Citizen Perceptions of Government Service Quality: Evidence from Public Schools [*]

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Abstract

Conventional models of democratic accountability hinge on citizens' ability to evaluate government performance accurately, yet there is little evidence on the degree to which citizen perceptions of the quality of government services correspond to actual service quality. Using nationally representative survey data, we find that citizens' perceptions of the quality of specific public schools reflect publicly available information about the level of student achievement in those schools. The relationship between actual and perceived 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. However, this relationship does not differ by homeowner status or by respondents' race, ethnicity, income, or education. 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.

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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, likewise aim to inform citizen perceptions with objective indicators of government performance (Berry and Howell 2007; Peterson and West 2003). Yet there is little direct evidence on the degree to which citizen perceptions of the quality of government services correspond to actual service quality, especially in the context of services provided by local governments. Do citizen perceptions 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 evidence on these questions has primarily reflected 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 the quality of these services. Recent developments in survey research methods—specifically the administration of surveys to respondents whose addresses are known in advance and can be linked to specific service providers via geographic identifiers—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 linked individual respondents to specific public schools in their community 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 at which 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 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 on student test scores to assign each school a letter grade. A regression discontinuity analysis of respondents who rated schools on either side of the cutoffs used to determine school grades confirms that highly salient government accountability systems can have a causal effect on citizen perceptions of school quality. The effect of accountability ratings appears to be limited to nonparents, however, consistent with theoretical models of opinion-formation suggesting that elite-generated information is most influential among citizens with the least prior information on the issue in question (Zaller 1992).

Citizen Perceptions of Service Quality

Multiple generations of survey research have characterized American citizens as inattentive to and ill-informed about public affairs (Bartels 1996; Berelson et al. 1954; Campbell et al. 1960; Converse 1964; Delli Carpini and Keeter 1995; Neuman 1986). To the extent that citizens think about public affairs at all, their perceptions are more likely to be colored by partisan or ideological orientations than informed by "objective" facts (Bartels 2002; Zaller

1992). From this vantage it appears unlikely that citizen perceptions of the quality of government agencies such as public schools would be closely linked to actual agency performance.

Yet other evidence suggests that, when turning from the encyclopedic quizzes of political knowledge upon which much of this consensus is based, Americans may know more than they let on. The best documented example of informed judgment is voters' capacity to assess economic performance and incorporate these perceptions into their evaluations of the parties in presidential and congressional elections (Fiorina 1981; Lewis-Beck and Stegmaier 2000). Especially in a federal system like the United States, however, political issues and government activity extend well beyond the performance of the national economy. Do American citizens also possess politically relevant information about the quality of local government services such as public education?

The answer may depend on the citizens in question. Most citizens have little incentive to acquire detailed information about specific issues on a routine basis. Acquiring such knowledge requires time and effort, and the benefits of doing so are not readily connected in the minds of citizens to their interests or values (Downs 1957). But the costs and benefits of gathering information about specific policies vary systematically across groups. The literature on issue publics, for example, suggests that individuals with strong attachments to a particular policy issue may possess accurate information about those issues (see, e.g., Hutchings 2003).

In the case of public education, the most likely issue publics are parents of school-age children and homeowners. As potential consumers of public education, parents have especially strong incentives to be informed about the performance of local schools. In addition to the information made available to the public through formal accountability systems, 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. 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 (Black 1999; Figlio and Lucas 2004).[1]

The accuracy of citizen perceptions of government service quality may also vary according to general political sophistication. Survey research has shown that those who are more politically sophisticated in a general sense (i.e. those who are more aware of and interested in public affairs) tend to be better informed than their peers across multiple dimensions of political knowledge (e.g., see Converse 1964; Delli Carpini and Keeter 1996). While this sort of awareness may be a function of idiosyncratic taste for political information and discourse, it also correlates with elements of social and economic status, such as income and education, that reduce the costs associated with political engagement generally and information acquisition specifically (Verba et al. 1995). Those who have greater social and economic resources may therefore be more likely to have access to reliable information on the performance of government agencies such as public schools.

The role of individuals' demographic characteristics in shaping perceptions of school quality has in fact been a prominent concern in debates about education reform strategies that would expand parental choice over the school their child attends (Teske et al 2006). Gewirtz et al. (1995), for example, hypothesize that disadvantaged parents will be particularly uninformed about or uninterested in school quality. Schneider et al. (1998, p. 769), using data from two

[1] From a Downsian perspective the incentive to obtain costly information is "very small" for individual citizens because their vote is unlikely to be decisive in an election (Downs 1957, p. 298). In the case of local school quality, however, parents and homeowners may have incentives to gather information beyond that of hoping to influence election outcomes. As such, the improbability of casting a decisive vote does not fully erode the potential benefit they may derive from policy information.

regional districts in New York City, find that "*on average* low-income parents have very little accurate information about objective conditions in the schools." This research suggests the importance of comparing the accuracy of citizens' perceptions of school quality across lines of race, ethnicity, income and education.

There is also reason to suspect that citizen evaluations of government services could be biased by a reliance on indicators unrelated to quality. In particular, 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, sociologist Amy Stuart Wells (1993) concluded that parents' choices were based "on a perception that county is better than city and white is better than black, not on factual information about the schools."[2] Although perhaps less troubling in its implications, a perception that smaller schools and class sizes are superior could also lead citizens to rate schools offering these readily observable features more highly regardless of their relationship to actual performance.

Finally, to the extent that citizen perceptions do reflect actual service quality, the relationship could result from either direct observation of agency performance or information disseminated by accountability programs. Moreover, the relative importance of these two sources of information could also vary across groups. Zaller's (1992) Receive-Accept-Sample model of opinion-formation suggests that elite-generated information is most influential when people have few alternatives sources of evidence. Parents may therefore be least likely to benefit from 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 school accountability programs and the coverage those ratings receive from local media

[2] 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).

outlets. Our empirical analysis, which exploits newly collected data and recent advances in geo-coding technology, is therefore designed not only to examine the degree to which various groups of citizens are able to perceive school quality accurately but also the mechanisms responsible for any observed relationships.

Data on Perceived and Actual Quality of Public Schools

Data limitations have been the primary roadblock to explaining individuals' perceptions of the quality of government services. When examining determinants of these perceptions, political scientists have focused on demographic variation across individuals (e.g., Hero and Durand 1985) while ignoring variation in objective measures of service quality, in effect asking "Do groups see service quality differently?" rather than "Do individuals accurately perceive quality?" or "Do groups differ in the accuracy of their perceptions?" This approach reflects two difficulties related to data collection.

First, analyzing the relationship between perceived and actual 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, the quality of provision is rarely uniform even 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 3,251 respondents, including oversamples of 434 non-Hispanic blacks, 481 Hispanics, and 948

residents in 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.[3]

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 elementary, middle, and high schools (up to five schools of each type) operated by the relevant school district.[4]

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?" It then offered each respondent a personalized list of the five closest elementary schools from which to pick; respondents were also allowed to specify a school that did not appear on the list or to indicate that they did not know. 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.

[3] KnowledgePanel® members are chosen via a probability-based sampling method and 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.

[4] 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.

Even when subjects can be placed within the appropriate jurisdiction, a second difficulty remains: Obtaining objective measures of service quality against which to compare perceptions. Such measures have not been available for most services. As a result, political scientists investigating the link between perceived and actual quality 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 actual performance.

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 are drawn from SchoolDataDirect.org for the 2007–2008 school year—the most recent year for which information on test scores would have been publicly available in all states.[5] Because math and reading proficiency rates are used to evaluate school performance under No Child Left Behind, 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

[5] For 15 (mostly small) states we use data from 2006–2007 (the most recently available year); the correlation between school-level percent proficient for 2006–2007 and 2007–2008 is 0.94. Data are not available for either year for Oklahoma, so the small number of survey respondents from that state are excluded from the analysis.

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 heavily 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 does produce achievement gains.[6]

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

[6] 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.

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.[7] 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.

Methods for National Analysis

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 drop 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 to F grades that respondents assigned to their schools into a standard Grade Point Average (GPA) scale (with A=4 and F=0) and use Ordinary Least Squares to regress this variable on school proficiency rates, demographic characteristics, and resource measures. 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. All models are weighted using survey weights provided by Knowledge Networks® to correspond to known

[7] 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).

demographic characteristics of the national population, and standard errors are clustered by respondents to account for the fact that most respondents rated multiple schools.

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 1 provides the results of our most fully specified model using ordered probit.

Citizen ratings of school quality could also 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 present results 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

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 72 percent of respondents who could name both their elementary and middle schools, the 14 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 2).[8]

We begin our analysis of the ratings assigned by respondents who could identify at least one elementary or middle school by estimating the relationship between perceived quality and a variety of school characteristics. The (weighted) mean grade assigned to elementary and middle schools in our sample was 2.57 on a four-point GPA scale, with a standard deviation of 0.90.[9] 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.

We first examine whether the racial/ethnic and class makeup of the student body influences how citizens rate their local schools. Examining these characteristics in isolation suggests that both are important predictors of citizen evaluations—a fact which may explain the

[8] Linear probability models confirm that, holding constant the respondent characteristics included in Appendix Table 2, 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 associated with the probability of being able to identify their local schools.

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

common perception that this is the case. The first column of Table 1 indicates that schools with 25 percentage points more black students received ratings that were 0.14 grade points lower, while schools with 24 percentage points more Hispanic students received ratings that were 0.11 lower. The second column indicates that schools that had 26 percentage points more students eligible for a free lunch received ratings that were 0.24 lower. However, when these three variables are examined simultaneously (column 3) only the poverty indicator retains 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.[10] Adding average cohort size and pupil-teacher ratio to the model (column 4) shows that these variables 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. Adding state dummies (in anticipation of adding percent proficient, the definition of which varies by state) again makes little difference to the results (column 5).

Column 6 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 0.16 grade points higher—a effect that is moderate in size relative to the standard deviation in respondent

[10] Appendix Table 3 shows that these patterns are consistent across racial/ethnic and socioeconomic groups, with the possible exception that black respondents are more sensitive to racial composition and less sensitive to poverty than are Hispanic and white respondents. This unusual pattern for black respondents is not evident in models that do not include state dummy variables (results available upon request). This table also shows that the middle school effect is significantly larger for parents than for nonparents, but the other coefficients are similar (with the important exception of percent proficient, which is discussed below). None of the estimated coefficients for homeowners and non-homeowners are not statistically distinguishable from each other.

ratings of 0.9 grade points.[11] Controlling for student proficiency rates reduces the relationship between free lunch eligibility rates and respondent ratings by roughly one fourth, but this relationship remains statistically significant and comparable in size to the relationship for proficiency rates.

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 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 7) are less precise, as is expected given the limited variation with which they are estimated. The coefficient on percent proficient is essentially unchanged, however, although 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.

Table 2 considers whether disadvantaged groups are systematically less well-informed about school quality than more advantaged groups by running models that interact demographic characteristics with the percent proficient measure. The first column shows that, compared to the

[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). Standardizing percent proficient within each state produces qualitatively similar results to those reported below (results available upon request).

performance-rating relationship for whites, the relationship among blacks is the same and the relationship among Hispanics is slightly larger (although the difference is not statistically significant). This relationship is also essentially the same for high-income and more-educated respondents as it is for low-income and less-educated respondents (columns 3 and 5). The analogous results that condition on respondent dummies are too imprecisely estimated to warrant detailed interpretation, although many of the point estimates are similar.

We next turn to whether the performance-rating relationship is stronger for two potential issue publics: parents of school-age children and homeowners.[12] The first column of Table 3 confirms that the coefficient on percent proficient is twice as large for parents of school-age children as it is for other respondents: 0.33 vs. 0.13. 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 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.

This pattern does not emerge for homeowners, however, who appear to be no more sensitive to differences in school quality than non-homeowners. The relationships between actual and perceived quality for parents and homeowners remain essentially the same they are

[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 children aged 6–17. As a result, we likely misclassify a small number of parents of school-age children whose children do not reside in the same household.

estimated simultaneously (and controls are included for respondents' gender, race/ethnicity, and education) and are robust to the inclusion of respondent dummies. In fact, the within-respondent estimate of the performance-rating relationship for parents of school-age children reported in column 4 is even larger (0.58 and statistically significant, although it is imprecisely estimated).

One potential concern with the results presented thus far is that they are based only on the sample of respondents who were able to identify their local school. To the extent that citizens who are unable to identify their local school are less informed about school quality, these results 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. As expected, the magnitude of the coefficient on percent proficient attenuates (from 0.16 to 0.11 in models without respondent dummies) but remains statistically significant. Among parents, a one-standard-deviation increase in proficiency rates is associated in this more inclusive sample with a 0.25 grade point increase in school ratings (results available upon request).

Finally, the national sample also allowed 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 her school a better rating? The results presented in Table 4 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.

Achievement 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, we turn to our oversample of survey respondents in the state of Florida, where the state accountability system evaluates schools based on both test-score levels and test-score growth.

Florida schools are assigned letter grades based primarily on a points system with eight main components, which we divide into two categories:

1) Level-related points: percentage proficient in math, English, writing, and science (the four percentages are summed to calculate the total level-related points)
2) Growth-related points: percentage making gains in math and reading and the percentage 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.[13]

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

Column 1 of Table 5 shows that Florida residents' perceptions of school quality are more responsive to differences in student achievement levels than are those of the national public (and unrelated to school demographics). A one-standard-deviation increase in level-related points is associated with ratings that are almost one third of a letter grade higher. Column 3 suggests that ratings of school quality are also strongly related to student growth, but this relationship falls by more than half when respondent dummies are included (column 4). When both level-related and

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

[14] 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.

growth-related points are included simultaneously in column 5, the coefficients on both variables remain statistically significant but the coefficient on level-related points is almost twice as large as the coefficient on growth-related points. Moreover, only the coefficient on level-related points variable remains statistically significant when respondent dummies are added (column 6). Taken as a whole, the results in Table 5 suggest that citizen ratings 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.

As in the national sample, the relationships between school performance measures and respondent ratings are particularly strong for parents of school-age children. Table 6 shows that the coefficient on level-related points is roughly twice as large for parents as for nonparents. Because the overall coefficients are larger for the Florida oversample than for the national sample, the effects we estimate for parents are quite substantial. For example, the estimates in column 5 imply that a one standard-deviation increase in level-related points is associated with a rating by parents that is almost half of one letter grade higher. However, parents are no more responsive to the measure of growth-related points (the point estimate for the interaction term is negative) than nonparents.

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 between A and F. 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 respondent ratings) are a key component in the grades formula. Table 7 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.

The Effect of Accountability Programs: Regression Discontinuity Evidence

It is difficult to determine from the results presented above whether respondents' apparent sensitivity to service quality is the result of publicly available information or simply direct observation. Our finding of differential effects for parents but not for homeowners suggests that direct interaction with a school may be more important than simply having a vested interest in acquiring information about school quality. And the apparent effect of the grades assigned to schools in Florida, while perhaps suggesting that public information is important, 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 calculate the impact of the school grades in Florida on respondent ratings by comparing respondents whose schools were close to the cutoff in the points variable that determines the school grades.[15] We have shown that schools earning more points received higher ratings on average, but we might also expect to see a sharp jump in the average rating at the cutoff. Because schools on either side of the cutoff should be of essentially the same quality, we

[15] The total points variable is a sum of the level- and growth-related points variables, and an additional "bonus points" variable. School grades are sometimes also determined by other factors, such as testing at least a certain percentage of 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 regression discontinuity analysis.

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.[16]

In our sample, only a handful of respondents were matched to schools close to the D/F and C/D cutoffs so we are unable to examine 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).[17]

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 8 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 large enough to be statistically significant at the 5 percent level with one of the bandwidths and at the 10 percent level with another two. 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 do pay attention to the signals provided by the state's school accountability system.

[16] Our methods are similar to those of West and Peterson (2005) and Chiang (2009), who exploit the discontinuities in the Florida accountability system to estimate the impact of receiving various school grades on student achievement.

[17] 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).

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. The second panel of Table 8 shows, for different bandwidths, an average grade effect in the range of 0.09-0.32 (one estimate is statistically significant at the 5 percent level and another is significant at the 10 percent level). The bottom panel of this table allows the effect of school grades to differ for parents and nonparents. The effect for nonparents is in the 0.16-0.34 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 four bandwidths. Although the relative imprecision of these estimates warrants caution, they strongly suggest that nonparents are more responsive to the signals about school quality provided by public accountability programs than are parents.

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 the mechanisms explaining this responsiveness are not entirely clear, our evidence suggests that both direct experience and the public dissemination of performance data within the public education sector 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 is relatively modest for citizens as a whole, although it is quite strong for parents. Second, citizens appear sensitive to relative differences in school quality within their state (as reflected in school performance on state accountability systems) but insensitive to information on school quality in the state as a whole (as measured by performance on national exams). Finally, 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. 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.

At least two policy implications emerge from our results. First, our finding that citizens' assessments of their local schools are impacted by accountability ratings coupled with the fact that respondent ratings are more strongly associated with achievement levels than with achievement growth suggests that featuring growth measures more prominently in school accountability ratings could cause citizens to pay more attention to this aspect of school quality. Second, our finding that respondent ratings are associated with student performance on state tests but not with performance on a national assessment suggests that a closer alignment of state standards (or a move toward national standards) might help citizens form more accurate perceptions of their schools. In particular, it could lower perceptions of school quality in states where many students perform poorly relative to national norms but are deemed proficient by the state.

Our results also have implications for democratic theory in the context of local politics. With few exceptions (e.g., Berry and Howell 2007), previous work on retrospective voting has focused primarily 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. It now seems that citizens are also well equipped to assess the performance of important local services such as public schools.

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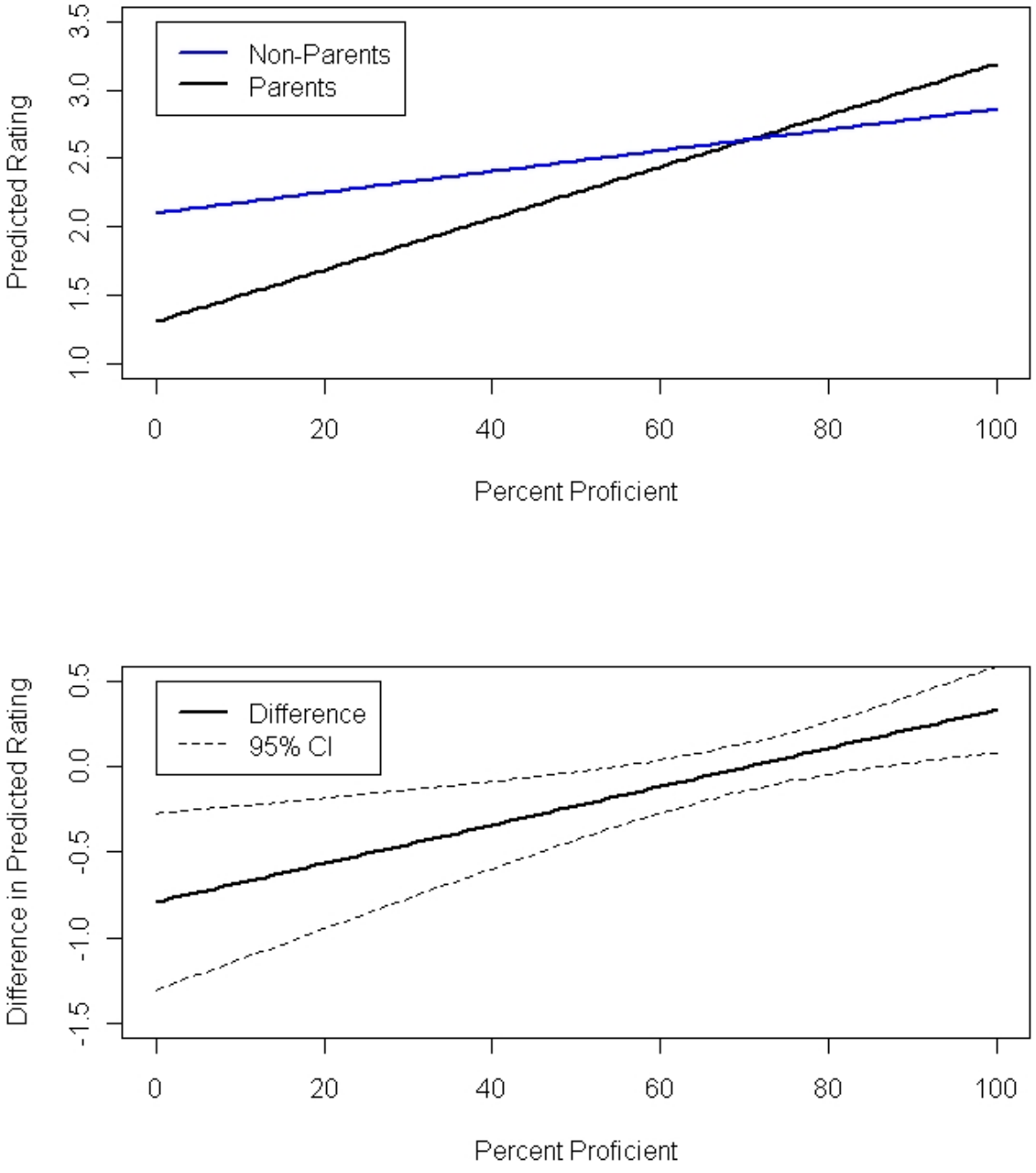
Figure 1. Relationship between Student Performance on State Tests and Respondents' School Ratings



Note: The top panel plots predicted ratings by proficiency rate based on the model presented in column 1 of Table 3 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.

Table 1

Relationship Between School Characteristics and Respondents' Ratings

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Percent black (unit is 25 points)	-0.138		-0.005	-0.001	-0.028	0.010	-0.114
	[0.028]**		[0.037]	[0.037]	[0.038]	[0.043]	[0.124]
Percent Hispanic (unit is 24 points)	-0.113		0.004	0.016	-0.037	0.003	-0.155
	[0.028]**		[0.035]	[0.035]	[0.038]	[0.040]	[0.150]
Percent free lunch (unit is 26 points)		-0.239	-0.239	-0.251	-0.229	-0.171	0.004
		[0.027]**	[0.040]**	[0.041]**	[0.039]**	[0.043]**	[0.097]
Average cohort size (unit is 133 students)				-0.035	-0.046	-0.044	-0.078
				[0.026]	[0.025]+	[0.026]+	[0.039]*
Pupil-teacher ratio (unit is 3.2 students)				-0.014	0.049	0.059	0.037
				[0.024]	[0.028]+	[0.029]*	[0.048]
Percent proficient (unit is 18 points)						0.163	0.149
						[0.051]**	[0.099]
Middle school	-0.258	-0.286	-0.289	-0.251	-0.234	-0.182	-0.114
	[0.028]**	[0.028]**	[0.028]**	[0.040]**	[0.039]**	[0.041]**	[0.058]*
State dummies?	No	No	No	No	Yes	Yes	No
Respondent dummies?	No	No	No	No	No	No	Yes
Observations	5,157	5,158	5,131	5,127	5,127	4,937	4,937
R-squared	0.05	0.09	0.09	0.09	0.16	0.18	0.87

Notes: + significant at 10%; * significant at 5%; ** significant at 1%; 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.

Table 2

Performance-Rating Relationship, by Respondents' Demographic Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
Percent proficient (unit is 18 points)	0.153	0.148	0.166	0.173	0.153	0.149
	[0.056]**	[0.124]	[0.059]**	[0.156]	[0.054]**	[0.114]
Percent proficient * black	-0.010	0.132				
	[0.060]	[0.192]				
Percent proficient * Hispanic	0.071	-0.087				
	[0.068]	[0.171]				
Black	0.375					
	[0.244]					
Hispanic	-0.136					
	[0.274]					
Percent proficient * income less than			-0.002	-0.041		
$50,000			[0.048]	[0.165]		
Income less than $50,000			0.071			
			[0.199]			
Percent proficient * bachelor's degree					0.039	0.003
or higher					[0.057]	[0.146]
Bachelor's degree or higher					-0.134	
					[0.252]	
Respondent dummies?	No	Yes	No	Yes	No	Yes
State dummies?	Yes	No	Yes	No	Yes	No
Observations	4,937	4,937	4,937	4,937	4,937	4,937
R-squared	0.19	0.87	0.18	0.87	0.18	0.87

Notes: + significant at 10%; * significant at 5%; ** significant at 1%; standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. All regressions include school-level controls (indicator for middle school, percent black, percent Hispanic, percent eligible for free or reduced-price lunch, average cohort size, and pupil-teacher ratio). Percent proficient has been standardized based on the distribution of elementary and middle schools matched to respondents in our sample.

Table 3

Performance-Rating Relationship, by Whether Respondent is a Parent or Homeowner

	(1)	(2)	(3)	(4)	(5)	(6)
Percent proficient (unit is 18 points)	0.132	0.172	0.095	0.073	0.037	-0.073
	[0.051]**	[0.059]**	[0.079]	[0.084]	[0.128]	[0.154]
Percent proficient * parent with child	0.200		0.222	0.509		0.473
aged 6-17 in household	[0.064]**		[0.062]**	[0.230]*		[0.200]*
Parent with child aged 6-17 in	-0.790		-0.897			
household	[0.263]**		[0.259]**			
Percent proficient * homeowner		-0.013	-0.004		0.154	0.162
		[0.054]	[0.057]		[0.151]	[0.121]
Homeowner		0.046	0.043			
		[0.219]	[0.231]			
Respondent dummies?	No	No	No	Yes	Yes	Yes
State dummies?	Yes	Yes	Yes	No	No	No
Respondent-level controls?	No	No	Yes	No	No	Yes
Observations	4,937	4,937	4,937	4,937	4,937	4,937
R-squared	0.18	0.18	0.20	0.87	0.87	0.87

Notes: + significant at 10%; * significant at 5%; ** significant at 1%; standard errors adjusted for clustering within respondents appear in brackets. Omitted category includes non-parents and parents without children aged 6-17 living in their household. All regressions employ survey weights. Respondent-level controls include gender, race/ethnicity, education, and interactions between these variables and percent proficient (regressions that include respondent dummies only include the interaction terms). All regressions include school-level controls (indicator for middle school, percent black, percent Hispanic, percent eligible for free or reduced-price lunch, average cohort size, and pupil-teacher ratio). Percent proficient has been standardized based on the distribution of elementary and middle schools matched to respondents in our sample.

Table 4

Relationship Between Respondent Ratings and State-Level Performance on the NAEP

	(1)	(2)	(3)	(4)
Percent proficient (unit is 18	0.131	0.135	0.093	0.096
percentage points)	[0.036]**	[0.036]**	[0.035]*	[0.036]**
Percent proficient * parent			0.213	0.217
			[0.062]**	[0.066]**
Parent with child age 6-17			-0.677	0.954
			[0.403]+	[2.757]
State's percent proficient on NAEP	-0.025		-0.020	
(unit is 7 percentage points)	[0.047]		[0.044]	
State's percent proficient on NAEP *			-0.041	
parent			[0.071]	
State's average score on NAEP (unit		-0.032		-0.026
is 6 scale score points)		[0.045]		[0.042]
State's average score on NAEP *				-0.046
parent				[0.071]
Respondent dummies?	No	No	No	No
State dummies?	No	No	No	No
Observations	4,937	4,937	4,937	4,937
R-squared	0.11	0.11	0.12	0.12

Notes: + significant at 10%; * significant at 5%; ** significant at 1%; standard errors adjusted for clustering within states appear in brackets. All regressions employ survey weights. "Parents" include respondents who are parents with at least one child aged 6-17 living in their household. All regressions include school-level controls (indicator for middle school, percent black, percent Hispanic, percent eligible for free or reduced-price lunch, average cohort size, and pupil-teacher ratio). All continuous variables have been standardized based on the distribution of elementary and middle schools matched to respondents in our sample.

Table 5

Relationship Between Test-Score Levels/Growth and Respondents' School Ratings, Florida

	(1)	(2)	(3)	(4)	(5)	(6)
3-year average of level-related points	0.300	0.228			0.211	0.230
(unit is 41 points)	[0.056]**	[0.064]**			[0.064]**	[0.082]**
3-year average of growth-related			0.217	0.089	0.112	-0.001
points (unit is 20 points)			[0.044]**	[0.047]+	[0.052]*	[0.061]
Percent black (unit is 20 points)	-0.000	-0.049	-0.045	-0.122	-0.012	-0.049
	[0.043]	[0.100]	[0.041]	[0.095]	[0.043]	[0.100]
Percent Hispanic (unit is 17 points)	0.086	0.046	0.056	0.014	0.070	0.047
	[0.036]*	[0.114]	[0.036]	[0.115]	[0.037]+	[0.114]
Percent free lunch (unit is 20 points)	-0.036	-0.064	-0.128	-0.133	-0.039	-0.064
	[0.057]	[0.087]	[0.050]*	[0.087]	[0.057]	[0.087]
Average cohort size (unit is 205	-0.117	-0.088	-0.106	-0.096	-0.107	-0.088
students)	[0.053]*	[0.067]	[0.053]*	[0.071]	[0.053]*	[0.070]
Pupil-teacher ratio (unit is 2.3	-0.010	-0.014	-0.016	-0.016	-0.009	-0.014
students)	[0.043]	[0.049]	[0.043]	[0.049]	[0.043]	[0.049]
Middle school	-0.066	-0.142	-0.208	-0.225	-0.116	-0.142
	[0.073]	[0.080]+	[0.069]**	[0.081]**	[0.075]	[0.088]
High school	0.134	-0.007	0.031	-0.138	0.158	-0.007
	[0.132]	[0.130]	[0.119]	[0.121]	[0.133]	[0.130]
Respondent dummies?	No	Yes	No	Yes	No	Yes
Observations	2,227	2,227	2,227	2,227	2,227	2,227
R-squared	0.13	0.78	0.13	0.77	0.14	0.78

Notes: + significant at 10%; * significant at 5%; ** significant at 1%; 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 6

Relationship Between Student Performance and Respondents' School Ratings, Florida, Parents vs. Non-Parents

	(1)	(2)	(3)	(4)	(5)	(6)
3-year average of level-related points	0.243	0.186			0.145	0.183
(unit is 41 points)	[0.059]**	[0.075]*			[0.066]*	[0.093]+
3-year average of level-related points	0.221	0.153			0.307	0.216
(unit is 41 points) * parent	[0.072]**	[0.099]			[0.114]**	[0.161]
3-year average of growth-related			0.183	0.066	0.123	0.001
points (unit is 20 points)			[0.051]**	[0.055]	[0.060]*	[0.070]
3-year average of growth-related			0.128	0.085	-0.116	-0.059
points (unit is 20 points) * parent			[0.056]*	[0.065]	[0.091]	[0.113]
Parent with child aged 6-17	-1.293		-1.431		-0.464	
	[0.462]**		[0.673]*		[0.732]	
Respondent dummies?	No	Yes	No	Yes	No	Yes
Observations	2,227	2,227	2,227	2,227	2,227	2,227
R-squared	0.14	0.78	0.13	0.77	0.15	0.78

Notes: + significant at 10%; * significant at 5%; ** significant at 1%; standard errors adjusted for clustering within respondents appear in brackets. Omitted category includes non-parents and parents without children aged 6-17 living in their household. All regressions employ survey weights. All regresesions include school-level controls (indicators for middle and high school, percent black, percent Hispanic, percent free lunch, average cohort size, and pupil-teacher ratio). All continuous variables have been standardized based on the distribution of schools matched to respondents in our Florida oversample.

Table 7

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	2,209	2,209	2,209	2,209
R-squared	0.12	0.77	0.13	0.78

Notes: + significant at 10%; * significant at 5%; ** significant at 1%; standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. All regresesions 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 8

Regression Discontinuity Estimates of Accountability Grade Effect on Respondent Ratings

	B/C Cutoff Only: Bandwidth (Points)			
	10	15	20	25
Higher Grade (Relative to	0.442	0.569	0.410	0.363
Lower Grade)	[0.372]	[0.270]*	[0.242]+	[0.196]+
Points (0 = Grade	-0.010	-0.006	0.002	0.005
Threshold)	[0.041]	[0.023]	[0.024]	[0.014]
Higher Grade * Points	-0.005	-0.036	-0.026	-0.024
	[0.058]	[0.034]	[0.030]	[0.019]
Observations	196	284	367	461
R-squared	0.23	0.17	0.11	0.10

	All Cutoffs Pooled: Bandwidth (Points)			
	10	15	20	25
Higher Grade (Relative to	0.092	0.264	0.224	0.323
Lower Grade)	[0.173]	[0.155]+	[0.140]	[0.141]*
Points (0 = Grade	0.025	0.002	0.002	-0.010
Threshold)	[0.023]	[0.014]	[0.011]	[0.006]+
Higher Grade * Points	-0.015	-0.011	-0.007	0.004
	[0.033]	[0.020]	[0.014]	[0.007]
Observations	541	770	1,038	1,317
R-squared	0.13	0.12	0.09	0.09

	All Cutoffs Pooled: Bandwidth (Points)			
	10	15	20	25
Higher Grade (Relative to	0.156	0.327	0.255	0.340
Lower Grade)	[0.175]	[0.155]*	[0.141]+	[0.142]*
Points (0 = Grade	0.025	0.002	0.002	-0.010
Threshold)	[0.022]	[0.014]	[0.011]	[0.006]+
Higher Grade * Points	-0.018	-0.010	-0.004	0.005
	[0.032]	[0.020]	[0.014]	[0.007]
Higher Grade * Parent	-0.331	-0.440	-0.266	-0.113
	[0.251]	[0.219]*	[0.192]	[0.142]
Parent	0.012	0.022	0.043	-0.022
	[0.190]	[0.175]	[0.172]	[0.134]
Observations	541	770	1,038	1,317
R-squared	0.14	0.14	0.10	0.09

Notes: + significant at 10%; * significant at 5%; ** significant at 1%; standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. All regressions include school-level controls (indicator for middle and high school, percent black, percent Hispanic, percent free lunch, average cohort size, and pupil-teacher ratio).

Appendix Table 1

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 (unit is 18 points)	0.045	0.036	-0.054	-0.019	-0.008
	[0.014]**	[0.011]**	[0.017]**	[0.006]**	[0.003]**
Percent black (unit is 25 points)	0.004	0.003	-0.004	-0.002	-0.001
	[0.011]	[0.009]	[0.014]	[0.005]	[0.002]
Percent Hispanic (unit is 24 points)	0.002	0.001	-0.002	-0.001	0.000
	[0.011]	[0.009]	[0.013]	[0.005]	[0.002]
Percent free lunch (unit is 26 points)	-0.050	-0.039	0.060	0.021	0.008
	[0.012]**	[0.010]**	[0.015]**	[0.005]**	[0.003]**
Average cohort size (unit is 133	-0.013	-0.010	0.016	0.005	0.002
students)	[0.007]+	[0.005]+	[0.008]+	[0.003]+	[0.001]+
Pupil-teacher ratio (unit is 3.2	0.016	0.013	-0.020	-0.007	-0.003
students)	[0.008]*	[0.006]*	[0.010]*	[0.003]*	[0.002]+
Middle school	-0.050	-0.039	0.060	0.021	0.009
	[0.012]**	[0.010]**	[0.014]**	[0.005]**	[0.003]**
Observations	4,937	4,937	4,937	4,937	4,937

Notes: + significant at 10%; * significant at 5%; ** significant at 1%; standard errors adjusted for clustering within respondents appear in brackets. All regressions employ survey weights. Reported coefficients are marginal effects from ordered probit regresesions. 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.

Appendix Table 2

Descriptive Statistics, By Whether Respondent Identified Local Elementary and Middle Schools

	All	Identified		
	Respondents	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	24%	3%	20%*	29%**
Homeowner	72%	58%	53%+	79%**
Number (unweighted)	3,251	345	447	2,459
Percent (weighted)	100%	14%	15%	72%

Notes: 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

Appendix Table 3

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 black (unit is 25 points)	-0.147	0.069	-0.094	0.031	-0.058	-0.043	0.015	-0.029	0.095
	[0.065]*	[0.124]	[0.059]	[0.055]	[0.057]	[0.085]	[0.046]	[0.050]	[0.070]
Percent Hispanic (unit is 24 points)	-0.123	0.037	-0.052	-0.003	-0.012	0.053	-0.002	0.019	-0.006
	[0.104]	[0.074]	[0.059]	[0.055]	[0.055]	[0.079]	[0.043]	[0.049]	[0.069]
Percent free lunch (unit is 26 points)	0.080	-0.160	-0.162	-0.143	-0.181	-0.252	-0.166	-0.145	-0.203
	[0.099]	[0.068]*	[0.052]**	[0.064]*	[0.056]**	[0.073]**	[0.048]**	[0.047]**	[0.080]*
Average cohort size (unit is 133	-0.009	-0.045	-0.030	-0.035	-0.054	0.036	-0.051	-0.046	-0.006
students)	[0.073]	[0.068]	[0.028]	[0.040]	[0.032]+	[0.053]	[0.027]+	[0.029]	[0.055]
Pupil-teacher ratio (unit is 3.2	0.134	0.156	0.022	0.021	0.083	0.036	0.069	0.085	-0.018
students)	[0.055]*	[0.067]*	[0.033]	[0.046]	[0.035]*	[0.065]	[0.032]*	[0.039]*	[0.036]
Percent proficient (unit is 18 points)	0.227	0.147	0.168	0.175	0.154	0.333	0.132	0.188	0.127
	[0.092]*	[0.107]	[0.066]*	[0.063]**	[0.073]*	[0.107]**	[0.050]**	[0.062]**	[0.081]
Middle school (0/1)	-0.209	-0.243	-0.168	-0.199	-0.151	-0.385	-0.145	-0.162	-0.229
	[0.111]+	[0.135]+	[0.046]**	[0.062]**	[0.053]**	[0.093]**	[0.045]**	[0.047]**	[0.091]*
State dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	624	725	3,327	1,886	3,051	976	3,961	4,122	815
R-squared	0.37	0.32	0.20	0.21	0.22	0.40	0.17	0.19	0.30

Notes: + significant at 10%; * significant at 5%; ** significant at 1%; 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.