When Schools Fail:
Policy Feedback in No Child Left Behind

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ABSTRACT: Do voters respond to school information provided in No Child Left Behind's school report cards? In this paper, I use a discontinuity imbedded in NCLB to measure the causal effect of school failure on voter turnout in school board elections. I find that failing schools increase voter turnout, with effect sizes consistent with other get out the vote interventions. NCLB's report cards appear to increase community involvement in schools. However, accountability signals also encourage less desirable behavior. Mobilizing effects are short-lived, with some evidence of repeated failure depressing turnout. And, when schools fail high resource parents vote with their feet and move out of the school. On the whole then, failing schools initiate important policy feedback that shift participation, but not always in desirable ways.

"We are transforming our schools by raising standards and focusing on results. We are insisting on accountability, *empowering parents & teachers*, and making sure that local people are in charge of their schools … We will leave no child behind." –George W. Bush[1]

When schools fail, do voters react? Communities have a powerful incentive to care about the local school's performance. When school quality deteriorates, homebuyers vote with their feet, gravitating en masse to areas with high quality schools. This behavior drives up housing values (e.g. Black 1999). Simply put, people prefer to live near high quality schools rather than low quality. But outside of moving, how do voters get what they want?

If a neighborhood school begins to fail, attentive residents have three options. They can move, they can do nothing and hope the school improves, or they can try to improve the quality of the school (Hirschman 1970). The first option may be unpalatable, as moving has high costs. And patience might be in short supply; doing nothing has the steep cost of losing

[1] 2004 Republican Convention Acceptance Speech, Sep 2, 2004; emphasis added.

additional housing value. Alternatively, incentivized individuals could get involved in improving the quality of the school. They can exercise voice.

Given a distinctive lack of traceability in the education system, people may struggle to find the optimal way to improve the school. On a local level, they could choose to volunteer at the school or give feedback to teachers and the principal. Alternatively, they could trace the problem, and solution, to district officials: participating in school board or PTA meetings. At a higher level, they could lobby federal or state lawmakers to divert resources towards the school.

As one ascends the school governance structure, participation options become more costly: requiring skills, networks, and resources that residents might not have. As a result, much of the participation may involve local or district officials. Among these less costly alternatives, residents could play a part in influencing and/or choosing the local school board.

School boards play an integral role in education reform. They influence schools by overseeing administrative, curricular, and resource-based decisions. These decisions are of critical importance, forming the basis of education processes in classrooms and schools (Ehrensal & First 2008). As such, school board elections play a fundamental roll in the education process. These elections tend to be close, further pushing individuals toward this venue for voicing their displeasure of school deterioration (Gerber & Green 2008, p. 2-3). Simply put, residents concerned with failing schools have powerful reason to focus their efforts on the local school board. This paper examines the extent to which this type of behavior occurs. In short, it examines whether failing schools influence the decision to vote in elections where school board officials are on the ballot.

When the neighborhood school fails, should we expect voters to turnout? We know that in many situations citizens are woefully incapable or unwilling to engage in political

processes (Converse 1964; Zaller 1992, Popkin 1994; Delli Carpini & Keeter 1996; Mettler 2011). A lack of pertinent information certainly restricts participation and democratic accountability. However, retrospective citizens directly affected by education policy may buck this trend (Schneider et al. 1997; Hastings et al. 2005; Kisida & Wolf 2010).

Certainly, well-designed public policies have the potential to mobilize previously unengaged citizens. Policy feedback occurs when policies move political behavior. Scholars studying in this area have documented numerous instances where this has occurred, including responses to military (Mettler 2004; 2005a; 2005b; 2005c; Teigen 2006; Erikson & Stoker 2011), entitlement (Pierson 1992; Soss 1999; Soss & Schram 2007; Campbell 2002; 2003; 2011), health (Campbell 2011), and education (Rangazas 1995; Hastings et al. 2005; Sondheimer & Green 2010; Solis, working paper) policies, to name a few. Depending on how governments publish school failings, citizens may alter their subsequent political behavior (Jacobsen et al., working paper). However, whether or not No Child Left Behind's (NCLB) mandate for state governments to publish the pass/fail status creates policy feedback is an open question.

Signed into law on January 8, 2002, the No Child Left Behind Act significantly shifted U.S. education policy. Its desired effect was to raise student achievement above certain thresholds, across various student subgroups, by the year 2013-2014. NCLB sought to achieve this ambitious goal through a system of test-based accountability. This system has two primary

policy levers.[2] First, NCLB required a rigorous system of standardized testing and sanctions for schools that didn't meet certain performance thresholds. This first accountability channel has been explored extensively, with scholars heavily disputing the effect of NCLB sanctions. Some argue that test-based accountability distorts behavior in schools and has little effect on achievement (Figlio & Winicki 2005; Ladd 2007; Figlio & Ladd 2008). Others hold that NCLB has had moderate impacts on student achievement, while having minor distorting impacts (Ahn & Vigdor working paper; Dee & Jacob 2011).

Second, NCLB published the performance of schools on these tests, in hopes that it would motivate parents, policy-makers and the community at large to become more involved in reforming local education systems. The text of the No Child Left Behind Act repeatedly mentions involving parents and communities as a means of "improving student academic achievement and school performance" (NCLB 2002, Sec. 1118 (2)(A)).[3] President George W. Bush, campaigned on this component of education reform, repeatedly stating that he "support[ed] empowering parents with information by requiring states to publish school-by-school report cards with annual test results".[4] The president, and his contemporaries, envisioned a system of increased citizen-driven education accountability. They were hoping for policy feedback.

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[2] The NCLB act is a long bill with many provisions. The third most prevalent policy lever could be thought of as raising the quality of teachers.
[3] A simple text search of the NCLBA reveals that parents are mentioned on just under 50% of the pages, with "parental involvement" being mentioned on 20%.
[4] GeorgeWBush.com: 'Issues: Policy Points Overview', Apr 2, 2000

Were their aspirations realized? While debate on the first accountability channel is prevalent, debate over the effect of NCLB's second policy is virtually non-existent. This paper examines the extent to which NCLB's revealing of failing schools moves communities to get more involved in the education process. In particular, I focus on voters' propensity to turnout at school board elections when NCLB labels their school as failing. To answer this question causally, I use discontinuities imbedded in No Child Left Behind (NCLB) to measure the effect of school performance on voter turnout among the mass public. Such an approach examines the voter-school interaction among schools close to the arbitrary cutoff of passing or failing adequate yearly progress (AYP). This approach is robust to possible confounders or reverse causation. To my knowledge, this is the first paper to leverage causal methods to shed light on the effectiveness of NCLB at stimulating citizen-led accountability.

I find that failing schools cause individuals to vote at higher rates in school board elections[5]: NCLB influenced the voting patterns of mass publics. Effect sizes are consistent with other GOTV interventions, with important sub-group heterogeneities. However, such effects do not last, with perpetually failing schools eventually depressing voter turnout. Individuals do respond to failing schools, however perhaps not always in the way that policymakers intended. Still, NCLB initiated a significant policy feedback process that noticeably shifted participation.

[5] Or more accurately, if they showed up in elections where a school board race is on the ballot. I cannot tell if individual voters actually voted in the school board election when it was on their ballot.

II. NCLB, Creating Policy Feedback?

Generally, how do we think about the potential for policies to build voice? Scholars studying *policy feedback* have devoted considerable attention to this question. When policies impact civic capacity, political mobilization and social capital, we call it *policy feedback.* "New policies create new politics" as Schattschneider put it (Schattschneider 1935, p. 288). While this framework seems straightforward, the question remains why policies move political behavior. At first glance, policy feedback may be unanticipated, resulting from policy effects on unintended outcomes: not all policies specify citizen engagement as a specific policy goal (Mettler 2005). Still, policy feedback occurs as a result of policy design, independent of explicit intent.

Policies shift *resources, incentives, information, and interpretations* (Pierson 1993; Mettler 2004). Figure 1 displays the formal theoretical model of policy feedback.

[Figure 1 Here]

Given the fundamental forces in creating policy feedback, ex-ante would we expect NCLB's failing schools to produce higher levels of mass participation? Theoretically there are both reasons for both optimism and skepticism. No Child Left Behind's provision of failing schools possesses several key components that would lead us to believe that policy feedback would occur. But, it's key provisions are may lack key components to create the desired mobilization.

NCLB could influence political behavior by providing *information.* This may be the

easiest mechanism to understand and the most fundamental to the policy design of NCLB.[6] Policies may fill information gaps, solving delegation problems in principal-agent settings. Information may promote evaluation, increasing the level of accountability between individuals and their government (Pande 2011). In many states before NCLB there was a glaring information gap in the performance of individual schools. Some information existed, but this information was sporadic, aggregated, and informally dispersed. NCLB provided a large-scale information shock about the performance of individual schools. Did this information mobilize parents and communities?

What can we learn from previous work regarding NCLB's potential power to mobilize? Previous work yields conflicting reports. Some information experiments or quasi-experiments, primarily in international contexts, have shown that information can mobilize, change preferences, and substantively alter the behavior of the state (Ferraz & Finan 2008; Banerjee et al 2010; Chong et al 2010). These scholars argue that information can help citizens hold government accountable (Pande 2011). Perhaps we can extend these lessons to the NCLB context. However, experiments within the United States have found strikingly different results. Information experiments stripped from emotive appeals, personal contact, or social pressure find little mobilizing power in raw information provision. Green and Gerber, authors of many of these studies have concluded, "mobilizing…is not just a matter of putting …

[6] One of the reasons NCLB was passed was to provide parents, and communities with the information necessary to hold schools accountable. To many in the policy-making community, these vested individuals are thought to be the "catalyst" behind improving school performance (McDonnell 2004).

information in front of [individuals]" (Gerber & Green 2008, p. 137). Viewed in light of this literature, we may expect little from NCLB's information provision.

NCLB's information may be *visible* enough to create policy feedback. State, media, Internet, and home-buying networks may combine to form the dispersion mechanism of schools' performance. A small, but growing literature has shown that individuals pay attention to school performance data when presented with it (Charbonneau & VanRyzin, 2012; Jacobsen et al., working paper). While these findings are promising, there are reasons to be skeptical. Despite numerous efforts, many individuals remain naïve to the nearby school's performance. They may only respond if specific interventions go above and beyond the normal channels for distributing school performance (ala. Charbonneau & VanRyzin, 2012).[7] Left to their own devices, individuals are notoriously naïve when it comes to policy (Converse 1964; Delli, Carpini & Keeter 1996; Mettler 2011), perhaps blunting NCLB's mobilizing power. And knowing and acting are two separate phenomena. In short, whether NCLB's provision of *information* mobilizes is unclear. Though NCLB's information provisions alone may be insufficient, when combined with other forces it can substantially move behavior.

Information is not the only mechanism that could spur a policy feedback process. In addition, the policies put in place by NCLB may encourage engagement by shifting *incentives*. Incentives define alternatives available and create inducements to make particular

[7] Their study examined parents' subjective evaluations of schools when school performance was distributed in a one-shot, large-scale survey.

choices (Pierson 1993). Incentives create the environment for human behavior to develop. One of NCLB's primary policy levers was a sanctions-based incentive system. Schools that fail to make AYP have substantial incentive to improve; they are punished if they do not. This system is independent of additional resources from Federal and State sources. It is distinctly an incentives-based system. Given these school-level incentives, and a lack of substantial additional resources, mass-publics may be recruited to participate by individuals with vested interest in the performance of the school. Given no other options, principals may reach out to community members to elicit their support in hopes that increased social capital will raise achievement scores (ala. Freitag 2007; Putnam 2001, 2007). Numerous studies have indicated that parent-community-school partnerships are often forged as an improvement strategy, despite their mixed results (Epstein et. al 2001; Curto, Fryer & Howard 2011; Fuhrstenberg 2011). This participatory outreach may spillover across participatory venues: from volunteering in the school to voting in school board elections. However, *incentives* may not mobilize. Parents may see sanctions as a substitute for their involvement.

In addition, No Child Left Behind shifts *resources*, albeit indirectly. *Resource* constraints are often cited as reasons for obstructing political involvement (Brady, Verba, Schlozman 1994; Plutzer 2002). Resource constraints may influence transportation, residence, and social networks: all factors in the decision to vote (Brady & McNulty 2011). If citizens are given additional resources through a policy intervention they may engage more: policies allow participation for the willing but unable. They motivate citizens to get involved.

No Child Left Behind diverted very little additional direct financial to states and schools (Peterson & West 2003), and very little of this likely trickled down to individuals not in the school system. Still, NCLB transfers resources through a powerful indirect channel to those inside and out of the school system. NCLB may substantially move housing values. Previous research has indicated that individuals prefer to live in areas close to high performing schools. No Child Left Behind's accountability system provides a statewide system for distinguishing between high and low performing schools. Given a codified system, homeowners may experience shifts in their home equity (e.g. Black 1999; Caetano 2010). Given this potentially large resource shift, mass-publics in failing school areas may be mobilized. This may particularly be the case if area schools are only marginally failing.

Finally, No Child Left Behind may facilitate participation-shifting *interpretations*. Interpretations provide "a toolkit of symbols and arguments that actors use in their efforts to assemble meaningful interpretations of the world around them" (Pierson 1993). People's evaluations of government policy go beyond simple benefit-cost analysis. They attach meaning and affect with specific government activity. Soss has argued that individuals on TANF learn the broader attributes of government, perhaps incorrectly, by their individual experiences with welfare caseworkers (Soss 1999). These beneficiaries are demobilized by the negative messages conveyed by the intrusive, arbitrary, and confusing process of obtaining government assistance.[8]

[8] Conversely, others have documented instances where government policy conveyed positive meaning to individuals and groups, which fed-back into their subsequent engagement (Campbell 2002; Mettler 2004)

Beyond NCLB's effect on resources, incentives, and information, the law provides the establishment of mutually recognized, *simple* to interpret signals. NCLB groups schools into "pass/fail" dichotomies. The "pass/fail" dichotomy is almost universally recognized, prevalent across many contexts, and reacted to more than other similar information formats (Jacobsen et. al, working paper).[9] It comes with a certain stigma, which may play a key role in components of the test-based accountability systems (e.g. Rouse and Barrow's response to Peterson & West 2006. See Rouse & Barrow 2008, p. 34). However, feedback doesn't always produce its intended affect (Dweck & Mueller 1998). Perhaps this negative affect spurs political participation: people don't like failing, and work hard to avoid such a label. Perhaps not (Jacobs & Weaver 2010). This type of reaction may be contingent on the *traceability* of the negative signal.

Traceability is the recognition and attribution of government policy. Given limited cognitive ability, individuals may only be moved by policies they recognize and attribute to a certain government body (Pierson 1993; Campbell 2011; Mettler 2011). Within a schooling context, even if individuals know that their school is failing, they may not know whom to hold accountable. Individuals may be motivated to act politically, but not know how to do so. They may ask: who is at fault when a school fails? Answering that question is complex. Concerned citizens have multiple levels to attribute blame, including teachers, principals, school boards,

[9] This study showed evidence that the pass/fail description moved subjective evaluations more than other comparable data formats.

state bureaucrats, members of Congress, etc. Given the difficulty of seeing political behavior at some of these levels, policy feedback might be stunted.

From a theoretical perspective, there are reasons to suspect that NCLB produces policy feedback; that individuals pay attention and react politically when a nearby school fails. NCLB may provide necessary *information,* shift *resources,* and produce *incentives* sufficiently to produce a feedback effect. However, *visibility* and *traceability* remain theoretically problematic. Without empirical investigation the effect of failing schools on political behavior is ambiguous. Only rigorous, causal hypothesis testing can come to a definitive answer.

III. Data

This paper uses publically available data from the North Carolina voter file and the state's Accountability Services Division within the state Department of Education to answer whether failing schools mobilize mass publics. Table 1 provides summary statistics across the two data sources.

[Table 1 Here]

Since the data from these two sources are at different levels and don't naturally "fit" together cleanly, I describe both in detail here. The first part of the data was collected from the North Carolina voter file. The state's voter file contains information about individuals' voting history along with individual addresses, school district assignment[10], and a variety of demographic factors.[11] Individuals' voting history is the primary dependent variable in my analyses. In the voter file, I <u>do not</u> restrict the data to individuals with children in schools. I examine the broader voting patterns of all registered voters. I <u>do</u> restrict voting to elections in

[10] But not individual school assignments
[11] Including race, age, party-identification, and gender.

which a member of the school board was on the ballot.[12]

North Carolina school boards hold elections every two years, at varying times during the year. Elections are either held during the May even-year primary, November odd-year municipal, or November even-year general election. Districts consistently fall within one of these categories over the time period I explore. Because of this variation, school board races occur in a variety of electoral contexts.[13] Table 2 documents these contexts, along with information on my second data source: school performance.

[Table 2 Here]

The second part of the data was collected for all available schools from 2004-2011. These data comprise the primary independent variable in my analyses. Under reforms enacted with the passage of NCLB, states are required to publically report school-level performance data. The metrics mostly consist of student test scores, but also include attendance (in elementary and middle schools) and graduation rates (in high schools). Schools are required to report all metrics for 10 sub-groups.[14] Schools' performance in these subcategories determines whether or not the school meets adequate yearly progress (AYP). AYP is achieved if all subcategories surpass state-set arbitrary proficiency standards.

If schools fail to meet AYP for two consecutive years, they enter into a graduated

[12] I use "school board election" and "election with a school board race on the ballot" interchangeably.
[13] Something I explore in the results section.
[14] Subgroups include: All students, American Indian, Asian, Black, Hispanic, Two or More Races, White, Economically Disadvantaged, Limited English Proficiency, and Students with Disabilities. Schools having 40 students enrolled in the sub-group categories being required to report results. The required metrics for the 10 sub-groups can be viewed here: http://www.ncpublicschools.org/accountability/reporting/aypresults

system of sanctions. In the first sanctioned year, the school must offer intra-district transfers. However, few students take advantage of this option. In the next failing year, schools must offer supplemental education services (SES). SES include tutoring services to low-income students. Following these relatively light sanctions, the sanctions increase in severity. The third failing year requires corrective action, which includes changes to staff/leadership, curriculum, instructional time, or the appointment of outside advisors. In subsequent years, schools must design, submit, and execute a restructuring plan. These include: converting the school to a charter, replacement of the principal and most staff, state takeover, contracting with another entity to manage the school, or similar major change to school governance.

School and voter data are collected at different levels. The unit of observation in the voter file is the individual, and the unit of observation in the accountability data is the school. In order to fit the two data sources together, voters were matched to the school that the minimized Euclidean distance between the voter and a public school.[15] The matching process did not separate elementary, middle, or high schools; all were matched to the most proximate school.[16] And individual voters could be matched to any public school that reported NCLB school performance.[17] This matching process was relatively efficient, with 96.4% of voters in the voter file being matched to the school closest to their address.[18] There was no difference in match rates across passing and failing schools.

The advantage to this matching approach is that it links school performance with actual

[15] Euclidean distances are measured as one would measure with a ruler: "as the bird flies".
[16] Future iterations of this paper will include separate matches to school type.
[17] As public schools who fall under NCLB criteria, Charters are included.
[18] Unfortunately, this matching strategy could not be cross-validated with official school-address assignments. The state has relatively little involvement in determining school assignment, aside from drawing district boundaries. School assignment is primarily determined at the district level. With more than 100 districts, virtually 100 school assignment procedures exist. All districts draw maps that determine school assignment by address. However, the availability of these maps varies substantially across districts.

voter behavior, something not done previously. Previous work has focused on matching school performance to survey responses, focusing on self-reports rather than actual behavior (Chingos et. al. 2012; Jacobsen et. al., working paper). My strategy gives us a richer picture of the effect of school performance and citizen voice. The disadvantage to this matching approach is that some matches are more accurate than others. The proximity process matches voters to their *assigned* school better when individuals do not live near school boundaries. Though this is problematic, aligning some voters to schools that they are not assigned, it matches with the general research question outlined in previous sections. Individuals, be they parents with children in school or citizens without children, may look to the "neighborhood school" in determining whether to get involved by voting in school board elections. This neighborhood school need not be the school that individual voters are actually assigned to, but may be a school close by that represents that voter's depiction of how schools are doing in their area. This matching strategy fits a world in which voters are semi-informed, often voting based on limited or flawed information. In accordance with my matching strategy, voters may pay more attention to the proximate school than the one that they are assigned.

IV. Methods

Estimating the relationship between school performance and voter behavior is likely confounded by a number of factors, some difficult to observe. A complex web of institutional, community, and individual factors may influence voter turnout and education performance, thus biasing naïve models that relate the two. Formally modeling all these factors is a daunting task. And signing potential biases from the interrelated factors may be impossible. In lieu of controlling for a complex array of variables, I use the arbitrary nature of sorting schools into passing or failing categories. Sufficiently close to the line of treatment, observations are separated primarily by exogenous shocks, allowing us to establish treatment and control groups

separated only by local randomization (Butler & Butler 2007). Regression discontinuity leverages this fact, using data points close to the arbitrary cutoff to model the effect of treatment. Under modest assumptions, RD models produce a local average treatment effect that is free from omitted variable and simultaneity biases (Nichols 2007).[19] Though unbiased, the results outlined below are local estimates: having validity only close to the AYP threshold.[20]

Within the education context, schools close to failure are sorted into treatment or control groups based on trivial factors outside the control of schools and individuals. In large samples potential confounders (be they institutional, community, individual, etc.) are balanced at the margin (see Table 1). In this paper, I use the arbitrary nature of NCLB's proficiency cutoffs to run regression discontinuity (RD) models. This method allows me to estimate the causal effect of poor school performance on voter turnout.

In this paper, treatment consists of missing AYP (being a failing school).[21] Figure 1 shows the distribution of performance mapping AYP status for all schools in the 2009-2010 year along with a year-by-year summary of school performance.

[Figure 1 Here]

Schools pass AYP when they meet *all* arbitrarily set test-score thresholds for 10 different subgroups.[22] Schools meet arbitrarily set proficiency thresholds for each of the subgroups

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[19] This method has long been available to researchers (Thislethwaite & Campbell 1960), but has only recently grown in prominence recently within political science (Lee, Moretti, & Butler 2004; Butler & Butler 2007; Hainmueller & Holger 2008; Lee 2008; Ferraz & Finan 2008).
[20] This is an inherent weakness of all RD models.
[21] I also look at failure followed by sanction if the school is in the second consecutive year missing AYP
[22] Subgroups: all students, White, African American, Hispanic, Asian, American Indian, two or more races, economically disadvantaged, students with disability, limited English proficiency. Subgroups are measure in both math and reading. If fewer than 5 students are categorized in each subgroup in a school, that school is exempt from reporting test scores in that group.

through three *channels*. First, schools can pass if their score, for all student subgroups, simply exceeds the overall proficiency *level*. Second, schools pass if their school is *proximate* to the threshold.[23] Finally, schools can pass if they exhibit sufficient *growth* from year to the next. If one of these channels places the school above the proficiency threshold, the school passes. If one of the channels does not push the school above the arbitrary proficiency threshold, for all subgroups, the school fails. Table 3 provides an illustration of this process.

[Table 3 Here]

For the RD models, I must establish not only whether schools fail but also how close they are to doing so. With 10 subgroup categories[24] and 3 channels of passing, identifying the running variable is no small task. To do so, I use a procedure similar to that developed by Ahn and Vigdor (Ahn & Vigdor, working paper). Their procedure identifies both a *channel* and a *subgroup score* to classifying proximity to failure. The intuition behind their procedure matches the codified rules which identifying school failure. Table 3 is a valuable reference point for understanding how the running variable is established.

The *channel of passing* identifies how close the school is to passing within a subgroup. The decision rule [D1] for choosing the *channel of passing* is:

> [D1] *If one or more channels indicates passing AYP, choose the channel of passing furthest above the threshold. If all channels indicate failure, choose the channel closest to the threshold.*

The intuition behind the decision rule for *channel of passing* is that if any one channel places the school above the threshold, that subgroup is marked passing under NCLB's provisions. The channel that produces the highest score identifies how far a school would have

[23] Termed passing with confidence interval.
[24] In 2 subjects: math and reading.

to deteriorate to not pass on at least one channel within the subgroup. Similarly, if all channels are below the threshold, the closest channel to the threshold represents the most likely way the school could achieving a passing score.

The *subgroup score* identifies one of the subgroup categories to decide overall proximity to failure. The decision rule [D2] for choosing the *subgroup score* is:

> [D2] *If thresholds are met for all subgroups, use the subgroup closest to the threshold. If all thresholds are not met, use the subgroup difference furthest below the threshold.*

The intuition behind choosing the *subgroup score* is analogous to the channel of passing. If any subgroup score falls below the cutoff, the school fails AYP. Passing schools are most likely to fail if their closest subgroup score falls below the threshold. If schools are failing, passing occurs only once all subgroup categories are brought above the threshold. The furthest subgroup score approximates how far a failing schools has to go to pass.

The Ahn/Vigdor specification of the running variable is not the only way to identify proximity to failure. One could imagine approaches that average the various channels of passing and subgroup differences or that choose the metrics closest to the discontinuity.[25] However, the Ahn/Vigdor approach best sorts schools into the correct pass/fail groups, correctly identifying 60-80% of schools.[26] This allows the models to be run with the least amount of fuzziness: preserving the largest jump in the probability of treatment at the margin. Figure 2 illustrates this jump graphically.

[Figure 2 Here]

Fuzzy RD is required, as schools are not perfectly categorized as passing or failing by the running variable. However, this is of limited threat to the validity of the estimates (Angrist &

[25] Other ways of specifying the channel of passing and subgroup gap yield similar results to those discussed below.
[26] Depending on the bandwidth used.

Pischke 2008). Fuzzy RD uses standard IV methods to adjust for non-compliance.[27] Functions [1] and [2] show the general form of the fuzzy RD models, as estimated in a two-staged procedure, with each variable indexed *i* for school and *t* for year.

[1]

[2]

To correspond with the data matching process (described in the previous section), the dependent variable in function [2] is indexed at time T+α, with the distance in time between the independent and dependent variables varying across election context.[28] In the first stage, function [1], the treatment variable *Failing School* is instrumented by the running variable (proximity to failure) and the failure rule (*T*). *T is* a binary variable, which takes a value of 1 if the running variable indicates failure. The second stage estimates the instrumented effect of Failing School on Voting: the TOT.[29] Estimating the true effect of school failure on voter turnout requires two modeling decisions. First, getting the functional form of the model. Getting this correct is of upmost importance. If the functional form is misspecified, non-linear relationships can be mistaken for discontinuous jumps. To account for such a possibility, I fit a quartic polynomial RD model.[30] Second, using the correct bandwidth of data around the cutoff. To adjust for this,

[27] Non-compliance is in place because of imperfect treatment categorization by the running variable. It is not because schools dodge failure if they are supposed to fail.
[28] α=4 months (general & municipal elections) or α=10 months (primary elections).
[29] Results are robust to more complicated instrumenting procedures, such as interacting *T* with the running variable.
[30] Results are robust to the modeling of the running variable.

my models are run across a variety of bandwidths.[31]

In order to correctly estimate the standard errors in function [2], an adjustment for clustering within schools is made. Remember, treatment is administered at the school level, with voting occurring at the individual level. When treatment is administered in this way, individual-level voting behavior is correlated within clusters. Without an adjustment, standard errors would be underestimated. In order to adjust for the clustered nature of the data, I take two approaches. For most models I collapse the individual voter data to the school level, and weight according to the number of voters within the school zone. Hence, *Voting* is a continuous variable representing voter turnout within in a school zone. However, in several models, I leave data at the individual level, making *Voting* a 0/1 variable. In these models I cluster at the year-school level using Moulton's correction for large clusters (Angrist & Pischke 2008).

V. Specification Checks

If the assumptions of RD hold, the estimate for Failing School (β_1) will be unbiased by confounders or simultaneity. Close to the arbitrary cutoff individual schools are separated, on average, only by exogenous shifts (Butler & Butler 2007). Put another way, schools fail randomly within a narrow bandwidth. They are distributed in an as-good-as random

[31] To be thorough, I include estimates across a range of bandwidth values in the running variable. Bands reflect the range of data included in RD models. Model results are often sensitive to bandwidth selection. To incorporate this the traditional approach is to use the optimal bandwidth calculation of Imbens and Kalyanaraman (2009). This approach is designed to minimize MSE. However, this approach is not canonical, and RD model results are often sensitive to bandwidth selection. To reflect this, I report results over a broad range of bandwidths (Nichols 2007). Generally, my results are robust across a variety of bandwidths, with extremely narrow bandwidths lacking data support to come to firm conclusions about coefficients estimated.

fashion.[32]Thus, the interpretations of coefficient estimates are similar to that in a randomized-control experiment.

Though the arbitrariness of a cutoff cannot be tested formally, a couple of checks are illuminating. First, no previous research identifies the specific cutoffs as being substantively meaningful. The threshold for individual schools is sufficiently precise so as to allay any concern that the threshold itself had any substantive meaning. For example, for elementary schools during the 2010-2011 school year the AYP cutoffs were 71.6% of students passing in reading and 88.6% percent in math. These specific numbers have little meaning independent of their distinction as the pass/fail level.

Second, if observable traits are relatively balanced at the cutoff, we can reasonably infer that the cutoff is arbitrary. By this specification check, the threshold for individual schools was arbitrarily set. Table 1 (shown earlier) provides evidence that failed schools, and matched voters, were remarkably similar at the pass/fail margin. Figure 3 is complimentary to Table 1, plotting some potential confounders at the margin. Several possible confounders are balanced at the discontinuity. Importantly, lagged voter turnout is balanced at the margin. Before failing schools failed, they had similar baseline levels of voter turnout. In addition to the controls I

[32] Though this assumption is inherently untestable, validity tests exist to lend support or oppose. If schools cannot perfectly manipulate the running variable or do not know the cut-off, then the distribution of the running variable should be smooth across the distribution (Chen and van der Klaauw, 2008; Lee, 2008; Lemieux and Milligan, 2008). If there is jump in the running variable at the discontinuity point, it is possible that school manipulation (perhaps through school cheating) is occurring. McCrary developed a specification test along these lines to check the continuity of the running variable at the discontinuity (McCrary 2008).

show, Ahn and Vigdor show that the percent of students who are free-reduced price lunch, limited English proficient and minorities in the year of failure is smooth across the NCLB discontinuity (Ahn & Vigdor, working paper). Together, this provides strong suggestive evidence that the pass/fail discontinuity establishes local randomization. Such results lend support to using RD as a means to analyze the impact of school performance on voter turnout.

[Figure 3 Here]

Finally, figure 4 provides another empirical check on the arbitrariness of the cutoff and of potential manipulation of the running variable at the discontinuity. It shows McCrary's test for a discontinuity in the running variable. For some specifications of the running variable, there is a cluster of schools just above the pass/fail line.

[Figure 4 Here]

This cluster of schools suggests that some schools were able to identify the level of effort necessary to pass, and manipulate their test scores to make it just above that level. However, this may be an artifact of the way the running variable is specified. The cluster of schools disappears when the running variable is specified as the average subgroup score. And if I break down the specification test by year, most of the years satisfy McCrary's suggestive conditions; with no clear pattern of schools increasingly being able to game the system over time.[33] More often than not schools are distributed equivalently at the discontinuity threshold (Ahn & Vigdor, working

[33] My results are robust to whether the unbalanced years are included or left out. It does not appear that my results are biased by rampant manipulation of the running variable, if there is any. The results reported below include all years to increase precision.

paper).

In total, there is little evidence that the cutoff is not arbitrary, the covariates unbalanced, or test scores susceptible to rampant manipulation. The specification tests outlined here lend support to the use of RD as a means of obtaining unbiased estimates of the causal effect of school failure on voter turnout.

VI. Results

When schools fail, voters take notice, and their voting behavior is changed. Coefficients displayed in table 4 are estimates of β_1 in function [2].

[Table 4 Here]

Generally speaking, having a failing school nearby causes an increase in voter turnout of about 2.2% (estimates range from about 2-3%). Though this effect size seems substantively small, it is likely a conservative estimate, shields substantial heterogeneities, and is in line with effect sizes from previous GOTV studies. Figure 4 shows this relationship graphically. Figure 5 is a stylized version of function [2]. For visualization purposes, it shows the linear fit of bin averages across the running variable. However, higher order specifications yield similar results.

[Figure 5 Here]

At the margin, the effect size is robust to model specifications. And the definition of the margin appears to have little effect either. Figure 6 shows the effect of a failing school on voter turnout across a variety of bandwidths, for both the Ahn/Vigdor and average specficications of the running variable. Lack of significance in the narrower bandwidths may simply reflect a lack of

power in the narrow range of the running variable. Overall, it appears that I cannot reject my hypothesis; there is substantial evidence that voters turnout at higher rates when they are exogenously placed near a failing school.

[Figure 6 Here]

VII. Confounded by Exit?

My estimates indicate that failing schools moderately increase voter turnout in elections involving a school board race. However, when individuals receive a signal that their school has failed, they could choose to vote with their feet rather than voting at the ballot box. This behavior could drive or confound my results. The extent and attributes of movers determine the nature of the bias moving introduces to the school-voter relationship. If we can identify the type of individuals who move when a school fails, we can sign the bias introduced to the relationship between school failure and voter turnout. Table 5 illustrates this with a simple table.

[Table 5 Here]

If high propensity voters (high income, education, etc. ala. Verba, Brady, & Schlozman's high resource individuals) move to passing school zones when their school fails, my estimates would be biased downward. More high propensity voters in the control group (passing schools) would inflate their turnout numbers in subsequent elections, thus narrowing the effect size of failure on turnout. Conversely, if low propensity voters move from failing schools to passing schools I would overestimate my effects. This second type of behavior would be particularly

troubling. As it is unclear a-priori which type of movement occurs[34], I turn to alternate models to describe who moves when a school fails.

First, how often do voters move when a school fails? There is some evidence that moving occurs after a school fails. Table 6 illustrates the effect of school failure on the number of registered voters in the school zone in the election after the school fails.

[Table 6 Here]

Table 6 indicates that when schools fail, individuals move. Depending on the model used or what the school has at stake with the next failure (sanctions or not), failing schools decrease the number of registered voters in the next election by a few hundred.[35] Some models lack statistical significance at traditional levels, however, generally the models indicate that when schools fail, some voters notice and vote with their feet.[36]

But, who moves? Regardless of net changes there may be bias introduced by the nature of the voters who move. In the voter file it is difficult to sort out who moves and who stays. Individuals may choose to leave their registered address the same when they move, confounding the possibility of looking at mover type using the voter file. Instead, I turn to descriptive characteristics of individuals enrolled in schools a year after school failure. This data

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[34] It is possible that high propensity voters are more likely to move when there school fails. Or, high propensity voters may send their children to a private school rather than moving. Low propensity voters (being generally low income individuals) may not have this option, making them more likely to move.

[35] The mean number of registered voters in a school zone is 1,153 with a standard deviation of 5,300.

[36] The number of voters also decreases, ruling out the possibility that an increase in turnout is an artifact of a lower denominator only.

is furnished through the North Carolina Education Resource Data Center (NCERDC) housed at Duke University. This data provides demographic and socioeconomic characteristics of all students enrolled during the period I study. Though this does not document the full population I examine in the voter file, it overcomes limitations in the voter file.[37] And it gives us a rich understanding of who moves when a school fails.

Table 7 shows estimates for the effect of school failure on a pair of school composition outcomes: parental education level and student free-reduced price lunch status.

[Table 7 Here]

When schools fail, the next year there are fewer students who have parents with a college degree. This result is robust to model specification, though the effect size varies somewhat. Overall, when schools fail they lose about 10-25% of their highly education parents the next year. In addition, when schools fail, wealthy parents exit. The year after failure, schools are comprised of 7-10% more students on free-reduced price lunch. This effect is somewhat sensitive to model specification. Overall, these results indicate that when schools fail, high propensity voters (Verba, Schlozman, Brady 1994) move.

In sum, there is reason to believe that my estimates are biased downward. When

[37] This assumes that if movement in the broader population occurs, we would see similar patterns in movement among those enrolled in the school. While I cannot test this assumption, analogous models to those run in Table 6 were estimated using the total number of students in the school as a dependent variable. When a school fails, the number of students enrolled slightly declines, mirroring the overall moving trend found in the voter file. This provides suggestive evidence that movement in the general population can be picked up by looking at movement from the school.

schools fail, those who have more education and income exit. This result aligns with previous work indicating that individuals with a high propensity to vote might also have a high propensity to move (Hirschman 1970; Verba, Brady, Schlozmann 1994). Since this seems to be the case, and little evidence points towards low propensity voters doing the moving, my estimates are likely underestimating the true effect of school failure on voter turnout. If anything, failing schools mobilize voters more than a 2-3 point bump suggested in the previous section.

VIII. Treatment Heterogeneities

In establishing a relationship between failing schools and voter turnout, electoral context could matter. School board elections in North Carolina occur at three times: during odd year Municipal Elections, even year Primaries, and even year Generals. Across the electoral context, effect sizes vary greatly. Table 8 illustrates this point.

[Table 8 Here]

Ex-ante, general elections may seem like the least likely time to see effects, with school-quality being muted by myriad other issues. We might expect failing status to influence voter turnout most in municipal elections, where campaigns focus on more local issues. However, when aggregated together, effect sizes are largest in even year general elections, moderately smaller in primaries, and smallest in municipals. At first glance this may seem puzzling. What drives this phenomenon? When broken down individually, municipal elections have quite a bit of heterogeneity. Municipal elections see the largest positive coefficient sizes with 3-point bumps in turnout in 2005 and 2009. However, negative effects in

other years mask these effects.

The general election effect appears to be driven almost entirely by the 2004 General Election. This election was held while NCLB was in its formative years. School sanctions were only beginning, with the 2004-5 school year being the first for failing schools to be held accountable. Most communities had only begun to receive signals that schools were failing and being punished. In addition, education was a highly salient issue in the President Bush's re-election. Compared to other elections, the context surrounding 2004 made failing schools a highly salient issue. This effect diminished over time, with campaigns focusing on other issues[38], and voters having received multiple signals of the neighborhood school's performance. This general pattern also occurs in municipal and primary elections: in both election types largest effect sizes tend to be found in earlier years, with effects sizes diminishing over time, and sometimes becoming negative. This pattern has been observed in other policy feedback studies (Campbell 2003, ch. 7).

Effect heterogeneities also exist across a variety of demographics. The overall effect is driven by treatment response among females, blacks, democrats, and certain age groups. Effect sizes within these groups tend to be around 4.5-5.5%.

[Table 9 Here]

As the results in Table 9 are collapsed to the school level, demographic heterogeneities are

[38] 2006 was largely a referendum of President Bush's performance (Jacobsen 2007). 2008 was similar with focus on the flailing economy and conflict abroad. In 2010, campaigns focused largely on President Obama's performance with the economy, deficits, and healthcare.

expressed as averages within a school cluster. Thus, the results in Panel A are interpreted as effects within areas whose voter enrollment is comprised of high numbers of females, blacks, democrats, etc. Heavily populated areas are defined as areas having populations ½ σ above the mean composition. The results are generally not sensitive to this arbitrary decision. In addition, the results are not sensitive to individual-level models, which cluster at the school level.

In addition, voters respond to failing schools differentially across age, with largest effect sizes when average age in a school cluster is between 35-50 or 55-65. This may coincide with a life-cycle type treatment response, particularly for voters with children (Verba, Brady, Schlozman 1995). Voters within the 35-50 group may be responsive to failing schools, as they have children enrolled in schools. Voters within the 55-65 group may be responsive to failing schools, as this is when children leave the house and/or homes are sold coinciding with retirement.[39]

VIIIA: Heterogeneities- Do Feedback Effects Perpetuate?

Contrary to previous education policy feedback studies (Hastings et. al 2005), there is a distinct time component to the failing schools treatment.[40] School-voter clusters can experience failing continuously year after year, or they may exit failure. Table 10 shows the effect of perpetually failing schools, those that remain and progress through the sanctioning

[39] This conclusion is robust to different average age groupings. The current decision was made with data support at the discontinuity in mind.
[40] Other feedback studies have identified that policy feedback is contingent on previous experience with public policy (see Mettler 2005).

system.[41] In short, Table 10 shows that the positive mobilizing effect of a failing school does not persist if a school repeatedly fails.

[Table 10 Here]

In the overall model, schools that make it above the restructuring sanction level (meaning they failed for at least 6 years without two consecutive passing years) experience school board turnout that is 22% lower than comparable perpetually failing schools that pass. This phenomenon is generally observed across demographic subgroups. Most of the coefficients in later years are negative, however data support in these two-way heterogeneities may be lacking to achieve statistical significance.

If schools perpetually fail, the positive turnout effect of a failing school appears to disappear, and in most instances become negative. Certain policies have the distinct role of demobilizing citizens, thus potentially changing the nature of future policy-making (Soss 1999; Campbell 2011). NCLB pass/fail status appears to follow this pattern. After receiving multiple signals that their proximate school is failing, voters may eventually become significantly depressed. The mechanisms behind this effect are unknown. However, this finding may be explained through mechanisms such as learned helplessness (White 1992), changing salience of failing schools in the minds of voters, or by voting with ones feet. Regardless of the mechanism, depressed participation among perpetually failing schools may be a driving force in the lack of a grassroots campaign to reform NCLB.

[41] Time and sanction level are highly correlated.

IX. On Effect Sizes:

One might respond that the estimates appear to be quite small; though failing schools influence voter turnout, they do so only minimally. However, inferring this from the results presented above would be a mistake. Effect sizes presented here are consistent with effect sizes from other work within the voter turnout literature. Table 11 presents the results outlined above in context with the size of other GOTV interventions.

[Table 11 Here]

Failing schools have a comparable effect on voter turnout to other GOTV interventions. My effect sizes seem reasonably sized when compared to Gerber and Green's estimates of face-to-face contact, targeted mailers, and phone contact.[42] In general, face-to-face contact remains supreme as a GOTV intervention. However, a failing school seems to have similar impact to targeted mailers, and larger than the estimate of most phone solicitations.

In addition, treatment heterogeneities reveal that the effect of a failing school depends on demographics, age, timing, and repeated treatment with several of these groups seeing substantial changes in their voter turnout when a proximate school fails.

Finally, I re-emphasize that my results are likely biased downwards because of the possibility of high resource individuals voting with their feet when the neighborhood school fails. Consistent with Hirschman's analysis of the interaction between voice and exit, my results are likely drawn from a slightly less mobilized population than would otherwise be observed if

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the electoral behavior of movers was observed.

In short, though the effect of a failing school is small in absolute numbers, relative to other interventions they are right on par. The choice to vote is more fully determined by other factors (i.e. age, parental voting patterns, etc.), but other influences can matter. Voters are influenced by the performance of the neighborhood school.

X. Discussion

It's possible to question the results I have presented here as analyzing the wrong dependent variable. Perhaps the results are interesting, but not informative from a policy perspective. Should policy makers care about voting? They should.

Voting is an informative act, in and of itself. In a democracy, voter outcomes predict future policy outcomes. Often in electoral contexts, races are close, well within manipulation by mobilization techniques (Gerber & Green 2008). As education policy can serve as a get out the vote intervention (Hastings et al. 2007), voting should be examined as a primary outcome in education studies.

Even if one asserts that voting is not an expressly important policy variable, it may still important to examine this variable in policy contexts. Exploring voter behavior reveals things about people that we wouldn't know otherwise. Voting is a key component in the broader concept of citizen voice (Hirschmann 1970), civic capacity, and social capital (Putnam 2001, 2007). It is the most common act of political involvement (Brady, Verba, Schlozman 1994). Voter behavior could matter if it spills over into other contexts or proxies for other expressly important policy variables. Previous research indicates that voting is highly correlated with behaviors such as volunteering and other forms of civic participation (Hart & Atkins 2002; Frisco, Muller, & Dodson 2004; Hart et. Al 2007; Pasiek, Romer, Jamieson 2008) and

attitudes/attributes such as civic knowledge, trust, tolerance, and reciprocity (Wichowsky, A. & Moynihan 2008). Collectively, these attributes reveal the quality of democratic institutions, and the health of society. Policy-makers, particularly in education contexts, should value these outcomes even if they do not value voting per-se. They are highly related, and possibly causally prior, to important education outcomes (Putnam 2001, 2007). Truly, "Mass political behavior cannot be adequately understood without attention to how it is influenced by public policy; and public policy cannot be adequately analyzed apart from its effects on mass opinion and behavior" (Mettler & Soss 2004).

In short, voting proxies for policy relevant variables. In short, policy feedback is relevant from a policy perspective. In the case of NCLB, there appears to be noticeable policy feedback built into the law's sanctioning system. Voters do pay attention to the performance of the neighborhood school. Presented with a failing school nearby, voters initially turnout in higher numbers. However, this promising result does not perpetuate. Eventually, failing schools depress turnout.

On the whole, the results signal that NCLB's system of test-based accountability has mixed effects on stimulating school accountability from the mass public. It may improve some policy relevant outcomes in some contexts. However, in other contexts NCLB sanctions may have an opposite effect. At bottom, a full understanding of this law requires balance. Given a slew of recent state-level waivers from NCLB's sanctions, policy makers should be very careful before they jump into new accountability structures. Such structures are loaded with promise, but also unintended consequences for citizen-based accountability; which should not be ignored. Policy makers should view sanctioning systems with wariness and care: those that do not do so at the peril of the voters and children whom they govern.

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APPENDIX

Figure 1: Policy Feedback

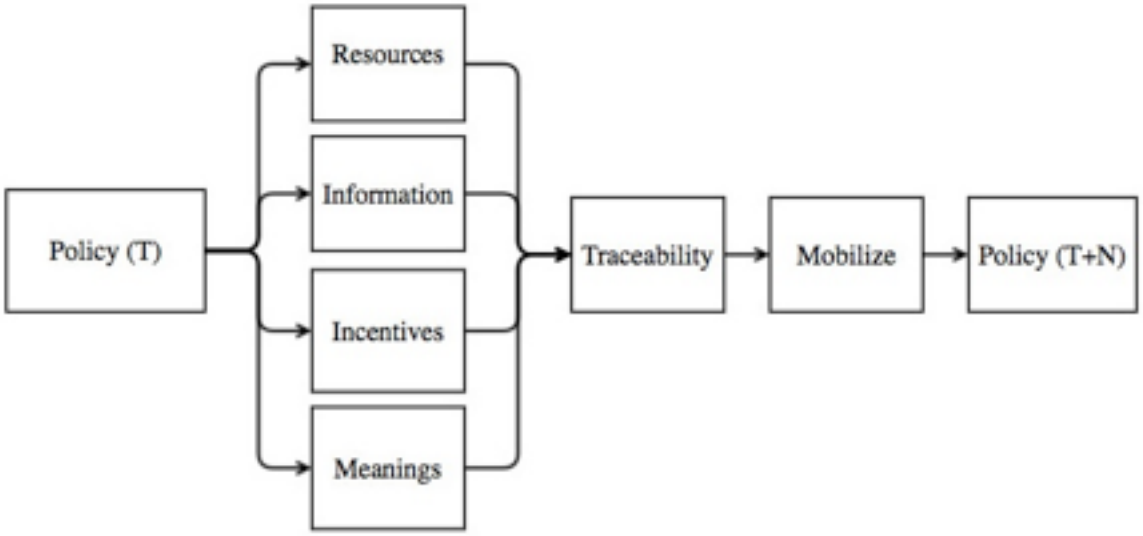


Table 1: Summary Statistics by AYP Status

Schools			
Variable	Failed Schools	Passing Schools	P(T=C)
# Students	530	492	0.10
% Targeted Assistance	39.0%	43.1%	0.30
% Female	48.6%	48.8%	0.33
% Migrant	0.1%	0.2%	0.60
% Homeless	0.2%	0.2%	0.58
% Parents w College Degree	27.4%	30.2%	0.16
% Free/Reduced Lunch	52.0%	50.0%	0.06
% Gifted in Reading	9.2%	8.2%	0.20
% Gifted in Math	9.1%	8.5%	0.49
% African American	31.3%	26.1%	0.00
% Students w Disability	13.9%	13.3%	0.10
Voters			
Variable	Failed Schools	Passing Schools	P(T=C)
Lagged Voter Turnout	39.6%	41.1%	0.40
% Democrats	44.1%	43.2%	0.53
% African American	19.4%	17.4%	0.16
% Female	53.6%	55.1%	0.07
Age	52.4	52.2	0.60
#Voters in School Zone	1042	1124	0.30

Note: The following summary statistics are from a bandwidth of .04 around the pass/fail discontinuity. Prob. T=C is from a simple difference of means (more accurately expressed: $P(T=C) \mid H_0$: True

Table 2: Election-School Matching

Election Data	Election Date	AYP Data Released	School Year Data
2004 General	11/2/04	7/21/2004	2003-2004
2005 Municipal	11/8/05	7/21/2005	2004-2005
2006 Primary	5/2/06	7/21/2005	2004-2005
2006 General	11/7/06	7/21/2006	2005-2006
2007 Municipal	11/6/07	7/21/2007	2006-2007
2008 Primary	5/6/08	7/21/2008	2006-2007
2008 General	11/4/08	7/21/2008	2007-2008
2009 Municipal	11/3/09	7/21/2009	2008-2009
2010 Primary	5/4/10	7/21/2009	2008-2009
2010 General	11/2/10	7/21/2010	2009-2010
2011 Municipal	11/8/11	7/21/2011	2010-2011
2012 Primary	5/8/12	7/21/2011	2010-2011

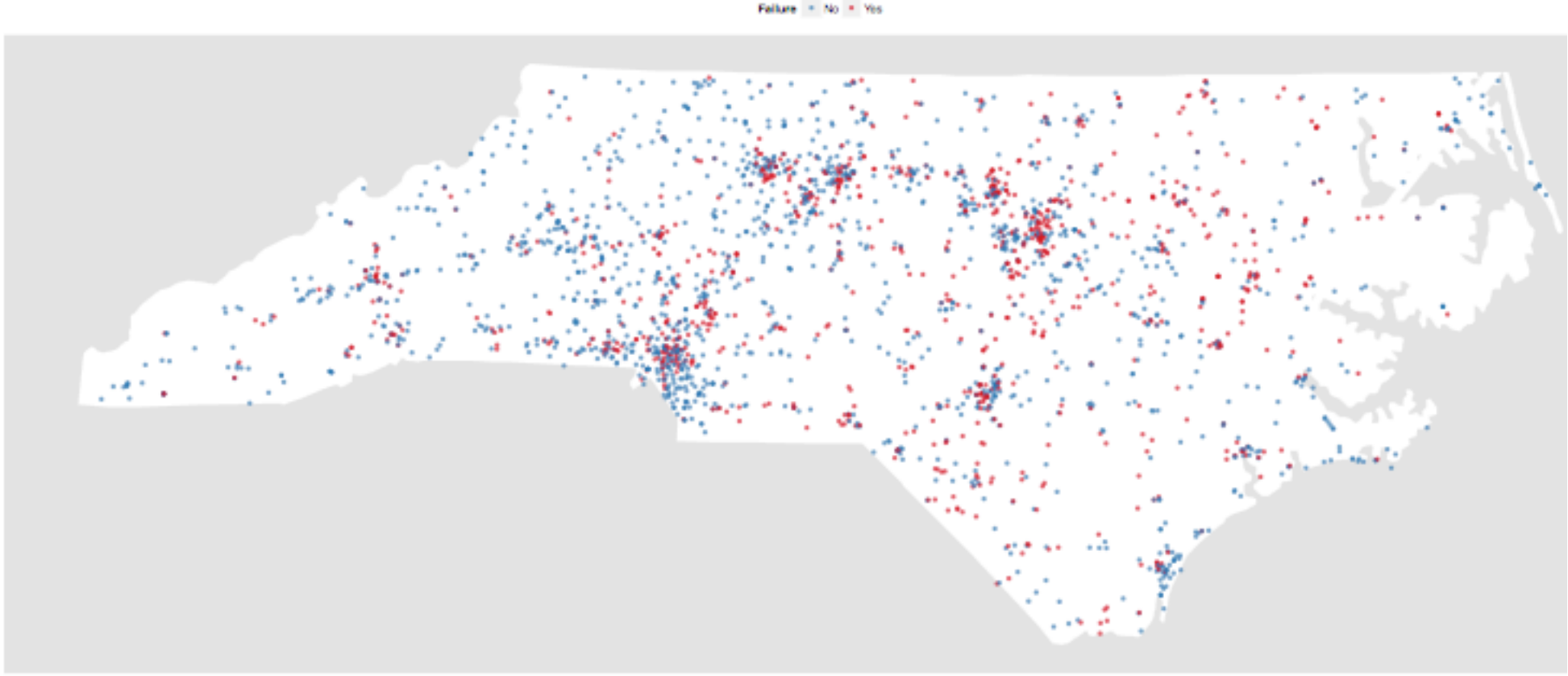
Table 3: Channels and Subgroup Scores Determine AYP Status

School	Subgroup 1	Subgroup 5	Subgroup 7	**Subgroup 10**	AYP Status
School 1	**Proximity** Growth Level	**Growth** Proximity Level	**Level** Proximity Growth	**Level** Proximity Growth	Fail (Subgroup 10)

Table 3 shows the inputs of determining 1.) failure and 2.) distance from failure. First, if one of the three channels (level, growth, or proximity) is above the threshold (represented by the line within the cells), the school passes within that subgroup. If not, the subgroup fails. Schools must be over the threshold in all subgroups to pass. School 1 fails AYP because of its performance within subgroups 7 and 10.

Second, to identify distance from failure I choose one **channel per subgroup** then one **subgroup per school (**see [D1] and [D2]). In this example the channels would be proximity (for subgroup 1), growth (subgroup 5), and level (subgroups 7 and 10). Because it's chosen channel is further away from the threshold, Subgroup 10's level score would be used to define distance from failure.

Figure 2: AYP Status in NC (2010)



	2003	2004	2005	2006	2007	2008	2009	2010	2011
% NC Schools Missing AYP	52.0%	28.3%	41.4%	52.3%	52.6%	66.1%	24.4%	35.9%	70.7%
% NC Schools Under Sanction			22.1%	24.9%	34.3%	45.6%	50.4%	51.3%	37.6%

Figure 3: Fuzzy Treatment at the Margin

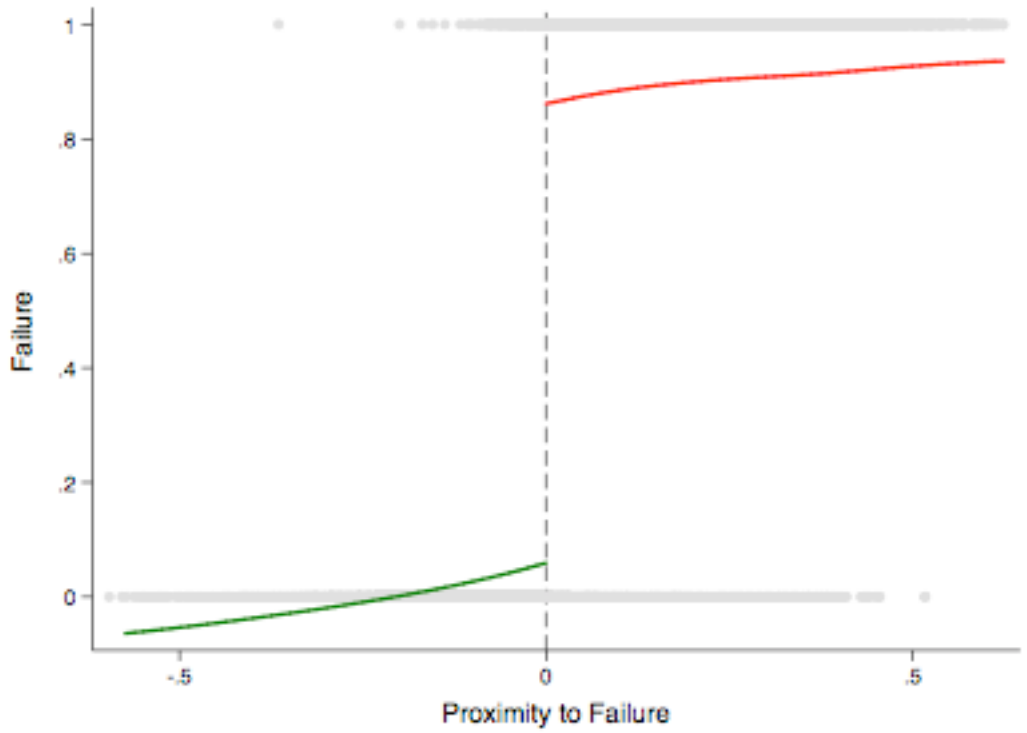
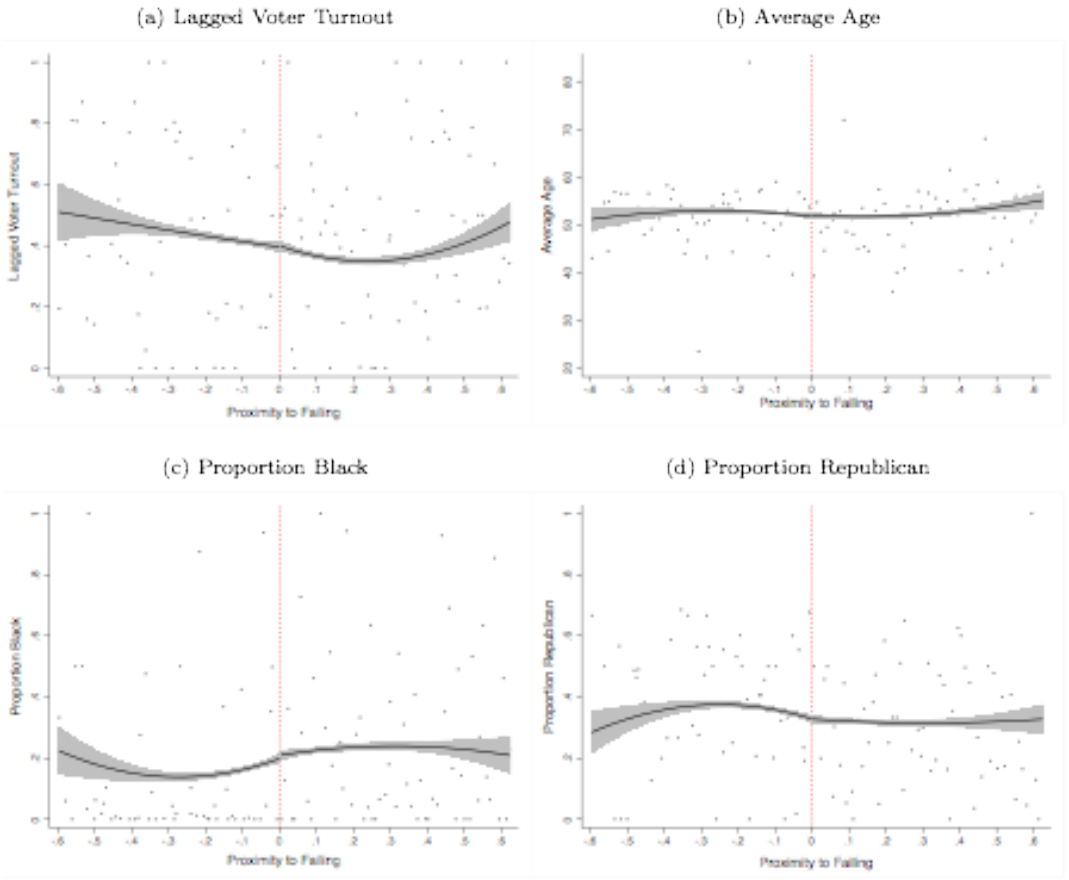


Figure 4: Covariate Balance at Discontinuity



Note: Figure 3 shows balance of observable covariates at the discontinuity. Regression discontinuity designs assume that those who were just barely treated are the same as those who were marginally not treated. On these observables, this assumption appears to be satisfied.

Figure 5: McCrary Density Test by Running Variable Specification

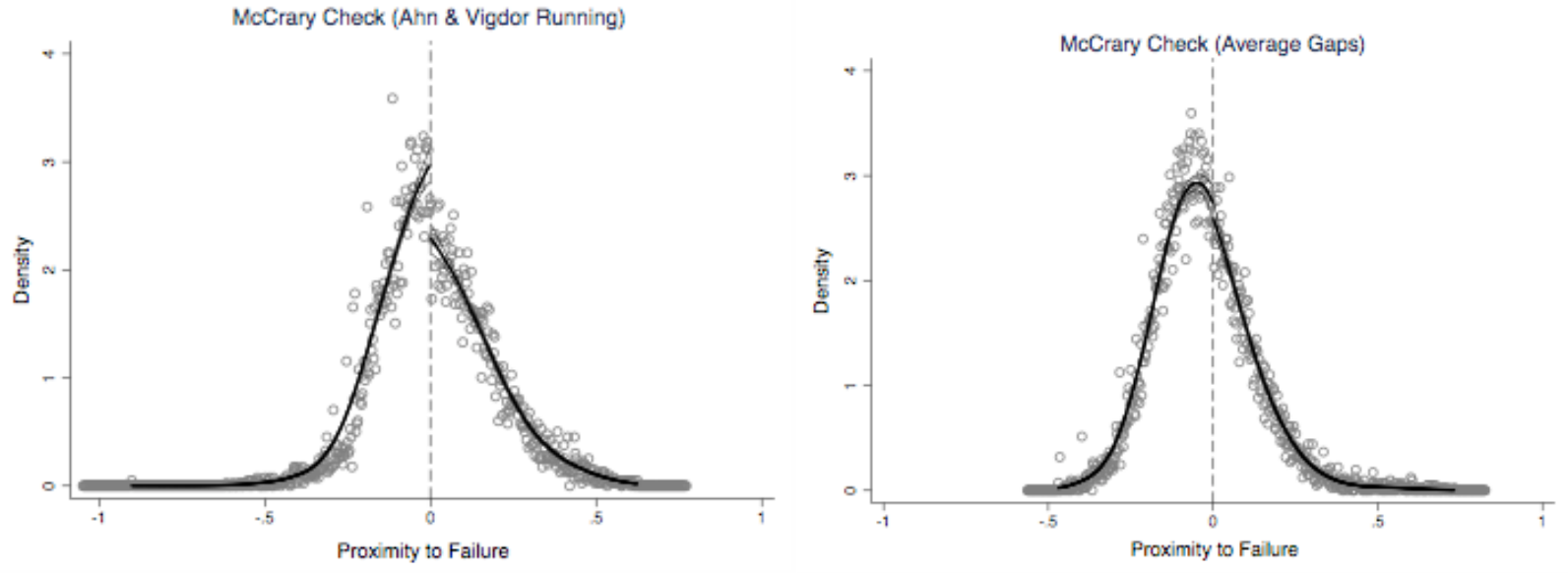


Table 4: Overall Estimates

Panel A: Collapsed to School Level

	DV=Proportion Voted Bandwidth= .1	DV=Proportion Voted Bandwidth= .2	DV=Proportion Voted Bandwidth= .3	DV=Proportion Voted Bandwidth= .4	DV=Proportion Voted Quartic Polynomial
Failing School	-0.007	0.027**	0.027***	0.023**	0.022**
	[-.049, .033]	[.001, .053]	[.005, .049]	[.003, .042]	[.000, .043]
MSE	0.08	0.08	0.08	0.08	0.08
R2	0.001	0.001	0.001	0.001	0.002
N	6,615	11,133	12,964	13,642	14,041

Panel B: Individual Level with Clustering

	DV=Voted (0=No, 1=Yes) Bandwidth= .1	DV=Voted (0=No, 1=Yes) Bandwidth= .2	DV=Voted (0=No, 1=Yes) Bandwidth= .3	DV=Voted (0=No, 1=Yes) Bandwidth= .4	DV=Voted (0=No, 1=Yes) Quartic Polynomial
Failing School	0.022	0.013	0.025**	.029***	0.020**
	[-.005, .054]	[-.012, .039]	[.002, .047]	[.007, .049]	[.001, .039]
R2	0.0005	0.0005	0.0013	0.0018	0.0004
N	7,616,924	12,741,562	14,721,027	14,721,027	15,855,806
Clusters	6,618	11,136	12,966	13,644	14,043

***< . 01, **< . 05, *< .10. 95% Confidence Intervals are in square braces below coefficient estimates. Standard errors for the models in Panel B are clustered at the school level, using the Moulton procedure outlined by Angrist and Lavy (2008).

Figure 6: Overall Effect

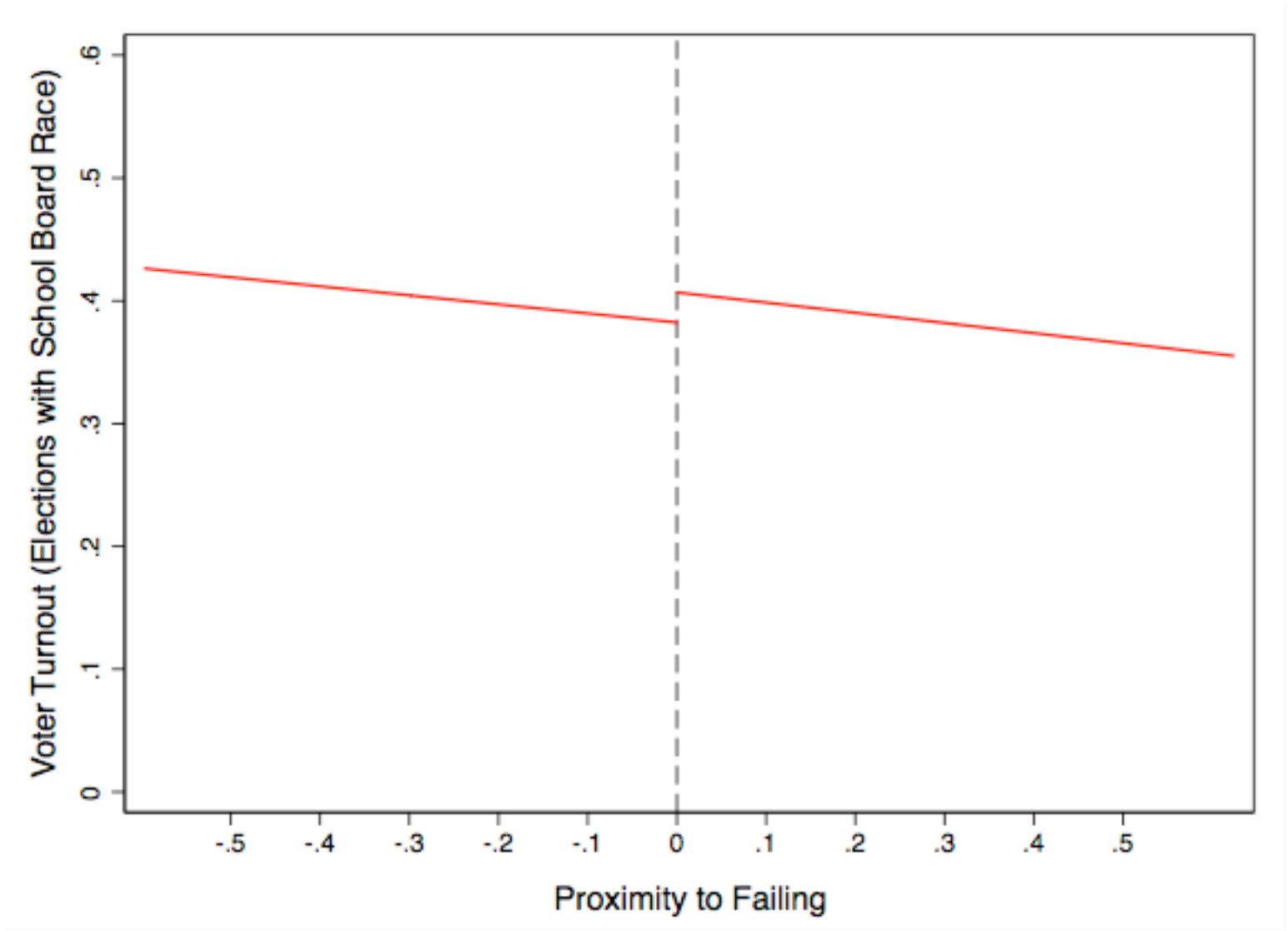


Figure 7: Overall Effect by Bandwidth

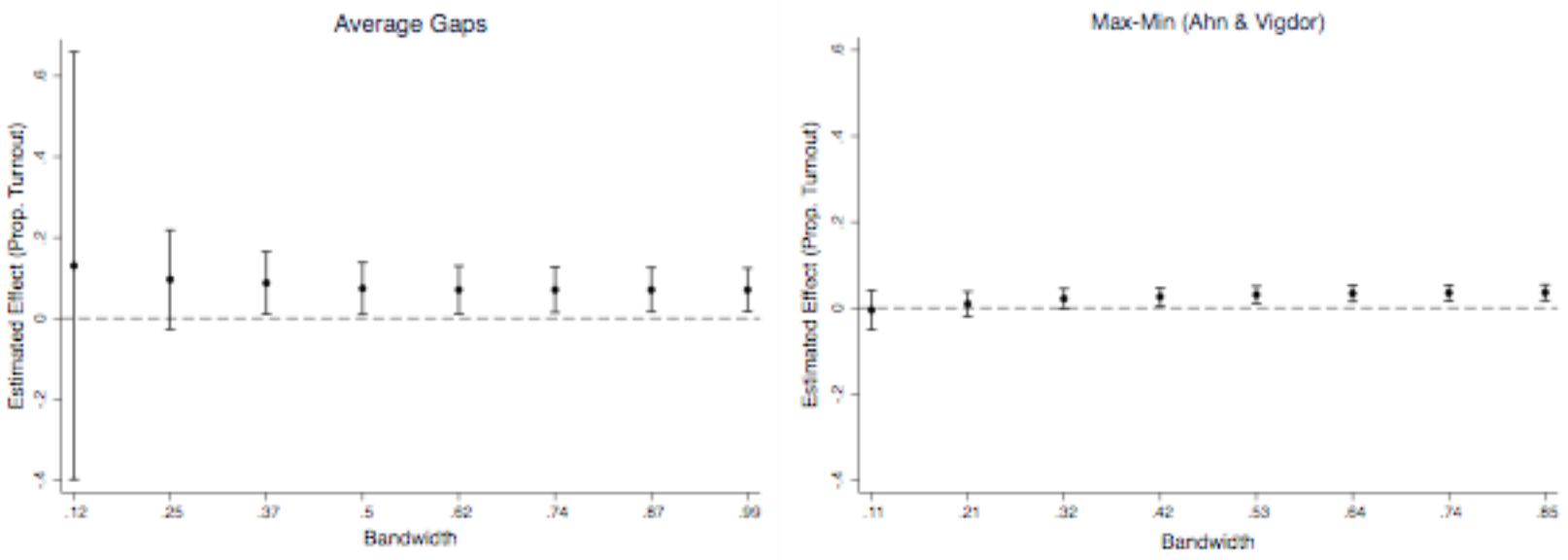


Table 5: Bias from Movers

Voter Type	Move to a Failing School	Move to a Passing School
High Propensity	Overestimate	Underestimate
Low Propensity	Underestimate	Overestimate

Table 6: When Schools Fail, Do Voters Move?

IV	DV	Overall	No Sanction	Sanction at Stake
Failing School	# Registered Voters (Quartic Polynomial, All Data)	-347*	-367	-181
	# Registered Voters (Quartic Polynomial, Bandwidth= .8)	-475*	-622*	-311
	# Registered Voters (Quartic Polynomial, Bandwidth= .6)	-557*	-744*	-428
	# Registered Voters (Quartic Polynomial, Bandwidth= .4)	-473	-849	-122
	# Registered Voters (Quartic Polynomial, Bandwidth= .2)	-267	-980	388
	# Registered Voters (Linear, Bandwidth= .1)	-283	-767	147

***< . 01, **< . 05, *< .10. The table shows coefficients for failing schools in the RD models. Rows are the model type. Columns are whether failure would lead to sanctions.

Table 7: When Schools Fail, Who Moves?

DV	DV: Prop. FRL	DV: Prop. Parent College
Failing School	.09*	-.25**
MSE	0.042	0.044
R2	0.01	0.01
N (Students)	1095983	4571053
N (Schools)	2006	10223

***< . 01, **< . 05, *< .10. The table shows coefficients for failing schools in the RD models. SE's clustered to school level.

Table 8: Heterogeneities- Election Type

Panel A: Collapsed to School Level

	DV=Proportion Voted Municipal Elections	DV=Proportion Voted Primary Elections	DV=Proportion Voted General Elections
Failing School	0.004	0.013	0.042**
	[-.027, .035]	[-.008, .035]	[.007, .076]
MSE	0.02	0.04	0.05
R2	0.004	0.028	0.055
N	1703	6847	4936

Panel B: Individual Level with Clustering

	DV=Voted (0=N, 1=Y) Municipal Elections	DV=Voted (0=N, 1=Y) Primary Elections	DV=Voted (0=N, 1=Y) General Elections
Failing School	0.002	0.052***	0.098***
	[-.026, .030]	[.035, .068]	[.076, .120]
MSE	0.12	0.21	0.23
R2	0.003	0.006	0.01
N	2793236	7541820	4728369
Clusters	1702	6850	4936

***< . 01, **< . 05, *< .10. 95% Confidence Intervals are in square braces below coefficient estimates. Standard errors for the models in Panel B are clustered at the school level, using the Moulton procedure outlined by Angrist and Lavy (2008).

Table 9: Heterogeneities- Demographics

	DV=Prop. Voted Female	DV=Prop. Voted Male	DV=Prop. Voted Black	DV=Prop. Voted White	DV=Prop. Voted Democrat	DV=Prop. Voted Republican
Failing School	0.044***	0.015	0.050***	0.006	0.055***	0.014
	[.012, .076]	[-.015, .045]	[.008, .092]	[-.027, .040]	[.015, .094]	[-.025, .054]
MSE	0.08	0.08	0.06	0.09	0.07	0.08
R2	0.004	0.002	0.009	0.002	0.003	0.002
N	6974	7647	3311	7145	4169	4839

	DV=Prop. Voted $17 \leq Age \leq 35$	DV=Prop. Voted $35 < Age \leq 50$	DV=Prop. Voted $50 < Age \leq 55$	DV=Prop. Voted $55 < Age \leq 65$	DV=Prop. Voted $Age < 65$
Failing School	-0.03	0.043**	0.002	0.050**	-0.041
	[-.219, .160]	[.003, .082]	[-.027, .033]	[.003, .097]	[-.248, .165]
MSE	0.11	0.07	0.06	0.08	0.17
R2	0.014	0.006	0.005	0.007	0.003
N	267	3996	5884	3460	434

***< . 01, **< . 05, *< .10. 95%. 95% Confidence Intervals are in square braces below coefficient estimates. Heavily populated areas are defined as 1/2 σ above the mean

Table 10: Heterogeneities- Years in Sanction

Years in Sanction	Overall	Female	Male	Black	White	Democrat	Republican
All	0.022**	0.043**	0.015	0.032**	0.009	0.032**	0.025
0	0.012	0.042**	-0.010	0.041**	-0.005	0.028	0.016
1	-0.009	-0.006	-0.052	0.012	-0.101**	0.042	-0.119**
2	0.054*	0.030	0.122**	.073*	0.031	-0.009	0.072
3	-0.073*	-0.016	-0.149**	0.028	-0.216***	0.002	-0.219***
4	0.121	0.252**	0.163	0.048	0.148	0.108	0.207
5	-0.012	-0.032	-0.004	-0.023	-0.018	-0.007	-0.020
>5	-0.222*	-0.270**	0.083	-0.226*	-0.302	-0.167	-0.067

Years in Sanction	Overall	17 ≤ Age ≤ 35	35 < Age ≤ 50	50 < Age ≤ 55	55 < Age ≤ 65	Age < 65
All	0.022**	-0.029	0.043**	0.003	0.050**	-0.041
0	0.012	0.075	0.029	0.001	0.036	-0.229*
1	-0.009	-	0.060	-0.076	-0.093	0.386
2	0.054*	-	0.067	0.017	-0.010	0.214
3	-0.073*	-	-0.080	0.021	-0.250*	-
4	0.121	-	0.169	0.031	0.500*	-
5	-0.012	-	0.067	0.144	-	-0.289
>5	-0.222*	-	-0.206**	-0.020	0.054	.578**

***<.01, **<.05, *<.10 Coefficients from data collapsed to the schol level. Highly populated groups are defined as greater than the median. All models are from a quartic polynomial specification. Rows denote how long a school has been in failing when they fail in time t.

Table 11: Effect Sizes

Treatment	Face to Face	Mailers	Telephone	Treatment	Failing School
Overall	0.098***	0.0063***	-0.035	Overall	0.020**-0.029***
Civic Duty	.091***	.018***	-	Generals	0.042**-0.098***
Solidarity	0.051	-	-	Primaries	0.013-0.052***
Election is Close	0.121***	-	-	Municipals	0.002-0.004
Hawthorne	-	.026***	-	Female	0.044***
Self Voting	-	.049***	-	Black	0.050***
Social Pressure	-	.081***	-	Democrat	0.055***

***< . 01, **< . 05, *< .10. Estimates of GOTV are drawn from Gerber & Green 2000 and Gerber, Green, Larimer 2008. For the failing schools, the upper and lower bound estimates are reported. Failing schools have impacts similar to other GOTV efforts.