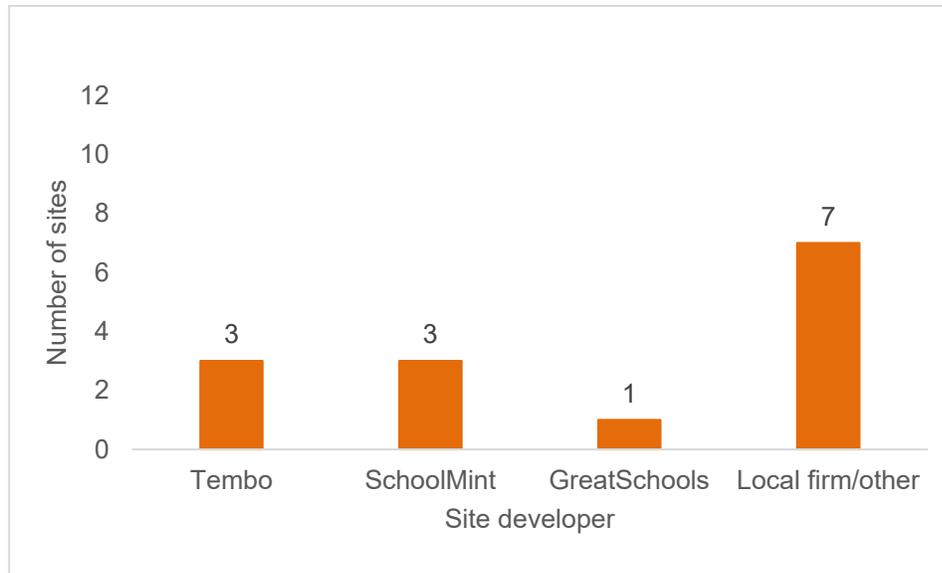
Site entry and layout

   Entry screen and default sort. The order in which schools appear on the lists can be important because it determines which schools appear most prominently. Every site that lists schools must have an initial sort order, or default, which, as we noted, can influence behavior. Four of the 14 sites required users to enter information before they could see the school information, and the user input from those entry screens for 3 of those sites determined the default sort order. Seven of the sites had an optional entry screen, meaning that users received a prompt for information, but they could skip and go straight to the lists with whatever defaults the designers programmed.

Figure 2.   Must users supply information before they can see school data?
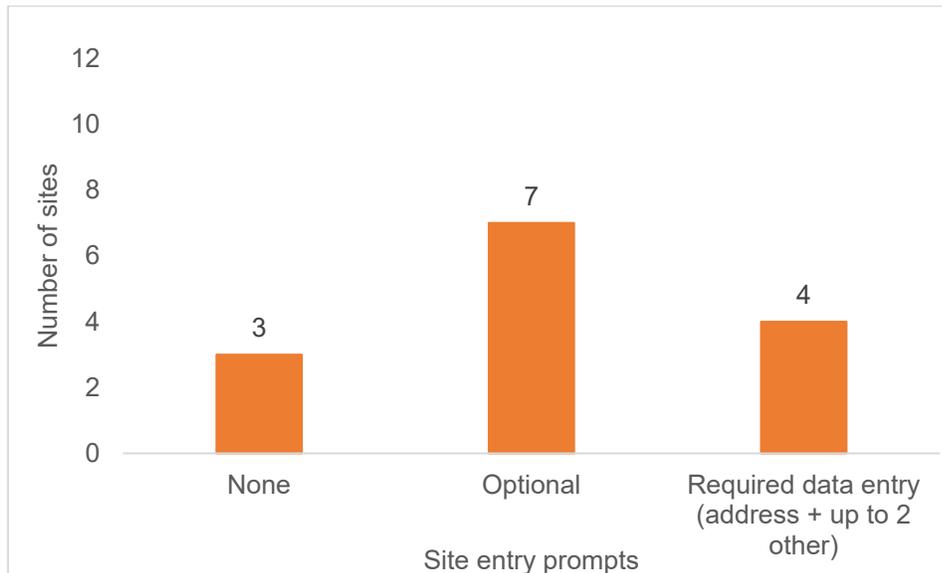
The most common default sort order was alphabetical by name (5 sites), followed by performance measure and distance (3 sites each). The other 3 required user input. In some cases the user input on grade level, location, and program offerings can be used to create a "match score" which then serves as the default sort criterion. For others, the user just identifies which is most important: distance or school performance.

Figure 3.   How are schools sorted by default?
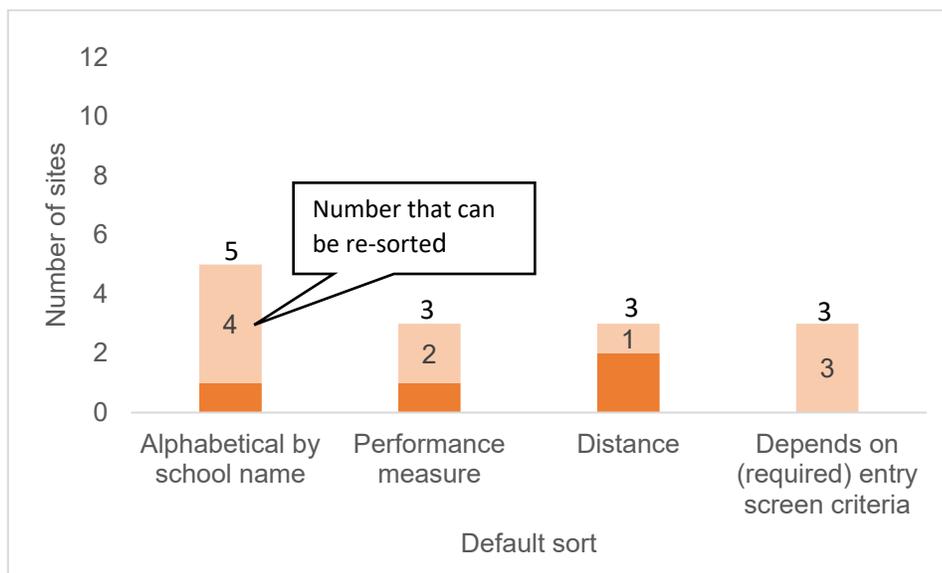
In most cases, but not all (10 of 14), visitors to the site can re-sort the list by selecting a different criterion. Sites varied in how flexible they were in allowing re-sorting, particularly in the number of criteria that users could sort on and the method by they could select the re-sort. Common design elements included dropdown lists of sort terms or, if the data appeared in grid

format, icons next to each column header that the user could click to sort on that column's attribute and click again to reverse the sort order.

Map of schools. A common feature of school shopping sites is a display of the schools on a map. Most of the 14 sites (8) displayed a map by default. The map positioning was not the same on all sites (see Figure 4). Three sites placed the map on top; 3 on the left, and one each on the bottom and on the right side of the screen. Four of the remaining 6 that did not display a map by default did allow site visitors to click to open a map.

Figure 4.   Is there a map of schools, and if so, what is its location on the page?
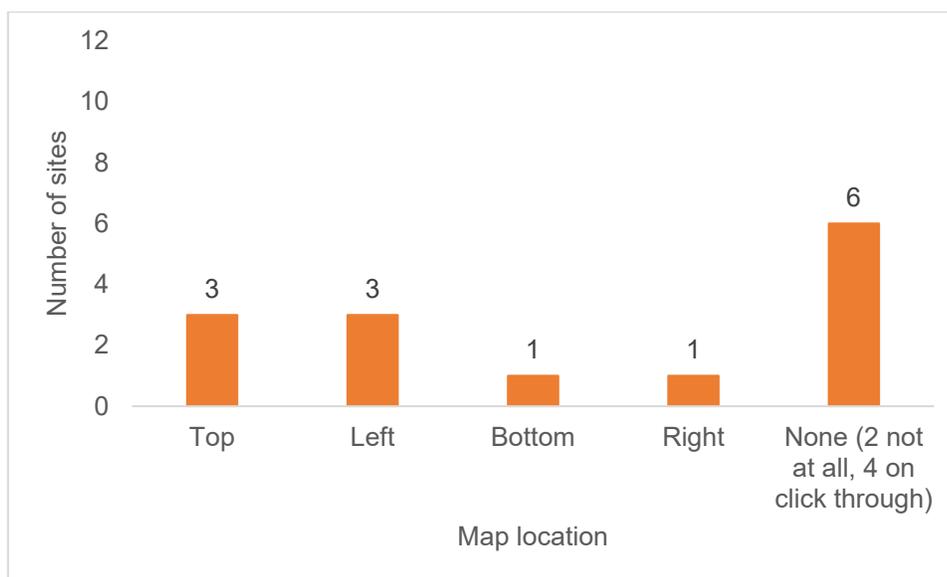
Filtering and comparison. Another potentially useful feature, especially if the number of schools is large, would be the ability to select schools as "favorites" to review in a smaller list or to compare their features side by side. Introducing these features might require more effort from the web developer but, depending on the goal of the site, might be worth the effort. Nine of the sites allowed users to tag favorites, although not all made it possible to compare the favorites without the rest of the list.

All but 2 of the sites we reviewed allowed some type of filter to exclude schools that did not meet a user-entered criterion. The most common filter was entry grade or grade span, but others included distance (typically in tiered categories), neighborhood, sector (including subsector designations such as whether a private school was religious or not, or whether a district school was traditional, selective, magnet, and so on), and performance level (see Figure 5). Sites with detailed filters allowed parents to include only schools that had the selected programmatic offerings or transit options, and one approach is to create a match rate, so schools can be sorted by the percentage of criteria that match. It should be noted that true filtering, through which schools that do not have the required criteria disappear from the list, may restrict choices in ways that parents who are shopping for schools may not have intended. Rather than apply filters that eliminate schools entirely, the Denver SchoolMatch site invites parents to identify which school

characteristics they value and then calculates a "match strength" for every possible school, which can be used in a sort, as mentioned above.

Figure 5.   Example of a filter by performance

Filter the list of schools by selecting the Performance Levels you want to see for each Performance Category:				
SCHOOL QUALITY RATING	☑ Under Performing	☑ Needs Improvement	☑ Making Progress	☑ On Track
ACADEMIC PERFORMANCE	☑ Under Performing	☑ Needs Improvement	☑ Making Progress	☑ On Track
SCHOOL VISIT	☑ Under Performing	☑ Needs Improvement	☑ Making Progress	☑ On Track

Use of icons, graphs, or numbers. There are many ways to represent numeric data, each of which has advantages and disadvantages. For example, binning schools into categories by using icons results in losing information that obscures some differences (between schools that fall into the same category) while also simplifying choice. The sites we reviewed for this analysis varied in how they represented such data on the main page with the list of schools: icons, graphs and icons, or just numbers. (Many had elaborate data representations on linked sites that gave detailed school-specific profiles, but here we discuss only the main page, which is what most parents would see). Half of the 14 sites used some kind of icons, but not graphs; 4 used icons and graphs; and 3 had only numeric data, with no use of icons or graphs.

Figure 6.   How was quantitative data represented on the main page?
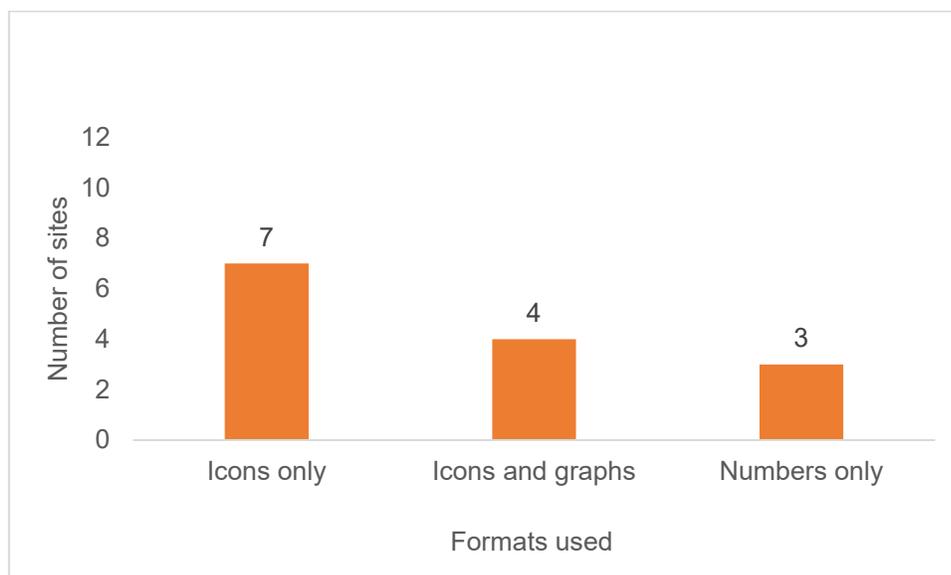

It can be useful to examine the types of icons and graphs that appeared on the sites. Of the 4 sites with graphs on the main page, 3 were star ratings showing a row of five stars per school, partially or fully filled in or a horizontal bar chart, as with the examples below.

Figure 7.   Examples of bar charts used in school shopping sites

Some of the icon displays were color-coded, with green-yellow-red "stoplight" colors most common. Figure 8 provides examples. Web designers do not always use stoplight colors, though, perhaps because red and green are hard for color blind users to distinguish. Many used word icons, some used letter grades, and others used picture icons to represent availability of certain kinds of public transportation (bus or rail) or programmatic services (such as handicapped access or sports).

**Figure 8.   Examples of icons school shopping sites use**
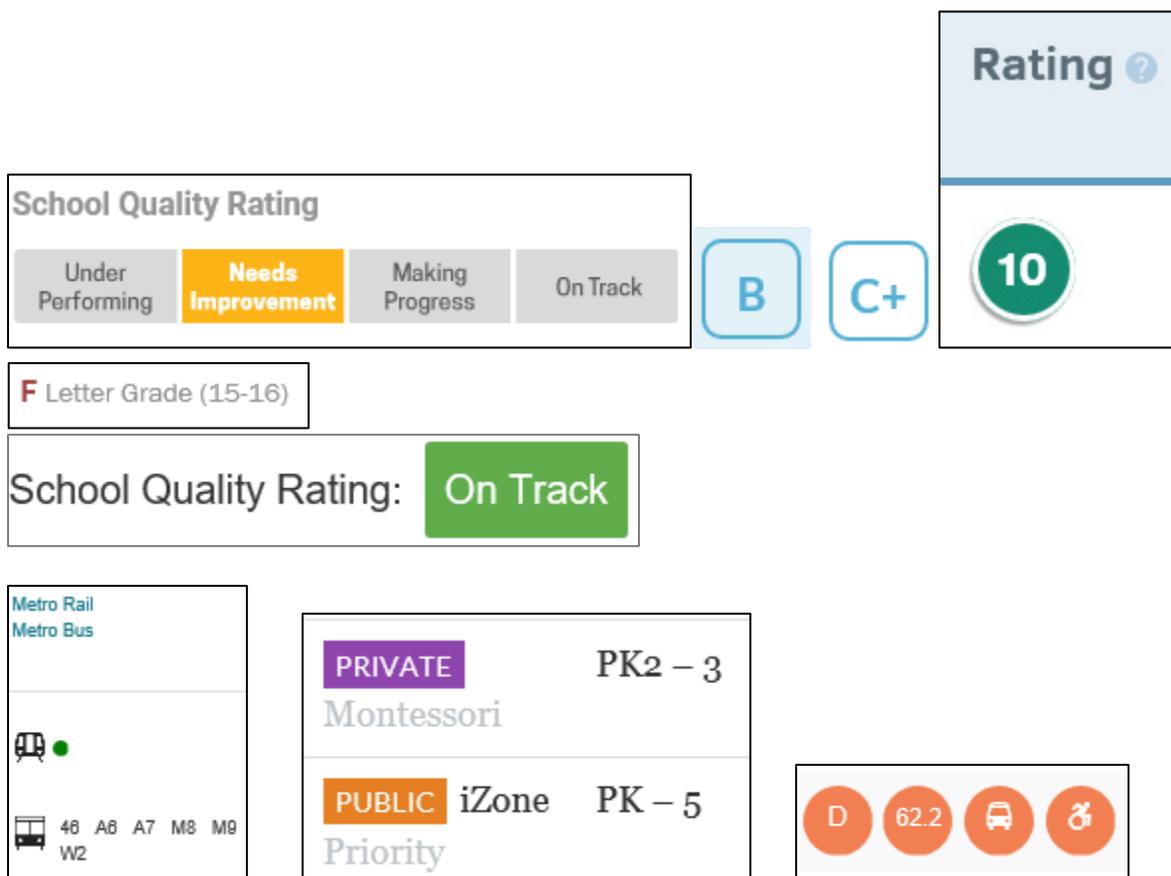
Comparisons with district or state. Data can sometimes be presented in context, such as with a districtwide or state comparison, for example, but none of the sites had this information on

the main page. At least 2 had district comparisons available if users click through to school profiles.

Amount of information

A designer of a school shopping site must decide how much information to display at once so parents have data useful for making decisions but are not overloaded. Site visitors can always click hyperlinks to see more information or scroll down to see more schools, but the designer must determine the number of schools and data elements to put in the initial display. To characterize the amount of information, we selected a browser and window size and kept them constant as we recorded the number of schools on the page and the number of unique data elements shown for each school. We hid the map if it was present and scrolled away any extraneous information other than column headers that label the data elements. The actual numbers might change with different browsers and screens, but the relative positions, as we show in Figure 9, illustrate variation in the amount of information by either metric, with the sites in the upper right having the most information and those in the lower left having the least. Arbitrary guidelines are included just above 5 schools and 5 data elements in the figure to help readers partition the sample by relative amount of information.

Figure 9.   Amount of information on the main page
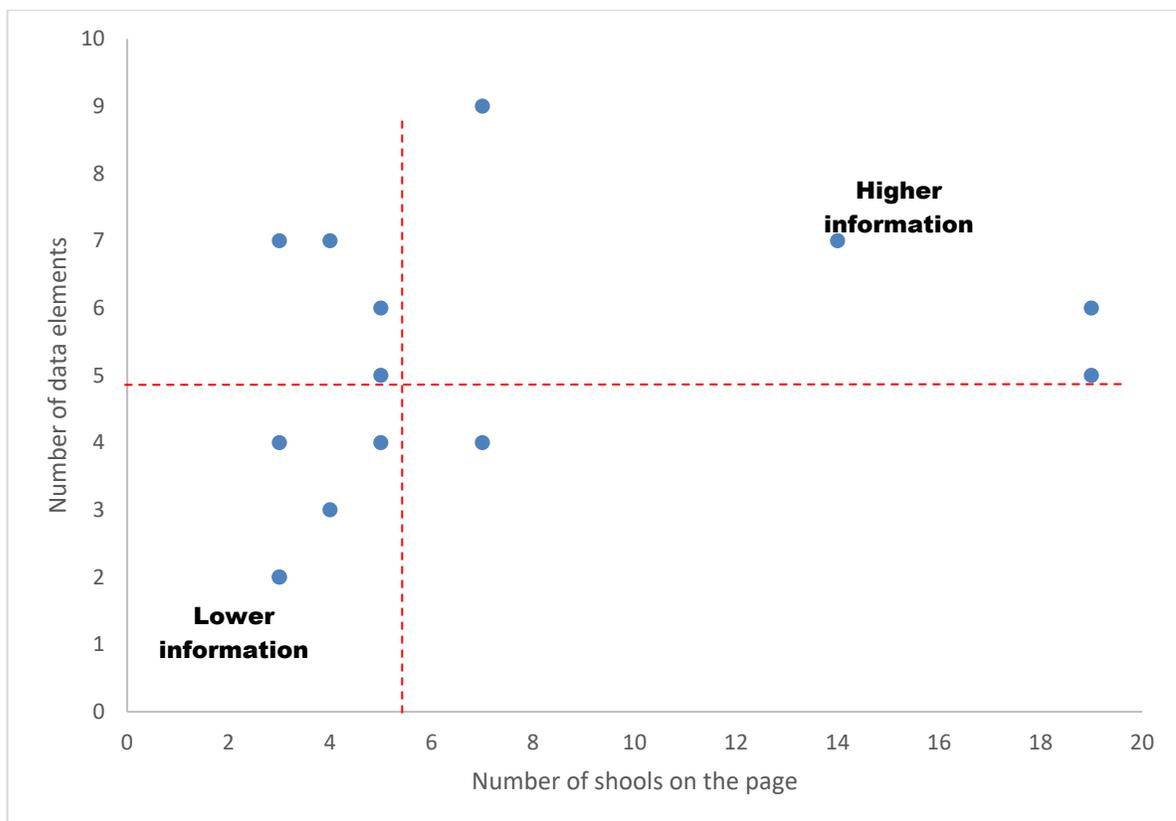
Designers of the sites made very different decisions about how much to put in front of consumers. These decisions, to the extent that designers made them consciously, might indicate a belief that parents want to see a wide variety of options to compare at one time or that parents

want to consider just a few at a time. Still other designers may think of the site as a way to provide bare-bones information, such as school name and contact information or links to detailed reports so parents can do most of their data gathering off the main page of the site.

Site content

What kinds of information do the sites show parents? Policymakers might hope that parents place considerable emphasis on certain characteristics of a school—such as academic performance—when they make their school selections, but the attributes policymakers consider important might not be the same ones that parents value highest when selecting a school (Hastings et al. 2006; Harris and Larsen 2015; Glazerman and Dotter 2017; Abdulkadiroglu et al. 2017). Parents might care about many factors unrelated to academic performance, including such convenience factors as the location of the school and its accessibility by public transportation, and the demographics of the student body. Similarly, average test scores or proficiency rates might be a proxy for student characteristics because there is a high positive correlation between income and test scores (Tienken et al. 2017).

Academic performance. One of the least standardized and potentially most confusing aspects of a display of school profiles is the representation of schools' academic performance or "quality," where format alone can shape parent perceptions of absolute and relative school strengths (Jacobsen et al. 2014). Much of the confusion probably arises from the lack of consensus on what makes a high-performing school and how to measure it. Indicators in use include measures of:

- Test score *levels* of students in tested grades and subjects, such as average scores, proficiency rates, or categorical ratings based on either of those two metrics

- Test score *growth* measures. These can include growth percentiles or value added (Walsh and Isenberg 2015). However, trends or year-over-year comparisons of school-wide levels are often presented as growth measures even though Glazerman and Potamites (2011) argue that such successive cohort comparisons are misleading ("false performance gains")

- *Parent ratings*, such as number of stars out of five, where the star ratings might have qualitative descriptors similar to those of a restaurant review

- Composites that include any combination of the above measures plus other indicators, such as safety (disciplinary incidents), attendance, school climate, or test score measures calculated for subgroups in terms of level or gap measures. These composites are typically expressed as weighted averages of several components, with the weights explicitly stated or not. Composite measures are often proposed as a compromise when various stakeholders each have their own preferred indicators and there is political pressure to include every indicator in some way.

We first categorize the 14 sites we reviewed for this study on the basis of whether the main page contained any information on school academic performance. Three of the 14 sites had no academic performance data on the main page. One of those required users to click through to individual school profile pages; one required users to click to PDF reports for each school; one had no performance data at all.

Of the 11 sites that did have performance information on the main page, most (9) had some kind of composite measure or summary rating such as a letter grade. Only 2 reported test score data by themselves. One of those used proficiency rates; one showed proficiency and growth.

The sites vary widely as to how much explanation they provided. Most provided detail on a separate page that includes separate glossary/methodology pages or detailed school-specific profiles that users must access one school at a time. For example, the main page for Great Philly Schools in Philadelphia shows a number icon from 1 to 10 with no labels. The column header has a link that users can follow to read a methodology page, with separate sets of criteria and criterion weights for elementary/middle schools and high schools, each of which is a combination of proficiency rate school deciles (by subject), attendance, and safety ratings. Other summary measures combined growth and proficiency or attendance with proficiency. Of those that used categorical ratings such as letter grades, there was variation as to whether the grade was relative to all schools in the state or was district-specific.

It is likely that school shopping sites will gravitate toward reporting indicators that are in the most common use and easiest to obtain at the school level. Under the Every Student Succeeds Act (ESSA), most states are developing performance measures they will calculate and disseminate statewide, so as those measures are finalized, they will likely be the main reported statistic in a school shopping site. Some states are adopting single rating scales, such as A–F report card ratings, or 1–5 star ratings. Others are adopting multiple measures approaches that represent different dimensions of school quality rather than collapsing performance into a single summary rating of performance.

Student demographics. Research on what parents value when they pick schools suggests that choosing a school is actually choosing a peer group (Glazerman and Dotter 2017; Abdulkiradoglu et al. 2017), so the characteristics of the student body may be as salient as any academic performance measure. Nevertheless, presenting information on student demographics highlights the tension between giving parents what they want and risking exacerbating racial or class segregation. Findings from studies of rank-ordered lists parents submitted when choosing schools in Minneapolis in 1993 (Glazerman 1998) and Washington, DC in 2014 (Glazerman and Dotter 2017) suggest that choosers tend to prefer schools where they would not be in a racial or ethnic minority. Simulations from both studies suggest that school choice can produce levels of segregation that mirror or improve upon patterns of residential segregation. Showing data on a school's racial or ethnic makeup might reinforce tendencies to select schools on that basis rather than on the basis of academic offerings or performance, even if it is information that parents want to know.

None of the 14 shopping sites displayed demographic data on the main page, but many had that information on the individual school profiles. Memphis and St. Louis school profiles used verbal descriptors such as "very economically diverse," "somewhat economically diverse," or "lacks economic diversity," with percentages of "economically disadvantaged" students reported as well. Others presented pie charts or tables with percentages of students by race/ethnicity. Still others required following multiple links to find demographic information, or did not provide links to such information at all. We did not perform systematic coding of data elements beyond the main page.

School building information, programmatic offerings, and other school attributes. Depending on the layout and available space on the page, school shopping sites can include information about the facility such as address, phone number, web address, school hours, transit options, and photos. This can be an important component of linking parents to schools which might prompt in-person data gathering such as school visits for information sessions or tours. It can also establish how easy or difficult a commute might be.

Information on academic and extracurricular programmatic offerings rarely appeared on the main page of school choice sites, but when such information did appear, it indicated availability of before or after school programs. One site did allow selection on detailed programmatic offerings such as language immersion, art programs, and so on, where search results showed a match quality based on the selections. Others had filters that functioned similarly.

Other information included on the main page or on the detailed school profiles included such school policies as dress code, handicap access, narrative description of school philosophy or offerings, parents' reviews, a news feed, performance comparisons with state average, teacher demographics, and admissions information.

Accessibility

One set of design decisions that affects users differentially is the accessibility of the site. This includes translation into languages other than English and formatting for mobile devices. This is important because online school shopping sites can help school choice level the playing field or they can exacerbate differences, depending on whether the sites are understandable to immigrant families and families who may lack a desktop or laptop computer with Internet access, but do have a smartphone. We categorized the sites by noting whether they had an option to select languages other than English and verified that the site rendered most of its content in that language. We also checked mobile device compatibility using the Google application at https://search.google.com/test/mobile-friendly, where anyone can enter a website address and the site indicates whether the site is mobile friendly.

Most sites offered information in at least one language other than English. Only 3 of the 14 sites were available only in English. The most common approach—which 7 of the 14 sites used—was offering content in Spanish as well as English. Among the remaining 4, New Orleans translated into Spanish and French, Oakland offered five additional languages, Boston eight additional languages, and Chicago a large dropdown list from which the user could select any language into which Google Translate would render the page.

The Google app we consulted for this analysis judged 10 sites mobile friendly, two not mobile friendly and two were blocked. When we did a manual check of the two that were blocked, we found that the Safari web browser indicated the sites would show up on a mobile (we used an iPhone), though school performance data did not appear in the mobile version.

Discussion and further research

We sought with this paper to document the ways in which school choice markets have evolved to give information about schools to consumers. Understanding the choices that have been made and the scope of decisions to be made is an important grounding for architects of

choice sites. It can also help researchers understand the demand for different types of schools and the demand for information on schools. Studies of choice behavior similar to those that Hastings and Weinstein conducted in Charlotte, North Carolina (2008), Harris and Larson conducted in New Orleans (2015), Glazerman and Dotter conducted in Washington, DC (2017), and Abdulkadiroglu and colleagues conducted in New York City (2017) are all examining behavior within a particular information format.

The first vital step is to understand what the information regime is in each case. It is difficult to speculate on whether parents value some dimension of school quality—such as productivity of the teachers in terms of raising student test scores—without knowing if the information about that dimension is readily available or difficult to obtain and understand. We provided with this paper a framework for learning this in cities where online resources are available. The next step is to test the best ideas under consideration by designers to determine how well they work and to learn about the mechanisms by which information displays can influence consumers.

The diversity of approaches to presenting school information may reflect a lack of consensus on best practices, but it can also reflect the diversity of goals of each site and priorities in each community. The provider of information can be a public agency seeking to be a neutral arbiter of information or it can be an organization representing just the charter sector. It can also be a traditional district that is competing with charter and private schools. Each of these orientations will almost certainly affect the type of information and the functionality of the site. For example, some sites are designed solely to direct parents to detailed profiles of schools. Others are linked to an application and enrollment management system, in which case the goal is to encourage users to compare and rank the schools.

Future research should examine not only how choice architecture influences the schools that parents choose, but how different types of parents are influenced and whether school shopping resources level the playing field or exacerbate inequities. Some of the information displays can be cognitively demanding, be harder for non-native English speakers to navigate, require more time to understand, assume considerable expertise with online navigation, or demand of users a familiarity with statistics and data. Therefore, the next generation of product testing and research should consider specific populations of consumers and, as a matter of public policy, researchers should model the implications of design choices for aggregate outcomes such as the sorting of students across schools and equitable access to high quality education.

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