Citizen Perceptions of Government Service Quality: Evidence from Public Schools

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Matthew M. Chingos[1], Michael Henderson[2], and Martin R. West[3]

[1]*Brookings Institution, Washington, D.C. 20036, USA; mchingos@brookings.edu*
[2]*Department of Political Science, University of Mississippi, University, MS 38677, USA; mbhende1@olemiss.edu*
[3]*Department of Government, Harvard University, Cambridge, MA 02138, USA; martin_west@gse.harvard.edu*

ABSTRACT

Conventional models of democratic accountability hinge on citizens' ability to evaluate government performance accurately. In recent years, public reporting of governmental performance has expanded in many policy domains, potentially enhancing citizen capacities to make accurate evaluations. Yet there is little evidence on the degree to which citizen perceptions correspond to actual service quality. Using survey data, we find that citizens' perceptions of the quality of specific public schools reflect available information about the level of student achievement in those schools. The relationship between perceived and actual school quality is two to three times stronger for parents of school-age children, who have the most contact with schools and arguably the strongest incentive to be informed. A regression discontinuity analysis of an oversample of Florida residents confirms that public accountability systems can have a causal effect on citizen perceptions of service quality, particularly for those with fewer alternative sources of relevant information.

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Conventional models of democratic accountability hinge on the ability of citizens to evaluate government performance accurately and base political decisions accordingly (Dahl, 1989; Hamilton *et al.*, [1788] 1999). Accountability policies, such as those now prevalent in American public education, aim in part to inform citizens' perceptions with objective indicators of government performance, enabling them to meet this necessary condition. Yet there is little evidence on the degree to which citizen perceptions of the quality of government services correspond to publicly reported data on their actual performance, especially in the context of services provided by local governments. We investigate two related questions: Do citizen perceptions of local service quality correspond to objective information on government performance? If so, does information provided by accountability programs have a causal effect on those perceptions?

The lack of prior evidence on these questions primarily reflects data constraints, in particular the difficulties of (1) linking individuals in nationally representative datasets to local institutions through which services are delivered and (2) obtaining objective measures of service quality that are comparable across jurisdictions. Recent developments in survey research methods and the accountability provisions of the federal No Child Left Behind Act of 2002 (NCLB) have mitigated these difficulties with respect to public education. As part of a nationally representative survey conducted in 2009, we used geographic identifiers to link individual respondents to specific public schools in their communities and obtained their subjective ratings of the quality of those schools. We also gathered publicly available data on student achievement in the same schools, allowing us to compare respondents' subjective ratings to objective quality measures at the institutional level where the service is provided.

Our results indicate that citizens' perceptions of the quality of local public schools do correspond to publicly available information on their performance, as measured by student proficiency rates in core academic subjects. The relationship between actual and perceived school quality is two to three times stronger for parents of school-age children, who have the most direct contact with schools and arguably the strongest incentive to be informed. It is also generally robust to specifications which exploit the fact that individual respondents rated multiple schools (i.e., an elementary school and a middle school) to control for unobserved characteristics of individuals or neighborhoods that could be correlated with school quality.

We supplement this national analysis with evidence from an oversample of residents of the state of Florida, where the state uses a point system based in part on student test scores to assign each school a letter grade. A regression discontinuity analysis of respondents whose local schools scored on either side of the cutoffs used to determine school grades confirms that government accountability ratings can have a causal effect on citizen perceptions of school quality. The effect of accountability ratings appears to be stronger for nonparents, however, suggesting that elite-generated messages may be most influential among citizens with less prior information on the issue in question.

Are Citizens Informed About Government Performance?

Citizens' evaluations of their government have long been a chief concern in the study of politics. These evaluations play a crucial role in traditional models of democratic accountability as well as in modern theories of retrospective voting, in which voters are thought to assess the state of the world and judge candidates for elected office accordingly (Fiorina, 1981; Key, 1966). In these accounts, the electorate is an ''appraiser of past events, past performance, and past actions,'' using these judgments to reward or punish public officials at the ballot box (Key, 1966, p. 61). Retrospective judgment is often credited for minimizing informational burdens by reducing the voting calculus to a single heuristic: voters decide whether to support incumbents based on a judgment about whether the state of the world has improved or declined during their time in office (Berry and Howell, 2007; Popkin, 1994). However, the notion of the retrospective voting heuristic as guarantor of democratic accountability still depends on citizens' capacity to recognize the state of the world. If citizens are inattentive to actual conditions, then elected officials can safely ignore any threat imposed by poor performance.

The notion that voters will judge elected officials based on their performance is also central to the recent spread of government accountability and transparency programs, which are designed to provide citizens with the information needed to perform this task. Accountability systems that generate performance data about schools have become a defining feature of American public education since the 1990s, particularly since the advent of NCLB. The theory underlying accountability systems is, in part, that, armed with better information about school performance, the public will pressure schools to

improve.[1] Indeed, public attentiveness to this information is a necessary condition for these systems to generate public pressure. Yet, we have very little evidence that the public pays attention to the reams of data that accountability systems generate. Given the theoretical and practical importance of citizens' evaluations of their government's performance, our understanding of whether these evaluations are rooted in actual performance remains surprisingly incomplete.

The strongest evidence to date that Americans base their evaluations of government performance on real-world conditions concerns the roles of the economy and war in national politics. The relationship between indicators of economic performance or wartime casualties and such aggregate measures as presidential job approval (Kenski, 1977; Lewis-Beck and Stegmaier, 2000; Mueller, 1973) and election outcomes (Bartels and Zaller, 2001; Campbell, 2008; Hibbs, 2000; Lewis-Beck and Stegmaier, 2000) is well-documented. The evidence at the individual level, however, is less clear. Although scholars concur on the strong relationship between individuals' perceptions of the economy and their support for incumbents (Lewis-Beck and Stegmaier, 2000; MacKuen *et al.*, 1992; Nadeau and Lewis-Beck, 2001; Norpoth, 1996), they debate whether actual economic conditions or political biases drive these perceptions (De Boef and Kellstedt, 2004; Evans and Andersen, 2006; Evans and Pickup, 2010; Lewis-Beck, 2006; Lewis-Beck *et al.*, 2008).

Even setting this debate aside, political issues and government activity extend well beyond the performance of the national economy. This is doubly true in a federal system like the United States, in which many important public services are financed and governed by local officials. Yet inquiries into informed judgment at other levels of government or in more specific policy domains remain scarce.[2]

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[1] For example, President George W. Bush appealed to this purpose in January 2002 when signing the landmark NCLB legislation aimed at collecting and releasing data on school performance: "This is the end of a legislative process... But it's just the beginning of change. And now it's up to you, the local citizens of our great land, the compassionate, decent citizens of America, to stand up and demand high standards, and to demand that no child — not one single child in America — is left behind" (White House Office of the Press Secretary, 2002).

[2] The literatures on local and urban politics have explored the individual and contextual sources of satisfaction with specific public services, yielding a number of valuable insights. Subjective evaluations of quality vary across several demographic characteristics including age, race, income, and homeownership (DeHoog *et al.*, 1990; Hero and Durand, 1985). For example, African Americans tend to report poorer quality of government service (Durand, 1976; Schuman and Gruenberg, 1972). Attitudinal variables, most especially political efficacy and community attachment, also predict perceptions of quality (Lyons and Lowery, 1989; Stipak, 1977), as do

This is not to say that scholars have failed to recognize the importance of this concern. Rather, the primary roadblock to addressing these questions has been the lack of data on the quality of government services that are comparable across jurisdictions. Political scientists examining the link between perceived and actual quality of government services have had little choice but to rely on subjective measures, most commonly using average perceptions within a jurisdictional unit as the benchmark against which to compare individual perceptions (Beck *et al.*, 1987; DeHoog *et al.*, 1990). Unfortunately this amounts to comparing what individuals think about service quality to what those around them think, an exercise which offers little insight into whether their quality assessments are informed by data on their actual performance.[3]

We advance this literature by analyzing citizen evaluations of performance in a key area of local government service: public education. In so doing, we make at least two contributions. First, by comparing perceptions of government performance to actual performance measured on a common scale across jurisdictions, we fill a key gap in the literature on the sources of satisfaction with government. Second, we assess whether the public release of performance information shapes those perceptions. Accountability systems potentially subsidize the costs of information acquisition, but whether these

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such contextual variables as government structure, racial heterogeneity, and income distribution (DeHoog *et al.*, 1990; Lowery and Lyons, 1989; Lyons and Lowery, 1989; Schuman and Gruenberg, 1972). Yet these analyses either neglect or take for granted the role played by true differences in service quality. It is not enough to know how individual and contextual characteristics are related to citizens' evaluations of their government; assessing the prospects for democratic accountability requires understanding the extent to which these evaluations reflect actual conditions on the ground.

[3] A related set of studies in public administration has gone further in addressing this issue. Motivated by a practical concern with validating performance measurements rather than a theoretical concern with democratic governance, these scholars compare survey-based evaluations of service quality to administrative performance measures. Although the general thrust of this research indicates that subjective evaluations of services are not strongly related to administrative measures (Kelly, 2003; Parks, 1984; Stipak, 1979), consensus remains elusive (e.g., Van Ryzin *et al.*, 2008). The divergent results stem from the piecemeal character of the data collection strategies that have been employed. Comparable performance metrics across jurisdictions are rare, so much of this work relies on case studies of select locations within which there may be little variation in service quality. Efforts to build standardized survey-based and administrative performance measures across jurisdictions, such as work undertaken by the International City/County Management Association (ICMA), have to date yielded only a small number of voluntary participants (Kelly, 2003; Kelly and Swindell, 2002), posing sample size and selection bias problems.

subsidies inform citizen judgments of government performance remains unknown.

Information Costs and Perceptions of School Quality

Although not specifically directed at evaluations of government performance, multiple generations of survey research characterize American citizens as inattentive to and ill-informed about public affairs (e.g., Bartels, 1996; Campbell *et al.*, 1960; Delli Carpini and Keeter, 1996; Neumann, 1986). To the extent that citizens think about public affairs at all, their judgments are more likely to be colored by partisan orientations, prejudices, and other preferences than to be informed by ''objective'' facts (Bartels, 2002). From this vantage it appears unlikely that citizen perceptions of the quality of government agencies would be closely linked to actual performance.

In the case of public schools there is additional reason to suspect that citizen evaluations could be biased by a reliance on indicators unrelated to quality. For example, perceptions of school quality may be influenced by the racial or socioeconomic makeup of a school's student body. In a study of St. Louis parents participating in a voluntary desegregation program, Wells (1993) concluded that parents' choices about which school to attend were based ''on a perception that county is better than city and white is better than black, not on factual information about the schools.''[4] Similarly, preferences over other school characteristics (e.g., a belief that modern facilities or smaller class sizes are superior) could lead citizens to rate schools offering these readily observable features more highly regardless of their relationship to actual performance.

Yet a consideration of the conditions for learning about public affairs suggests a more optimistic view. Theorists of rational information acquisition (e.g., Downs, 1957) argue that citizens will typically gather only limited information on matters related to government policies or programs. This is because acquiring such information typically entails large, immediate costs — including time, effort, money, and any forgone activities — far outweighing the uncertain and generally small potential returns. The key

[4] A more recent analysis of the search behavior of Washington DC parents using an online database with information on local schools also found that parents spent more time seeking out information on the demographic composition of schools' student bodies than on their academic performance (Buckley and Schneider, 2007).

insight from this literature, however, is that information acquisition varies with costs. Citizens are more likely to gather information available at a relatively low cost, for example through the ''free information stream'' (media), through direct exposure to a government service, or as a byproduct of nonpolitical activities. In the case of public education, this logic suggests that many citizens will have relevant information about school quality at hand when forming judgments about them.

Several features of public education lower the cost of information about schools relative to other areas of government service. First, public schools are ubiquitous. Americans live among nearly 100,000 public schools operating in neighborhoods and communities across the country. Millions of Americans have children in these schools or live among neighbors who do. Proximity to this service allows citizens to encounter information about local schools with relative ease, especially if they are parents of school-age children. Parents of children enrolled in public schools have the opportunity to gain insight into school performance in their day-to-day interactions with their children, their children's peers, and their children's schools.

Less direct sources of information about schools are also available at relatively low cost. The expansion of school accountability programs in recent years, particularly in the wake of NCLB, has further reduced the cost of obtaining information on one aspect of school performance. States and school districts are legally bound to measure school performance and report this information to the public. Debate about the quality of this information continues, but the programs represent a government-sponsored effort to deliver policy information to the public on a scale rarely (if ever) seen in other policy domains. Once in the ''free stream'' — whether through media coverage, conversations with neighbors and colleagues, or another source — this information becomes available to all citizens, even those without direct means of observing schools, at a reduced cost.

Certain groups of citizens may also have powerful nonpolitical incentives to attend to school quality. As potential consumers of public education, parents have incentives to be informed about the performance of local schools that extend well beyond the hope of influencing election outcomes. The improbability of casting a decisive vote in elections therefore does not erode the potential returns they may derive from policy information. Meanwhile, research indicating that school quality has a causal effect on property values suggests both that homeowners have a financial stake in the performance

of local schools and that the marginal homebuyer is informed about school quality at the time of purchase (Black, 1999; Figlio and Lucas, 2004).

Given the availability of relatively low-cost information about school quality, we expect evaluations of schools to reflect this information. We further expect that parents' and homeowners' evaluations of schools will reflect this information more strongly because of their personal stakes in the issue. To be clear, we do not argue that citizens walk around with precise performance indicators (such as proficiency rates on standardized tests) in their heads. Rather, we argue that citizens' perceptions of schools will reflect the information available to them at low cost, whether it is obtained through direct experience, media coverage of schools, conversations with colleagues and neighbors, or some similar source. In the case of public education, because the available low-cost information in part reflects academic performance at these schools, so too will citizens' judgments of them.

Of course, all parents and other citizens may not be created equal when it comes to obtaining or interpreting performance-related information about their local schools. Indeed, the possibility that access to information on school quality is stratified along socioeconomic and racial lines has been a prominent concern in debates over education policies that expand parental choice over the school their child attends (Henig, 1994). In a comprehensive study of parental knowledge in the context of public school choice programs, Schneider *et al.* (2000) find that parents who are less educated and from traditionally disadvantaged minority groups are, on average, less accurate in describing objective conditions at their children's schools than are other parents. At the same time, they also show that more educated parents tend to rely on their denser social networks as their primary source of information about schools, whereas less educated parents tend to rely more heavily on the media and other formal sources. Given our focus on the relationship between citizen perceptions and performance information available through these latter sources, we do not have clear expectations as to whether citizens who are less advantaged socioeconomically will be differentially responsive to this information.

A final theoretical concern remains. To the extent that citizen perceptions overall do reflect actual conditions at schools, the relationship could result from either direct observation of performance or information disseminated by accountability programs. Moreover, the relative importance of these two sources of information may vary across groups such that government-provided information is more influential for citizens with fewer

alternatives sources of evidence. We suggest that this pattern is likely for two reasons. First, insofar as information has declining marginal value (Downs, 1957) those who have already acquired information about government have less incentive to attend to alternative sources which impose additional costs. Second, even if they do acquire additional information, the impact of these new messages will be diluted by the balance of preexisting perceptions (Zaller, 1992). We therefore expect parents to be less influenced by the public release of information on school performance because they already have opportunities to observe schools directly. In contrast, nonparents may rely more heavily on ratings issued by formal accountability programs and the coverage those ratings receive from local media outlets. Our empirical analysis, which exploits newly collected data and recent advances in geo-coding technology, aims not only to examine the degree to which various groups of citizens are able to perceive school quality accurately but also to shed light on potential mechanisms responsible for any observed relationships.

Data on Perceived and Actual Quality of Public Schools

Two data collection challenges have to date hampered analyses of the relationship between perceived and actual performance. First, analyzing the relationship between perceived and actual service quality requires placing subjects within the jurisdictions through which government services are provided. Until recent advances in geo-coding technology, individuals in nationally representative surveys could not be assigned reliably to jurisdictional units smaller than counties or cities. Although municipal officials have authority over certain public services, it would be unwise to assume that the quality of provision is uniform within their jurisdictions, much less within congressional districts or states.

In contrast, we are able to link individuals to specific public schools, i.e., the institutional level at which the service in question is provided. We use the 2009 *Education Next*-Program on Education Policy and Governance (PEPG) Survey conducted by Knowledge Networks®. The results presented here are based on a nationally representative stratified sample of 3251 respondents, including oversamples of 434 non-Hispanic blacks, 481 Hispanics, and 948 residents of the state of Florida. The Florida oversample was conducted to permit additional analyses that exploit features of that state's school accountability program. Samples were drawn from the

probability-based KnowledgePanel® and surveys were administered over the internet between February 25 and March 13, 2009.[5]

Through this sampling method, respondents were identified by physical address before the survey was administered. Prior to fielding the survey, we geo-coded these addresses to latitude–longitude coordinates and census blocks. We also obtained latitude–longitude coordinates for every U.S. public school from the U.S. Department of Education National Center for Education Statistics' Common Core of Data School Address File (2006–2007). Using census blocks to situate respondents within school districts, we then linked each respondent to the closest public elementary, middle, and high schools (up to five schools of each type) operated by the school district in which he/she resides.[6]

When fielding the survey we presented each respondent with this personalized list of the five closest public schools for each school type. The survey asked all respondents this question: ''Each of the following schools in your area serves elementary-school students. Which one, if any, do you consider your local elementary school?'' Respondents were also allowed to specify a school that did not appear on the list or to indicate that they did not know which school they considered their local school. Rather than designating the school for each respondent to evaluate based on proximity, district student assignment practices, or some other arbitrary decision rule, this more flexible approach allowed respondents to select the school they perceive as their local public school regardless of whether it is a neighborhood school or public school of choice (e.g., a magnet or charter school). After a specific elementary school had been identified, the survey asked the respondent to grade that school on a scale from A to F. This same process was repeated for middle and high schools.

Even when subjects can be placed within the appropriate jurisdiction, a second difficulty remains: obtaining objective measures of service quality

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[5] KnowledgePanel® members are chosen via a probability-based sampling method using known sampling frames that cover 99% of the U.S. population. Because Knowledge Networks® offers members of its panel free Internet access and a WebTV device that connects to a telephone and television, the sample is not limited to current computer owners or users with Internet access.

[6] A school was included in the list of nearby elementary schools if it served any grades in K–4 or if it served only grade 5. A school was included as a middle school if it served any grades in 7–8 or if it only served grade 6. A school was included as a high school if it served any grades in 10–12 or if it only served grade 9. These definitions imply that many schools, such as those serving grades K–8 or grades 7–12, were included on multiple lists.

against which to compare perceptions of individuals living across different jurisdictions. Over the past two decades, however, state governments have been collecting more and better data on the academic performance of individual schools. We measure school quality as the percentage of students in a school who achieve ''proficiency'' in math and reading on the state's accountability exams (taking the average proficiency rate across the two subjects). School-level proficiency data were acquired from GreatSchools, an online information source on public schools, for the 2007–2008 school year — the most recent year for which information on test scores would have been publicly available in all states.[7] Because math and reading/English language arts proficiency rates are used to evaluate school performance under NCLB, these indicators are available for virtually every public school in the United States. Although the rigor of state definitions of math and reading proficiency varies widely, we can adjust for these differences by restricting comparisons to respondents within the same state.

The percent of students performing at proficient levels in core academic subjects is an imperfect measure of school quality, even when comparing schools in the same state. Given the strong influence of out-of-school factors on student academic achievement, any quality measure based on the level at which students are performing at any point in time will be influenced by the characteristics of a school's student body. Proficiency-based quality measures are also insensitive to the performance of schools in promoting the achievement of students well below or above the proficiency cutoff. At the same time, proficiency rates are the only objective measure available for a national sample of schools; they are determined in part by the amount students learn in school; and research suggests that moving to a school with higher proficiency rates has a positive impact on student achievement.[8]

More generally, it is worth noting that the ability to promote math and reading achievement is hardly the only dimension along which citizens are

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[7] Missing values in the GreatSchools database are filled in using an alternative data source, SchoolDataDirect.org. For a small number of schools for which percent proficient was not available from either data source in 2007–2008, we use data from the previous school year. The correlation between school-level percent proficient for 2006–2007 and 2007–2008 is 0.95 in math and 0.92 in reading/English language arts in the GreatSchools data.

[8] For example, see Hastings and Weinstein (2008), which uses data from Charlotte–Mecklenburg school district in North Carolina (where parents can choose among public schools) and finds that providing parents with information on the average test scores of schools increases the percentage of parents choosing a high-scoring school. In turn, attending a school with higher test scores increased students' own test scores by a substantial amount.

likely to evaluate their local schools. To the extent that citizens value educational goals not reflected in math and reading proficiency rates, our analysis will be biased against finding that parents are informed about school quality. In other words, a finding that citizen perceptions of school quality do not respond to differences in proficiency rates would not necessarily imply that they are uninformed about the performance of their local schools. Evidence of responsiveness, however, nonetheless indicates that they are informed about the performance of schools as measured by state math and reading tests or about factors correlated with it.

As noted above, perceptions of school quality may be influenced by such factors as the demographic composition of the student body or school resources. We therefore also gathered data on the percentage of black and Hispanic students within each school, the percentage of students eligible for free or reduced-price lunch (a poverty indicator), average grade cohort sizes (our preferred measure of school size), and pupil–teacher ratios (a proxy for class size) from the 2007–2008 NCES Common Core of Data Public Elementary/Secondary School Universe Survey Data file.[9] We use these variables to examine their independent relationship with perceptions of school quality separately and as controls when examining the relationship between perceived and actual quality.

Empirical Strategy

These data enable us to characterize the relationship between perceived and actual school quality for a nationally representative sample of American adults. We pool the relevant data on elementary and middle schools but exclude high schools from the national analysis. We exclude high schools because data on the percentage of students who are proficient are not available for many of them and typically reflect the performance of only a single cohort of students (because most states test students only once in high school).

We convert the A–F grades that respondents assigned to their schools into a standard Grade Point Average (GPA) scale (with $A = 4$ and $F = 0$)

[9] Missing values in the 2007–2008 file are filled in using values from the 2006–2007 if they are available. Missing values of the pupil–teacher ratio are imputed using the district average. Average cohort size is calculated as the average of grade enrollments in grades that had enrollments of at least 50 percent of the unadjusted average enrollment per grade (the correlation between this adjusted measure and a simple average grade enrollment measure is 0.99).

and use Ordinary Least Squares to regress this variable on school proficiency rates, demographic characteristics, and resource measures.[10] The latter two sets of variables are included to evaluate the degree to which perceptions about performance are sensitive to these other observable school characteristics. We also include a variable identifying middle schools, which on average have lower proficiency rates and receive lower respondent ratings (even after controlling for proficiency rates). Prior to estimation, we standardize the continuous independent variables based on the weighted distribution of elementary and middle schools matched to respondents in our sample.[11] All models are weighted using survey weights provided by Knowledge Networks® to correspond to known demographic characteristics of the national population, and standard errors are clustered by respondents to account for the fact that most respondents rated multiple schools. To assess whether the relationship between perceived and actual school quality is stronger for parents of school-age children and homeowners, we estimate models that include dummy variables identifying these two groups and the interaction between these variables and school proficiency rates.[12]

Our preferred specification of these models does not include additional controls for the demographic characteristics of individual survey respondents. Although the literature discussed above has documented correlations between citizen satisfaction with government services and various demographic characteristics — chief among them race, income, and education — these findings could reflect differences across groups in the actual quality of services received. Given our primary interest in examining the correspondence of actual and perceived quality of services for citizens as a whole, including controls for demographic characteristics would be inappropriate. As a practical matter, however, this decision is unimportant: all of the results

[10] Ordinary Least Squares regression makes a linearity assumption—namely that the difference between any two adjacent respondent ratings (e.g., *A* and *B* or *D* and *F*) reflects the same difference in perceived quality. We find this assumption intuitively plausible, but we confirmed that substantively identical results are obtained using ordered probit models, which do not make this assumption but are more cumbersome to report and interpret. Appendix Table A1 provides the results of our baseline model using ordered probit.

[11] The state-level mean of school-level percent proficient varies substantially across states (the mean is 71 and the standard deviation is 12) but the state-level standard deviation does not (it has a mean of 13 and a standard deviation of 3). As a result, standardizing percent proficient within each state produces qualitatively similar results to those reported below.

[12] We identify parents of school-age children as respondents who are identified as parents and who live in a household with at least one child aged 6–17. As a result, we likely misclassify a small number of parents whose children do not reside in the same household.

presented below concerning the relationship between perceived and actual school quality remain substantively identical when we include controls for race/ethnicity, gender, income, parent status, homeowner status, education, and age.[13]

Citizen ratings of school quality could be influenced by unobserved characteristics of the neighborhoods and districts in which respondents reside. For example, perceptions of school quality may be affected by the quality of other locally provided public services, such as police and sanitation. Alternatively, the demographic composition of respondents' neighborhoods may impact their assessment of school quality. As a check on the robustness of our main results, we therefore also estimate models that condition on respondent dummies and thus only reflect the extent to which differences between the characteristics of each respondent's local elementary and middle school predict the difference in the ratings the respondent assigned to each school. The variation in school characteristics with which these models estimate their relationship to citizen ratings is quite limited, as elementary and middle schools in the same area tend to serve similar students and produce similar academic results. Estimates of these relationships will therefore be less precise than in our main specifications. To the extent that they yield similar point estimates, however, they should mitigate concerns that any relationships we find are driven by unobserved respondent characteristics or by neighborhood characteristics that are constant across school levels.

Citizen Ratings and School Characteristics: National Evidence

We begin our analysis of the ratings assigned by the 89 percent of survey respondents who could identify at least one elementary or middle school by estimating the relationship between perceived quality and a variety of school characteristics.[14] The (weighted) mean grade assigned to elementary and middle schools in our sample was 2.57 on a four-point GPA scale, with a

[13] These results are available from the authors upon request.

[14] Our analysis of the relationship between survey respondents' ratings of school quality and objective characteristics of those schools is necessarily limited to respondents who were able to identify at least one of their local schools. We therefore exclude the 345 respondents who could not identify their local elementary or middle school. Compared to the 76 percent of respondents who could name both their elementary and middle schools, the 11 percent of our sample who could identify neither is modestly better educated but less likely to be a parent of a child aged 6–17 or a homeowner (see Appendix Table A2). (Applying the survey weights, 14 percent of respondents identified neither school and 86 percent identified at least one.) A regression

standard deviation of 0.90.[15] Because all continuous independent variables have been standardized based on the distribution of elementary and middle schools matched to sample respondents, the coefficient estimates reported in the tables and text indicate the effect of a one-standard-deviation change in each variable on citizen ratings.

Column 1 in Table 1 confirms that student proficiency rates are a significant predictor of respondent ratings of school quality. Holding constant other school characteristics, an increase of 18 percentage points in percent proficient is associated with a rating that is on average 0.15 grade points higher — an effect that is moderate in size relative to the standard deviation in respondent ratings of 0.9 grade points. Among demographic characteristics of schools, only the poverty indicator exhibits predictive power; the coefficients on percent black and Hispanic are statistically insignificant and sufficiently precise to rule out even small relationships between these indicators and quality ratings. Average cohort size and pupil–teacher ratio only weakly predict respondent ratings. In fact, the relationship between pupil–teacher ratio and school ratings is in the opposite of the expected direction: schools with larger classes receive somewhat higher grades, perhaps because effective schools attract more families.[16]

These results reflect variation in ratings and school characteristics both across respondents (who are generally rating schools in different neighborhoods) and within respondents (because most respondents rated both their

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analysis confirms that, holding constant the respondent characteristics included in Table A2, parents of school-age children are 9 percentage points more likely than nonparents to identify either their local elementary or middle school and homeowners were 12 percentage points more likely than non-homeowners to do so. No other respondent characteristics are significantly associated with the probability of being able to identify their local schools.

[15] More specifically, the distribution of respondent ratings was 14 percent *A*, 41 percent *B*, 36 percent *C*, 7 percent *D*, and 2 percent *F*.

[16] One potential concern with the analysis is that it is based only on the sample of respondents who were willing and able to identify their local school. To the extent that citizens who failed to identify their local school are less informed about school quality, our results would represent an upper bound on the responsiveness of perceptions to quality. As a robustness check, we replicated our main results with respondents who did not identify their local school matched to the geographically closest public school. This was possible because even though these respondents could not identify their local school by name, the vast majority nonetheless provided a rating of the quality of that school. The magnitude of the coefficient on percent proficient attenuates (from 0.15 to 0.10 in models without respondent dummies) but remains statistically significant and is not statistically distinguishable from the result using the more limited sample. This attenuation could stem from respondents having rated a school different from the nearby school to which we assigned them for this analysis or could suggest that respondents who failed to identify their local school are in fact less informed.

Table 1. Relationship between school characteristics and respondents' ratings.

	(1)	(2)	(3)	(4)	(5)
Percent proficient	0.149	0.101	0.115	0.163	−0.059
(unit is 18 points)	[0.051]	[0.094]	[0.050]	[0.059]	[0.124]
Percent black	0.010	−0.153	0.009	0.010	−0.147
(unit is 25 points)	[0.042]	[0.120]	[0.042]	[0.043]	[0.122]
Percent Hispanic	−0.007	−0.182	−0.007	−0.006	−0.184
(unit is 24 points)	[0.039]	[0.146]	[0.039]	[0.040]	[0.145]
Percent free lunch	−0.174	0.001	−0.176	−0.175	0.013
(unit is 26 points)	[0.042]	[0.096]	[0.043]	[0.042]	[0.096]
Average cohort size	−0.047	−0.081	−0.048	−0.047	−0.075
(unit is 133 students)	[0.025]	[0.038]	[0.025]	[0.025]	[0.037]
Pupil–teacher ratio	0.056	0.032	0.058	0.056	0.037
(unit is 3.2 students)	[0.028]	[0.046]	[0.028]	[0.028]	[0.046]
Middle school	−0.182	−0.124	−0.179	−0.183	−0.123
	[0.041]	[0.057]	[0.041]	[0.041]	[0.057]
Parent with child aged			−0.867		
6–17 in household			[0.265]		
Percent proficient ∗ parent			0.216		0.448
with child aged 6–17			[0.064]		[0.232]
in household					
Homeowner				0.075	
				[0.213]	
Percent				−0.021	0.117
proficient ∗ homeowner				[0.053]	[0.130]
State dummies?	Yes	No	Yes	Yes	No
Respondent dummies?	No	Yes	No	No	Yes
Observations	5039	5039	5039	5039	5039
R-squared	0.171	0.865	0.179	0.171	0.869

Notes: Standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. All continuous variables have been standardized based on the distribution of elementary and middle schools matched to respondents in our sample. In columns (3) and (5), omitted category includes nonparents and parents without children aged 6–17 living in their household.

elementary and middle schools). Thus the positive coefficient on percent proficient could reflect unobserved differences between school districts or neighborhoods. We address this concern by estimating the same model while controlling for respondent dummies. The results with respondent dummies (column 2) are less precise, as is expected given the limited variation with which they are estimated. The coefficient on percent proficient is reduced by one-third and is no longer statistically significant at conventional levels due to its larger standard error. The coefficient on percent free lunch falls essentially to zero, most likely due to the fact that there is very little within-respondent variation in this variable. The final notable change between the models is that average cohort size is now a stronger predictor of respondent ratings (with respondents preferring schools with fewer students in each grade), although the magnitude of this effect is still quite modest.[17]

We next turn to whether the performance-rating relationship is stronger for parents of school-age children and homeowners. The third column of Table 1 confirms that the coefficient on percent proficient is nearly three times as large for parents of school-age children as it is for other respondents: 0.33 vs. 0.12. In other words, a one-standard-deviation increase in percent proficient is associated with a rating from parents that is one-third of a letter grade higher. The large negative coefficient on the parent main effect coupled with the positive coefficient on the interaction term indicates that parents give low-scoring schools lower ratings than nonparents, but that this difference narrows and eventually reverses as proficiency rates increase. This pattern is evident in Figure 1, which plots the predicted ratings as a function of percent proficient (with all other variables held constant at

[17] The national sample also allow us to examine the degree to which citizen ratings of school quality are responsive to performance levels relative to the nation as a whole or simply to relative differences in performance within specific states. The National Assessment of Educational Progress (NAEP) conducted every two years by the U.S. Department of Education provides evidence on the average performance of fourth- and eighth-grade students in each state in mathematics and reading. We use these data to see whether respondents in states with higher average scores on the National Assessment of Education Progress (NAEP) rate their schools higher, on average, than respondents in states with lower NAEP scores. That is, if we compare two respondents whose local schools have the same percent proficient (and other characteristics), does the one in the state with better schools (as measured by student performance on the NAEP) give him/her school a better rating? The results (available from the authors upon request) provide no evidence that respondents in general, or even parents, have information about school quality beyond the information provided on the state assessments. In other words, citizens appear to be taking cues about school quality from local comparisons or from information provided by their state testing system without taking into account the relative difficulty of state standards.

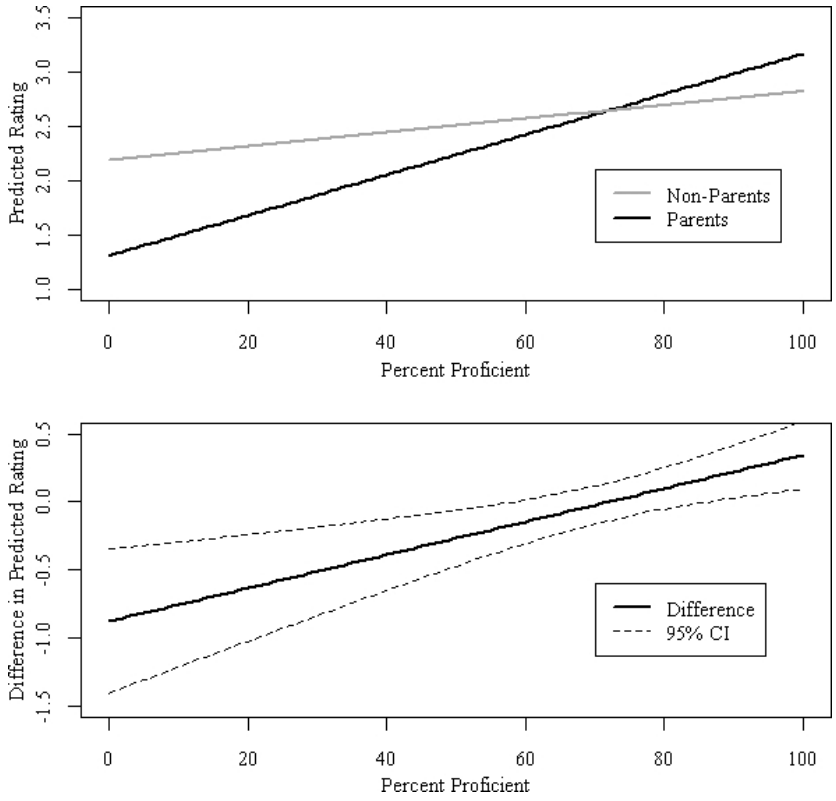

Figure 1. Relationship between student performance on state tests and respondents' school ratings.

Note: The top panel plots predicted ratings by proficiency rate based on the model presented in column 3 of Table 1 with all control variables (including state dummies) held constant at their means. The bottom panel plots the difference in predicted ratings between the two groups and its 95 percent confidence interval.

their means) for parents and nonparents in the top panel and the predicted difference between the two groups (and its 95 percent confidence interval) in the bottom panel. Perhaps surprisingly, the same pattern does not emerge for homeowners, who appear to be no more sensitive to differences in school quality than non-homeowners (column 4). This result and the relationship between actual and perceived quality for parents are robust to the inclusion of respondent dummies. In fact, the within-respondent point estimate of the performance-rating relationship for parents of school-age children reported

in column 5 is even larger (0.39 and statistically significant at the 10 percent level, although it is imprecisely estimated).

Why are homeowners no more sensitive to actual performance than non-homeowners? Perhaps the salience of school performance for homeowners peaks only at times of sale or purchase, whereas parents face sustained incentives to follow school quality. The differences between these groups could also imply that information costs matter more than benefits. Both parents and homeowners have incentives to pay attention to school quality, but parents likely have more opportunities to observe performance directly than do homeowners. Our data do not allow for final resolution among the several possibilities.

Table 2 considers whether the degree to which citizens are informed about school quality varies with other demographic characteristics. As noted above, although some research suggests that socioeconomically disadvantaged parents have lower levels of information about their local schools, the relevance of these findings to responsiveness to publicly reported performance indicators is unclear. Compared to the performance-rating relationship for whites, we find that the relationship among blacks and Hispanics is approximately the same. This relationship is also essentially the same for high-income and more-educated respondents as it is for low-income and less-educated respondents. We do find suggestive evidence that blacks are more sensitive to the racial makeup of schools, whereas whites and Hispanics are more sensitive to the socioeconomic composition. Another notable difference between groups in Table 2 is that the ''middle school penalty'' is more than twice as large for parents as compared to non-parents.

Performance Levels vs. Growth? Evidence from Florida

Our analysis of nationally representative data yields strong evidence that citizens, and especially parents of school-age children, rate schools in a way that lines up with the level of student performance at those schools. As noted above, however, test-score levels reflect not only the amount students learn in school but also their background and experiences in other settings. To examine the responsiveness of citizen perceptions to measures of test-score growth, which may be more reflective of what schools actually accomplish, we turn to our oversample of survey respondents in the state of Florida,

Table 2. Relationship between schools' demographic characteristics and respondents' ratings, by respondent characteristics.

	Black	Hispanic	White	Low-Income	High-Income	Parent	Non-Parent	Homeowner	Non-Homeowner
Percent proficient	0.156	0.169	0.161	0.160	0.129	0.347	0.114	0.173	0.112
(unit is 18 points)	[0.097]	[0.105]	[0.065]	[0.062]	[0.071]	[0.105]	[0.050]	[0.063]	[0.078]
Percent black	−0.158	0.068	−0.085	0.026	−0.057	−0.036	0.016	−0.030	0.091
(unit is 25 points)	[0.064]	[0.123]	[0.060]	[0.054]	[0.056]	[0.082]	[0.045]	[0.049]	[0.070]
Percent Hispanic	−0.127	0.029	−0.059	−0.018	−0.014	0.053	−0.011	0.013	−0.023
(unit is 24 points)	[0.105]	[0.073]	[0.058]	[0.053]	[0.055]	[0.080]	[0.042]	[0.048]	[0.067]
Percent free lunch	0.017	−0.154	−0.159	−0.139	−0.200	−0.254	−0.171	−0.145	−0.216
(unit is 26 points)	[0.097]	[0.069]	[0.051]	[0.062]	[0.055]	[0.073]	[0.047]	[0.046]	[0.079]
Average cohort size	−0.009	−0.066	−0.034	−0.043	−0.057	0.010	−0.051	−0.047	−0.013
(unit is 133 students)	[0.070]	[0.066]	[0.028]	[0.039]	[0.031]	[0.054]	[0.027]	[0.028]	[0.057]
Pupil-teacher ratio	0.086	0.168	0.023	0.016	0.081	0.048	0.062	0.086	−0.022
(unit is 3.2 students)	[0.059]	[0.067]	[0.032]	[0.044]	[0.034]	[0.066]	[0.031]	[0.038]	[0.036]
Middle school (0/1)	−0.234	−0.206	−0.165	−0.194	−0.153	−0.367	−0.148	−0.162	−0.245
	[0.118]	[0.131]	[0.045]	[0.061]	[0.052]	[0.092]	[0.045]	[0.045]	[0.096]
State dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	650	745	3375	1927	3112	997	4042	4198	841
R-squared	0.349	0.319	0.195	0.208	0.213	0.401	0.164	0.187	0.296

Note: Standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. The cutoff between low and high income is $50,000. Parents are respondents who have children age 6–17 living in their household. All continuous variables have been standardized based on the distribution of elementary and middle schools matched to respondents in our sample.

where the state accountability system evaluates schools based on both test-score levels and test-score growth.

The Florida Department of Education assigns each Florida school a letter grade between A and F based primarily on a points system with eight main components, which we divide into two categories:

(1) *Level-related points*: percent of students in tested grades who are proficient in math, reading, writing, and science (the four percentages are summed to calculate the total level-related points)
(2) *Growth-related points*: percent of students in tested grades making learning gains in math and reading and the percent of the lowest 25 percent of students making gains in math and reading (the four percentages are summed to calculate the total growth-related points).

The level-related points variable (calculated using publicly available data from the Florida Department of Education) is highly correlated with the percent proficient measure used in the national analysis ($r = 0.92$); the correlation between the growth-related points variable and percent proficient is only 0.58.[18]

Our basic strategy is to regress the ratings Florida residents assigned to their schools on variables measuring level-related and growth-related points and the same demographic and school characteristics used in the national analysis. Because measures of test-score growth are less stable over time than measures of test-score levels (Kane and Staiger, 2002), we average the points awarded to each school based on levels and growth over the previous three years.[19] In Florida, data on percent proficient are widely available for high schools and reflect the performance of both ninth- and tenth-grade students, so we include them along with the elementary and middle schools (adding a variable identifying high schools to all of the models) to maximize our sample size. Finally, to make the results as comparable as possible to those reported for the national sample, we rescale the points variables such that a one-unit increase in each corresponds to a one-standard-deviation

[18] Both correlations are for the specific schools matched to our survey respondents and incorporate survey weights.

[19] Among Florida schools, the correlation between level-related points in 2007 and 2008 was 0.92, as compared to 0.39 for growth-related points. This reflects the fact that measures of test-score growth, which involve taking the difference between two error-prone measures of student achievement, suffer from more measurement error and therefore have a lower signal-to-noise ratio. Although actual school quality may change from year to year, the benefits of reducing measurement error likely outweigh the drawbacks of relying on a single year of data.

shift in the performance distribution of Florida public schools matched to respondents.

Column 1 of Table 3 shows that Florida residents' perceptions of school quality are even more responsive to differences in student achievement levels than are those of the national public (and are unrelated to school demographics). A one-standard-deviation increase in level-related points is associated with ratings that are one-fifth of a letter grade higher. The results also suggest that ratings of school quality are related to student growth, but the coefficient on level-related points is almost twice as large as the coefficient on growth-related points. Moreover, only the coefficient on the level-related points variable remains statistically significant when respondent dummies are added (column 2). As in the national analysis, the relationships between school performance measures and respondent ratings are particularly strong for parents of school-age children. The coefficient on level-related points is roughly three times as large for parents (column 3) as for nonparents. However, parents are no more responsive to the measure of growth-related points than nonparents. Taken as a whole, these results suggest that citizen ratings do reflect differences in the growth in student achievement across schools but that this is primarily because of the correlation between achievement growth and achievement levels.

The Effect of Accountability Ratings: Regression Discontinuity Evidence

Although the results presented above indicate that on average citizens' ratings of schools are reflective of student performance, we do not know how they acquire this information. Our finding of differential effects for parents but not for homeowners suggests that direct interaction with a school may play an important role, but what of nonparents? Through school accountability programs, states have subsidized the cost of information by collecting performance measures and releasing them to the public. Does this subsidized information shape citizen perceptions?

As noted above, the Florida Department of Education uses the total number of points received (i.e., the sum of level- and growth-related points), along with other factors, to assign each school a letter grade. These grades receive considerable media attention in Florida, so we might expect respondents' school ratings to be correlated with them. Indeed, we should expect to find this given that level-related points (which are correlated with

Table 3. Relationship between test-score levels/growth and respondents' school ratings, Florida.

	(1)	(2)	(3)	(4)
3-year average of level-related	0.211	0.230	0.145	0.183
points (unit is 41 points)	[0.064]	[0.082]	[0.066]	[0.093]
3-year average of growth-related	0.112	−0.001	0.123	0.001
points (unit is 20 points)	[0.052]	[0.061]	[0.060]	[0.070]
Percent black	−0.012	−0.051	−0.016	−0.050
(unit is 21 points)	[0.045]	[0.106]	[0.045]	[0.104]
Percent Hispanic	0.076	0.050	0.078	0.030
(unit is 18 points)	[0.039]	[0.123]	[0.039]	[0.118]
Percent free lunch	−0.040	−0.066	−0.041	−0.050
(unit is 21 points)	[0.059]	[0.090]	[0.060]	[0.085]
Average cohort size	−0.110	−0.091	−0.114	−0.083
(unit is 210 students)	[0.054]	[0.072]	[0.054]	[0.070]
Pupil-teacher ratio	−0.009	−0.014	−0.009	−0.022
(unit is 2.4 students)	[0.044]	[0.051]	[0.044]	[0.050]
Middle school	−0.116	−0.142	−0.116	−0.144
	[0.075]	[0.088]	[0.075]	[0.088]
High school	0.158	−0.007	0.147	−0.016
	[0.133]	[0.130]	[0.137]	[0.134]
Parent with child age 6–17			−0.464	
			[0.732]	
3-year average of level-related			0.307	0.216
points (unit is 41 points) ∗ parent			[0.114]	[0.161]
3-year average of growth-related			−0.116	−0.059
points (unit is 20 points) ∗ parent			[0.091]	[0.113]
Respondent dummies?	No	Yes	No	Yes
Observations	2227	2227	2227	2227
R-squared	0.136	0.778	0.147	0.780

Note: Standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. All continuous variables have been standardized based on the distribution of schools matched to respondents in our Florida oversample.

Table 4. Relationship between school grades and respondents' school ratings, Florida.

	(1)	(2)	(3)	(4)
FL Grade (4-point scale)	0.174	0.103		
	[0.039]	[0.054]		
FL Grade = B (relative to A)			−0.137	0.067
			[0.087]	[0.100]
FL Grade = C (relative to A)			−0.223	−0.098
			[0.104]	[0.127]
FL Grade = D (relative to A)			−0.550	−0.380
			[0.138]	[0.165]
FL Grade = F (relative to A)			−1.152	−0.633
			[0.264]	[0.300]
Respondent dummies?	No	Yes	No	Yes
Observations	2209	2209	2209	2209
R-squared	0.123	0.774	0.128	0.778

Note: Standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. All regressions include school-level controls (indicators for middle and high school, percent black, percent Hispanic, percent free lunch, average cohort size, and pupil-teacher ratio).

respondent ratings) are a key component in the grades formula. Table 4 confirms this expectation: a school grade that is one point higher (again measured on a standard GPA scale) is associated with a respondent rating that is 0.2 grades higher. Column 3, which treats each grade as a separate variable, shows that the relationship between accountability system grades and respondent ratings appears to be largest for the lowest two grades (D and F). Columns 2 and 4 confirm that these results are robust to (although attenuated by) the inclusion of respondent dummies. Although these patterns suggest that the state-assigned grades may have a causal impact on citizen evaluations, they could simply reflect the correlation between those grades and citizens' direct observations.

To test the hypothesis that public information has a causal impact on citizen perceptions that is in addition to any impact of direct observation of quality, we use regression discontinuity methods to estimate the impact of

the school grades in Florida on respondent ratings by comparing respondents whose schools were close to the numerical cutoffs in the points variable that determines the school grades.[20] Because the quality of schools and respondent characteristics should vary continuously at these cutoffs, we can interpret any jump in the rating observed at the cutoff as the pure information effect of the school grade on respondents' perceptions of school quality.[21]

Only a handful of respondents were matched to schools close to the D/F and C/D cutoffs due to the fact that relatively few Florida schools receive D or F grades, precluding us from examining these cutoffs separately. We implement the regression discontinuity for the A/B and B/C cutoffs by regressing the respondent ratings on a dummy for receiving the higher grade, the number of points received, an interaction between the grade dummy and points variable, and the controls included throughout our analyses. We run these models including schools within different ranges of points from the cutoff (''bandwidths''). Ideally, the results will not be sensitive to the selection of bandwidth (Imbens and Lemieux, 2008).[22]

The results for the A/B cutoff (available upon request) are all statistically insignificant but sufficiently imprecise that even large effects cannot be ruled out. However, results for the B/C cutoff presented in the first panel of Table 5 suggest a large positive effect of receiving the higher (B) grade on respondent ratings, with a magnitude in the range of 0.36–0.57. The effect is imprecisely estimated, but it is statistically significant at the 5 percent level with one of the bandwidths and at the 10 percent level with the other two. Appendix Table A3 tests for discontinuities in respondent characteristics at the same cutoff, finding very little evidence to suggest that the

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[20] The total points variable is a sum of the level- and growth-related points variables and, for high schools, an additional "bonus points" variable that awards 10 points to schools in which at least 50 percent of grade 10 students who initially failed the state's graduation test passed when retested. School grades are sometimes also determined by other factors, such as failure to test at least a certain percentage of their students. Schools for whom the points variable did not bind (e.g., schools just below the cutoff that would not have received the higher grade had they earned points above the cutoff) are excluded from the discontinuity analysis.

[21] Our methods are similar to those of West and Peterson (2006) and Chiang (2009), who exploit the discontinuities in the Florida accountability system to estimate the impact of receiving various school grades on student achievement.

[22] We also examined the density of the points variable used to assign school grades within the total population of Florida public schools, finding no evidence that schools are concentrated in points ranges just above the grade cutoffs. The absence of such clustering suggests that schools are unable to manipulate the points variable strategically in order to obtain a higher school grade (e.g., by putting forth just enough effort to get above a cutoff).

Table 5. Regression discontinuity estimates of accountability grade effect on respondent ratings.

	B/C cutoff only: Bandwidth (Points)		
	15	20	25
Higher Grade	0.569	0.410	0.363
(Relative to Lower Grade)	[0.270]	[0.242]	[0.196]
Points (0 = Grade Threshold)	−0.006	0.002	0.005
	[0.023]	[0.024]	[0.014]
Higher Grade ∗ Points	−0.036	−0.026	−0.024
	[0.034]	[0.030]	[0.019]
Observations	284	367	461
R-squared	0.175	0.111	0.105
	All cutoffs pooled: Bandwidth (Points)		
	15	20	25
Higher Grade	0.264	0.224	0.323
(Relative to Lower Grade)	[0.155]	[0.140]	[0.141]
Points (0 = Grade Threshold)	0.002	0.002	−0.010
	[0.014]	[0.011]	[0.006]
Higher Grade ∗ Points	−0.011	−0.007	0.004
	[0.020]	[0.014]	[0.007]
Observations	770	1038	1317
R-squared	0.120	0.090	0.091
	All cutoffs pooled: Bandwidth (Points)		
	15	20	25
Higher Grade	0.327	0.255	0.340
(Relative to Lower Grade)	[0.155]	[0.141]	[0.142]
Points (0 = Grade Threshold)	0.002	0.002	−0.010
	[0.014]	[0.011]	[0.006]
Higher Grade ∗ Points	−0.010	−0.004	0.005
	[0.020]	[0.014]	[0.007]
Higher Grade ∗ Parent	−0.440	−0.266	−0.113
	[0.219]	[0.192]	[0.142]
Parent	0.022	0.043	−0.022
	[0.175]	[0.172]	[0.134]
Observations	770	1038	1317
R-squared	0.135	0.096	0.093

Note: Standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. All regressions include school-level controls (indicators for middle and high school, percent black, percent Hispanic, percent free lunch, average cohort size, and pupil-teacher ratio).

assumptions of the regression discontinuity model do not hold.[23] Similarly, Appendix Table A4 reports the results of placebo tests which look for discontinuities in citizen perceptions at false cutoffs 15 points above and below those actually used to distinguish B and C schools. The effects estimated at these false cutoffs are all statistically insignificant and inconsistently signed across bandwidths, further strengthening confidence in the validity of the regression discontinuity design. That the school grades have a direct effect on respondent ratings over and above the relationship between ratings and the underlying points variable suggests that citizens are attentive to the signals provided by the state's school accountability system.

As discussed above, nonparents have fewer alternative sources of information about school quality and therefore may be more responsive than parents to the signals provided by accountability systems. In order to distinguish between parents and nonparents in the regression discontinuity analysis while retaining sufficient statistical power, we pool respondents across each of the four available grade cutoffs — effectively constraining the effects of receiving a higher grade to be the same across the A-F scale. The second panel of Table 5 shows, for different bandwidths, an average grade effect in the range of 0.22–0.32 (one estimate is statistically significant at the 5 percent level and another is significant at the 10 percent level). As in the case of the B/C cutoff, tests for discontinuities in respondent characteristics and placebo tests for effects on citizen perceptions reported in Tables A3 and A4 suggest that the regression discontinuity model remains valid in this pooled setup.

The bottom panel of this table allows the effect of a higher school grade to differ for parents and nonparents. The effect for nonparents is in the 0.26–0.34 range, and is statistically significant at the 5 percent level for two of the bandwidths and at the 10 percent level for another. The effect for parents is never statistically significant, and the difference between parents and nonparents is statistically significant for one bandwidth and large enough to be substantively important across all three bandwidths. Although the relative imprecision of these estimates warrants caution, they suggest that nonparents are more responsive to the signals about school quality provided by public accountability programs than are parents.

[23] The probability that a respondent is male increases modestly at the cutoff, a result that is statistically significant for two bandwidths. However, the results presented in Table 5 are substantively unchanged in models that control for the full set of respondent characteristics included in Table 4.

Conclusions

We have provided what is, to our knowledge, the first evidence that citizen perceptions of the quality of government services reflect objective measures of performance of the specific institution providing the service. More specifically, we find that the grades Americans assign to their local public school reflect publicly available information about the academic achievement of its students. Although we cannot directly examine the mechanisms explaining this responsiveness, our evidence suggests that both direct experience with schools and the public dissemination of performance data may play a role. Interestingly, the signals provided by accountability systems appear to have the greatest influence on nonparents, who have the least opportunity for direct contact with public schools.

It is worth emphasizing the limitations on this evidence of responsiveness. First, the relationship between actual and perceived quality, although quite strong for parents, is relatively modest for citizens as a whole. Second, it appears that both parents and the general public are more responsive to the level of student achievement at a school as opposed to the amount students learn from one year to the next, which may in fact be more reflective of service quality. Nor do we have direct evidence that perceptions of school quality influence citizens' behavior in the context of school board elections, local political activism, or school choice.

Finally, it is worth asking whether these results are transferable to other policy domains. Are schools a special case? The widespread use of accountability systems in public education and the availability of other sources of low-cost information about schools might suggest so. We cannot know the answer to this question, but the regression discontinuity evidence for nonparents suggests that individuals can judge government performance more accurately if information is provided, even in the absence of other low-cost sources.

Nevertheless, both policy and theoretical implications emerge from our results. First, our finding that citizens' assessments of their local schools are impacted by accountability ratings suggest that public reporting of governmental performance can in fact inform the citizenry. However, the fact that respondent ratings of schools are more strongly associated with achievement levels than with achievement growth suggests that citizens are most likely to pick up and rely upon the information most subsidized by these efforts. In the case of public education, featuring growth measures more prominently

in school accountability ratings could cause citizens to pay more attention to this aspect of school quality.

Our results also have implications for democratic theory in the context of local politics. With few exceptions (e.g., Berry and Howell, 2007), work on retrospective voting has focused on behavior in federal elections. By showing that voter decisions correspond to objective economic indicators, this body of research suggests that voters are sufficiently informed about government performance to hold parties and politicians accountable regarding that issue. This article does not go quite as far in the case of public education; we do not look downstream at how perceptions shape electoral choice. However, we provide evidence of a critical link that must precede the vote decision. For accountability systems to generate public pressure on officials governing schools, citizens must pay attention to the information these systems provide. In demonstrating that the public does pay attention to the quality of schools we establish a necessary condition for democratic accountability — a link more often assumed than tested.

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Table A1. Relationship between school characteristics and respondents' school ratings, marginal effects from ordered probit models.

	Marginal effect on probability of giving a grade of:				
	A	B	C	D	F
Percent proficient	0.041	0.033	−0.050	−0.017	−0.007
(unit is 18 points)	[0.014]	[0.011]	[0.017]	[0.006]	[0.003]
Percent black	0.004	0.003	−0.005	−0.002	−0.001
(unit is 25 points)	[0.011]	[0.009]	[0.014]	[0.005]	[0.002]
Percent Hispanic	−0.001	−0.001	0.001	0.000	0.000
(unit is 24 points)	[0.011]	[0.009]	[0.013]	[0.004]	[0.002]
Percent free lunch	−0.051	−0.040	0.061	0.021	0.009
(unit is 26 points)	[0.012]	[0.010]	[0.014]	[0.005]	[0.002]
Average cohort size	−0.014	−0.011	0.017	0.006	0.002
(unit is 133 students)	[0.007]	[0.005]	[0.008]	[0.003]	[0.001]
Pupil-teacher ratio	0.015	0.012	−0.019	−0.006	−0.003
(unit is 3.2 students)	[0.008]	[0.006]	[0.009]	[0.003]	[0.001]
Middle school	−0.050	−0.040	0.060	0.021	0.009
	[0.011]	[0.010]	[0.014]	[0.005]	[0.002]
Overall probability	2.4%	6.9%	35.6%	40.8%	14.2%
Observations	5039	5039	5039	5039	5039

Note: Standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. Reported coefficients are marginal effects from ordered probit regressions. All regressions include state dummy variables. All continuous variables have been standardized based on the distribution of elementary and middle schools matched to respondents in our sample.

Table A2. Descriptive statistics, by whether respondent identified local elementary and middle schools.

	All Respondents	Identified		
		Neither	One of Two	Both
Age	46.5	46.0	46.9	46.5
Male	49%	46%	47%	50%
Black	12%	14%	18%$^{+}$	10%*
Hispanic	13%	11%	19%**	12%
Income	$57,972	$57,898	$49,771**	$59,655
College Degree	27%	34%	20%**	27%**
Parent of Child 6-17	15%	3%	8%*	19%**
Homeowner	73%	58%	53%$^{+}$	79%**
Number (unweighted)	3251	345	447	2459
Percent (weighted)	100%	14%	15%	72%

Note: Statistical significance from the mean for "neither" is indicated at the 10%, 5%, and 1% levels by $^{+}$, *, and **, respectively. All averages are weighted unless otherwise indicated. Of those respondents that could only name 1 of 2 schools, 64% named their local elementary school.

Table A3. Regression discontinuity estimates of accountability grade effect on respondent characteristics.

	B/C cutoff only: Bandwidth (Points)		
Dependent variable	15	20	25
Parent	0.124	−0.030	−0.020
	[0.085]	[0.088]	[0.081]
Homeowner	−0.103	−0.012	0.006
	[0.140]	[0.120]	[0.106]
Black	0.088	0.103	0.015
	[0.104]	[0.102]	[0.090]
Hispanic	−0.005	−0.003	−0.026
	[0.064]	[0.071]	[0.075]
College graduate	0.092	−0.019	0.045
	[0.133]	[0.098]	[0.085]
Male	0.394	0.243	0.156
	[0.145]	[0.134]	[0.126]
Log(Income)	0.216	0.143	0.056
	[0.294]	[0.236]	[0.227]
	All cutoffs pooled: Bandwidth (Points)		
Dependent variable	15	20	25
Parent	0.020	−0.110	−0.020
	[0.093]	[0.083]	[0.084]
Homeowner	−0.174	−0.114	−0.146
	[0.088]	[0.083]	[0.087]
Black	0.118	0.132	0.131
	[0.068]	[0.074]	[0.078]
Hispanic	0.047	0.032	0.015
	[0.071]	[0.059]	[0.055]
College graduate	0.039	0.029	−0.036
	[0.086]	[0.078]	[0.071]
Male	0.060	−0.042	0.042
	[0.095]	[0.086]	[0.090]
Log(Income)	0.134	0.127	−0.016
	[0.187]	[0.172]	[0.148]

Note: Standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. All regressions include school-level controls (indicators for middle and high school, percent black, percent Hispanic, percent free lunch, average cohort size, and pupil-teacher ratio).

Table A4. Regression discontinuity estimates of accountability grade effect on respondent ratings, false cutoffs.

	B/C cutoff only: Bandwidth (Points)		
	15	20	25
Increase cutoff by 15 points	0.165	0.206	−0.028
	[0.375]	[0.321]	[0.302]
Decrease cutoff by 15 points	0.089	−0.209	−0.261
	[0.254]	[0.221]	[0.205]
	All cutoffs pooled: Bandwidth (Points)		
	15	20	25
Increase cutoff by 15 points	−0.132	−0.181	−0.290
	[0.215]	[0.179]	[0.178]
Decrease cutoff by 15 points	−0.131	−0.152	−0.166
	[0.181]	[0.153]	[0.139]

Note: Standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. All regressions include school-level controls (indicators for middle and high school, percent black, percent Hispanic, percent free lunch, average cohort size, and pupil-teacher ratio).