Voter Identification Laws and Voter Turnout[1]

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May 28, 2013

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I would like to thank Jonathan Rodden, Paul Sniderman, Jowei Chen, Gary Cox, John Geer, Justin Grimmer, Bobby Gulotty, Shanto Iyengar, Alexander Lee, Avital Livny, Clayton Nall, Amanda Robinson, Arjun Wilkins, the Stanford Methods Workshop and the Stanford American Politics Workshop for helpful comments.

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Do Voter Identification statutes reduce voter turnout? This paper demonstrates that the expansion of Voter ID statutes in the past decade has demobilized Democratic-leaning individuals including young adults, renters, the poor and African Americans. I assess millions of individual voting records over five general elections (2004-2012) and document that Voter ID's demobilizing effects are larger during low salience midterm elections than during presidential contests. The study's difference-in-differences approach compares voter turnout among voter subgroups in states that underwent Voter ID policy changes with turnout among voters in states with no election law policy change.

Thirty states have enacted and adopted laws requiring voters to show an ID at the polls before they may cast a ballot.[3] In 2011 alone, 34 states introduced Voter ID legislation and eight states adopted new policies.[4] This paper examines whether the expansion of Voter ID statutes has reduced voter turnout and whether these statutes disproportionately demobilize certain subgroups of voters.

The scholarly literature on Voter ID has yielded puzzling, contradictory findings because it suffers from methodological and data limitations – it has assessed earlier, more lenient statutes, analyzed aggregate county or state-level data incapable of detecting effects across voter subgroups and relied on survey-based studies containing measurement and sampling error.[5] My research examines both strict and lenient policies over the past decade, minimizes sampling error and addresses (and dismisses) many potential threats to validity.

My research aggregates tens of millions of individual level voting records over five general elections (2004-2012) using a national voter database. I isolate groups with low ID ownership rates such as the working class, renters, African Americans, young

[3]National Conference of State Legislatures `http://www.ncsl.org/documents/legismgt/elect/Canvass_Apr_2012_No_29.pdf`

[4]This expansion was driven by a U.S. Supreme Court decision upholding an Indiana statute, *Crawford v. Marion County Election Board*, 553 U.S. 181 (2008), and widespread Republican gains in 2010 in state houses. `http://www.ncsl.org/legislatures-elections/elections/voter-id.aspx`

[5]For a list of studies, see `http://www.brennancenter.org/content/resource/research_on_voter_id/`

adults and Hispanics using demographic information contained in the voter files. Then, I use a difference-in-differences approach to compare the turnout of these voter subgroups before and after a Voter ID law change with turnout patterns among the same subgroups in states with no policy change over the same time frame.

This paper has two principal findings. First, Voter ID statutes exert a modest but meaningful demobilizing effect between one and three percentage points overall. My research is among the first to demonstrate that Voter ID laws disproportionately demobilize the poor, young adults, renters and African Americans, and these heterogeneous effects are robust to a series of data validity checks.[6]

Second, Voter ID laws are more likely to reduce turnout in lower salience midterm elections. Political scientists have examined differential voting patterns between high stimulus presidential elections and low stimulus midterms elections for decades. This finding suggests that widespread mobilization and voter outreach efforts during presidential contests can offset the impact of election laws and policies that impose costs on voters.

The results discussed below indicate that Voter ID laws have modest effects that are substantial enough to influence election outcomes in close races. Since the results

[6]See the Appendix for a fuller discussion that addresses estimation issues related to the non-random assignment of Voter ID policies to states, the Stable Unit Treatment Value Assumption (SUTVA) and more.

indicate that Voter ID demobilizes groups that disproportionately favor Democrats, a decrease in voter turnout corresponds with a decline in Democratic vote share. A one percent reduction in turnout among adults under 30 in 2008 corresponds with a 0.4% decline in Democratic vote share because they supported Democrats by a 2-to-1 margin.[7]

Furthermore, modest declines in Democratic vote share can influence both top-of-the-ballot contests, along with Congressional, mayoral and state legislative races. The margin of victory has been less than two percentage points in four percent of state legislative races between 1968 and 2010 and less than one percentage point in two percent of contests.[8]

The study proceeds as follows. First, I describe the widespread adoption of Voter Identification statutes in the past decade and assess the scholarly literature. Then, I discuss hypotheses, research design, data sources and findings. The last section concludes.

[7]A one percent reduction among African Americans in Ohio, who typically cast 95%+ of their ballots for Democrats, corresponds with a loss of more than 5,000 votes for Democrats in a presidential election.

[8]Source: Klarner, Carl, William Berry, Thomas Carsey, Malcolm Jewell, Richard Niemi, Lynda Powell, and James Snyder. State Legislative Election Returns (1967-2010). ICPSR34297-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2013-01-11. doi:10.3886/ICPSR34297.v1.

The Expansion of Voter Identification Statutes

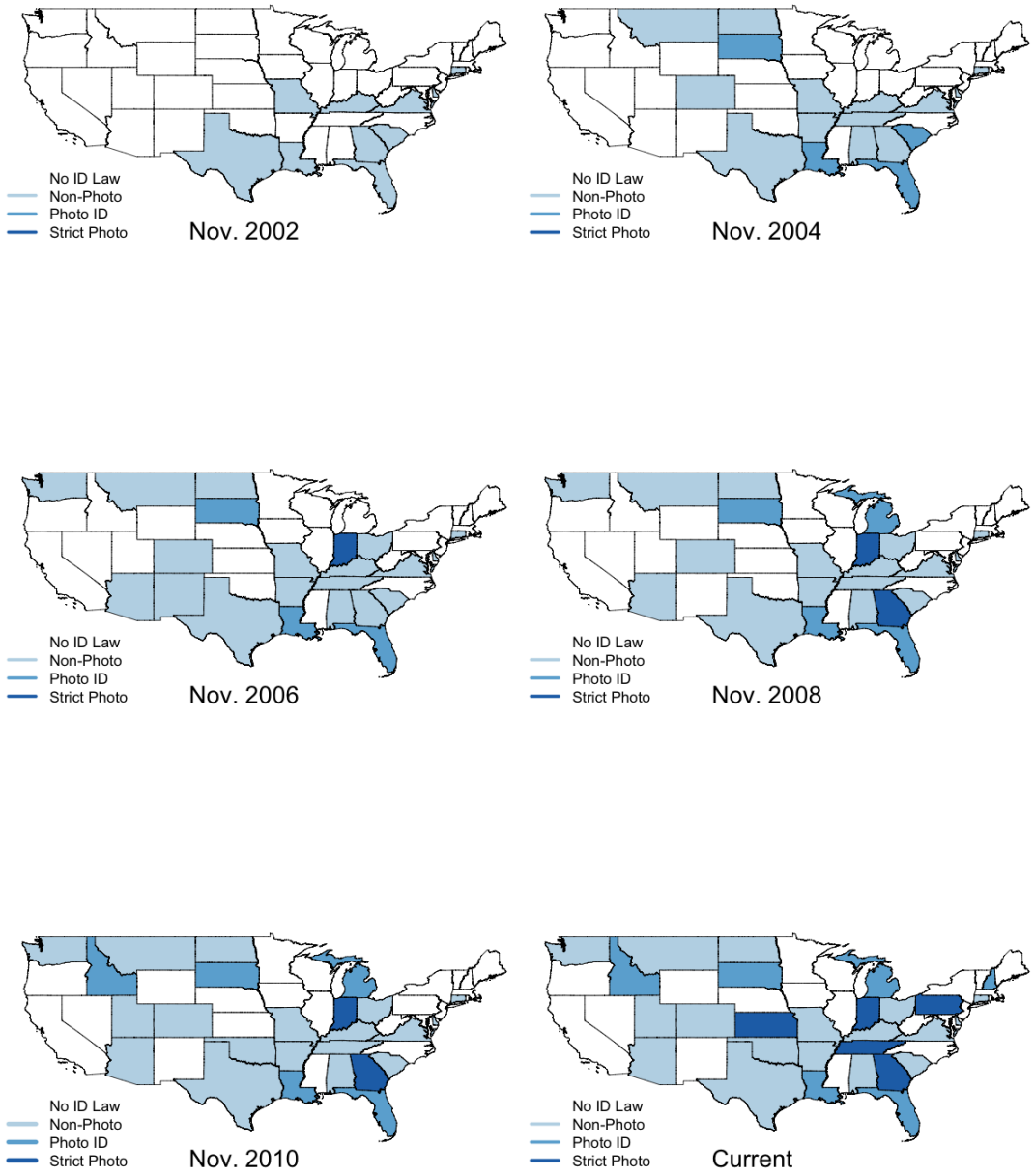
Figure 1 displays state-level Voter ID statutes from 2002 to the present. States in white have adopted the Help America Vote Act (HAVA) minimum requirement, whereby voters can present an range of IDs or the last four digits of their Social Security Number to register and vote.[9] States shaded light blue require a Non-Photo ID (e.g., bank statement) and states shaded blue require a Photo ID (e.g., driver's license). Dark blue states require a Photo ID and provide limited alternatives for casting a provisional ballot.[10]

Figure 1 exhibits at least three trends: Voter ID policies have spread across the country, have become more stringent and have spread as a result of factors other than simple diffusion to neighboring states.

[9] See the Appendix for more information on HAVA

[10] Alvarez et al. (2007) use an 8-point coding scheme rather than a 4-point classification. They assign states to the following Voter ID requirements: state name, signature, matching signature, request ID, require Non-Photo ID, require ID plus signature, request Photo ID, require Photo ID. The four point classification is more appropriate for illustrating the decade-long trend toward more stringent Voter ID policies. The 4-point classification scheme used in this paper is based on the National Conference of State Legislatures' methodology.

Figure 1: Voter ID statutes from 2002 to present. The shading corresponds with the HAVA minimum (white), a Non-Photo ID requirement (light blue), a Photo-ID requirement (blue) and a Photo-ID requirement with limited provisional balloting (dark blue).



First, Voter ID policies have spread from the South across the country in the past decade. Since 2002, Voter ID statutes have spread from Conservative Southern states to the Mountain West, the Southwest, the Midwest and even the Northeast. In 2011, only three states without Voter ID statutes – Oregon, Vermont and Wyoming – did not consider legislation to strengthen existing policy.[11]

Second, Voter ID statutes have become more restrictive. In 2001, no Voter ID states turned away voters without a suitable ID. These early Voter ID statutes requested a Non-Photo ID and provided voters with opportunities to cast provisional ballots. Today there are Photo ID requirements in 11 states, compared with four in 2004 and none in 2002. Since Indiana enacted the first strict Voter ID policy in 2006, at least 10 more state legislatures have passed strict policies.[12] The trend is exemplified in Indiana, where voters must present an ID issued by the state or federal government that contains an individual's name, a photo and an expiration date.

Third, the spread of Voter ID statutes has been driven by partisan factors. There is a strong relationship between GOP control of state government and a state's Voter ID policy. Twenty-one of the 26 states where Republicans controlled both legislative chambers after the 2010 elections have enacted Voter ID statutes above the HAVA

[11] `http://www.ncsl.org/legislatures-elections/elections/voter-id-2011-legislation.aspx`

[12] Courts or federal agencies have invalidated or postponed the implementation of a number of these laws, including policies in Wisconsin and Pennsylvania.

minimum, and Republicans have unified legislative control in all 11 states with the most stringent Photo ID or Strict Photo ID requirements.[13] On the other hand, only 4 out of 15 states with current unified Democratic legislative control have enacted Voter ID statutes.[14] Not surprisingly, these policies are supported or opposed along party lines at both the state and federal level, with more than 95% of Republicans supporting Voter ID legislation compared with fewer than 5% of Democrats at both levels.[15]

The Scholarly Literature

A burgeoning research literature, summarized in Table 1, has yielded puzzling, mixed findings on the impact of Voter ID statutes on voter turnout. Some scholars have

[13]They had unified Republican control after the 2010 midterm elections.

[14]I obtained data on the party composition of state legislatures from 2000-2011 from the National Conference of State Legislatures and merged it with the four-point classification of Voter ID statutes (1 = HAVA minimum, 2 = Non-Photo ID, 3 = Photo ID, 4 = Strict Photo ID). Overall, the correlation between unified GOP control of state legislatures in 2011 and current Voter ID policy is .57. The four Democratic states with Voter ID laws are Arkansas, Connecticut, Delaware and Washington. Each implemented a relatively weak Voter ID statute. Biggers and Hanmer (2011) examine Voter Identification statutes from 1972-2011 and find that partisan factors are more important than diffusion to neighboring states in predicting the passage of Voter ID statutes: "the switch to a Republican governor has a large positive effect on this decision to require identification at the polls" (Biggers and Hanmer, 2011, p. 27). The state legislative figures are valid for the state legislatures after the 2010 midterm elections.

[15]For example, more than 95% of Republican legislators supported Voter ID laws introduced at the state level between 2005 and 2007, compared with just 2% of Democrats, (Brief of Amici Curiae of Historians and Other Scholars in Support of Petitioners. Crawford et al. v. Marion County Election Board et al. Nos. 07-21, 07-25 (U.S., 2007) and there is a similar partisan gap among Voter ID bills at the federal level. For instance, the "average difference between the percent of Republicans and Democrats voting yea on the eleven Senate votes relating to HAVA was ninety-one percentage points" (Lee, 2009).

found that Voter ID laws exert a minimal impact on turnout because the laws are inconsistently implemented, most Americans have valid forms of identification, few voters would be turned away from the polls based on previous state-by-state requirements, adults without IDs are not likely to vote even in the absence of Voter ID statutes and many states allow voters without IDs to cast provisional ballots (Ansolabehere, 2009; Lott, 2006; Milyo, 2007; Mycoff et al., 2009; Pastor et al., 2010).[16] Ansolabehere (2009) examines Current Population Survey (CPS) data and concludes that "[v]oter ID appears to present no real barrier to access" because poll workers rarely ask for ID and individuals almost never say they did not vote because they lacked an ID. Mycoff et al. (2009) analyze data from the Cooperative Congressional Election Study (CCES) and similarly find that there is no relationship between the strictness of Voter Identification laws and turnout after controlling for demographic variables.

Other scholars have found that Voter ID statutes decrease turnout because they impose a cost on Americans without valid forms of identification (Alvarez et al., 2007,

[16]Based on state-by-state requirements, few voters would be turned away from casting a ballot because they lack an ID. One study estimates that .5% of respondents would be prevented from voting (Alvarez et al., 2008) `http://www.american.edu/spa/cdem/upload/VoterIDFinalReport1-9-08.pdf` while another estimates that one tenth of one percent of voters would be prevented from voting (Ansolabehere, 2007).

Fourth, studies of Voter ID statutes do not examine the full effect of requiring an ID versus asking for no ID. The Help America Vote Act established minimum identification standards for first-time voters and absentee voters, so any change in Voter ID policy is relative to those federal minimum standards.

Table 1: Findings from Previous Voter ID Studies

Authors	Treatment Effect	Data	Elections
Alvarez et al. 2011	-1 to -2%	CPS	2000-06
Ansolabehere 2009	No Effect	CCES, CPS	2006
Erikson and Minnite 2009	No Effect	CPS	2002-06
Milyo 2007	+2%	Aggregate	2002-06
Muhlhausen and Sikich 2007	No Effect	CPS	2004
Mycoff et al. 2009	No effect	CCES	2000-06
Vercellotti and Anderson 2004	-3 to -7%	CPS, Aggregate	2004

2011; Logan et al., 2007; Vercellotti and Anderson, 2006). Alvarez et al. (2011) analyze recent Current Population Survey data and find that stricter Voter ID requirements exert a larger, more negative effect on turnout compared with less stringent policies.

These mixed findings result from both data and methodological limitations. First, the available survey-based and aggregate data lacks statistical power to detect modest treatment effects across voter subgroups. Aggregate level studies using counties or states cannot document the impact of state-level interventions on voter subgroups because these units of analysis have limited variation on background characteristics such as race, age or gender. Survey data contains sampling error caused by small samples and measurement error in self-reports of voter turnout.

Scholars have highlighted these data limitations: "[W]e see the existing science re-

garding voter suppression as incomplete and inconclusive. This is not because of any reason to doubt the suppression effect but rather because the data that have been analyzed do not allow a conclusive test" (Erikson and Minnite, 2009, p. 98).[17]

Overall, the previous research literature on the subject has yielded mixed findings because it assesses earlier, more lenient statutes, aggregate level studies cannot detect subgroup effects, sampling error in survey data may overwhelm treatment effect sizes and survey data contains measurement error.

Hypotheses

Voter ID statutes may reduce turnout for at least three reasons: millions do not have valid forms of identification, Americans with valid IDs may be confused by a new statute's requirements or concerned about the fairness of the law's implementation[18] and Voter Identification laws may reduce voter impersonation, one type of

[17]Similarly, previous studies may have yielded null findings because they examine only earlier, more lenient election law changes: "[S]ince the changes in voter identification requirements have really only started since the passage of HAVA in 2002 and the law we are most interested in – photo identification requirements – was only implemented in 2006, we have only a small amount of information in the available data about how each of the voter identification requirements might affect participation" (Alvarez et al., 2011, p. 10).

[18]Cobb et al. (2012) administered an exit poll in Boston and find racial differences in the administration of Voter ID policy: "We find strong evidence that Hispanic and black voters were asked for IDs at higher rates than similarly situated white voters" (Cobb et al., 2012, p. 3). Ansolabehere (2009) also finds that minorities are more likely to report that they were asked to present an ID: "In the 2006 general election, 47% of white voters reported being asked to show photo identification at the polls, compared with 54% of Hispanics and 55% of African Americans. In the 2008 Super Tuesday primary states, 53% of whites were asked to show photo ID, compared with 58% of Hispanics

voter fraud.[20] I test these competing mechanisms in the findings section by identifying situations where the identification and information hypotheses predict different outcomes.

Identification Hypothesis. Voter ID statutes place an additional cost on citizens because millions of Americans lack valid forms of identification. While registered voters with valid IDs can show up at the polls on Election Day and cast a ballot, Americans without suitable IDs must also acquire a valid form of identification before Election Day. Research indicates that subgroups such as young adults, minorities, the working-class, renters and the elderly are less likely to own a suitable ID.[21] These groups also disproportionately favor the Democratic Party[22] and tend

and a staggering 73% of African Americans" (Ansolabehere, 2009, p. 128).[19]

[20]According to the NCSL, "Little evidence exists that fraud by impersonation at the polls is a common problem" http://www.ncsl.org/documents/legismgt/elect/Canvass_Apr_2012_No_29.pdf. Voter ID policies may reduce voter impersonation, but in-person voter fraud is only one of many types of voter fraud. In general, the potential for fraud is much higher with absentee balloting than for in-person voting http://www.nytimes.com/2012/10/07/us/politics/as-more-vote-by-mail-faulty-ballots-could-impact-elections.html?pagewanted=all

[21]Racial differences: Twenty-five percent of African Americans, 18% of seniors and 18% of adults under 25 lack the government-issued photo ID necessary to cast a ballot in stringent Voter ID states, compared with 8% of whites, according to the Brennan Center for Justice. http://www.brennancenter.org/page/-/d/download_file_39242.pdf. See also http://www.brennancenter.org/page/-/d/download_file_39242.pdf

Pawasarat (2005) finds that African Americans and Hispanics are less likely to have drivers licenses than whites in Wisconsin: "Less than half (47 percent) of Milwaukee County African American adults and 43 percent of Hispanic adults have a valid drivers license compared to 85 percent of white adults" (Pawasarat, 2005, p. 1).

Age, income, rental status differences: "The population that changes residence frequently is most likely to have a drivers license address that differs from their current residence. This would include lower-income residents who rent and students and young adults living away from home" (Pawasarat, 2005, p. 2). For additional evidence, see (Barreto et al., 2007; Sanchez et al., 2011; Pawasarat, 2005)

[22]According to the 2008 National U.S. House Exit poll, 93% of African Americans voted for

to be less familiar with the electoral system.[23] This hypothesis suggests, for instance, that stricter Voter ID laws should demobilize more voter than less stringent implementations.

Information Hypothesis. The second explanation, the information hypothesis, focuses on how the requirements of a newly adopted statute are communicated to voters. First, Voter ID policies can be exceedingly complex and it can be quite difficult for citizens to follow evolving legislation and court decisions. Second, citizens with valid IDs may be deterred from voting because they are confused or mislead about the provisions of a newly adopted statute. Advertisements sponsored by the Pennsylvania state government, for instance, told voters they must present an ID weeks after a court postponed a Voter ID law,[24] polling places have incorrectly displayed signs asking voters to present specific IDs[25] and campaign phone calls have mislead voters about proper forms of identification. Third, studies have shown that

Democrats, along with 68% of Latinos, 63% of Asians, 63% of 18-29 year-olds. Adults 65 and over split about evenly, 49% Democrat to 48% Republican. Fifty-nine percent of renters identify as Democrats or leaned Democrats, compared with 41% of home owners, according to a Gallup poll conducted January 5-8, 2012. In the same poll, 50% of home owners self-identified as Republican or leaned Republicans, compared with 31% of renters.

[23]When there are changes in election administration policies, Americans with higher levels of civic skills, resources or flexibility in work schedule may adapt more readily than those without such skills: "[The] presence or absence of resources contributes substantially to individual differences in participation. Resources are, in turn, not equally distributed; some socioeconomic groups are better endowed than others" (Brady et al., 1995, p. 274).

[24]`http://earlyreturns.post-gazette.com/home/early-returns-posts/5118-report-massive-confusion-over-voter-id`

[25]`http://www.npr.org/blogs/itsallpolitics/2012/11/06/164477671/heavy-turnout-confusion-over-voter-id-causes-some-issues`

Voter ID laws are inconsistently implemented at the polls – poll workers incorrectly have told voters new laws require certain forms of identification and poll workers are more likely to ask minority voters to present IDs (Cobb et al., 2012). This can reduce turnout because it may cause voters to leave the polling place or force individuals to cast a provisional ballot, which may or may not be counted in an official tally.

Cumulatively, this leads to the first prediction:

> *H1a: Voter ID laws will reduce turnout because they exclude voters without valid IDs and alter the information environment.*

We can adjudicate between these competing mechanisms by identifying situations when the information environment changes dramatically but ID requirements remain constant, such as courts overturning pending legislation, or vice versa.[26]

Voter ID statutes may not influence turnout if campaigns and interest groups devote additional resources toward voter education and outreach aimed at Americans lack-

[26] We can also identify situations when ID requirements shift dramatically but the information environment remains similar, such as comparing the impact of a shift from no policy to a non-photo policy versus a shift from no policy to a photo ID policy.

ing IDs,[27] interest groups collaborate with traditional allies,[28] or organized interests shift their mission to focus on voter outreach and education campaigns rather than persuasion efforts.[29] When voter mobilization and outreach efforts are less comprehensive, however, policies that impose costs on voters can reduce turnout.

The political science literature on differential voting patterns across midterm and presidential contests suggests that the impact of Voter ID laws depends on the type of election (Campbell, 1960). During high stimulus presidential contests, campaigns will have many more opportunities to help citizens obtain valid IDs and energized citizens will be more accepting of the additional cost of obtaining an ID.[30]

H2: Voter ID statutes will reduce turnout during midterm elections but have a limited impact on turnout during presidential elections.

[27]During the 2012 presidential election, the Obama campaign sent teams to educate Americans in Voter ID states: "Field workers for President Obama's campaign fanned out across the country over the weekend in an effort to confront a barrage of new voter identification laws that strategists say threaten the campaign's hopes for registering new voters ahead of the November election" (Shear, 2012). Moreover, the AFL-CIO "vowed to mount their biggest voter registration and protection efforts ever to counter these [Voter ID] laws" (Greenhouse, 2012).

[28]Election law changes increase interest groups' coordination efforts with traditional ideological allies: "The federation's [AFL-CIO] leaders said they would work closely with other groups, including the N.A.A.C.P. and the National Council of La Raza, to maximize voter turnout and provide whatever help is needed to enable elderly, disabled and poor Americans to get voter IDs" (Greenhouse, 2012).

[29]During the 2008 presidential campaign, The National Association for the Advancement of Colored People (NAACP) chose to "focus on voter education and outreach ahead of this year's presidential election in the wake of a U.S. Supreme Court ruling on voter identification laws" (Haines, 2008).

[30]"An excited election situation...may bring these peripheral voters to the polls in large numbers. In an election of lesser apparent importance and weaker total stimulation the participation of these peripheral voters decline, leaving the electoral decision largely to the high-interest core voters" (Campbell, 1960, p. 400).

Overall, I argue that Voter ID statutes impose a cost on citizens without suitable forms of identification. These laws are likely to depress turnout when campaign mobilization efforts are not intense, such as during midterm contests or off-cycle elections.

Research Design

Difference-in-differences is a widely used identification strategy that combines within-subjects comparisons over time and between-subjects comparisons across groups (Ashenfelter and Card, 1985; Campbell and Ross, 1968; Card and Krueger, 1994; Fisman, 2001).[31]

I compare the change in voter turnout among voter subgroups in states with a Voter ID implementation and in states with no policy change. The difference-in-differences estimator (DD) has two components

$$\delta \quad = (\bar{y}_{st1} - \bar{y}_{St0}) - (\bar{y}_{\sim st1} - \bar{y}_{\sim st0})$$

[31]Campbell and Ross (1968) studies the impact of a speeding crackdown in Connecticut on mortality rates by comparing change in turnout over time in Connecticut with neighboring states. Card and Krueger (1994) examine the impact of a minimum wage increase in New Jersey by assessing changes in employment in New Jersey, a treatment state, with changes in Pennsylvania, a state where minimum wages did not change. Fisman (2001) studies the impact of health incidents on the stock prices of politically connected firms.

$$\delta \quad = \Delta\bar{y}_s - \Delta\bar{y}_{\sim s}$$

where δ is the main effect, $\Delta\bar{y}$ is change in mean turnout for a voter subgroup before and after an intervention and a State is either S (policy change during the period) or $\sim$S (no policy change). I calculate $\Delta\bar{y}$ separately for changes in turnout between Nov. 2004 and Nov. 2008, between Nov. 2006 and Nov. 2010, between Nov. 2004 and Nov. 2010 and between Nov. 2008 and Nov. 2012.[32]

The identification strategy assumes that the observed difference between treatment and control groups should remain constant when there is no treatment. Estimates from differences-in-differences are problematic if there are systematic changes in the treatment and control group unrelated to the policy implementation.[33]

Data

I have assembled a database of Voter ID policies from 2002 to the present and have placed states in one of four categories: No Voter ID law, Non-photo ID law, Photo ID law and Strict Photo ID law.[34] Overall, 13 states changed their Voter ID statutes

[32]See the appendix for a discussion of a difference-in-difference-in-differences estimator that also accounts for state-level factors unrelated to Voter ID policy that may influence turnout.

[33]See Appendix for a discussion of potential threats to validity

[34]I utilize the National Conference on State Legislatures' methodology. `http://www.ncsl.org/legislatures-elections/elections/voter-id.aspx` The strict photo option refers to states that do not allow voters to cast provisional ballots unless they present a photo ID.

between the 2002 and 2004 election, seven strengthened their laws between 2004 and 2006, two tightened their policies between 2006 and 2008, three adopted Voter ID provisions between November 2008 and November 2010 and four strengthened their policies between November 2010 and November 2012.[35] By contrast, a few states weakened their policies in the past decade.

My paper and previous Voter ID research examines how a relative change in the strictness of Voter ID policy affects voter turnout because the majority of states in the sample changed their Voter ID statute by one increment in the four-point classification scheme described above.[36]

[35] 2002-04: AZ, MT, SD, ND, HI, CO, AR, LA, AL, FL, TN, SC, MD; 2004-06: WA, AZ, NM, FL, IN, OH, HI; 2006-08: MI, GA; 2008-10: ID, OK, UT. 2010-12: KS, NH, TN, PA

[36] See Erikson and Minnite (2009). The primary models treat each relative change in a Voter ID policy identically. For instance, an implementation from No ID law to a Strict Photo is coded the same as a state that changes from a Photo ID law to a Strict Photo law. I run separate models examining the impact of changes across each interval, along with the impact of large shifts. Plots in the results section indicate these methodological choices do not affect substantive conclusions. Alvarez et al. (2011) have developed an eight point classification scale based on the strictness of the statute and have categorized each state from 2000 through 2006. Their scheme includes the following categories, ranging from the least intrusive to the most stringent: 1) voter states name, 2) voter signs name, 3) voter signs and signature match, 4) voter is requested to present proof of identification or registration card, 5) voter must present proof of ID or voter registration card, 6) voter must present proof of identification and signature match, 7) voter is requested to present photo id, and 8) voter is required to present photo id (Alvarez et al., 2011)

Voter File and Census Data

I analyze individual level data from Catalist, a national voter database containing voter histories, demographic and commercial data for 180+ million registered voters.[37] Several times a year, Catalist purchases publicly available voter registration files and runs an extensive audit to identify movers, deceased voters or duplicate records. Political scientists have administered extensive validation checks on this data (Ansolabehere and Hersh, 2010; Hersh, 2011; Hersh and Nall, 2012).

The foregoing analysis examines the impact of Voter ID statutes during 2004, 2006, 2008, 2010 and 2012 and I have isolated individuals by race / ethnicity, age, gender, family income, home ownership, party affiliation and length of residence. I calculate voter turnout as total votes divided by the number of adults with an active voting history[38]

Findings

This section presents and explains treatment effects separately for presidential and midterm contests across age, race, family income, party registration and home own-

[37] I accessed Catalist through Stanford University's Academic Subscription. See the Appendix for more information on the Catalist database

[38] See the Appendix for more information on the Catalist voter subgroups and calculating population denominators.

ership status from 2004 to 2012. Each table compares the change in turnout among voter subgroups before and after the policy intervention with turnout among similar groups in states that underwent no election law change.

First, I assess the impact of Voter ID laws during presidential contests by estimating the change in turnout between November 2004 and November 2008. During this period, nine states tightened ID policies and one relaxed its policy. Then, I examine treatment effects between November 2008 and November 2012, a period when seven states strengthened their ballot security policies. Overall, I find that Voter ID policies exerted a limited impact on turnout during these presidential election cycles.

Next, I assess the impact of Voter ID laws during midterm contests. I argued above and find empirically that policies affecting the voting process may exert a larger impact during low salience, low mobilization contests such as midterms. I begin by estimating the change in turnout between November 2006 and November 2010. During this period, five states tightened their ID policies and one relaxed its policy. These states include Georgia, Idaho, Michigan, Oklahoma and Utah. Finally, I conduct another estimate of the effect of Voter ID statutes during midterm elections (November 2004 versus November 2010). This specification, which compares turnout between 2004 and 2010, yields similar results to 2006 - 2010 comparisons.

The relative strictness of laws implemented between 2004 and 2008, and those adopted

between 2006 and 2010 were similar. Therefore, the differential effects sizes between the two cycles likely are driven by changes in mobilization rather than the increased strictness of election law policies. This section proceeds by analyzing the impact of Voter ID statutes across age groups, income levels, length of residence, race and home ownership.

Main Effects. Table 2 displays the main effects across each of the four general election comparisons. This table displays voter turnout over two general election cycles for states that strengthened their Voter ID policy ("Yes") and states with no policy change ("No"). Overall, Voter ID policies have a limited impact on turnout during general elections. While the net effect is close to zero, this section will examine whether these policies have heterogeneous effects across voter subgroups. During midterm elections, voter turnout is approximately three percentage points lower in states that strengthened their Voter ID policies compared with those that held their policies constant. The next section examines which subgroups are demobilized by Voter ID statutes across both midterm and presidential elections.

Subgroup Effects. Figure 2 displays the treatment effects across five age cohorts.[39] The x-axis displays the percent change in voter turnout for individuals in states with a policy change minus the percent change for individuals in states with no policy

[39] collapsed the under 25 and 25-34 cohorts. The treatment effects sizes are similar for both cohorts.

Table 2: Voter ID Main Effects. This table displays voter turnout over two general election cycles for states that strengthened their Voter ID policy ("Yes") and states with no policy change ("No")

	ID Policy Change	% Turnout Pre-	% Turnout Post	Main Effect
2004 to 2008	Yes	0.72	0.82	-0.002
	No	0.72	0.82	
2008 to 2012	Yes	0.82	0.78	0.002
	No	0.82	0.78	
2004 to 2010	Yes	0.75	0.55	-0.037
	No	0.71	0.56	
2006 to 2010	Yes	0.54	0.53	-0.039
	No	0.52	0.56	

change. The panels present four separate election models.

The treatment effects in the 2004 - 2008 comparison (left panel) are small and suggest that Voter ID statutes have a limited impact on turnout across age cohorts during presidential elections. The youngest age cohort is slightly less likely to vote, though the results are not substantively large.

The midterm comparison (second panel) suggests that Voter ID laws reduce turnout among young adults dramatically but do not cause a similar decline in turnout among older adults. Voter ID laws reduced turnout among adults under 35 by five percentage points between 2006 and 2010, compared with no change among adults over 65. Since more than six in 10 young adults vote for Democrats, this increases the Republican Party advantage. The third panel looks nearly identical to the center

panel, with Voter ID statutes reducing turnout among adults under 35 but generally exhibiting smaller effects among older adults. The left panel, which displays effects for presidential elections, suggests that Voter ID policies reduce turnout by approximately two percentage points among young adults.

Figure 2: Voter ID treatment effects by age cohort. Voter ID statutes reduce turnout among young adults during midterm election contests.

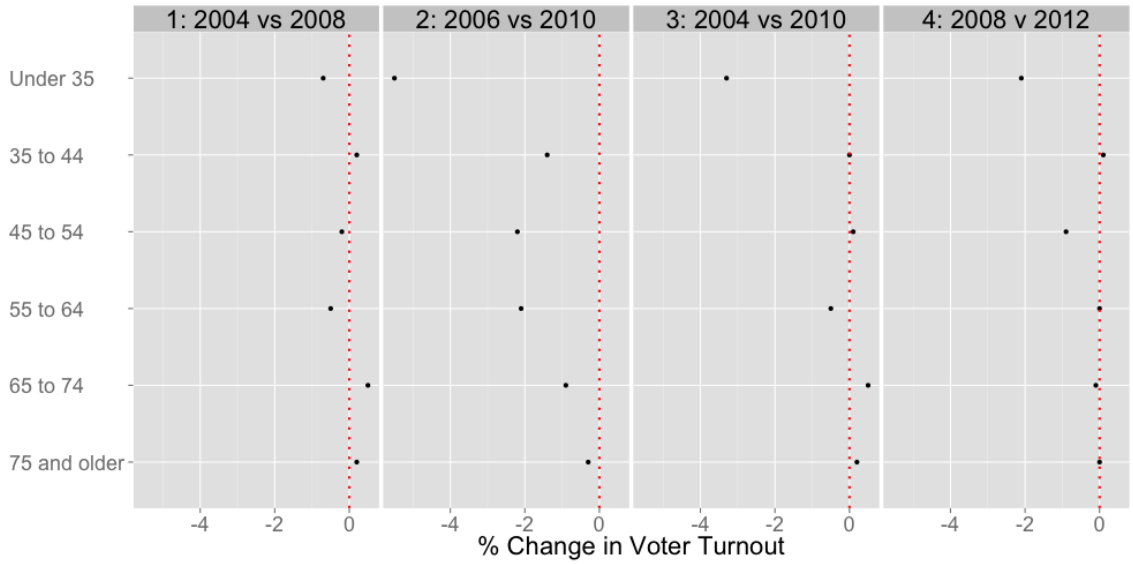


Figure 3 on Page 26 displays the treatment effects across six household income strata ranging from less than $20,000 annually to household income exceeding $100,000. Since low income Americans are more likely to rent and less likely to drive an automobile, I expect Voter ID statutes will demobilize these individuals. The effects in the 2004 to 2008 comparison indicate that Voter ID laws slightly increased turnout

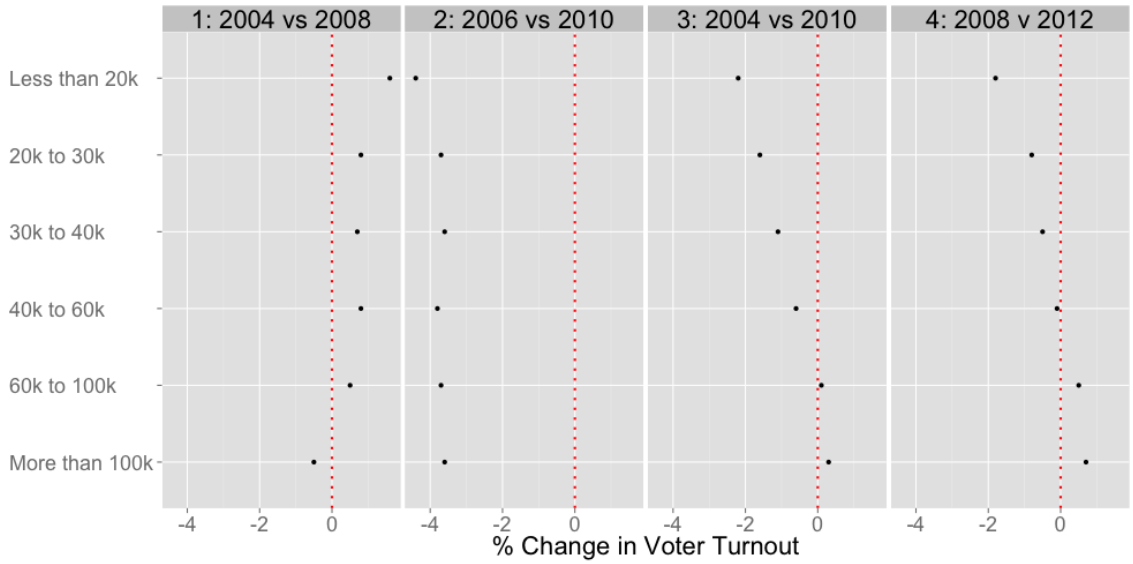
among citizens in the lowest income strata but do not influence turnout among individuals in other strata. During this cycle, the campaigns may have targeted low income voters in Voter ID states.

Among states that changed their policy between 2006 and 2010, Voter ID laws disproportionately demobilize poor and working class voters. Americans in households earning less than $20,000 annually are 4.5 percentage points less likely to cast a ballot in Voter ID states. Voters in the highest income strata exhibit declines of 3.5 percentage points this same period, a small but statistically significant difference.

Low income voters residing in states that changed their Voter ID polices between 2004 and 2010 experience a three percentage point decline in turnout. Wealthier voters, on the other hand, have no change in voter turnout. Among states that changed their policy between 2008 and 2012, Voter ID laws disproportionately demobilize working class voters. Americans in households earning less than $20,000 per year are about two percentage points less likely to cast a ballot in states than strengthen their Voter ID policies; by contrast, higher income individuals are not affected by the policy implementations.

Figure 4 displays the impact of Voter ID statutes based on the length of time the current resident has lived in his or her household. Individuals who have resided in their household for many years are more likely to own an ID listing their current

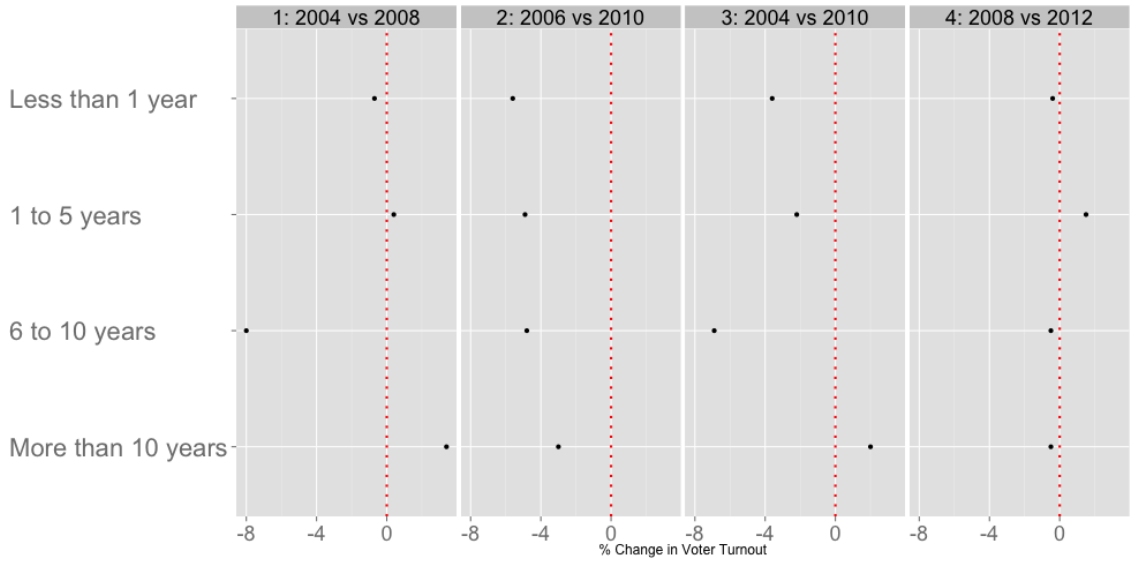
Figure 3: Voter ID treatment effects by income strata and election. Voter ID statutes slightly reduce turnout among low income adults during midterm election contests.



address.

Individuals who have lived in their current residence for less than one year are negatively affected by Voter ID statutes in all three panels, though the effects are most negative among adults who have lived in their household for six to 10 years. Overall, however, the plots suggest that Voter ID statutes depress turnout among residents who have lived in their current household for a relatively short amount of time. Across the three election comparisons, the declines in turnout among individuals who have lived in their current residence for more than 10 years are always smaller than the declines for short-term residents.

Figure 4: Voter ID treatment effects by length of residence and election. Short-term residents are demobilized by Voter ID statutes.



Party registration directly examines the effect of Voter ID statutes on the partisan composition of the electorate. Voters in seven states that strengthened their Voter ID statutes between 2004 and 2012 registered by party. The results in Table 3 and Figure 5 suggest that Voter ID laws demobilize Democrats more than Republicans. The first two columns in Table 3 compare changes in voter turnout among partisan voters in Arizona, Florida and New Mexico, three states that adopted Voter ID policies, and partisans in the 28 states with party registration but no Voter ID policy change. Between 2004 and 2006, Democratic voter turnout decreases 2.3 percentage points more in Voter ID implementation states than in states with no statutory

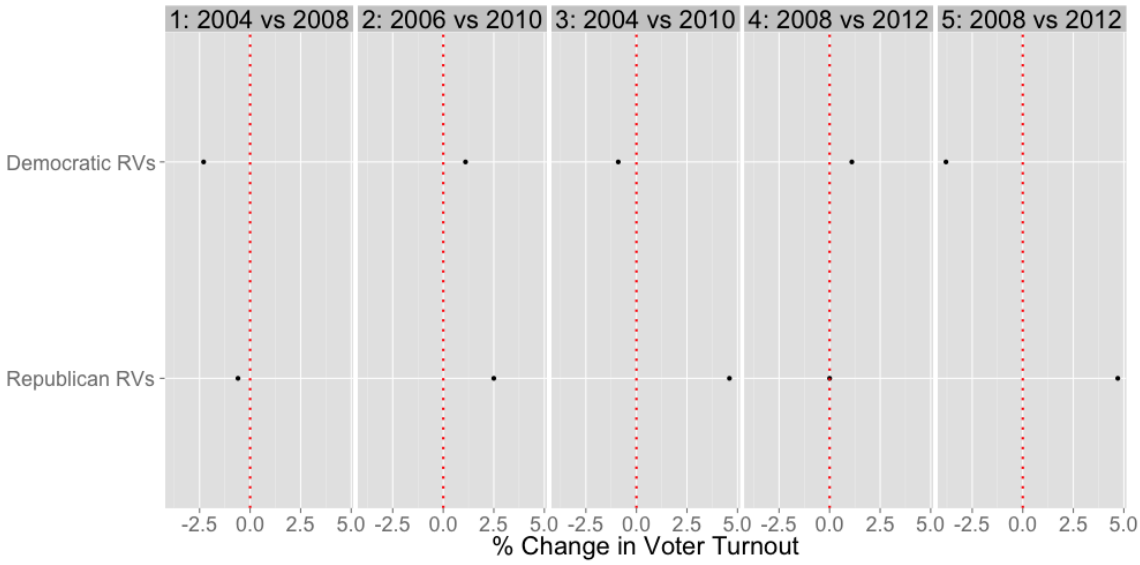
changes. Yet, there is little difference in Republican turnout (-0.6 percent) during this time period. Between the 2004 and 2008 presidential contests, Republican voter turnout increases by 2.5 percentage points more in Voter ID implementation states than in non-Voter ID states; however, Democratic turnout increases by one point, significantly less.

Table 3: Effects of Voter ID statutes among registered Democrats and Republicans

	△ %Turnout 2004 to 2006	△ %Turnout 2004 to 2008	△ %Turnout 2006 to 2010	△ %Turnout 2008 to 2010	△ %Turnout 2008 to 2012
Democrats					
Voter ID change	-20.9	11.1	1.4	-25.7	-9.3
No ID change	-18.6	10.0	2.3	-26.8	-5.5
Treatment Effect	-2.3	1.1	-0.9	1.1	-3.8
Republicans					
Voter ID change	-19.4	6.7	9.7	-18.4	0.2
No ID change	-18.9	4.2	5.1	-18.3	-4.5
Treatment Effect	-0.6	2.5	4.6	0.0	4.7

AZ, FL and NM are party registration states that implemented Voter ID between 2004 and 2006. OK and UT implemented Voter ID between 2008 and 2010. KS, NH, OK and UT implemented Voter ID between 2008 and 2012.

Figure 5: Voter ID treatment effects by party registration.



Two states with party registration, Oklahoma and Utah, strengthened their Voter ID policies between November 2006 and November 2010. Between 2006 and 2010, Democratic voter turnout decreases 0.9 percentage points more in Voter ID implementation states than in states with no statutory changes. However, there is a significant 4.6 percentage increase in Republican turnout in Voter ID states during this time period. Turnout patterns between 2008 and 2010 suggest that Voter ID laws mobilized Democrats more than Republicans.

Four states with party registration, Kansas, New Hampshire, Oklahoma and Utah, strengthened their Voter ID statutes between November 2008 and November 2012.

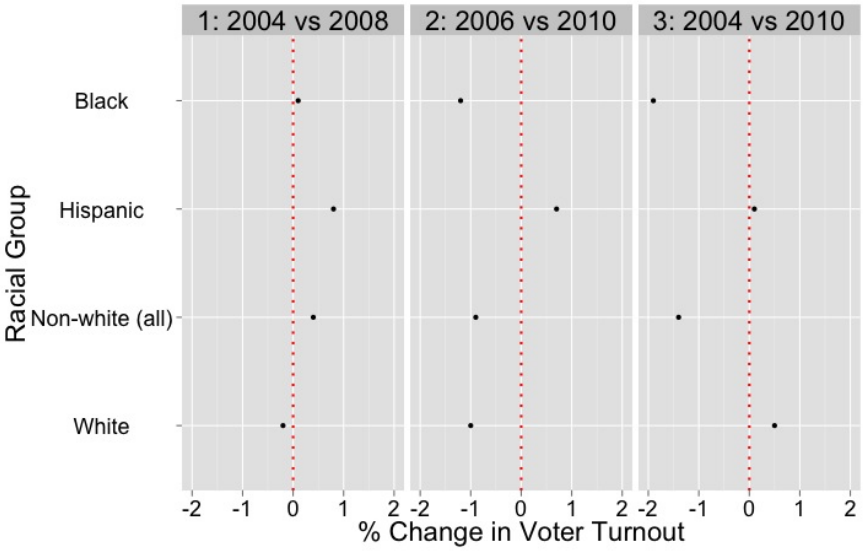
Between 2008 and 2012, Democratic voter turnout decreases by 3.8 percentage points more in Voter ID states than in states with no statutory changes. There is a significant 4.7 percentage point increase in Republican turnout during this time period. That is, despite no main effect on turnout between these two time periods, heterogeneous effects by party registration appear in the data.[40]

Figure 6 displays the impact of Voter ID statutes for African Americans, Hispanics, Whites and all non-whites. African Americans and Hispanics have extremely low ID ownership rates, and I hypothesize that Voter ID statutes will reduce turnout among these groups.

The effects of Voter ID across racial groups are small across the three panels. The third panel suggests that Voter ID laws cause an approximately 2 percentage point decrease among African Americans. Hispanic voter turnout is not affected in any of the specifications.

[40]The party registration results must be interpreted with caution. Only seven of the states that strengthened Voter ID policies have party registration, and state-by-state party registration rules may vary across states and over time.

Figure 6: Voter ID treatment effects by racial group.

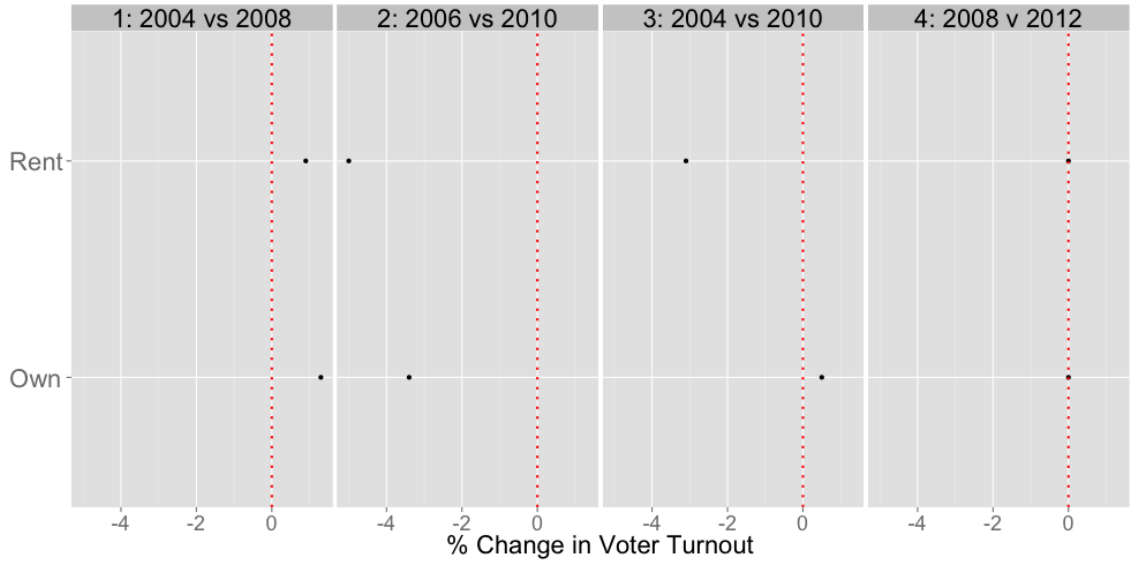


The negligible treatment effects among African Americans and Hispanics may result from a number of factors. First, significant numbers of African Americans and Hispanics lacking IDs may have been mobilized in the 2008 campaign. Second, African American and Hispanic voters may be easier to mobilize than low income voters or renters because they exhibit very high levels of geographic clustering and they tend to live in dense, urban areas.

I aggregated data based on respondents' rental status. Figure 7 shows that Voter ID statutes do not affect turnout for either group for the 2004, 2008 or 2012 presidential elections; however, in the midterm comparison and the 2004-10 comparison, there are significant differences between turnout patterns among renters and owners. The

data suggests that Voter ID policies decrease midterm turnout among renters by about five percentage points and decrease turnout between 2004 and 2010 by three percentage points.

Figure 7: Voter ID treatment effects by home ownership. Voter ID statutes reduce turnout among renters during midterm election contests.



Finally, between 2004 and 2012, two states eased their Voter ID statutes during the period of inquiry. New Mexico changed from a Non-Photo ID to No ID between 2006 and 2008, and South Carolina changed from a Photo ID to a Non-Photo ID policy between 2004 and 2006. After their Voter ID laws were loosened, the observed increases in turnout among young adults, low income adults, renters and African Americans were larger in these states than in the states where election law policy

stayed constant. This additional evidence suggests that Voter ID policies demobilize Democratic leaning voter groups.

In summary, Voter ID statutes exhibit a negative effect on voters during midterm election contests but have a limited impact on political participation during high interest presidential elections. The demobilizing effects are largest among low income adults, young adults, renters and Democrats.

Information versus Identification Hypotheses. The findings have shown that Voter ID laws can reduce turnout, especially during midterm contests. Both hypotheses predict the subgroup effects observed in the previous section. That is, voters without lower ID ownership rates and voters with less information are most likely to be demobilized by Voter ID statutes.

We can distinguish between two competing mechanisms for this effect, the information and identification hypotheses, by identifying situations when the information environment changes dramatically but ID requirements remain constant; alternatively, we can identify cases when the ID requirements are modified but the information environment does not.

In 2012, legislatures in Pennsylvania, South Carolina and Wisconsin passed laws that were eventually placed on hold in the lead-up to the election. The Identification

Hypothesis predicts there should be no difference in turnout between these states and other states with no policy change because the ID requirements stayed the same between election cycles. The Information Hypothesis predicts that we should observe turnout declines in these three states because surprise court decisions, confusing implementation and partisan messaging may confuse voters. The analysis indicates that between 2008 and 2012 subgroups in Pennsylvania, South Carolina and Wisconsin saw larger declines in turnout than in the comparison states that kept policy constant. Further, subgroups in these states saw similar, albeit modest, declines in turnout as in the states that actually strengthened their Voter ID policies.[41]

There are also scenarios where ID requirements shift dramatically but the information environment holds constant. We can compare the impact of states with the Help America Vote Act minimum implementing policies that are more or less inclusive. The Identification Hypothesis predicts that we should observe larger, more negative treatment effects when a state with no Voter ID policy adopts a strict photo ID law compared with a Non-Photo ID law because more voters should be excluded in the former. The Information Hypothesis, however, predicts that we should see no differ-

[41]I have also examined the impact of a neighboring state changing its Voter ID policy on turnout in states next door with no policy change. The Identification Hypothesis predicts that individuals in states with no policy change should see no turnout declines, whereas the Information Hypothesis predicts that individuals in counties bordering states with policy implementation may be exposed to the confusion associated with a neighboring state's Voter ID policy. The data suggests that residents living in the states with no policy change that border Voter ID states do not experience turnout declines, suggestive evidence for the Identification Hypothesis.

ence between these two sets of states because the simple passage of legislation and campaign dynamics cause confusion among voters. Tables 10 & 11, which examine the impact of Voter ID laws in states that changed policy from No ID to Non-Photo (Table 10) and Photo+ (Table 11), provide some support for the Identification Hypothesis. Treatments effects among groups such as young adults and the working class are larger and more negative in states that implemented a law requiring voters to present a Photo ID.

Discussion

Progressive Era reforms of the early 20th Century such as amendments for the direct election of senators, women's suffrage and state-level direct democracy reforms transformed the composition of the electorate and the representative-constituent linkage. The Supreme Court's landmark decision in *Baker v. Carr* (1962) sparked the Reapportionment Revolution – Congressional districts and state legislative districts had to be redrawn to contain approximately equal populations.[42]. I study whether the burst of legislative attention and widespread adoption of Voter Identification statutes at the beginning of the 21st Century has the potential to transform the electorate.

[42]See *Baker v. Carr* (1962), *Wesberry v. Sanders* (1964) and *Reynolds v. Sims* (1964)

My research aggregates tens of millions of individual level voting records over five general elections (2004-2012) using a national voter database. First, I isolate groups with low ID ownership rates such as the working class, renters, African Americans, young adults and Hispanics. Then, I use a difference-in-differences approach to compare the turnout of these voter subgroups before and after a Voter ID law change with turnout patterns among voter subgroups in states with no policy change.

Previous research has yielded puzzling, contradictory findings because it assesses earlier, more lenient statutes, aggregate county or state-level studies are not able to detect effects across voter subgroups and survey-based studies contain measurement and sampling error. I find that Voter ID statutes exert a modest but politically meaningful demobilizing effect, especially among the poor, young adults and renters. The treatment effects are the largest and most negative during midterm contests; however, the impact of these laws is negligible during high interest presidential contests.

My research is among the first to demonstrate that Voter ID laws impact the participation of a broad cross-section of the electorate. This research suggests that the decade long strategic effort among Republicans shifted the composition of the electorate in the GOP's favor. Since state Voter ID laws are becoming increasingly stringent, the findings here provide a floor for treatment effects estimates. Finally,

the study presents a template for future scholars to examine the effects of state-level interventions across voter subgroups.

The results discussed below indicate that Voter ID laws have modest effects that are substantial enough to influence election outcomes in close races. Since the results indicate that Voter ID demobilizes groups that disproportionately favor Democrats, a decrease in voter turnout corresponds with a decline in Democratic vote share. The findings suggest that the winner in four states in the 2004 presidential election (NH, NM, OH, WI), and two states in the 2008 presidential election (MO, NC), could have been different based on Voter ID policy implementations.

Furthermore, modest declines in Democratic vote share can influence both top-of-the-ballot contests and lower ballot contests such as U.S. House, mayor and state legislative races. The margin of victory has been less than five percentage points in 10 percent of state legislative races between 1968 and 2010, less than two percentage points in four percent of races and less than one percentage point in two percent of contests.[43]

Voter ID laws will continue to receive attention as state legislatures enact new laws and the Justice Department and courts hear challenges. The findings in this study

[43]Source: Klarner, Carl, William Berry, Thomas Carsey, Malcolm Jewell, Richard Niemi, Lynda Powell, and James Snyder. State Legislative Election Returns (1967-2010). ICPSR34297-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2013-01-11. doi:10.3886/ICPSR34297.v1.

suggest that Voter ID laws have shifted the composition of the electorate in the Republican Party's favor, especially during low salience midterm elections.

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Online Appendix

Contents

The Adoption of Voter ID laws

The widespread adoption of Voter ID statutes has been driven by the passage of the Help America Vote Act (HAVA) in 2002, an organized effort among Republican state legislators and governors to enhance ballot security, near unanimous public support for ballot security measures and the perception of pervasive voter fraud among Americans.[44]

The Help America Vote Act (HAVA) of 2002 established minimum federal standards for first-time voters, established the Election Assistance Commission (EAC) and replaced outdated voting systems such as punch cards.[45] The act passed with overwhelming bipartisan majorities in both the U.S. Senate and U.S. House and was signed into law by President George W. Bush in October 2002. The act provided voters with a range of options to register to vote and to verify their identify. First-time voters could register to vote by providing the last four digits of their Social Security Number, a current driver's license number, a state identification number, a Non-Photo ID or a Photo ID.[46] Many legislators and state officials, however, felt that the act did not go far enough to ensure ballot security and prevent voter fraud.

Voter ID laws receive widespread public support. Seventy-eight percent of Americans said voters should be required to show an official photo identification on Election Day, including 86 percent of Republicans and 71 percent of Democrats, according to a 2006 Pew poll.[47] Fully 48 percent of Americans say that voter fraud – people voting who are not eligible or voters casting multiple ballots – is a major problem, according to a 2012 *Washington Post* poll.[48]

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[44]

[45]Pub.L. 107-252 `http://www.gpo.gov/fdsys/pkg/PLAW-107publ252/html/PLAW-107publ252.htm`

[46]First-time voters must provide either a Photo ID, Non-Photo ID, their current and valid driver's license number, a state identification number or the last four digits of their Social Security Number.(Help America Vote Act, Section 303b `http://www.fec.gov/hava/law_ext.txt`). Individuals who cannot meet these requirements will be assigned a unique voter registration number.

[47]Survey by Pew Research Center for the People and the Press, October 17-22, 2006 based on 2,006 telephone interviews.

[48]The poll was conducted July 18-29, 2012, and based on 2,047 telephone interviews. Thirty-three

Difference-in-differences Example

Figure 8 displays the difference-in-differences estimates using voting data on low income voters. The figure displays voter turnout as a proportion of the voting eligible population (y-axis) for 2006 and 2010 (x-axis). The red line demonstrates that voter turnout among low income voters in states with no Voter ID change between 2006 and 2010 stays about the same over the two periods, whereas the black, downward sloping line exhibits the negative trend in voter turnout in states that underwent a policy change.

The key assumption of difference-in-differences is that, without treatment, the difference between treatment and control groups remains the same. This assumption is shown by the dotted counterfactual line. The low pre-treatment difference expands to a large post-treatment difference of approximately four percentage points. We can calculate the estimated treatment effect by comparing the expected voter turnout in the counterfactual with observed turnout.

Potential threats to validity

The foregoing section addresses and evaluates potential threats to validity that arise because the study uses an observational approach.

The Assignment Process. Random assignment typically ensures that treatment and control groups are similar across relevant covariates. The investigator, however, cannot control the assignment process in observational studies such as this one.

My study and previous research on Voter ID statutes have used difference-in-differences estimators to address problems associated with non-random assignment (Alvarez et al., 2011). While states that are electorally competitive or political conservative may be more likely to adopt Voter ID statutes, difference-in-differences sidesteps the problem of non-random assignment by measuring turnout before and after an intervention.[49]

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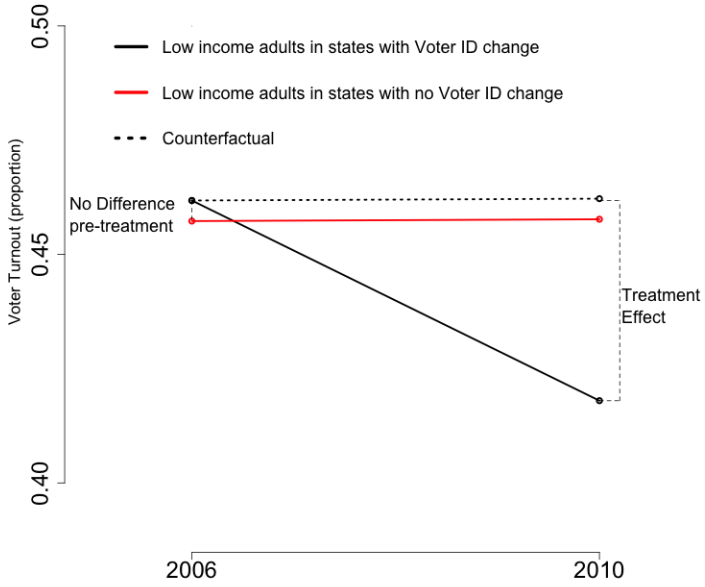
percent say it is a minor problem and 14 percent say it is not a problem.

[49] Alvarez et al. (2011) use a difference-in-differences estimator with Current Population Survey data to estimate the impact of Voter ID statutes: "[I]dentification requirements are not randomly assigned across states. This is a problem if states with historically lower turnout also tend to adopt stricter identification requirements, then we will have trouble isolating whether the low level of turnout is due to the identification requirement or to other factors that lead a given state to have lower turnout rates. The estimation strategy used exploits the temporal and geographic variability

Figure 8: Difference-in-differences estimate among low income voters



Campbell and Ross (1968) argue that scholars must find alternative explanations plausible to dismiss the validity of difference-in-differences approaches: "[L]ack of control and lack of randomization are damaging to inferences of cause and effect only to the extent that a systematic consideration of alternative explanations reveals some that are plausible" (Campbell and Ross, 1968, p. 34).

SUTVA. The stable unit treatment value assumption (SUTVA), a concern relevant to all observational studies, states that the assignment status of a given unit should not affect others units' potential outcomes.[50]

in voter identification requirements to sidestep the problem of non-random assignment. This is referred to as a difference-in-differences estimator and our analysis is built on a generalization of this procedure" (Alvarez et al., 2011, p. 10). Future research can analyze the 1% voter sample from Catalist, a national voter file database. The file contains detailed information on more than two million voters. If we match across a series of covariates, we can assume that the sole difference between units is their treatment assignment.

[50]"The [potential outcome] observation on one unit should be unaffected by the particular as-

Voter ID is a newsworthy and salient topic, and voters in a state without Voter ID might learn of a Voter ID policy in a neighboring state, believe the policy's provisions apply to them and not cast a ballot as a result. First, this phenomenon would bias estimates in the opposite direction, complicating the argument that Voter ID statutes decrease turnout among voter subgroups.[51] Second, it is unlikely that the recent adoption of Voter ID laws influences the behavior of neighbors because Voter ID policies have widespread recognition and many states already have adopted at least a lenient version of Voter ID. Third, I have compared the voting behavior of individuals who live in counties that neighbor states with a Voter ID policy change (e.g., Illinois residents on the Indiana border) with individuals who live in interior counties and have not found differences in voting behavior across election cycles. Individuals neighboring Voter ID states should be more likely to have heard about a Voter ID statute implementation, and, if SUTVA is relevant, their behavior should be more affected than individuals who live in interior counties.

Nonetheless, it is difficult to compute an average treatment effect because states administer multiple, complex policy treatments with varying minimum requirements, provisional ballot policies and more. Alvarez et al. (2011) address the variation in treatments: "[T]here are many methodological problems unique to this data, one of which is the ordinality of voter identification requirements. As is apparent from the listing of the types of regimes, it is not the case that a state either requires identification to vote, or does not. States require many different levels of identification from simply stating one's name to showing a picture identification. This further complicates the question, as we must determine not just one effect but several potentially incremental effects. Second, states may differ in their implementation of similar requirements. While one state may consider a student identification card or discount club membership card to be valid photo identification, another state may only recognize government-issued photo identification cards" (Alvarez et al., 2011, p. 9-10)

Clustered Standard Errors. Unlike a randomized experiment, we cannot assume that errors are independently and identically distributed because the individual level observations are grouped within the states in which the Voter ID implementation occurs. Estimates obtained without clustering observations result in downward bi-

signment of treatments to the other units" (Cox 1958). If assignment status influences potential outcomes, then there are several compound treatments, each of which involves a different assignment.

[51] Reports that voters are assigned to a Voter ID treatment may mobilize other voters in a non-policy state, leading to a biased estimate of the treatment effect.

ased standard errors because individual observations in clustered data contribute less information to a model than data without clustering.[52] Voter ID studies using robust rather than clustered standard errors understate the size of standard errors by up to a factor of seven and the computation of standard errors can determine whether findings are highly statistically significant or not statistically different from zero (Erikson and Minnite, 2009, p. 92).

The standard errors based on observed behavior from the tens of millions of voters in the national voter file are miniscule. Multiplying the standard error of a proportion of 10 million individuals by a factor of 30 produces a statistically significant finding for a one percentage point treatment effect at the 95 percent confidence level. The main models in this study estimate standard errors utilizing a cluster bootstrap at the state and county, which causes a modest increase in the size of the standard errors.[53]

Catalist

Validation. Ansolabehere and Hersh (2010) describe Catalist's basic data collection process and the rigorous procedures they implement to validate the data: "Several times a year, Catalist purchases the publicly available voter registration files made available by each state or county election office...Catalist then cross-references the registration lists with other public records, such as the National Change of Address (NCOA) database maintained by the Post Office and the Social Security death index. Movers and deceased voters are flagged. Catalist matches the registration files to commercial records from data aggregation firms that compile lists from retailers and direct marketing companies. This allows the firm to correct the records of individuals who may have a typo in their registration record or may have registered with a nickname rather than their legal name" (Ansolabehere and Hersh 2010, p. 5). There may be a slight discrepancy between the official vote tally and the number of votes cast in the database due to voter purges: "A vote tally from a registration file excludes the votes cast by citizens who were purged from the file since the election. For instance, a person who voted in 2006 but was since removed from the rolls would

[52]Research in social science has shown that not accounting for clustering can bias standard errors (e.g., Carsey and Wright, 1998; Green and Vavreck, 2008)

[53]I compute standard errors by aggregating individual level data to the county level. Then, I resample observations using a bootstrap at the state and county level. The bootstrap resamples entire clusters of observations rather than individual observations and modestly increases the size of the standard errors.

not be included in the county on the registration list but would have an official ballot counted. This presents a minor problem since it only applies to voters who confirmed with the registrar that they moved" (Ansolabehere and Hersh, 2010, p. 15).

States vary in the discrepancy between vote tallies and official results, though the discrepancy is less than 5% in most states: "The 2008 and 2006 vote history discrepancy rates vary considerably by states. In Oregon, North Carolina, Rhode Island, Delaware, and many other states, discrepancies are at a minimum, representing fewer than 5% of all votes. However, in other states like Mississippi, New York, and Texas, the 2008 discrepancy rate is closer to 10%" (Ansolabehere and Hersh, 2010, p. 15). The worst performers are Colorado, Maine, Mississippi and North Dakota.

Catalist Voter Groups. Voters were divided into the following racial groups: African American, Hispanic, White and Nonwhite.[54] Catalist acquires racial data from two sources: self-identified responses in voter files and CPM Ethnics race prediction software. The race variable in the database uses self-identified race in many Southern states, where residents list their racial status when registering.[55] Outside of the South, CPM Ethnics assigns a race based on a highly accurate algorithm including the respondent's first name, middle name, last name, age and characteristics of their Census geography.[56] Hersh (2011) finds that the race variable included in the Catalist data file is accurate between 91% and 96% of the time in Southern states.[57]

Voters were divided into the following age groups: Adults under 35, 35-44, 45-54,

[54]Nonwhite is the total number of votes minus the number of White votes.

[55]Specifically, Catalist reports racial source data for each state: AL 69%, FL 76%, GA 74%, LA 76%, MS 44%, NC 78%, SC 76%, TN 47%

[56]Given the geographic concentrations of Americans by race, the resulting predictions are highly accurate, though, not without error. Here is a research notes from CPM Ethnics: "In external blind testing against self-reported ethnicity identification, CPM Technologies solutions have shown over 20% more coverage than other established ethnicity appending services...CPM Ethnics software can find over 75% of the African Americans in lists and still maintains an accuracy of over 80%. CPM's algorithms are based upon modern machine learning techniques and are built using tens of millions of samples with known race."`http://cpm-technologies.com/cpmEthnics.html`

[57]"The exact model Catalist uses to predict race is proprietary, but we can check the quality of the prediction using survey responses that have been matched into the Catalist database. The 2009 Cooperative Congressional Election Study (CCES) was matched into Catalist's database. For the registrants with listed races, 96% of voters' self-reported races were the same as the publicly listed races. For the registrants whose races were predicted with confidence, 91% had the same self-reported race as predicted by Catalist's model. Though the match between self-reports and the Catalist data is not in perfect agreement, it is sufficiently accurate that each racial group in the Catalist database can be divided in two..." (Hersh, 2012, p. 9-10).

55-64, 65-74, 75+. An individual's age was calculated separately for each of the five general elections under investigation. While nearly all records include a birth date, records with a missing birth date were supplemented using a model including the number of years the individual has been registered to vote, the age of the head of household and the individual's first name.[58]

Adults who move frequently are less likely to have IDs with current addresses, and voters were divided into the following groups based on how long they have lived in their current residence: less than one year, one to five years, six to 10 years, 11 to 20 years and more than 20 years. Similarly, I identified individuals who were either renting or who owned their residence using household commercial data.

Scholars have hypothesized that Voter ID statutes will place an undue burden on working class and poor Americans. I identified household incomes in the following ranges using household level commercial data: less than $20,000, $20,001 to $30,000, $30,001 to $40,000, $40,001 to $60,000, $60,001 to $100,000 and over $100,000.[59]

Party registration data can provide a direct test of the impact of Voter ID statutes on the partisan composition of the electorate. Voters in five of 12 states that strengthened their Voter ID statutes between 2004 and 2010 register by party.[60]

Calculating Voter Turnout with Catalist Data The Catalist data provides a numerator for the total number of votes cast by a subgroup. I estimate turnout

[58] Future analyses can utilize a cohort analysis tracking turnout of the same group of adults.Ansolabehere and Hersh (2010) find that "1 in 7 records does not have a listed birthdate, and for many voters who do have a listed birthdate, the date entered is inaccurate." (Ansolabehere and Hersh, 2010, p. 2). The primary inaccuracy, however, is that the voter's birthdate was entered as the first of the month or as January 1.

[59] Both the household income data and the rental status data are largely based on Census block group characteristics. There are more than 200,000 Census block groups, and there is a high level of spatial clustering of income and rental status. Since renters and low-income individuals are concentrated in urban areas, the estimates, though not based on individual data, are highly accurate.

[60] Voter ID policy change states with party registration include Arizona, Florida, New Mexico, Oklahoma and Utah. Since Arizona, Florida and New Mexico strengthened Voter ID policies between November 2004 and November 2006, the analysis will compare changes in voter turnout over this time period among partisan voters in these three states and partisans in the 28 states with party registration but no Voter ID policy change. Since Idaho and Oklahoma strengthened their Voter ID policy between November 2008 and November 2010, the secondary analysis will compare changes in voter turnout over this time period among partisan voters in these two states with partisans in the 29 states with party registration but no Voter ID policy change. Similarly, I can estimate the proportion of the electorate that is Republican and Democratic in each state before and after the Voter ID policy intervention.

models with a series of three population denominators. The substantive findings are similar across the denominators.

First, I use change in total votes cast in a subgroup over time. This approach has limited sampling error but does not account for changes in state subgroup populations between November 2004 and November 2010.[61]

Second, I divide the total votes cast by the number of registered voters in Catalist's national database. This approach estimates the change in the percent of registered voters who cast a ballot and minimizes sampling error. However, across both states and voter subgroups, there may be differential rates of inactive voters, ineligible voters, dead voters or purged voters on registration rolls.

The final approach divides the total votes cast in a subgroup by the number of individuals in that subgroup in Catalist's database with an active voter history. Active voters are individuals who voted at least once between January 1, 2004, and December 31, 2010. This more precise estimate reduces the amount of deadwood in voter registration files because we only include citizens who have voted at least once since 2004.[62]

Non-Voter ID explanations for the Treatment Effects

Ballot Access Policies. Voter ID statutes may disproportionately reduce turnout during midterm election cycles. Alternatively, states lacking Voter ID laws may be exhibiting higher levels of relative turnout because they are enacting laws to expand ballot access. This ballot access explanation is unlikely because there has been limited expansion of election day registration in the past decade. Furthermore, the relationship between various types of absentee voting and the partisan composition of a state legislature is weak.

Competitiveness. The largest treatment effects appear in November 2010, and it is plausible that Democratic groups in Voter ID states may have exhibited lower

[61] State subgroup populations change over time, largely due to people changing residence. If, for instance, the number of African Americans in Voter ID states decreases at a higher rate than in non-policy states, we may erroneously conclude that Voter ID laws decrease turnout. For this to affect treatment estimates, though, there have to be systematic differences in population changes across Voter ID and non-policy states.

[62] As in the third approach, it is still possible that purging or removal of voters occurs at different rates across states and voter subgroups. See the appendix for more information on voter purging.

turnout because these states were less competitive than the national average. However, all five states that changed their Voter ID statutes between November 2006 and November 2010 held off cycle gubernatorial elections.

Voter Purging. Voter purging rates differ across states and municipalities. It is possible that voter purges young adults, low income adults, renters or deceased voters are higher in Voter ID states than in non-Voter ID states. Federal law stipulates that voters cannot be purged from the voting rolls for at least two general election cycles, so the number of adults purged in 2006 and beyond is likely quite low in the aggregate.

Placebo Tests

The figures displayed in the results section compare changes in voter turnout among individuals in Voter ID states with individuals in states that have no policy implementation. I have estimated a series of placebo tests that report change in turnout among voter subgroups in the election cycles immediately preceding a Voter ID statute implementation. Since neither set of states implemented Voter ID policies in this period of time, voter turnout across subgroups in these "future" Voter ID states should be no different from turnout patterns in states that never undergo a Voter ID policy implementation. These placebo tests are one method of examining whether individuals in Voter ID policy states are systematically different from voters in states that do not change their policy.

The final column of Table 4 , "04 to 08" compares the change in voter turnout among states that strengthened their Voter ID policy between 2006 and 2008 with states that did not have a Voter ID implementation in the period. It is evidence that low income and young adults are disproportionately demobilized by the Voter ID implementation. The third column, "04 to 06", examines change in voter turnout across the same sets of states for an earlier period when no states strengthened their Voter ID policies. Since neither set of states implemented Voter ID policies in this period of time, voter turnout across subgroups in these "future" Voter ID states should be no different from turnout patterns in states that never undergo a Voter ID policy implementation. The table indicates that voter turnout patterns among individuals who are demobilized by Voter ID statutes are not significantly differ in the third column.

Table 4: Placebo Test estimates

Category	Subcategory	04 to 06	04 to 08
Age	Under 35	0.75	-3.50
Age	35-44	3.32	-0.51
Age	45-54	2.67	-1.94
Age	55-64	1.58	-0.89
Age	65-74	1.27	-0.08
Age	75+	0.93	-0.15
Income	Under $20k	1.74	-2.17
Income	$20k-30k	0.73	-1.63
Income	30k-40k	0.46	-1.66
Income	40k-60k	0.55	-1.41
Income	60k-100k	0.83	-0.98
Income	100k+	1.13	-0.67
Owner	Owner	1.60	-1.28
Owner	Renter	-0.30	-1.80
Race	Black	3.58	-4.51
Race	Hispanic	2.54	0.46
Race	Caucasian	0.26	-1.28
Residence	< 1 year	-1.95	-1.79
Residence	1-5 years	-0.17	-1.46
Residence	6-10 years	-2.64	-4.90
Residence	10+ years	2.72	-0.02

Treatment Effects with Different Population Denominators

As noted above, the Catalist data provides a numerator for the total number of votes cast by a subgroup and I estimate turnout models with a series of three population denominators. The main models presented in the body of the paper use individuals with an active voting history as the denominator for calculating voter turnout. Here I present the treatment effects when I use registered voters and the change in total votes cast as denominators. In general, the substantive takeaways are very similar across the various population denominators.

Effects Among Registered Voters. Table 5 displays the main treatment effects among registered voters. The treatment effects by age, race, income and home ownership are small in the presidential election comparison. By contrast, there are

significant and negative findings in the two midterm election comparisons. For example, voter turnout is approximately 13 percentage points lower among young adults in states administering Voter ID policy changes than in states that underwent no policy change.

Table 5: Treatment effects among Registered Voters

Category	Subcategory	04 to 08	06 to 10	04 to 10
Age	Under 35	-0.53	-2.93	-1.05
Age	35-44	0.12	-0.73	0.44
Age	45-54	-0.23	-1.14	0.32
Age	55-64	-0.47	-1.12	-0.33
Age	65-74	0.14	-0.46	0.17
Age	75+	-0.02	-0.18	0.07
Income	Under $20k	0.85	-2.16	-1.16
Income	$20k-30k	0.55	-1.88	-1.03
Income	30k-40k	0.58	-1.89	-0.88
Income	40k-60k	0.67	-2.13	-0.64
Income	60k-100k	0.57	-2.28	-0.27
Income	100k+	-0.10	-2.45	-0.02
Owner	Owner	0.19	-2.32	0.14
Owner	Renter	0.60	-2.66	-1.75
Race	Black	0.14	-1.37	-0.91
Race	Hispanic	1.17	-2.35	0.10
Race	Caucasian	-0.19	-2.19	-0.55
Residence	$<$ 1 year	-0.20	-2.09	-1.34
Residence	1-5 years	0.01	-2.64	-1.03
Residence	6-10 years	-4.49	-2.88	-4.57
Residence	10+ years	2.34	-2.03	0.99

Effects Using Raw Vote Changes Table 6 displays the main treatment effects using the change in raw votes casts across elections as the measure. As in the previous table, the treatment effects by age, race, income and home ownership are small in the presidential election comparison. By contrast, there are significant and negative findings in the two midterm election comparisons. For example, voter turnout is approximately 20 percentage points lower among young adults and 10 percentage points lower among renters in states administering Voter ID policy changes than in states that underwent no policy change.

Table 6: Treatment effects using raw votes as a denominator

Category	Subcategory	04 to 08	06 to 10	04 to 10
Age	Under 35	-1.28	-24.04	-22.95
Age	35-44	0.57	-6.66	-4.01
Age	45-54	0.10	-6.48	-1.88
Age	55-64	-0.50	-3.21	-1.17
Age	65-74	1.10	-0.40	1.32
Age	75+	-0.31	0.61	0.54
Income	Under $20k	1.80	-10.50	-7.75
Income	$20k-30k	0.82	-8.02	-4.50
Income	30k-40k	0.70	-7.13	-2.62
Income	40k-60k	0.74	-6.95	-0.98
Income	60k-100k	0.34	-6.11	0.59
Income	100k+	-0.69	-5.45	0.83
Owner	Owner	0.05	-5.45	1.05
Owner	Renter	1.13	-10.68	-9.04
Race	Black	0.19	-5.95	-4.84
Race	Hispanic	3.77	-9.23	-2.35
Race	Caucasian	-0.34	-6.59	-2.17
Residence	$<$ 1 year	-1.35	-11.09	-7.83
Residence	1-5 years	0.11	-9.93	-5.25
Residence	6-10 years	-9.50	-8.39	-12.35
Residence	10+ years	3.77	-4.89	3.05

Calculating Treatment Effects with non-random assignment

The primary tables and figures in the next section present national estimates. I also analyze separate models with subsets of the data because Voter ID statutes have been disproportionately adopted in conservative and competitive states.

First, Table 7 examines competitive states where the 2004 presidential vote was within 10 percentage points. Second, Table 8 restricts the sample to Republican-leaning states – places that George W. Bush won in 2004. Finally, Table 9 examines states with at least a Non-Photo Voter ID policy in 2010.[63] The results for the three estimation approaches are similar to the findings reported in the paper's main body – small effects during presidential elections and modest, negative effects during

[63] Approximately 30 states have administered a Voter ID policy stricter than the HAVA minimum.

midterm contests.

Table 7: Treatment effects in 2008 battleground states (e.g., less than 10 percentage point margin)

Category	Subcategory	04 to 08	06 to 10	04 to 10
Age	Under 35	-1.56	-13.34	-5.59
Age	35-44	-0.91	-6.79	-1.38
Age	45-54	-0.82	-7.12	-0.83
Age	55-64	-1.43	-4.85	-1.96
Age	65-74	0.03	-2.25	-0.65
Age	75+	0.44	-1.42	0.04
Income	Under $20k	0.73	-12.38	-5.18
Income	$20k-30k	-0.43	-13.62	-5.09
Income	30k-40k	-0.42	-13.77	-4.21
Income	40k-60k	-0.29	-13.77	-3.24
Income	60k-100k	-0.80	-12.80	-2.48
Income	100k+	-1.92	-11.06	-1.23
Owner	Owner	-1.35	-11.38	-1.29
Owner	Renter	1.66	-14.31	-6.79
Race	Black	-5.68	-20.26	-7.13
Race	Hispanic	0.99	-15.45	-2.42
Race	Caucasian	-1.56	-10.78	-2.82
Residence	< 1 year	-3.86	-17.06	-9.14
Residence	1-5 years	-1.05	-17.92	-7.09
Residence	6-10 years	-15.98	-18.87	-14.80
Residence	10+ years	5.77	-8.47	2.43

Table 8: Treatment effects in states George W. Bush won in 2004

Category	Subcategory	04 to 08	06 to 10	04 to 10
Age	Under 35	-0.30	3.55	-1.96
Age	35-44	-0.48	3.82	-1.57
Age	45-54	0.50	2.98	0.59
Age	55-64	-0.71	0.92	-0.86
Age	65-74	0.13	0.40	-0.21
Age	75+	0.03	0.27	-0.43
Income	Under $20k	0.61	3.43	-3.13
Income	$20k-30k	0.13	4.27	-1.96
Income	30k-40k	0.06	4.54	-1.29
Income	40k-60k	0.15	4.32	-0.63
Income	60k-100k	-0.19	4.37	0.02
Income	100k+	-1.26	3.84	-0.35
Owner	Owner	-0.50	4.30	0.81
Owner	Renter	0.84	3.74	-3.70
Race	Black	-0.23	6.69	-0.55
Race	Hispanic	4.64	1.91	3.19
Race	Caucasian	-1.69	3.62	-1.82
Residence	$<$ 1 year	-1.01	5.79	-2.70
Residence	1-5 years	-0.90	5.23	-2.65
Residence	6-10 years	-8.58	5.47	-7.38
Residence	10+ years	3.16	2.82	2.29

Table 9: Treatment effects in states with at least a Non-Photo ID policy by November 2010

Category	Subcategory	04 to 08	06 to 10	04 to 10
Age	Under 35	-0.96	-4.61	-2.41
Age	35-44	-1.09	-1.73	-1.36
Age	45-54	-0.68	-2.41	-0.15
Age	55-64	-0.66	-2.11	-0.18
Age	65-74	-0.09	-1.27	-0.01
Age	75+	-0.09	-0.80	-0.23
Income	Under $20k	2.37	-4.46	-2.09
Income	$20k-30k	0.41	-4.05	-1.64
Income	30k-40k	0.16	-3.95	-1.23
Income	40k-60k	0.08	-4.24	-0.66
Income	60k-100k	-0.66	-4.17	-0.22
Income	100k+	-2.15	-4.16	-0.78
Owner	Owner	-1.01	-4.04	0.51
Owner	Renter	0.71	-4.68	-3.70
Race	Black	0.29	-3.11	-2.03
Race	Hispanic	4.20	-5.64	4.40
Race	Caucasian	-1.80	-3.94	-1.64
Residence	$<$ 1 year	-1.83	-4.97	-3.25
Residence	1-5 years	-1.24	-5.28	-3.31
Residence	6-10 years	-9.26	-4.19	-7.36
Residence	10+ years	3.29	-3.49	2.46

Table 10: Treatment effects in states that changed policy from No ID to Non-Photo ID

Category	Subcategory	04 to 08	06 to 10	04 to 10
Age	Under 35	-5.81	-0.48	-1.96
Age	35-44	-1.57	0.50	2.60
Age	45-54	-2.75	-0.88	0.73
Age	55-64	-0.88	0.23	1.92
Age	65-74	-0.13	0.16	1.21
Age	75+	-0.10	0.50	1.12
Income	Under $20k	-3.86	-1.26	-0.82
Income	$20k-30k	-3.39	-0.34	0.35
Income	30k-40k	-3.16	-0.31	0.79
Income	40k-60k	-2.56	-0.11	1.10
Income	60k-100k	-1.89	0.62	2.04
Income	100k+	-1.75	0.74	2.96
Owner	Owner	-1.69	0.53	2.62
Owner	Renter	-3.49	-1.13	-1.05
Race	Black	-9.56	-4.08	-8.10
Race	Hispanic	2.27	4.02	8.28
Race	Caucasian	-1.70	0.88	1.48
Residence	< 1 year	-2.21	1.51	2.63
Residence	1-5 years	-1.36	0.32	1.67
Residence	6-10 years	-6.49	-0.84	-1.91
Residence	10+ years	-1.77	-0.19	2.06

ID states - Arizona, Ohio, Oklahoma, Utah & Washington.

Table 11: Treatment effects in states that changed policy from No ID to Photo ID / Strict Photo ID

Category	Subcategory	04 to 08	06 to 10	04 to 10
Age	Under 35	0.35	-11.16	-6.24
Age	35-44	-0.38	-5.87	-1.10
Age	45-54	-1.52	-6.73	-2.79
Age	55-64	-1.19	-4.49	-1.89
Age	65-74	-0.35	-2.09	-0.62
Age	75+	-0.06	-1.19	0.09
Income	Under $20k	2.59	-11.40	-6.08
Income	$20k-30k	0.05	-11.13	-6.95
Income	30k-40k	-0.55	-11.03	-7.08
Income	40k-60k	-0.94	-10.24	-6.28
Income	60k-100k	-1.37	-9.97	-5.65
Income	100k+	-1.78	-9.54	-5.85
Owner	Owner	-1.18	-10.03	-5.23
Owner	Renter	-1.21	-10.05	-6.74
Race	Black	-4.70	-17.24	-11.82
Race	Hispanic	4.61	-11.88	-6.64
Race	Caucasian	0.96	-8.69	-4.85
Residence	< 1 year	-2.76	-13.95	-13.31
Residence	1-5 years	-0.46	-14.13	-11.39
Residence	6-10 years	-8.46	-12.59	-12.08
Residence	10+ years	2.25	-7.92	-1.98

ID states - Idaho, Indiana and Michigan.

Table 12: Treatment effects in states that weakened their Voter ID policy. There is evidence that Democratic-leaning groups' turnout increases more after Voter ID laws are weakened.

Category	Subcategory	04 to 08	06 to 10	04 to 10
Age	Under 35	3.88	3.49	5.08
Age	35-44	3.83	3.72	5.62
Age	45-54	1.99	3.55	3.36
Age	55-64	2.73	3.15	2.37
Age	65-74	2.68	3.25	3.22
Age	75+	1.18	2.42	1.93
Income	Under $20k	3.64	8.70	8.65
Income	$20k-30k	4.10	7.71	8.54
Income	30k-40k	4.08	6.74	7.64
Income	40k-60k	4.58	6.45	7.48
Income	60k-100k	4.93	5.78	7.79
Income	100k+	5.16	5.75	9.20
Owner	Owner	4.72	5.38	7.54
Owner	Renter	3.57	7.46	7.37
Race	Black	5.88	9.63	11.74
Race	Hispanic	-6.31	-0.40	-1.12
Race	Caucasian	4.49	5.17	6.64
Residence	< 1 year	7.06	7.87	10.52
Residence	1-5 years	6.81	10.50	13.23
Residence	6-10 years	12.29	8.07	14.18
Residence	10+ years	0.30	3.51	2.56

New Mexico and South Carolina.