Rock the Registration: Same Day Registration Increases Turnout of Young Voters*

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Abstract

Studies find that same day registration (SDR) laws increase turnout, but less is known about which kinds of voters are most affected. Young people are disproportionately burdened by traditional registration laws because they frequently change addresses and infrequently interact with government agencies providing registration services. SDR laws, which lower the cost of registration, should increase turnout most among young people. Laws that lower the cost of voting but not the cost of registration should be less effective at increasing youth turnout. Difference-in-difference estimates suggest SDR disproportionately increases turnout among individuals aged 18-24 (an effect between 3.1 and 7.3 percentage points). The effect of SDR on young voters is especially pronounced in presidential elections. By contrast, the effects of early voting and other reforms are smaller and do not consistently vary by age. The results suggest expanded SDR may produce a younger electorate.

Keywords:

elections, voting, turnout, registration, youth

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"It was easier to get my medical-marijuana card—not a right, or even federally legal—than it

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was to register to vote." Jocelyn, 27, Massachusetts[1]

Less than half of eligible Americans under the age of thirty voted in the 2016 presidential election (File 2017), and only 36 percent voted in the 2018 midterms—far short of senior citizens' turnout (Misra 2019). Activists and scholars alike express concern about low voter turnout among young Americans (e.g., McLeod 2000; Bogard, Sheinheit, and Clarke 2008; Cohen 2010). Moreover, a large body of research suggests that older individuals exert greater influence over American politics than younger people (e.g., Verba et al. 1995; Campbell 2002; Anzia 2018). Low participation rates may bear partial blame, leading policymakers to be less responsive to young people.

Can election reform improve turnout among young people? Prior studies have thoroughly investigated the effect of specific voting reforms, such as vote by mail (Southwell 2004, 2009; Southwell and Burchett 2000; Karp and Banducci 2000; Berinsky, Burns, and Traugott 2001; Kousser and Mullin 2007), absentee voting (Karp and Banducci 2001; Patterson and Caldeira 1985), early voting (Gronke, Galanes-Rosenbaum, and Miller 2007; Richardson and Neeley 1996; Stein and García-Monet 1997), and "motor voter" laws (Knack 1995, 1999; Franklin and Grier 1997; Martinez and Hill 1999; Wolfinger and Hoffman 2001). Other research has investigated differences in voter participation across age groups (e.g., Bhatti, Hansen, and Wass 2012; Wattenberg 2015). However, there has been less focus on how voting reforms may affect age groups differently.

We argue that same day registration (SDR) laws are especially likely to improve voter turnout among young people. SDR laws lower the cost of the major barrier to young potential voters: the registration process. Young people's life circumstances make traditional registration

[1] New York Magazine, October 10, 2012. http://nymag.com/intelligencer/2018/10/12-young-people-on-why-they-probably-wont-vote.html

uniquely costly. They are more likely to change residential addresses. They less frequently use government offices that provide registration materials. They have not yet developed habits of voting (Gerber, Green, and Shachar 2003) and may not know where or how to register. SDR laws should make voting less costly for these young voters by combining registering and voting into a single act (Wolfinger, Highton, and Mullin 2005).

By contrast, we expect that early voting (EV) and other laws less focused on registration are unlikely to increase turnout rates for young people. Under EV laws, registered individuals can cast a ballot in advance of Election Day (Burden et al. 2014). Laws such as EV and no-fault absentee voting make voting easier for those already registered, but they do not reduce the cost of registration itself. Because registering is especially costly for young people, we hypothesize that these post-registration laws will be less effective than SDR in increasing turnout among young people.

For this new research question, we improve upon the estimation strategies of prior studies of election reform in two ways. First, we use data with greater temporal coverage of voter turnout and state election laws. Second, we apply recent advances in difference-in-differences techniques to estimate the relationship between election laws and turnout.

The results consistently show a substantial positive effect of SDR on young people's turnout. Difference-in-difference results show an increase of between 3.1 and 7.3 percentage points in 18-24 year-olds' likelihood of voting, a greater increase than for older voters. Consistent with greater use of SDR among young voters, we find that young people are disproportionately likely to report registering at their polling place in SDR states. We also find that SDR is especially effective at increasing young people's turnout in presidential election years, while the effect of SDR on older voters is greater in non-presidential election years.

Further analysis suggests that SDR may have electoral and policy consequences. We predict that the U.S. electorate under expanded SDR would have significantly greater concentrations of voters under 35 and a relatively smaller proportion of older voters—which, due to partisan differences across age groups, has the potential to change outcomes in close elections. We also show that policy attitudes across many issue areas vary significantly by age. Given the potential policy consequences of these differences in opinion, as well as the importance of equal participation in democratic equality (Griffin and Newman 2005; Dahl 2006; Schlozman, Verba and Brady 2012), the implications of our findings are potentially profound.

Youth have often been at the vanguard of democratic and social movements (e.g., Youniss et al. 2002; Noguera, Ginwright, and Cammarota 2006). Yet with few exceptions (e.g., Holbein and Hillygus 2016), political science has had little to say about how laws may affect young people's participation. This article suggests that reducing barriers in the registration process may be especially effective at increasing the turnout of young people. Further research should investigate how other registration and voting reforms, such as newly implemented automatic voter registration laws and vote by mail, may affect young people differently from older people—and how such reforms may foster greater democratic inclusion (Wolbrecht and Hero 2005).

State SDR Laws

SDR allows individuals to register and cast their vote on the same day. Since its implementation in Maine in 1973, SDR has been adopted by twenty additional states, plus the District of Columbia. In nearly all of these states, voters can register and vote on Election Day; the one exception is North Carolina, which only allows individuals to register and vote on the same day in the lead-up to an election (NCSL 2019; see Appendix Table A9 for further details).

In 2012, nearly ten percent of voters used SDR to cast their ballot (Rogers and Carbó 2013). Descriptively, SDR states tend to have higher turnout than non-SDR states. In the 2012 presidential election, for instance, average turnout was more than ten percentage points higher in states that allow SDR.

A substantial body of research has estimated the effect of SDR on overall turnout; for instance, Burden et al. (2014, p. 26) find that SDR "marginally increas[es] turnout if the window for registration is sufficiently long." Much of this research has focused on EDR states—that is, the subset of states that only allow same-day registration on Election Day itself. These studies generally indicate that EDR laws have a positive effect on turnout. In 1978, Rosenstone and Wolfinger predicted that eliminating registration "closing dates," after which prospective voters could not register for an upcoming election, would boost turnout by 6.1 percent. Highton and Wolfinger (1998) later found that EDR laws in fact boosted turnout by a full 8.7 percent; other scholars have identified a turnout-boosting effect ranging from three to nine percent (Fenster 1994; Knack 2001). The current consensus is that EDR laws boost registration by "about five percentage points" (Highton 2004, p. 509; see discussion in Burden et al. 2014, p. 4). However, this research has not been updated to reflect the increasing number of states with SDR laws. Eleven of the 21 states with SDR (plus Washington, DC) enacted their laws in 2012 or later (NCSL 2019), and, to the best of our knowledge, no published study includes data covering this time period.

Other research has addressed how variation in election law and administrative behavior may have heterogeneous effects on individuals of different demographic and identity groups (e.g., Wolfinger, Highton, and Mullin 2005). Some studies investigate the effect of election law and administration with respect to race and ethnicity (Bowler, Donovan, and Brockington 2003;

White, Nathan, and Faller 2015; Elul, Freeder, and Grumbach 2017). Others look at the relationship between election law and the class distribution of the electorate (Avery and Peffley 2005; Rigby and Springer 2011; Kropf 2012).

Yet variation in the effect of SDR across demographic groups is less understood. To the extent that existing research has explored the heterogeneous effects of SDR laws, it has largely focused on party turnout. Some studies find that SDR laws primarily increase turnout among Democratic voters (Hansford and Gomez 2010; Berinsky 2005; Franklin and Grier 1997; Hanmer 2009; Knack and White 1998).[2]

While little election law research has focused on young voters, a small number of existing studies suggest that removing registration barriers boosts youth turnout. One study found that youth turnout in EDR states is 14 percentage points higher than in non-EDR states in presidential elections and 4 percentage points higher in midterm congressional elections (Fitzgerald 2003).[3] Similar effects have been seen with other voting reforms that lower barriers to registration; pre-registering 16- and 17 year-olds to vote, for instance, increases the probability that youth will vote by between 2 and 8 percentage points (Holbein and Hillygus 2016; Holbein and Hillygus 2017). Most importantly for our study, Leighley and Nagler (2013, Ch.4) compare the aggregate turnout of age groups before and after the implementation of EDR, finding that turnout of young voters increases significantly more than that of older voters.

In addition to covering a longer and more recent time period than earlier studies, we

[2] However, Neiheisel and Burden (2012) find that EDR laws in particular "actually decreased the Democratic share of the two-party vote for president," because the voters who take advantage of EDR "tend to have higher levels of education and income, factors that also make them likely to vote Republican." Yet increasingly, education and income do not predict support for Republican candidates (Pew Research Center 2016, 2018). Moreover, recent research by Burden et al. (2017) finds that EDR now benefits Democrats, while EV helps Republicans..

[3] Our study differs from Fitzgerald's. We increase the sample size (from n = 1,718 to n = 1.6 million individual observations) and use estimation strategies beyond cross-sectional regression.

make a number of additional contributions to provide a comprehensive analysis of SDR and age. First, we theorize mechanisms behind an age-conditional effect of SDR. Second, we offer an array of statistical models, using a variety of both individual-level and aggregate data. Third, we investigate additional heterogeneity in the age-conditional effect by election type. Finally, we investigate the potential downstream effects of SDR on election and policy outcomes.

Theory of Registration Costs, Voting Costs, and Turnout Among Young Voters

Young Voters and Registration Barriers

To understand why young voters may disproportionately benefit from SDR, we consider the potential outcomes of four types of individuals (following concepts from experimental and instrumental variable designs): never-voters, defiers, compliers, and always-voters. In a given election, never-voters do not wish to vote, and they will not vote even if SDR is present. Similarly, always-voters will definitely vote in the election, regardless of whether an SDR law is in place. Defiers will vote only when SDR laws are *not* present; theory presumes that this type of voter is either rare or non-existent. Compliers, on the other hand, are *potential voters*: eligible voters who wish to vote but only will do so in the presence of SDR. Even if they are inclined to vote in the election, compliers need the help of SDR to lower the cost of registration sufficiently to make voting worth their while. By lowering the cost of registration, SDR makes it possible for these potential voters to become *actual* voters.

One possibility for why SDR may disproportionately increase youth turnout is that there is a greater proportion of compliers among young voters than among older voters. That is, because they face especially high registration costs (discussed below), young voters disproportionately rely on SDR. Conversely, because their costs of registration are lower, older voters are more likely to be always-voters (or never-voters) who will definitely vote (or not vote)

in a given election, regardless of the presence of SDR.

There are reasons to believe that voter registration is a larger obstacle to turnout among young people than other age groups. Young people cite lack of registration as the number one issue preventing them from voting (Rogowski and Cohen 2015, p. 38), and they express greater interest in registering to vote than other age groups (Pew Charitable Trusts 2017). Registration may be especially problematic for young people due to their particular stage of life: in comparison to older adults, who are typically settled in one place and job and may no longer be caring for children, "young adults are struggling to succeed in their professional lives, are occupied with starting a family and securing their family's income" (Goerres 2007).

Young people are also far more likely to move than their older counterparts, a life-cycle effect with clear ramifications for their voting behavior (Ansolabehere, Hersh, and Shepsle 2012). Previous research finds that requiring people to re-register after moving "constitutes the key stumbling block in the trip to the polls," reducing voter registration rates (Squire, Wolfinger, and Glass, 1987, p. 45). People between the ages of 18 and 29 change addresses more than twice as frequently as those over the age of 30 (US Census Bureau 2016). Many relocate for college just as they become eligible to vote; in one study, more than half of people between the ages of 18 and 21 who reported having moved in the previous year cited education or schooling as a major reason for relocating (Taylor et al. 2008). Unless they are moving within a state with automatic voter registration, these young people must re-register to vote every time they move. We show in Appendix Figure A6 that young people move residences more frequently, and that recently moving is negatively associated with voting.

Another potential reason for SDR's disproportionate impact on youth voters is that political campaigns and organizations may prioritize mobilizing young people (as opposed to

other age groups) in states with SDR laws. Under traditional registration laws, campaigns, interest groups, and activists have little incentive to contact unregistered people after the registration deadline has passed. Under SDR, however, they have an opportunity to mobilize unregistered people during the lead-up to Election Day, and even on Election Day itself. Young people make for especially attractive mobilization targets under SDR: not only are they disproportionately unregistered, thus comprising a large pool of potential voters, but their voting behavior is less crystallized than that of older Americans, creating an outsize opportunity for parties and interest groups to influence their turnout decisions.[4] It may be especially valuable for parties and political organizations to engage with young people before their identities and attitudes are crystallized for the long term (Beck and Jennings 1991; Plutzer 2002).

Mobilization efforts may be particularly effective at boosting turnout among young people, as compared with other age groups (Bennion 2005). As one study put it, "when 'get out the vote' efforts are directed at young, first-time voters (e.g. college students), the payoffs are considerable" (Iyengar and Jackman 2003, p. 3). Moreover, once young people *are* registered, they are highly likely to vote. In the 2008 presidential election, for instance, 84 percent of registered voters between the ages of 18 and 29 cast a ballot (CIRCLE 2018), very close to the 88 percent of registered seniors over 65 who turned out to vote (File and Crissey 2012).

Even if young people are not directly mobilized by political groups, however, they may still be motivated to vote after contact with other actors, such as the media and their peers (e.g., Gerber, Karlan, and Bergan 2009; Bhatti and Hansen 2012). Media coverage, as well as peer contact in person and on social media, ramps up as Election Day approaches. In states with

[4] Campaigns and organizations attempt to mobilize young people during election years (e.g., Nickerson, Friedrichs, and King 2006; Miller, Reynolds, and Singer 2017), and parties and grassroots organizations alike actively try to "rock the vote" for young individuals who are newly eligible to cast a ballot (Burgess et al. 2000; Green and Gerber 2001; Rogowski and Cohen 2015, p. 39).

registration deadlines in place, however, much of this mobilizing stimulus may come too late; in the 2008 election, for instance, when unregistered young people were asked why they had not signed up to vote, a full one in five reported that they had missed the registration deadline (Godsay 2010). By making it legal for young people to register up until Election Day itself, then, SDR ensures that young people inspired to vote by late-stage media coverage or social pressure can still cast a ballot.

Both of our arguments, about the greater proportion of potential voters among young people and about mobilization, suggest that SDR may have a larger effect in presidential elections than midterm elections. Young voters are disproportionately activated by high-salience election environments (Jackson 2000). In highly salient presidential elections, many young people are likely to move from 'never-voters' to 'compliers,' hoping to vote but only when the costs of registration are sufficiently low. Older individuals, by contrast, are less affected by election salience and more likely to have established habits and identities around voting. Accordingly, they are more likely to already be 'always-voters' who benefit little from SDR laws in presidential years. (Descriptively, turnout among voters age 18-29 in presidential elections is already often double that of midterm elections, a much greater difference than for older voters.)

In addition, the importance of campaign, media, and social mobilization for young people also leads us to expect a greater SDR effect in presidential elections. Political campaigns invest more in voter mobilization in presidential election years (Jackson 1996; Bergan et al. 2005), and several recent presidential campaigns have been especially effective at connecting with and turning out *young* voters (Pomante 2017). Similarly, news media cover presidential campaigns more than their congressional counterparts (Flanigan and Zingale 2006), and social pressure is also presumably greater. By incentivizing groups to mobilize an even broader range of young

people, and by providing an opportunity for these youth to vote up until Election Day itself, SDR should amplify this turnout increase even further. Mobilization is unlikely to be as important for older voters, who are much more likely to already be registered and have calcified habits.

Young Voters and Other Electoral Reforms

In contrast to SDR, we expect policies focused on lowering the cost of voting—but not registration—to be less effective at increasing youth turnout. Early voting (EV) laws, which allow registered voters to vote ahead of Election Day, are a prominent example of such a policy. While EV laws make voting more convenient for those already prepared to cast a ballot, such as older voters with a long history of civic engagement, they do nothing to alleviate the voter registration burdens facing younger voters. Because EV laws fail to address registration barriers while making it easier for seasoned voters to participate in elections, we hypothesize that EV will not have a greater effect on turnout of younger individuals than older individuals.

No-fault (unrestricted) absentee voting laws similarly reduce the cost of voting by providing an alternative to in-person voting. Absentee voting allows voters to avoid potentially long lines at polling places, and may be especially beneficial for individuals who work or are otherwise busy during daytime voting hours, as well as rural voters (e.g., Oliver 1996). But like EV, no-fault absentee voting does not affect young people's disproportionately costly registration, and also does not interact with (and may even diminish) the role of organized mobilization efforts, media coverage, and social pressure. Like for EV, we hypothesize that no-fault absentee will not increase turnout as effectively as SDR among young voters.[5]

Methods

[5] We similarly do not expect voter ID laws to disproportionately affect turnout among young people. Although the effects of voter ID laws remain somewhat unclear (Hajnal, Lajevardi, and Nielson 2017; Grimmer et al. 2018; Fraga and Miller 2018), both young and elderly individuals are less likely to possess identification than middle aged people. We estimate the effect of voter ID and additional election laws on turnout by age in Appendix Figure A7.

Some studies define SDR relatively narrowly, conceptualizing it separately from Election-Day registration (EDR). In their view, SDR encompasses laws permitting people to register and vote up to, but not including, Election Day. By contrast, we view SDR as an umbrella concept that captures any law allowing people to register and vote on the same day. Since EDR allows same-day registration and voting, albeit only on Election Day, EDR falls under the broader SDR umbrella. Our definition follows the U.S. Election Assistance Commission's approach of definitionally grouping together laws that permit "registering to vote on the same day in which a vote may be cast" (Election Assistance Commission 2008, p. 8).

Data on SDR state laws comes primarily from the National Conference of State Legislatures (NCSL 2019); however, because NCSL lists the year of SDR *enactment*, rather than *implementation*, we update this data using information from state government reports and news coverage identifying the first election in which a given SDR law was used. Data on state early voting laws (Appendix Figure A4) and no-fault absentee voting laws are from Boehmke and Skinner (2012), Biggers and Hammer (2015), Grumbach (2018), and the U.S. Election Assistance Commission (2015); voter ID data come from Jordan and Grossmann (2020) and Biggers and Hanmer (2017). Our data cover the years 1978 through 2018.[6]

[FIGURE 1 HERE] Implementation of SDR in the U.S. States

We collect data for the dependent variable, voter turnout, from the Census Current Population Survey (CPS) Voter Supplement. The CPS Voter Supplement is a biennial survey of approximately 60,000 households,[7] which affords us a large sample for quite precise estimates. Our individual-level models use over 1.6 million observations. Like all prominent self-reported

[6] We exclude North Dakota, which does not require any form of voter registration, from our analysis.

[7] The CPS is administered every month in order to track unemployment and other labor market dynamics. Biennially, the CPS produces the Voter Supplement in November with survey questions related to voting.

measures of voter turnout, the CPS turnout question is known to suffer from over-reporting. However, studies suggest that this over-reporting is unlikely to introduce bias to estimates of the relationship between election laws and turnout (e.g., Highton 2005; Burden et al. 2014, p. 101).[8]

The CPS data also contain the age variables necessary to estimate the effect of election laws on the turnout of different age groups. The CPS measures specific yearly age. In our main analyses, we group individuals into conventional age categories: 18-24, 25-34, 35-44, 45-54, 55-64, and 65 and above.[9] The groups are of roughly comparable population size, except for the 18-24 category, which is a smaller group in the population (9.5% of the U.S. population in the 2010 Census, compared to 13.5% on average for the other groups).[10]

While the CPS is the canonical dataset for studies of election law and turnout (Nagler 1991; Alvarez, Bailey, and Katz 2011), as a robustness check, we replicate our analyses with data from Fowler (2017) in Appendix Figure A3. Despite these data being limited to 2010-2016, the results are consistent (though somewhat imprecise).

Estimation Strategy

Electoral reform does not happen in a vacuum; confounding variables may lead states to both implement SDR and have higher voter turnout. In this section, we describe our multifaceted strategy to avoid such confounders. Most studies of the effect of SDR on turnout have used traditional OLS and maximum likelihood estimation with controls for demographic characteristics that might affect turnout (e.g., Highton 1997; Brians and Grofman 2001; Knack

[8] Following convention (e.g., Burden et al. 2014, p. 101), we code individuals who respond with "Refused," "Don't know," or "No Response" as non-voters. As a robustness check, we replicate the main analysis excluding these individuals in Appendix Figure A9. The results are consistent.

[9] We use age categories because the conditional effect of election laws may not vary linearly by age. An alternative strategy is to use a continuous age variable with quadratic and/or cubic terms. The results are substantively consistent. We opt for the age categories for purposes of substantive clarity.

[10] We provide statistics on the age composition of the U.S. population in Appendix Table A12.

and White 2000). Burden et al. (2014) augment their regression analysis with matching and difference-in-differences analysis to mitigate the threat of confounders (see Hanmer 2009 for discussion of threats to causal identification in studies of turnout).

Our main estimates come from a difference-in-differences design, which exploits variation within states across time, protecting against time-invariant characteristics of states that may affect both SDR and turnout.[11] We fit difference-in-differences models on both individual-level and aggregate state-level data, using state and year fixed effects. With the individual-level data, we are able to include individual-level covariates for Census-categorized race (white, black, Native American, Asian, Pacific Islander/Native Hawaiian, multiracial, and other race), gender, family income, and education (Wolfinger and Rosenstone 1980). With the state-level data, we are able to include covariates for the percent of the state that is white, the percent that is Asian, and the percent that is black; the percent of the state living under the federal poverty line; and the percent that is a college graduate or above. Additional information on covariate measurement can be found in the Appendix ("Covariate Measurement").

The aggregate state-level data allow us to supplement our two-way fixed effects model with a weighted fixed effects (WFE) estimator (Imai and Kim 2017).[12] Because the weighting procedures of WFE reduce statistical precision considerably and our effective sample size is small, we primarily use it as a substantive robustness check.

All of our difference-in-difference specifications assume parallel trends across SDR and non-SDR states. Although this assumption cannot be directly tested, we support it with an event

[11] Specifically, within-state changes in turnout in SDR versus non-SDR years are compared to within-state changes in states that do not implement SDR.

[12] Goodman-Bacon (2018) shows that under varying treatment timing across units, unbiased two-way fixed effects requires the assumption of a time-invariant within-unit treatment effect. WFE relaxes this assumption, but at the cost of precision.

study design in the Appendix ("Event Study Analysis") that sheds light on pre-trends and long-run treatment effects. The event study is based on a model with state and year fixed effects that interacts treatment assignment with an indicator of the years until (or after) SDR treatment. The results, shown in Appendix Figures A1 and A2, corroborate our main findings about the SDR effect for young people (in absolute terms and relative to older age groups).

We also supplement our difference-in-differences analysis with a matching design (Appendix Tables A6), comparing differences in turnout between demographically similar individuals in SDR and non-SDR states in the same election, and with a placebo analysis that tests for post-matching differences in turnout between states that *will later adopt* SDR and those states that *never adopt* SDR (Appendix Table A7).[13] Through these multiple design strategies (including non-parametric tests), we improve on previous estimation strategies.

Results

We first present descriptive averages of turnout by age and SDR laws in Figure 2. The probability of voting for 18-24 year-olds increases by 6.9 (raw) percentage points under SDR, but only 2.5 percentage points for 55-64 year-olds and 4.9 percentage points for people 65 and over. These correlations are consistent with our theory of heterogeneous effects by age. The next section turns to our difference-in-differences design.

[FIGURE 2 HERE] Average Turnout by SDR and Age

Difference-in-Differences Results

Figure 3 plots the effect of SDR from separate difference-in-differences model specifications along with 95% confidence intervals. For 18-24 year-olds, the individual level models show a 3.23 and 5.41 percentage point increase in turnout for the bivariate and covariate-

[13] Although the placebo test is successful for young voters, these matching estimates rely on the selection on observables assumption and thus should be interpreted as more descriptive than causal.

adjusted specifications, respectively. When including state-decade fixed effects or state-specific linear time trends, the marginal effects range from 4.84 to 7.27. The aggregate state level models show effects of 3.10 (bivariate) and 3.51 percentage-points (controls). By contrast, SDR effects for individuals aged 25 and over, and especially for those 35 and over, are smaller within specifications. Estimates for groups 35 and over range from -0.99 to 4.49. With the exception of the WFE specification, the 18-24 coefficient is significantly greater than each of the coefficients for groups 35 and over ($p < 0.05$).

[FIGURE 3 HERE] Difference-in-Differences Effect on Turnout by Age

Note: All models include state and year fixed effects. State-decade FE specifications include three fixed effects for each state (1978-1990, 1992-2004, and 2006-2018). State-time trends specifications also include state fixed effects interacted with a linear time trend. State level models use aggregated state level data (N=980 for each age group model). Individual level covariates include race, gender, income, and education. State level covariates include percent white, percent black, percent Asian, poverty rate, and percent college graduates or above. Full regression results are presented in Appendix Tables A1, A2, A3, and A4. Robust standard errors are clustered by state. In addition to heteroskedasticity, WFE standard errors allow for arbitrary autocorrelation.

The WFE specification shows a 6.14 percentage point effect of SDR on the turnout of 18-24 year-olds, with a very similar estimate for 25-34 year-olds. As expected, the traditional fixed effects specifications produce estimates with considerably smaller variance than WFE.[14] In turn, although the SDR effect is again greatest for young voters, the estimates are not significantly greater than those of 45-54 year olds $p < 0.05$ level. As an additional robustness check, we provide a lagged dependent variable model in Appendix Table A13.

Finally, we run additional difference-in-differences analyses interacting other election laws—early voting, no-excuse absentee voting, and voter ID—with age (Appendix Figure A7). Unlike SDR, these reforms show similar turnout effects across age groups, and smaller turnout increases for young voters relative to SDR.

[14] This is due to the weighting and aggregation procedures of the WFE procedure (Imai and Kim 2017), especially the arbitrary autocorrelation correction used in WFE standard errors.

Additional Analyses

Effect of SDR Is Concentrated in Presidential Elections

We also suspected that the effect of SDR on youth turnout would be concentrated in presidential elections. Figure 4 compares the marginal effect of SDR laws on the probability of voting by age group in presidential and non-presidential elections.[15] The estimates in black represent presidential elections, and the estimates in grey represent non-presidential elections. The full models used for these estimates, which we subset to presidential or midterm election years, adjust for individual race, gender, and income and include state and year fixed effects; detailed results are shown in Appendix Table A11.

[FIGURE 4 HERE] Effect of SDR in Presidential and Non-Presidential Elections

(a) Bivariate Diff-in-Diff **(b) Diff-in-Diff with Controls**

Note: Predicted probabilities and 95% confidence intervals are derived from separate models for midterm and presidential elections. Models use individual level data and include state and year fixed effects. Robust standard errors are clustered by state.

The results show that the effect of SDR is conditional not only on age, but on age and the occurrence of a presidential election. For individuals aged 18-24 and 25-34, the effect of SDR is substantially greater in presidential elections than non-presidential elections. SDR affects individuals aged 35-44 and 45-54 similarly across election types. The effect of SDR is noticeably *smaller* in presidential election years for individuals over 45, and especially over 55. It may be that, during high-salience (presidential) elections, older Americans register to vote well in advance of registration deadlines, making SDR laws less necessary, whereas in in low-salience elections, they learn about the election closer to Election Day, at which point they need SDR to both register and vote.

[15] A descriptive plot of turnout by age group in SDR versus non-SDR states can be found in Appendix Figure A5.

SDR Makes Young Voters More Likely to Register at Polling Place

Figure 5 shows the effect of SDR on the probability of registering at a polling place. Marginal effects are based on individual-level difference-in-differences models that interact SDR with each age category. SDR increases the likelihood that younger people register at the polling place relative to alternative methods, such as registering at the DMV, a public assistance agency, a school, a hospital, a town hall or county/government registration office, or a registration drive, or by internet or mail. The relationship between SDR and the likelihood of registering at one's polling place varies by age. SDR makes people under 45 between 4 and 7 percentage points more likely to register at their polling place, whereas voters over 55 receive no such boost.

[FIGURE 5 HERE] SDR and Probability of Registering at Polling Place

Note: Models include state and year fixed effects. Robust standard errors are clustered by state. CPS data cover years 1996-2018; *N*=527,881.

SDR Makes the Electorate Younger

As noted earlier, age groups make up different proportions of the U.S. population. We estimate population effects to see how the composition of the electorate would change under expanded SDR. In Figure 6, we predict the change in the age composition of the U.S. electorate if all states were to allow for SDR. We first estimate the predicted probability of voting by age group under counterfactual scenarios of all states with SDR and no states with SDR (using the individual level bivariate and control specifications in Figure 3). For each counterfactual, we then weight these probabilities by the number of individuals of each age group in the population from the 2010 Census. We divide this estimate (the number of voters from each age group) by the total number of voters to estimate each group's percentage of the electorate.

Figure 6 plots the difference in percentage of the electorate from each age group under full SDR and no SDR, along with 95% confidence intervals around the predictions. The shares of 18-24 year-olds and 25-34 year-olds in the electorate increase under SDR. Mechanically, this

also means that older voters make up a smaller part of the electorate under SDR. It appears that universal statewide adoption of SDR would make the electorate younger.

[FIGURE 6 HERE] Change in Age Composition of Electorate Under SDR

A younger electorate could have major consequences for both election results and policy outcomes.[16] Previous research has estimated the impact of universal turnout on election outcomes; since non-voters lean slightly more Democratic than voters, universal turnout would likely increase Democratic vote shares by 1.5 percentage points in Senate races (Citrin, Schickler, and Sides 2003; Citrin, Schickler, and Sides 2008). However, because *young* non-voters are even more likely to lean Democratic, expanded SDR would likely change nearly as many election outcomes as universal turnout—including, quite possibly, the result of the 2016 presidential election. The non-SDR state of Michigan, for example, is home to nearly one million 18-24 year-olds. If additional voters from SDR were to have voted in the same patterns as real 2016 Michigan voters of their age groups (and if SDR did not meaningfully change other critical election factors such as the geography of turnout), our difference-in-differences estimate implies a counterfactual vote swing for Hillary Clinton of between 19,000 and 28,000 votes, larger than Donald Trump's victory margin in Michigan of 10,704 votes.[17]

Conclusion

Do election reforms affect younger and older individuals differently? Our analysis of over 1.6 million individuals across three decades and twenty elections suggests that they do. In addition to their less-developed voting habits, our theory points to young people's greater

[16] See Appendix Figure A10 for an original analysis of policy preferences by age group. We find that policy attitudes vary greatly by age, with young Americans holding more liberal stances on most issues.

[17] We take the partisanship of presidential vote by age group from the CCES data. The substantive point stands when using exit poll estimates instead. Overall, our prediction is relatively conservative given the greater effect of SDR on young people in presidential elections shown earlier.

propensity to change residences, a barrier to obtaining and maintaining consistent registration. We argue that lowering the costs of voter registration can significantly increase the size of the youth voting population, and that doing so may be more effective at increasing the turnout of young people than other election laws. We find that same-day registration laws disproportionately increase turnout among 18-24 year olds. By contrast, the effect of early voting and absentee voting laws is smaller for young people and less conditional on age. We conclude from this that electoral reforms can shape the composition of the electorate in important ways; specifically, we predict that universal expansion of SDR would make the overall U.S. electorate slightly younger by increasing the relative proportion of voters 35 and under.

As partisanship varies greatly by age, SDR's effect on the age distribution of the electorate could change electoral outcomes in close races. Selecting new representatives by swinging elections is one way that SDR could improve young people's representation in American politics—but greater turnout could also improve young people's representation if it opens up channels of communication between constituents and politicians (Griffin and Newman 2005, p. 1207-1208), or if reelection-minded politicians self-sanction according to the attitudes of the electorate (Fenno 1978). At present, young adults are dramatically underrepresented in elected office, and public budgets tend to support programs that disproportionately benefit older people.

We also find that SDR has a greater impact on youth turnout in presidential elections. Our theory centers around the potential interaction of mobilization and SDR laws. The 2018 midterm election featured historically high mobilization efforts, especially toward young people. Research should further explore whether SDR's effect on youth turnout varies based on the intensity of organized mobilization efforts, as well as media and social media activity (e.g.,

Moeller et al. 2013). Researchers should also explore whether and how voter mobilization efforts shift in response to the passage of SDR laws. In theory, SDR should give political groups greater incentive to reach out to young people on Election Day, regardless of whether those young people are currently registered.

Other emerging reforms could also substantially shape the age distribution of the electorate. Further research should pay special attention to automatic voter registration (AVR) laws, in which eligible residents of a state are automatically registered to vote upon interacting with a designated government office or agency, unless they opt out. These laws have diffused across states since 2016. As AVR dramatically reduces the cost of registration, its effect on turnout across age groups will be an important test of our theory. We expect AVR to have a positive effect on youth turnout. However, states that combine AVR with SDR may increase turnout even more, as SDR further lowers the cost of registration for individuals who do not interact with their state's motor vehicle agency or other AVR administrators.

The implications of our work should be of interest to both scholars of American government and elections, as well as policymakers and elected officials. While SDR laws are currently distributed across Democratic, Republican, and divided-control states (Appendix Table A10), in this politically polarized era, the two major parties have distinct relationships with democracy and the voting franchise. Although there is evidence that elements of the Democratic Party prefer to keep local elections off-cycle in order to control who votes (Anzia 2014; Hersh 2015), the Republican Party has stronger incentives to oppose reforms that expand the electorate (e.g., Ziblatt 2017), especially reforms that would increase the concentration of voters who lean Democratic, such as young people, people of color, and low income people.

In those states where SDR laws are passed, other political reforms are likely to follow, as

new participants in the political system—young voters in particular—express their policy preferences at the ballot. Past studies find that young people have distinct political attitudes (Foner 1974; Neugarten 1974; Cutler and Kaufman 1975; Rhodebeck 1993), and their electoral participation has been integral to political change over the past century; increasing their participation could significantly influence political outcomes. In political systems that increasingly resemble gerontocracies (Harper and Hamblin 2014; Atella and Carbonari 2017; Pollack 2017), this article points to SDR laws, and lowered registration costs more generally, as mechanisms to bring these changes to fruition.

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Supplemental Information for

"Rock the Registration: Same Day Registration Increases Turnout of Young Voters"

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Covariate Measurement

The covariates used in our individual- and state-level models come from Current Population Survey (CPS) data.

Individual-level covariates. The CPS measures age by year. We then group individuals into age categories coded as dummy variables: 18-24, 25-34, 35-44, 45-54, 55-64, and 65 and older (e.g., "age_group18.24"). Race is measured with a series of dummy variables for white, black/Negro, American Indian/Aleut/Eskimo, Asian or Pacific Islander, and other (e.g., "factor(race)200"). Sex is a dummy variable for female ("sex"). Family income ranges from (1) "less than $10,000" to (16) "500,000 or more" ("faminc"), and is adjusted to 1999 USD. Education ranges from (1) "No HS" to (6) "Post-grad" ("educ").

State-level covariates. Our state-level covariates are state percent white ("white"), state percent black ("black"), state percent Asian ("asian"), percent living under the Federal Poverty Line ("povrate"), and percent college graduates or above ("educ").

Event Study Analysis

For each age group, we fit a model based on the following equation for individual i in state s in year t, where Y_i is turnout, α_s are state fixed effects, δ_t are year fixed effects, X_i is a vector of individual level demographic covariates, $SDR\ State_s$ is an indicator of whether a state is ever treated by SDR, and $Years\ to\ SDR_{st}$ is a set of dummy indicators of the number of years until (or since) the state implemented SDR (from period -16 to 16, with the indicator for period -2 omitted):[1]

$$Y_i = \beta_1 SDR\ State_s \times Years\ to\ SDR_{st} + \beta_2 X_i + \alpha_s + \delta_t + \varepsilon_i$$

For the models with controls, the covariates are the same as the individual level difference-in-differences model with controls (gender, race, income, and education). The bivariate models remove the term $\beta_2 X_i$.

For individuals in SDR states, β_1 represents the marginal turnout effect of being in a state that will have implemented (or has already implemented) SDR in a given year, relative to two years prior to SDR's implementation—the last election for which SDR should have no effect on turnout, if the parallel trends assumption holds. (For individuals in non-SDR states, $SDR\ State_s \times Years\ to\ SDR_{st}$ turns to zero.) In the years leading up to SDR's implementation, estimates therefore represent the within-state turnout effect of same-day registration in pre-SDR states compared to never-SDR states. Prior to implementing SDR, we expect a zero 'effect' of SDR; turnout trends in pre-SDR states should be similar to those in never-SDR states (once de-meaned with state fixed effects). After SDR, we expect increased turnout from young people in SDR states relative to non-SDR states.

[1] In this rolling cross-sectional data, individual i appears in only one state-year.

Figures A1 and A2 present marginal effect estimates by years until/since SDR from covariate-adjusted and bivariate specifications, respectively. The grey ribbon represents 95% confidence intervals of the estimates, based on robust standard errors clustered by state. The solid horizontal lines represent the average pre- and post-SDR point estimates.

The results corroborate our main findings of a positive effect of SDR for younger voters, and that this effect is relatively larger than those for older voters. The estimates bounce around somewhat after SDR implementation; the SDR effect for 18-24 year-olds declines to near zero in elections 8 and 10 years after implementation, for example, but then increases again. On average, however, the point estimates for the 18-24 year-old SDR effect after implementation are significantly greater than zero, and also significantly greater than the pre-SDR effect (which can be considered a placebo).

Figure A1: Event Study (Controls)

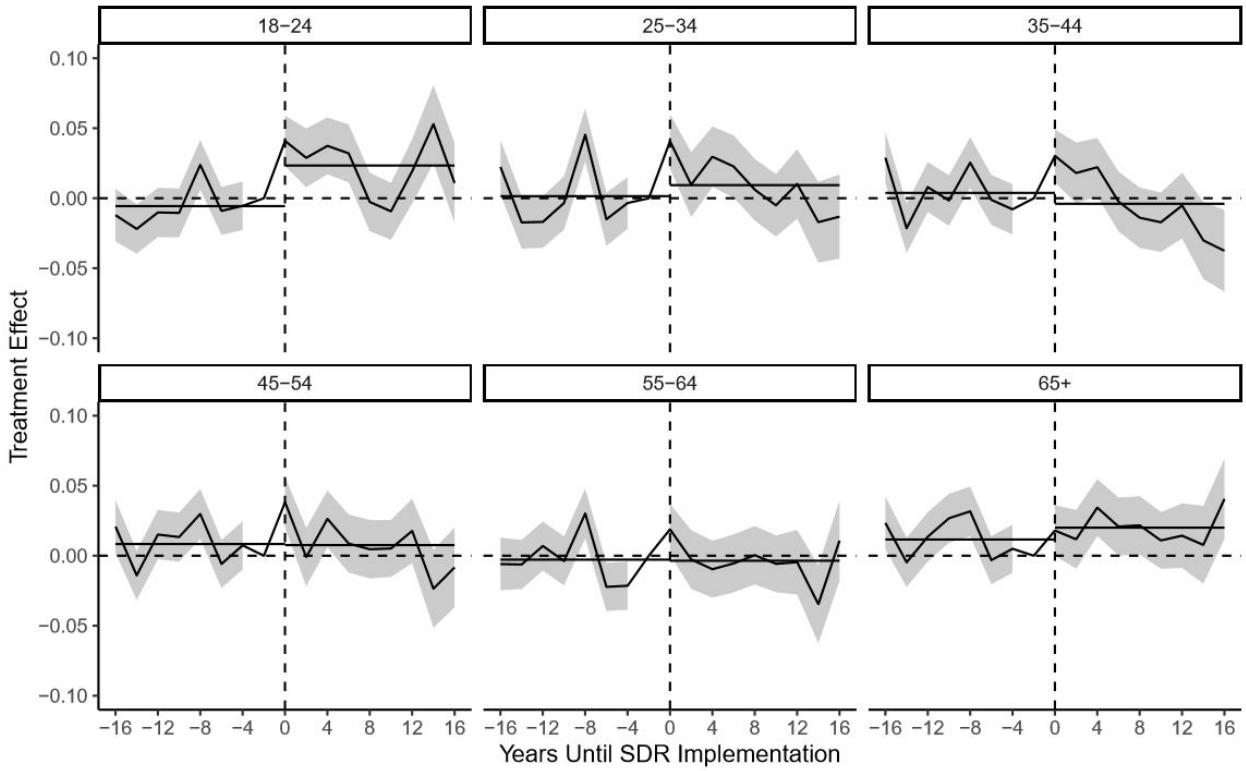
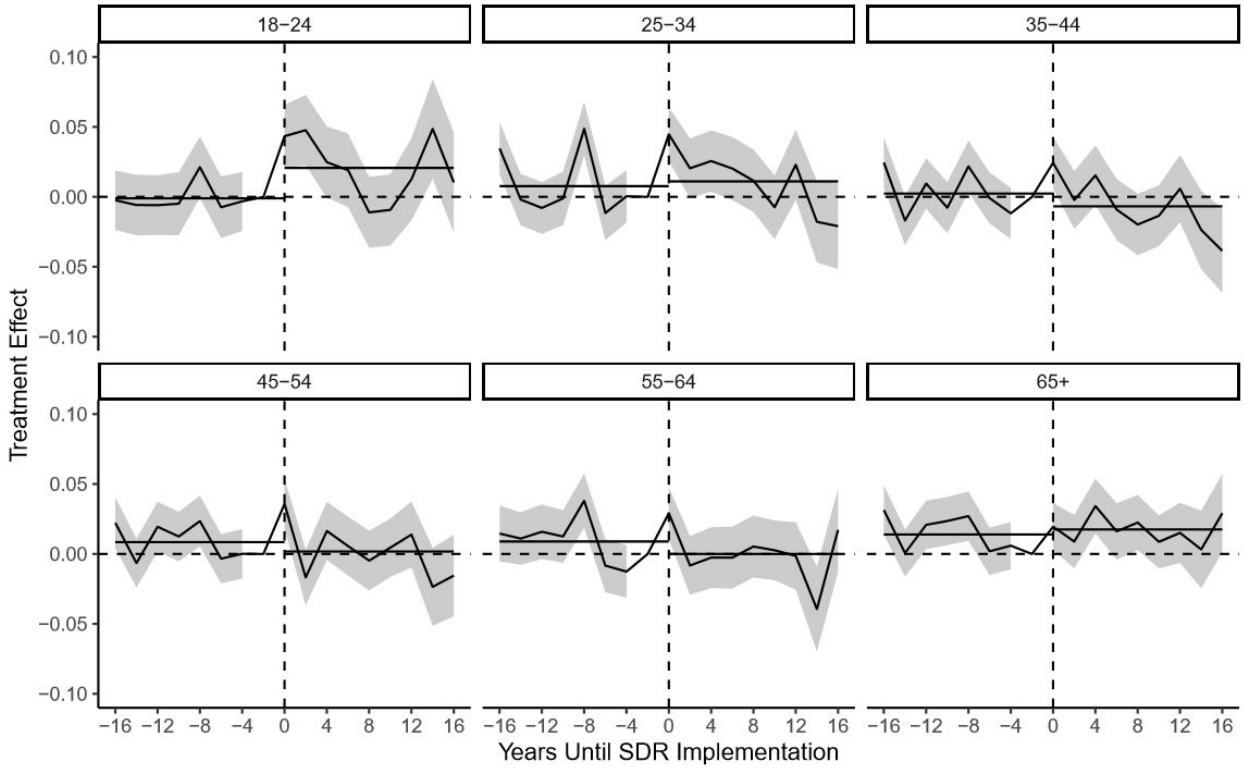


Figure A2: Event Study (Bivariate)



Difference-in-Differences Estimates

Table A1: Full Individual Level Difference-in-Differences Model Results

term	estimate	std.error	statistic	p.value	model
(Intercept)	0.61	0.01	60.54	0	Bivariate
sdr	0.01	0.02	0.72	0.47	Bivariate
age_group18.24	-0.36	0.01	-59.77	0	Bivariate
age_group25.34	-0.21	0.01	-35.7	0	Bivariate
age_group35.44	-0.1	0.01	-16.21	0	Bivariate
age_group45.54	-0.04	0.01	-7.34	0	Bivariate
age_group55.64	0.01	0	1.31	0.2	Bivariate
sdr:age_group18.24	0.02	0.01	2.13	0.04	Bivariate
sdr:age_group25.34	0	0.01	0.01	0.99	Bivariate
sdr:age_group35.44	-0.01	0.02	-0.88	0.38	Bivariate
sdr:age_group45.54	-0.01	0.01	-1.22	0.23	Bivariate
sdr:age_group55.64	-0.01	0.01	-1.55	0.13	Bivariate
(Intercept)	0.26	0.01	22.59	0	Controls
sdr	0	0.01	-0.22	0.83	Controls
age_group18.24	-0.42	0.01	-77.54	0	Controls
age_group25.34	-0.33	0	-81.08	0	Controls
age_group35.44	-0.22	0	-59.02	0	Controls
age_group45.54	-0.15	0	-39.84	0	Controls
age_group55.64	-0.07	0	-18.83	0	Controls
factor(race)200	0.05	0.01	6.55	0	Controls
factor(race)300	-0.05	0.01	-4.43	0	Controls
factor(race)650	-0.16	0.03	-5.2	0	Controls
factor(race)651	-0.18	0.01	-19.6	0	Controls
factor(race)652	-0.13	0.02	-6.87	0	Controls
factor(race)700	-0.09	0.02	-3.75	0	Controls
sex	0.02	0	13.66	0	Controls
faminc	0.01	0	52.03	0	Controls
educ	0.02	0	56.18	0	Controls
sdr:age_group18.24	0.06	0.01	6.09	0	Controls
sdr:age_group25.34	0.03	0.01	3.53	0	Controls
sdr:age_group35.44	0.01	0.01	1.37	0.18	Controls
sdr:age_group45.54	0	0.01	0.64	0.53	Controls
sdr:age_group55.64	-0.01	0.01	-1.21	0.23	Controls

Table A2: Full Individual Level Difference-in-Differences Model Results (State-Decade FEs)

term	estimate	std.error	statistic	p.value	model
(Intercept)	0.76	0.01	142.2	0	Bivariate
sdr	0.03	0.02	1.56	0.13	Bivariate
age_group18.24	-0.36	0.01	-59.51	0	Bivariate
age_group25.34	-0.22	0.01	-35.89	0	Bivariate
age_group35.44	-0.1	0.01	-16.06	0	Bivariate
age_group45.54	-0.04	0.01	-7.24	0	Bivariate
age_group55.64	0.01	0	1.41	0.16	Bivariate
sdr:age_group18.24	0.02	0.01	2.08	0.04	Bivariate
sdr:age_group25.34	0	0.01	0.01	0.99	Bivariate
sdr:age_group35.44	-0.01	0.02	-0.88	0.38	Bivariate
sdr:age_group45.54	-0.01	0.01	-1.22	0.23	Bivariate
sdr:age_group55.64	-0.02	0.01	-1.65	0.1	Bivariate
(Intercept)	0.22	0.01	21.96	0	Controls
sdr	0.01	0.01	0.87	0.39	Controls
age_group18.24	-0.42	0.01	-75.95	0	Controls
age_group25.34	-0.32	0	-75.74	0	Controls
age_group35.44	-0.22	0	-54.25	0	Controls
age_group45.54	-0.14	0	-35.58	0	Controls
age_group55.64	-0.06	0	-16.27	0	Controls
factor(race)200	0.05	0.01	5.83	0	Controls
factor(race)300	-0.06	0.01	-5.09	0	Controls
factor(race)650	-0.19	0.03	-7.41	0	Controls
factor(race)651	-0.17	0.01	-13.82	0	Controls
factor(race)652	-0.11	0.02	-6.98	0	Controls
factor(race)700	-0.09	0.02	-5.05	0	Controls
sex	0.02	0	12.83	0	Controls
faminc	0.01	0	37.31	0	Controls
educ	0.02	0	57.2	0	Controls
sdr:age_group18.24	0.06	0.01	6.36	0	Controls
sdr:age_group25.34	0.03	0.01	3.5	0	Controls
sdr:age_group35.44	0.01	0.01	1.5	0.14	Controls
sdr:age_group45.54	0	0.01	0.59	0.56	Controls
sdr:age_group55.64	-0.01	0.01	-1.36	0.18	Controls

Table A3: Full Individual Level Difference-in-Differences Model Results (State-Time Trends)

term	estimate	std.error	statistic	p.value	model
(Intercept)					Bivariate
sdr	0.03	0.01	2.32	0.02	Bivariate
age_group18.24	-0.36	0.01	-59.46	0	Bivariate
age_group25.34	-0.21	0.01	-35.52	0	Bivariate
age_group35.44	-0.1	0.01	-16.14	0	Bivariate
age_group45.54	-0.04	0.01	-7.3	0	Bivariate
age_group55.64	0.01	0	1.34	0.19	Bivariate
year	0	0	81.05	0	Bivariate
sdr:age_group18.24	0.02	0.01	2.17	0.04	Bivariate
sdr:age_group25.34	0	0.01	0.01	0.99	Bivariate
sdr:age_group35.44	-0.01	0.02	-0.9	0.37	Bivariate
sdr:age_group45.54	-0.02	0.01	-1.27	0.21	Bivariate
sdr:age_group55.64	-0.01	0.01	-1.57	0.12	Bivariate
(Intercept)					Controls
sdr	0.02	0.01	1.85	0.07	Controls
age_group18.24	-0.42	0.01	-76.88	0	Controls
age_group25.34	-0.32	0	-80.08	0	Controls
age_group35.44	-0.22	0	-58.58	0	Controls
age_group45.54	-0.15	0	-39.68	0	Controls
age_group55.64	-0.07	0	-18.84	0	Controls
factor(race)200	0.05	0.01	6.53	0	Controls
factor(race)300	-0.05	0.01	-4.18	0	Controls
factor(race)650	-0.17	0.03	-6.09	0	Controls
factor(race)651	-0.17	0.01	-14.01	0	Controls
factor(race)652	-0.11	0.01	-7.29	0	Controls
factor(race)700	-0.11	0.02	-6.58	0	Controls
sex	0.02	0	13.66	0	Controls
faminc	0.01	0	51.45	0	Controls
educ	0.02	0	56.76	0	Controls
year	0	0	32.36	0	Controls
sdr:age_group18.24	0.06	0.01	6.32	0	Controls
sdr:age_group25.34	0.03	0.01	3.52	0	Controls
sdr:age_group35.44	0.01	0.01	1.23	0.23	Controls
sdr:age_group45.54	0	0.01	0.43	0.67	Controls
sdr:age_group55.64	-0.01	0.01	-1.29	0.2	Controls

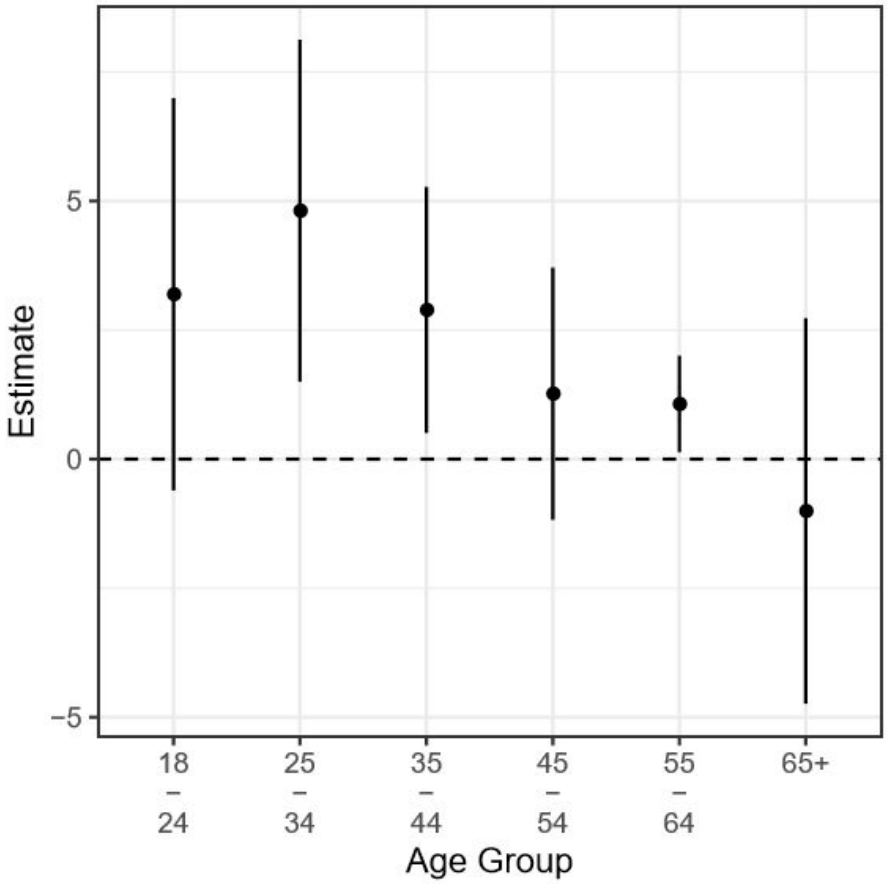
Table A4: Full State Level Difference-in-Differences Model Results

term	estimate	std.error	statistic	p.value	group	model
(Intercept)	0.31	0.01	21.26	0	18-24	Bivariate
sdr	0.03	0.01	3.46	0	18-24	Bivariate
(Intercept)	-0.2	0.16	-1.44	0.15	18-24	Controls
sdr	0.04	0.01	3.9	0	18-24	Controls
white	0.05	0.12	0.54	0.59	18-24	Controls
black	0.07	0.14	0.64	0.53	18-24	Controls
asian	0.3	0.13	3.69	0	18-24	Controls
povrate	0	0	2.8	0.01	18-24	Controls
educ	0.02	0.01	3.74	0	18-24	Controls
(Intercept)	0.43	0.01	27.13	0	25-34	Bivariate
sdr	0.01	0.01	1.28	0.2	25-34	Bivariate
(Intercept)	-0.6	0.2	-3.56	0	25-34	Controls
sdr	0.01	0.01	1.53	0.13	25-34	Controls
white	0.34	0.16	2.55	0.01	25-34	Controls
black	0.32	0.19	2.06	0.04	25-34	Controls
asian	0.38	0.15	3.31	0	25-34	Controls
povrate	0	0	3.29	0	25-34	Controls
educ	0.04	0.01	7.15	0	25-34	Controls
(Intercept)	0.51	0.02	34.49	0	35-44	Bivariate
sdr	0	0.01	-0.31	0.75	35-44	Bivariate
(Intercept)	-0.47	0.15	-3.13	0	35-44	Controls
sdr	0	0.01	0.28	0.78	35-44	Controls
white	0.42	0.14	3.14	0	35-44	Controls
black	0.4	0.17	2.61	0.01	35-44	Controls
asian	0.52	0.15	4.14	0	35-44	Controls
povrate	0	0	3.06	0	35-44	Controls
educ	0.03	0	7.34	0	35-44	Controls
(Intercept)	0.54	0.01	36.46	0	45-54	Bivariate
sdr	0	0.01	-0.13	0.9	45-54	Bivariate
(Intercept)	-0.46	0.19	-2.76	0.01	45-54	Controls
sdr	0.01	0.01	1.03	0.3	45-54	Controls
white	0.45	0.18	2.78	0.01	45-54	Controls
black	0.56	0.2	3.16	0	45-54	Controls
asian	0.53	0.18	3.56	0	45-54	Controls
povrate	0	0	3.53	0	45-54	Controls
educ	0.03	0	8.38	0	45-54	Controls
(Intercept)	0.61	0.01	43.91	0	55-64	Bivariate
sdr	0	0.01	-0.43	0.67	55-64	Bivariate
(Intercept)	-0.29	0.23	-1.5	0.14	55-64	Controls
sdr	0	0.01	0.28	0.78	55-64	Controls
white	0.43	0.24	2.2	0.03	55-64	Controls
black	0.57	0.24	2.82	0	55-64	Controls
asian	0.38	0.22	2.33	0.02	55-64	Controls
povrate	0	0	2.69	0.01	55-64	Controls

educ	0.03	0	9.1	0	55-64	Controls
(Intercept)	0.63	0.01	50.98	0	65+	Bivariate
sdr	0	0.01	0.46	0.65	65+	Bivariate
(Intercept)	-0.26	0.2	-1.38	0.17	65+	Controls
sdr	0.01	0.01	0.89	0.37	65+	Controls
white	0.56	0.19	3.08	0	65+	Controls
black	0.45	0.2	2.32	0.02	65+	Controls
asian	0.58	0.21	3.31	0	65+	Controls
povrate	0	0	0.91	0.36	65+	Controls
educ	0.02	0	8.43	0	65+	Controls

Replication with Fowler Data

Figure A3: Difference-in-Differences (Bivariate) with Data from Fowler (2017)



Note: Model uses data on aggregate state level turnout by age group from Fowler (2017). Data cover the years 2010-2016. The model includes state and year fixed effects. Robust standard errors are clustered by state.

Matching Results, Balance Statistics, and Placebo

We supplement our difference-in-differences analysis with a matching design, which compares differences in turnout between demographically similar individuals in SDR and non-SDR states in the same election. The matching strategy pairs each treatment unit to a similar control unit, avoiding comparing individuals who are very likely or unlikely to live in an SDR state (Rubin 2006). This matters because SDR states may be substantively different from non-SDR states; for instance, SDR states had smaller concentrations of racial minorities than non-SDR states until the 2010s (see Figure A8 for demographic concentrations of SDR and non-SDR states over time). Importantly, matching designs depend on the assumption that matched pairs are similar on all variables correlated with both the treatment (SDR) and the outcome (turnout); if important explanatory variables have been omitted, the estimated relationship between the treatment and outcome can be biased. For this reason, we have greater confidence in the difference-in-differences results presented in the main paper.

We use genetic matching, which generates many potential matches of control units to treated units until covariates are balanced across the treatment and control groups (Diamond and Sekhon 2013). Specifically, within each age group and election year, we match individuals by race, gender, and continuous measures of age, income, and education.[2]

[2] We exact match on race and gender.

Table A5: Matching Estimates of SDR Effect by Age

Age Group	*ATT Estimate*	*95% CI*
18-24	0.063	(0.056, 0.071)
25-34	0.059	(0.052, 0.066)
35-44	0.060	(0.053, 0.066)
45-54	0.048	(0.042, 0.055)
55-64	0.043	(0.036, 0.050)
65+	0.047	(0.041, 0.053)

A paired t-test estimates the average treatment effect on the treated (ATT) for the matched sample.[3] Table A5 reports ATT estimates of the effect of SDR on the probability of turnout by age group, along with 95% confidence intervals. Again, SDR increases turnout for all age groups, but especially among younger voters. The matching results show one important difference compared to the regressions presented earlier. Whereas the earlier estimates suggested that the SDR effect is significantly greater for 18-24 year-olds than for any other age group, the matching estimates show an effect for 18-24 year-olds that is virtually identical to the effect for 25-34 year-olds. Still, the SDR effects for 18-24 year-olds and 25-34 year-olds are significantly greater than the effect for each other age group (though only at the $p<0.1$ level when comparing to 35-44 year-olds).[4]

[3] Unlike an average treatment effect $E[Y(1) - Y(0)]$, an ATT is the average difference between only the observed treated units and their counterfactuals $E[Y(1) - Y(0) \mid T=1]$.

[4] In Appendix Table A8, we interact SDR not only with age, but also with race, gender, income, and education. The results are consistent with respect to age. We find modest variation by race and income, with the SDR effect largest among white, Asian, and lower-income individuals, but these differences are significantly smaller than variation by age. A younger electorate also entails a more racially diverse electorate. Because black, Asian, and Latino Americans, for instance, change residential addresses more frequently than non-Hispanic whites (Mateyka 2015), SDR may disproportionately increase the turnout of people of color. On the other hand, there is evidence that parties are less effective at mobilizing Asian and Latino constituents (e.g., Hajnal and Lee 2011), a potential mechanism in the relationship between SDR and turnout.

Table A6: Matching Balance Statistics

Covariate	Mean Treated	Mean Control	T-Test p-value	Age Group
Age	20.919	20.916	0.133	18-24
Income (31 categories)	20.663	20.67	0.029	18-24
Education (32 categories)	19.173	19.169	0.339	18-24
Female	0.508	0.508	1	18-24
White	0.891	0.891	1	18-24
Black	0.057	0.057	1	18-24
Native American	0.011	0.011	1	18-24
Asian/Pacific Islander	0.002	0.002	1	18-24
Asian Only	0.02	0.02	1	18-24
Asian/Hawaiian	0.002	0.002	1	18-24
Other	0.002	0.002	1	18-24
Age	29.542	29.541	0.871	25-34
Income (31 categories)	22.064	22.066	0.311	25-34
Education (32 categories)	21.417	21.415	0.442	25-34
Female	0.512	0.512	1	25-34
White	0.906	0.906	1	25-34
Black	0.051	0.051	1	25-34
Native American	0.01	0.01	1	25-34
Asian/Pacific Islander	0.001	0.001	1	25-34
Asian Only	0.019	0.019	1	25-34
Asian/Hawaiian	0.002	0.002	1	25-34
Other	0.001	0.001	1	25-34
Age	39.513	39.513	1	35-44
Income (31 categories)	23.694	23.698	0.04	35-44
Education (32 categories)	21.595	21.598	0.585	35-44
Female	0.512	0.512	1	35-44
White	0.912	0.912	1	35-44
Black	0.045	0.045	1	35-44
Native American	0.009	0.009	1	35-44
Asian/Pacific Islander	0.001	0.001	1	35-44
Asian Only	0.02	0.02	1	35-44
Asian/Hawaiian	0.002	0.002	1	35-44
Other	0.001	0.001	1	35-44
Age	49.501	49.503	0.443	45-54
Income (31 categories)	24.19	24.192	0.11	45-54
Education (32 categories)	21.376	21.371	0.102	45-54
Female	0.512	0.512	1	45-54
White	0.913	0.913	1	45-54
Black	0.046	0.046	1	45-54
Native American	0.008	0.008	1	45-54
Asian/Pacific Islander	0.001	0.001	1	45-54
Asian Only	0.02	0.02	1	45-54
Asian/Hawaiian	0.001	0.001	1	45-54
Other	0	0	1	45-54
Age	59.254	59.254	0.715	55-64
Income (31 categories)	23.216	23.219	0.158	55-64
Education (32 categories)	21.058	21.053	0.174	55-64
Female	0.51	0.51	1	55-64
White	0.922	0.922	1	55-64
Black	0.043	0.043	1	55-64

Native American	0.008	0.008	1	55-64
Asian/Pacific Islander	0.001	0.001	1	55-64
Asian Only	0.018	0.018	1	55-64
Asian/Hawaiian	0.002	0.002	1	55-64
Other	0.001	0.001	1	55-64
Age	73.798	73.795	0.478	65+
Income (31 categories)	20.017	20.022	0.032	65+
Education (32 categories)	19.546	19.549	0.244	65+
Female	0.556	0.556	1	65+
White	0.933	0.933	1	65+
Black	0.037	0.037	1	65+
Native American	0.006	0.006	1	65+
Asian/Pacific Islander	0	0	1	65+
Asian Only	0.017	0.017	1	65+
Asian/Hawaiian	0.001	0.001	1	65+
Other	0	0	1	65+

We report statistics on covariate balance in Table A6. Even with our large sample sizes, only four of the 66 age group-covariate combinations significantly differs between treatment and control units at the $p < 0.05$ level (the average p-value for difference-in-means of covariates is 0.83), indicating strong balance on observables.

Table A7: Placebo Test for Matching Design

Age Group	*ATT Estimate*	*95% CI*
18-24	-0.007	(-0.013, 0.000)
25-34	-0.003	(-0.009, 0.003)
35-44	0.006	(0.000, 0.012)
45-54	0.003	(-0.004, .009)
55-64	0.010	(0.003, 0.017)
65+	0.015	(0.009, 0.021)

Table A7 shows the results of a placebo test for the matching design. The test involves comparing turnout in SDR states during the years *before SDR implementation* to turnout in states that *never implemented SDR*. A successful test would show no difference in turnout between similar young people in pre-SDR and never-SDR states. If we find large differences in turnout, the analysis likely suffers from omitted variable bias or endogeneity. We find that turnout in

pre-SDR states is modestly greater for older but not for younger voters. The placebo estimate for 18-24 year-olds is a precisely estimated zero.

Table A8: All Demographic Interactions

	Dependent variable:			
	voted			
	(1)	(2)	(3)	(4)
sdr	0.061***	-0.011		
	(0.005)	(0.006)		
earlvot			0.005	0.028***
			(0.004)	(0.004)
age_group18.24	-0.420***	-0.421***	-0.422***	-0.425***
	(0.001)	(0.001)	(0.001)	(0.001)
age_group25.34	-0.324***	-0.325***	-0.320***	-0.323***
	(0.001)	(0.001)	(0.001)	(0.001)
age_group35.44	-0.222***	-0.223***	-0.216***	-0.219***
	(0.001)	(0.001)	(0.001)	(0.001)
age_group45.54	-0.148***	-0.149***	-0.144***	-0.146***
	(0.001)	(0.001)	(0.001)	(0.001)
age_group55.64	-0.067***	-0.067***	-0.061***	-0.063***
	(0.001)	(0.001)	(0.001)	(0.001)
race_5Asian	-0.164***	-0.170***	-0.202***	-0.190***
	(0.002)	(0.003)	(0.004)	(0.004)
race_5Black	0.044***	0.053***	0.039***	0.056***
	(0.001)	(0.001)	(0.001)	(0.001)
race_5Other	-0.032***	-0.051***	-0.045***	-0.061***
	(0.003)	(0.003)	(0.003)	(0.003)
sex	0.023***	0.024***	0.021***	0.022***
	(0.001)	(0.001)	(0.001)	(0.001)
faminc	0.009***	0.009***	0.009***	0.009***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
educ	0.023***	0.022***	0.023***	0.023***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)

sdr:age_group18.24	0.059***	0.057***		
	(0.004)	(0.004)		
sdr:age_group25.34	0.030***	0.026***		
	(0.004)	(0.004)		
sdr:age_group35.44	0.016***	0.011**		
	(0.004)	(0.004)		
sdr:age_group45.54	0.007	0.004		
	(0.004)	(0.004)		
sdr:age_group55.64	-0.006	-0.008*		
	(0.004)	(0.004)		
sdr:race_5Asian	-0.015*	0.007		
	(0.007)	(0.007)		
sdr:race_5Black	-0.019***	0.006		
	(0.005)	(0.005)		
sdr:race_5Other	-0.036***	-0.013		
	(0.008)	(0.008)		
sdr:sex	-0.002	-0.001		
	(0.002)	(0.002)		
sdr:faminc	-0.001***	-0.0001		
	(0.0002)	(0.0002)		
sdr:educ	0.0002	0.001*		
	(0.0002)	(0.0002)		
earlvot:age_group18.24			0.047***	0.048***
			(0.003)	(0.003)
earlvot:age_group25.34			0.003	0.003
			(0.003)	(0.003)
earlvot:age_group35.44			-0.013***	-0.012***
			(0.003)	(0.003)
earlvot:age_group45.54			-0.011***	-0.011***
			(0.003)	(0.003)
earlvot:age_group55.64			-0.025***	-0.024***
			(0.003)	(0.003)
earlvot:race_5Asian			0.061***	0.043***
			(0.005)	(0.005)
earlvot:race_5Black			-0.011***	-0.009**
			(0.003)	(0.003)

earlvot:race_5Other			0.027***	0.029***
			(0.005)	(0.005)
earlvot:sex			0.008***	0.008***
			(0.002)	(0.002)
earlvot:faminc			-0.0003**	-0.0005***
			(0.0001)	(0.0001)
earlvot:educ			-0.001***	-0.001***
			(0.0002)	(0.0002)
Constant	0.239***	0.261***	0.240***	0.256***
	(0.002)	(0.004)	(0.002)	(0.004)
State FEs	No	Yes	No	Yes
Year FEs	Yes	Yes	Yes	Yes
Observations	1,623,917	1,623,917	1,647,652	1,647,652
R^2	0.169	0.174	0.168	0.174
Adjusted R^2	0.169	0.174	0.168	0.174
Residual Std. Error	0.452 (df = 1623875)	0.451 (df = 1623827)	0.452 (df = 1647610)	0.451 (df = 1647561)
F Statistic	8,083.059*** (df = 41; 1623875)	3,853.446*** (df = 89; 1623827)	8,098.143*** (df = 41; 1647610)	3,864.853*** (df = 90; 1647561)

Note: *p<0.05; **p<0.01; ***p<0.001
Robust standard errors are clustered by state.

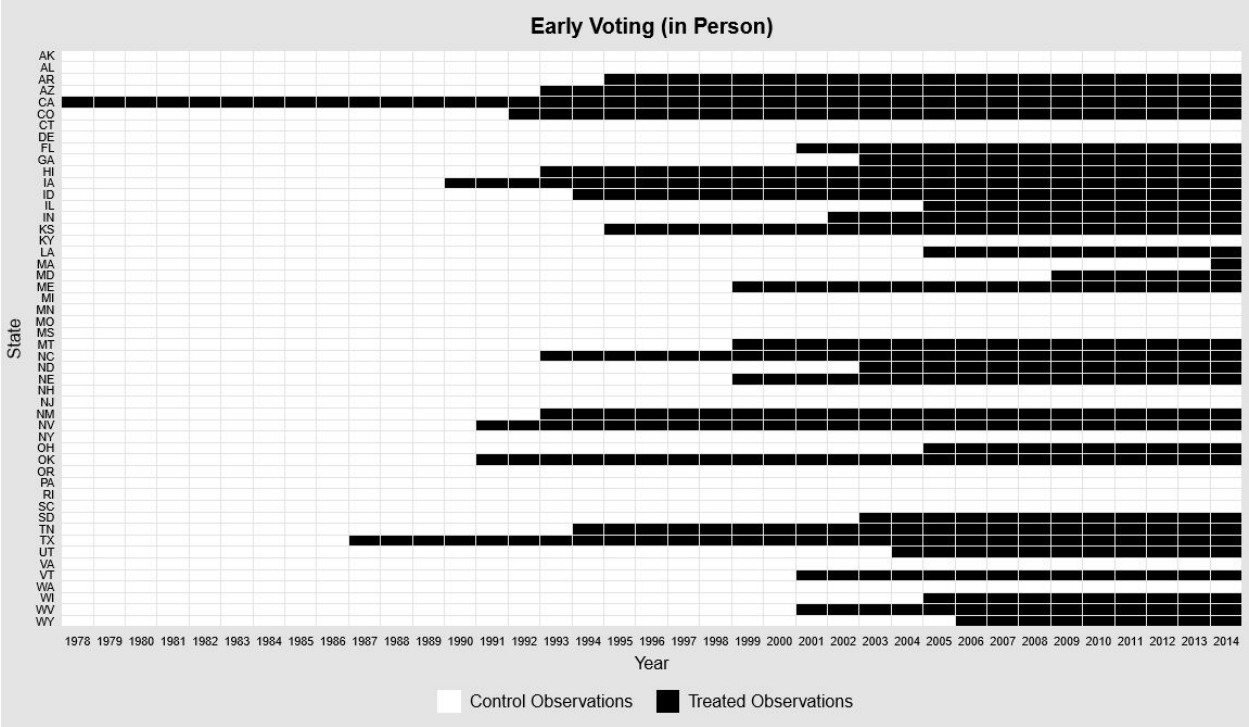
Early Voting Laws

We collect a new dataset on state early voting laws. These EV data and coding procedures primarily draws upon the U.S. Election Assistance Commission (2015) and Biggers and Hanmer (2015). This data covers EV laws adopted between 1978 and 2014. The term 'early voting' (EV) generally refers to a policy that allows voters to cast their ballot in advance of Election Day. However, there is substantial variation among scholars and practitioners in which states are deemed to have EV policies in place. Some adopt a broad definition of EV that includes both early in-person voting (EIP) and also no-excuse absentee voting, as absentee voters can submit their ballot in the weeks leading up to the election. Others use a more restrictive definition that requires that voters be able to exercise the dominant mode of voting—in most states, receiving and filling out a ballot at their polling place—before Election Day. Both the broad and restrictive definitions also include states with all-mail voting, as all voters in these states can vote in advance of the election.

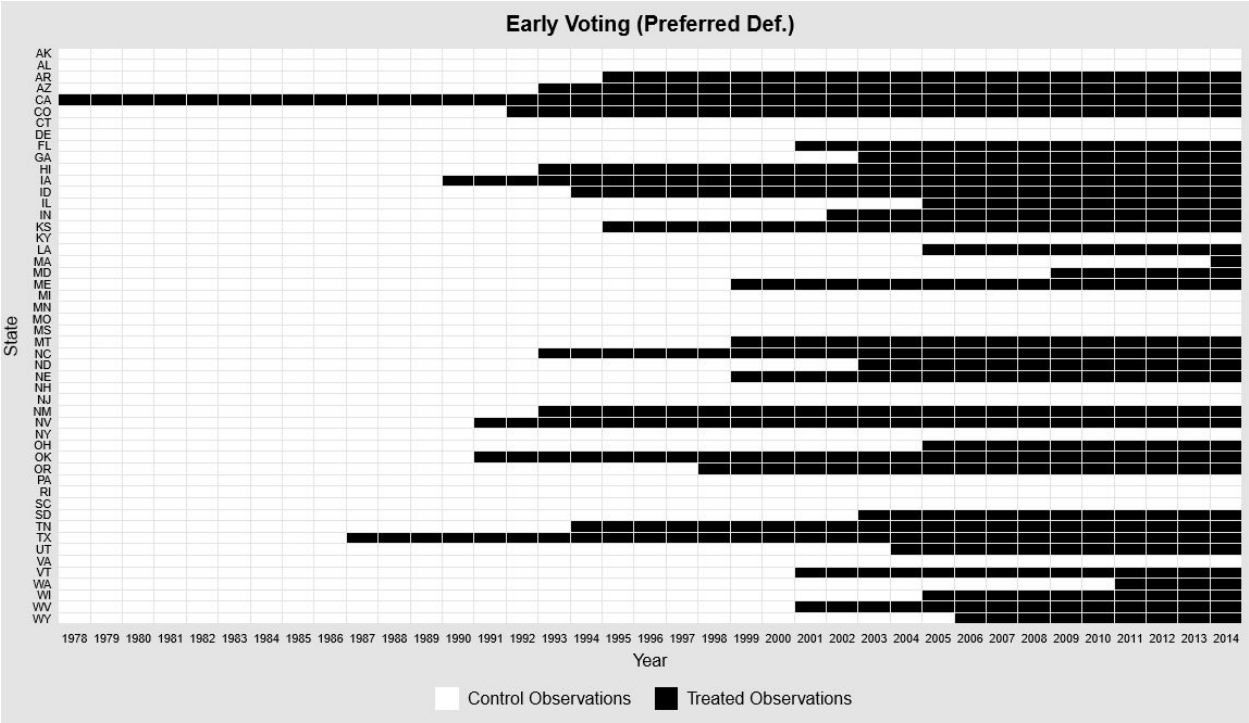
We use three different coding schemes for early voting. First, we code *in person* EV, only those states that offer early voting at multiple physical polling places. Second, we code *broad* definition early voting states that have adopted at least one of the following policies: no-excuse absentee voting, early in-person voting, or all-mail voting (shown in Figure A4b). Third, our *preferred* definition early voting states must have adopted either early in-person voting or all-mail voting (in Figure A4a). Our preferred definition excludes states that only offer EIP to absentee voters, as most voters will not request an absentee ballot and therefore cannot take advantage of the policy.

Figure A4: Early Voting Laws in the States

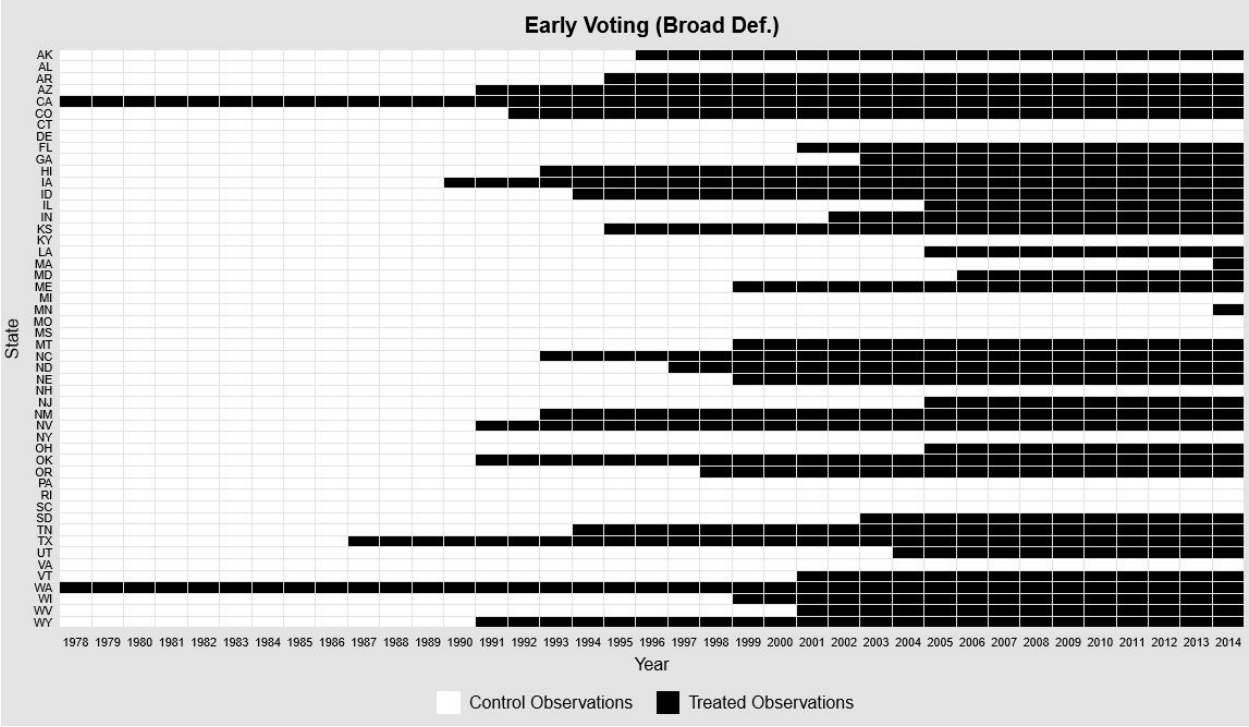
(a) In-Person Only



(b) Preferred Definition



(c) Broad Definition



Varieties of Same Day Registration

Table A9: Varieties of Same-Day Registration

Election Day Only	Election Day & Early/Absentee Voting	Early/Absentee Voting Only
1. Connecticut 2. District of Columbia 3. Idaho 4. Maine 5. Minnesota 6. New Hampshire 7. Wisconsin 8. Wyoming	1. California 2. Colorado 3. Hawaii 4. Illinois 5. Iowa 6. Maryland 7. Michigan 8. Montana 9. Nevada 10. Utah 11. Vermont 12. Washington	1. New Mexico[5] 2. North Carolina 3. Ohio[6]

Source: Authors' analysis of National Conference of State Legislatures data data (NCSL 2019).

Table A10: Party Control of SDR States

Republican Control	Divided Control	Democratic Control
1. Idaho 2. Iowa 3. Utah 4. Wyoming	1. Maryland 2. Michigan 3. Minnesota 4. Montana 5. New Hampshire 6. North Carolina 7. Vermont 8. Wisconsin	1. California 2. Colorado 3. Connecticut 4. District of Columbia 5. Hawaii 6. Illinois 7. Maine 8. Nevada 9. New Mexico 10. Washington

Source: Authors' analysis of National Conference of State Legislatures data data (NCSL 2019) and Ballotpedia's party control of state government data (Ballotpedia 2019).

[5] Beginning January 1, 2021, qualified voters can register and vote on Election Day.

[6] From 2005 to 2014, Ohio had in place a so-called "Golden Week," during which voters could register and vote on the same day. This week—technically six days—resulted from the overlap of two other voting provisions: voter registration that ended 30 days before the election, and same-day registration that started 35 days before the election. During the 6 days of overlap, voters could both register and vote on the same day.

Turnout in Presidential and Non-Presidential Elections by Age

Figure A5: Turnout by Age and SDR in Presidential and Non-Presidential Elections

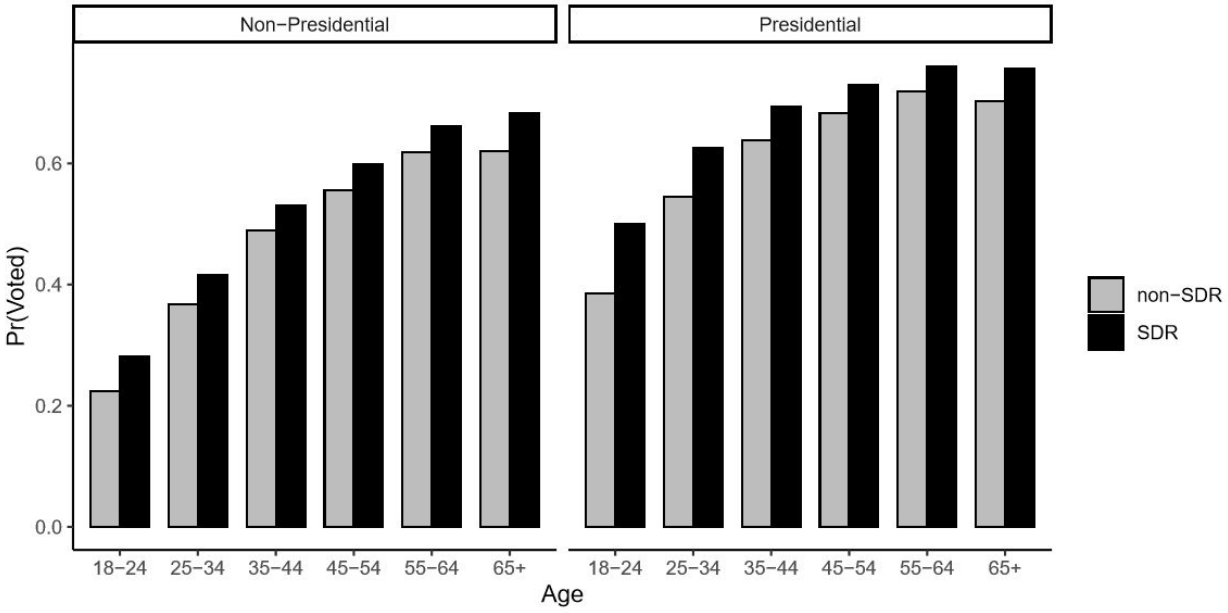


Table A11: SDR Effect in Presidential vs. Non-Presidential Elections

	Dependent variable:			
	Pr(Voted)			
	(1)	(2)	(3)	(4)
sdr	0.001	-0.013	0.013	-0.002
	(0.018)	(0.013)	(0.014)	(0.014)
age_group18.24	-0.320***	-0.376***	-0.404***	-0.462***
	(0.007)	(0.008)	(0.005)	(0.005)
age_group25.34	-0.163***	-0.276***	-0.262***	-0.368***
	(0.006)	(0.005)	(0.004)	(0.004)
age_group35.44	-0.067***	-0.192***	-0.135***	-0.250***
	(0.006)	(0.004)	(0.004)	(0.004)
age_group45.54	-0.021***	-0.132***	-0.064***	-0.165***

	(0.006)	(0.005)	(0.004)	(0.004)
age_group55.64	0.015**	-0.063***	-0.002	-0.071***
	(0.005)	(0.004)	(0.004)	(0.004)
sex		0.036***		0.013***
		(0.002)		(0.002)
faminc		0.009***		0.009***
		(0.0002)		(0.0002)
educ		0.023***		0.022***
		(0.0004)		(0.0004)
sdr:age_group18.24	0.057***	0.086***	-0.003	0.040**
	(0.012)	(0.012)	(0.014)	(0.014)
sdr:age_group25.34	0.025	0.048***	-0.013	0.016
	(0.015)	(0.009)	(0.012)	(0.012)
sdr:age_group35.44	0.002	0.025**	-0.022*	0.005
	(0.016)	(0.009)	(0.011)	(0.011)
sdr:age_group45.54	-0.007	0.010	-0.017*	0.003
	(0.013)	(0.009)	(0.008)	(0.008)
sdr:age_group55.64	-0.010	-0.003	-0.017*	-0.010
	(0.009)	(0.007)	(0.007)	(0.007)
Constant	0.703***	0.228***	0.645***	0.318***
	(0.007)	(0.010)	(0.012)	(0.012)
Race Dummies	No	Yes	No	Yes
Year FEs	Yes	Yes	Yes	Yes
State FEs	Yes	Yes	Yes	Yes
Observations	949,396	754,732	1,039,105	869,185
R^2	0.060	0.158	0.088	0.164
Adjusted R^2	0.060	0.158	0.088	0.164
Residual Std. Error	0.470	0.442	0.477	0.457

Note: *p<0.05; **p<0.01; ***p<0.001; robust standard errors clustered by state.

Table A11 shows the heterogeneous relationship between SDR and turnout by age and presidential election. Models 1 and 2 show the effect of SDR by age group in presidential years only. Models 3 and 4 fit the same model specifications for non-presidential election years. Again, the SDR coefficient represents the effect of SDR for individuals 65 and over (the omitted category), whereas the SDR effect for the other age groups is the sum of the SDR coefficient and the coefficient for the age group's interaction term.

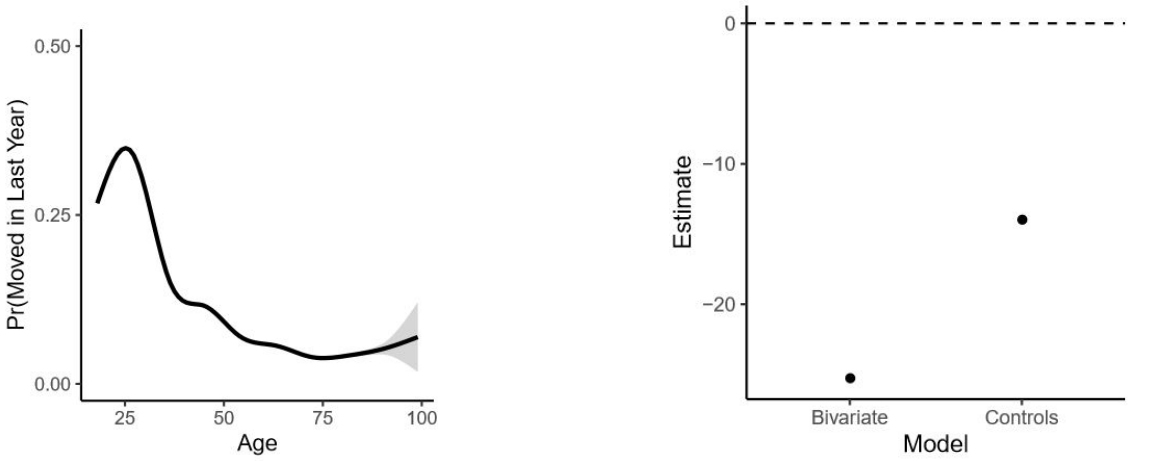
In absolute terms, the SDR effect is larger in non-presidential years for individuals 65 and over and similar for middle aged individuals compared to the effect in presidential years. By contrast, the SDR effect is significantly greater in presidential elections for individuals age 18-24 and 25-34.

The relative effect of SDR on young people compared to older people is also much more pronounced in presidential elections. The coefficients for the interaction terms SDR × Age 18-24 and SDR × Age 25-34 are positive and significant in Models 1 and 2, indicating that the SDR effect is greater for them than for individuals 65 and over (and greater than for middle aged people because their interaction terms are zero or negative). However, the SDR effect is no greater, and may be significantly smaller, for young people than older people in non-presidential elections. In Models 2 and 3, the coefficients for SDR × Age 18-24 and SDR × Age 25-34 are negative or close to zero.

Residential Mobility and Turnout

Figure A6: Residential Mobility and Turnout

(a) Age and Residential Mobility **(b) Residential Mobility and Turnout**

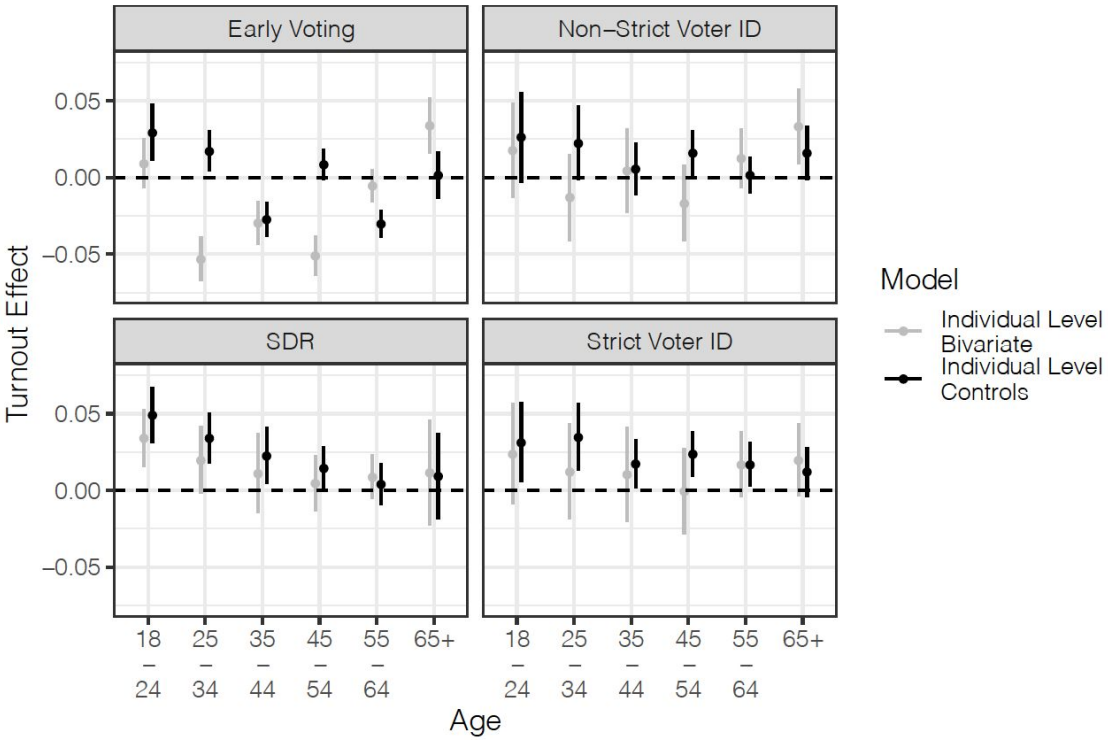


Note: Panel (a) fits a loess curve of the relationship between age and probability of having moved residences in the past year, showing that young people are more mobile (CPS data). Panel (b) shows that residential mobility is strongly and negatively correlated with turnout (CPS data; covariates include race, gender, income, and education; *N*=1,535,228; 95% confidence intervals are included but too small to be visible).

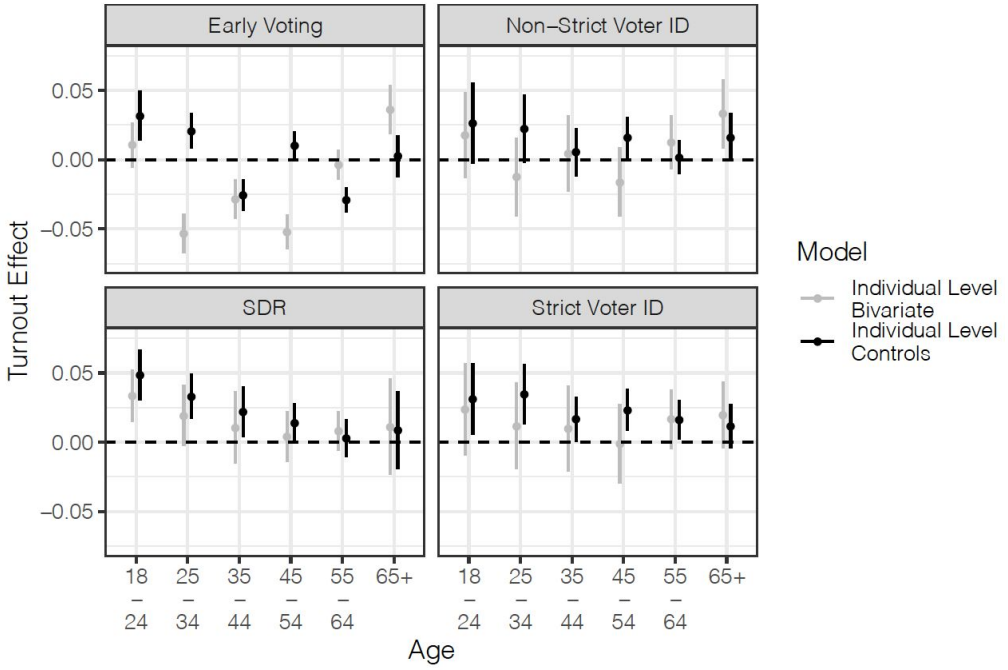
Analysis of Additional Election Laws

Figure A7: Interacting Additional Election Laws with Age (Diff-in-Diff)

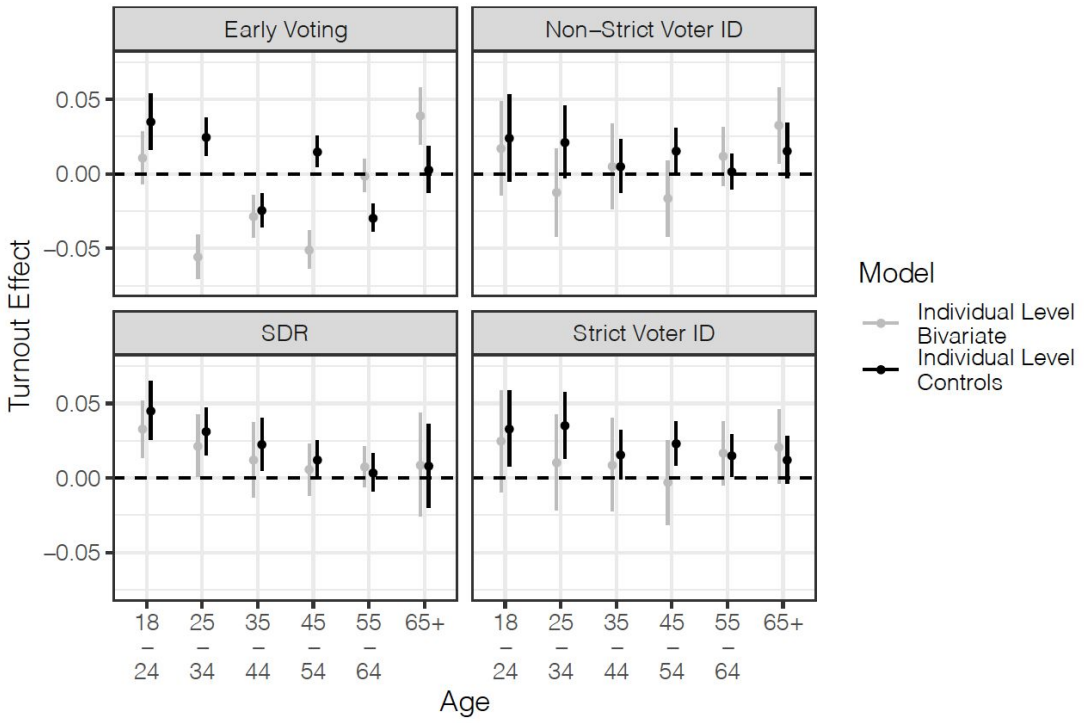
(a) Using In-Person EV Definition



(b) Using Preferred EV Definition



(c) Using Broad EV Definition



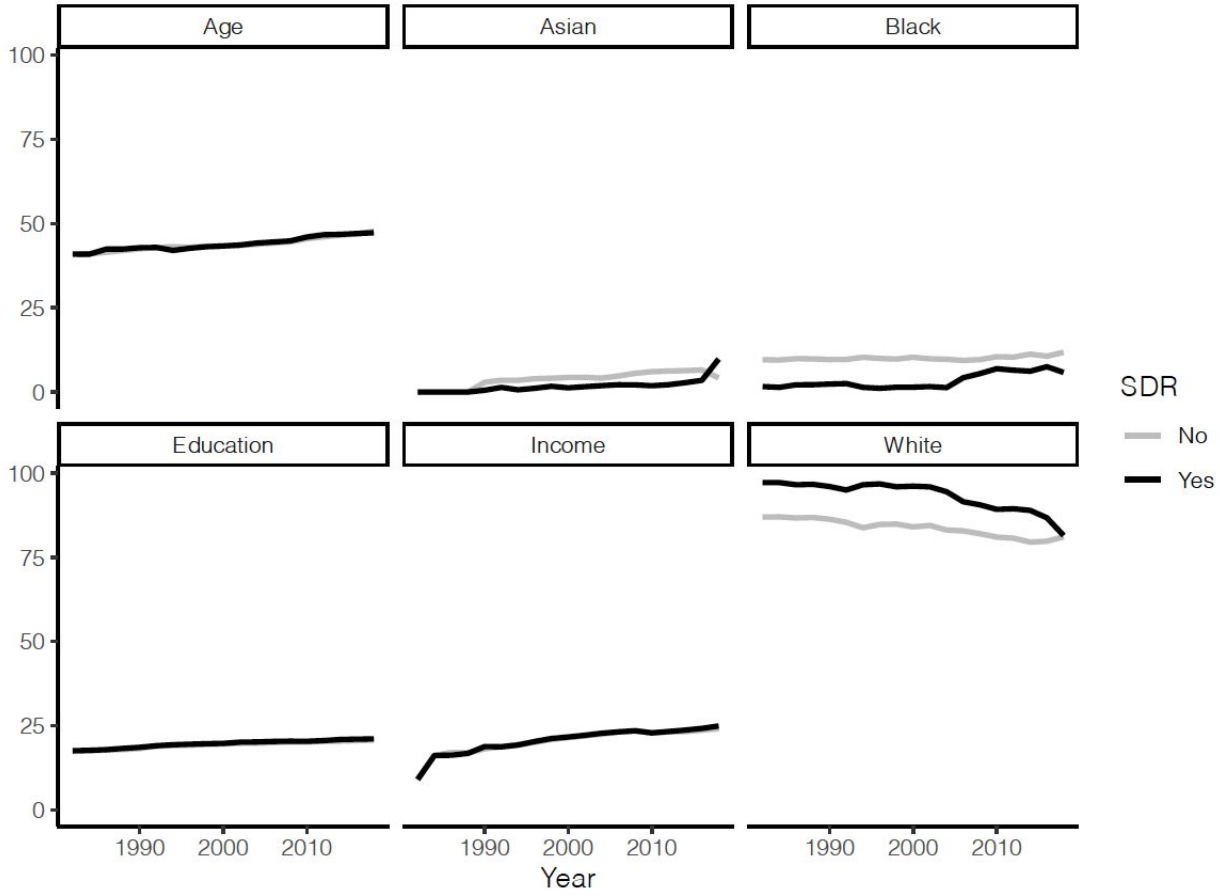
Note: Each panel (a) through (c) shows marginal effect estimates with 95% confidence intervals each derived from a single model that interacts early voting, SDR, and voter ID with each age category. Strict voter ID laws require photo identification; non-strict requests or requires some form of identification. Control specifications adjust for individual level race, gender, income, and education. Years covered are 1978-2016. $N = 1{,}811{,}864$. Robust standard errors are clustered by state.

Population Demographics in SDR and non-SDR States

Table A12: Population by Age

Age Group	*Percent of U.S. Population (2010 Census)*
18-24	9.5
25-34	13.8
35-44	12.5
45-54	13.2
55-64	12.8
65+	15.2

Figure A8: Demographics of SDR and non-SDR States Over Time



Note: Data are from the Census Current Population Survey.

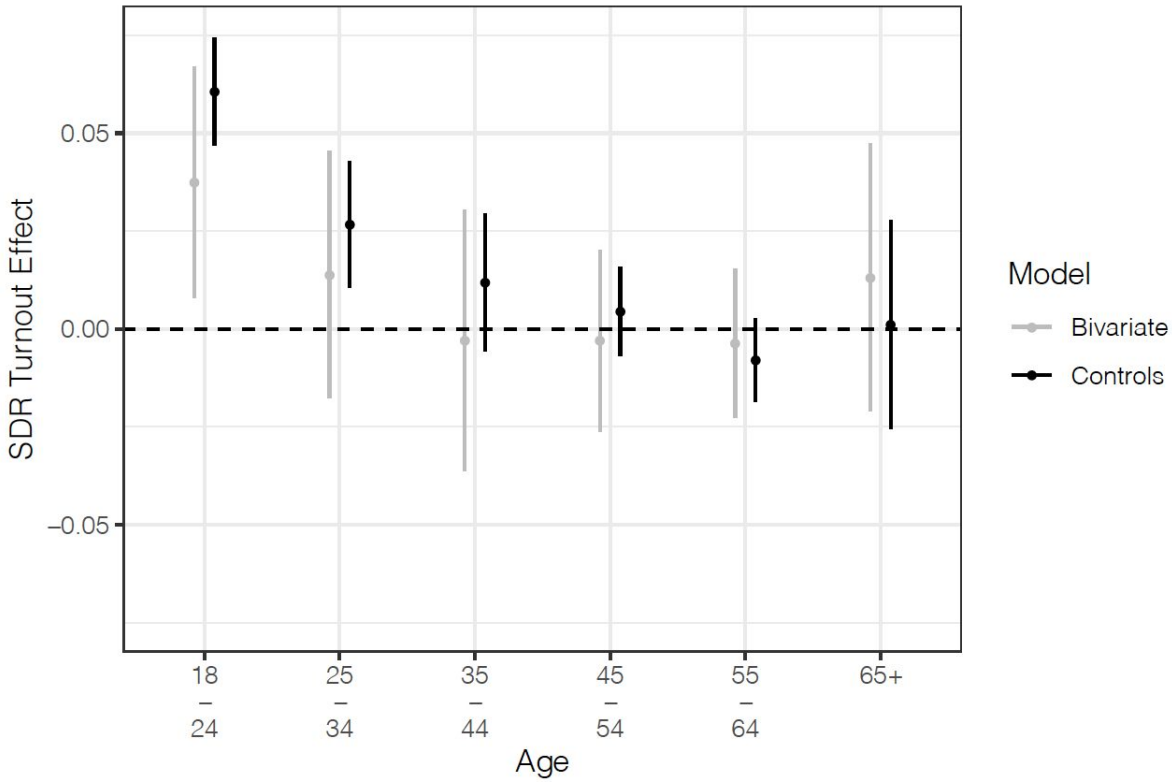
Additional Robustness Checks

Table A13: Bivariate Lagged Dependent Variable Models (Robustness Check)

Age Group	Treatment	Estimate	SE
18-24	SDR	0.065	0.01
25-34	SDR	0.044	0.011
35-44	SDR	0.027	0.012
45-54	SDR	0.026	0.01
55-64	SDR	0.022	0.009
65+	SDR	0.032	0.006
18-24	Early Voting	-0.009	0.01
25-34	Early Voting	-0.017	0.01
35-44	Early Voting	-0.019	0.008
45-54	Early Voting	-0.017	0.007
55-64	Early Voting	-0.015	0.007
65+	Early Voting	-0.002	0.007

Note: Estimates are from bivariate models using aggregated state level data (N=980), controlling for the age group's turnout in year t - 4 (for consistency of election type). Robust standard errors are clustered by state.

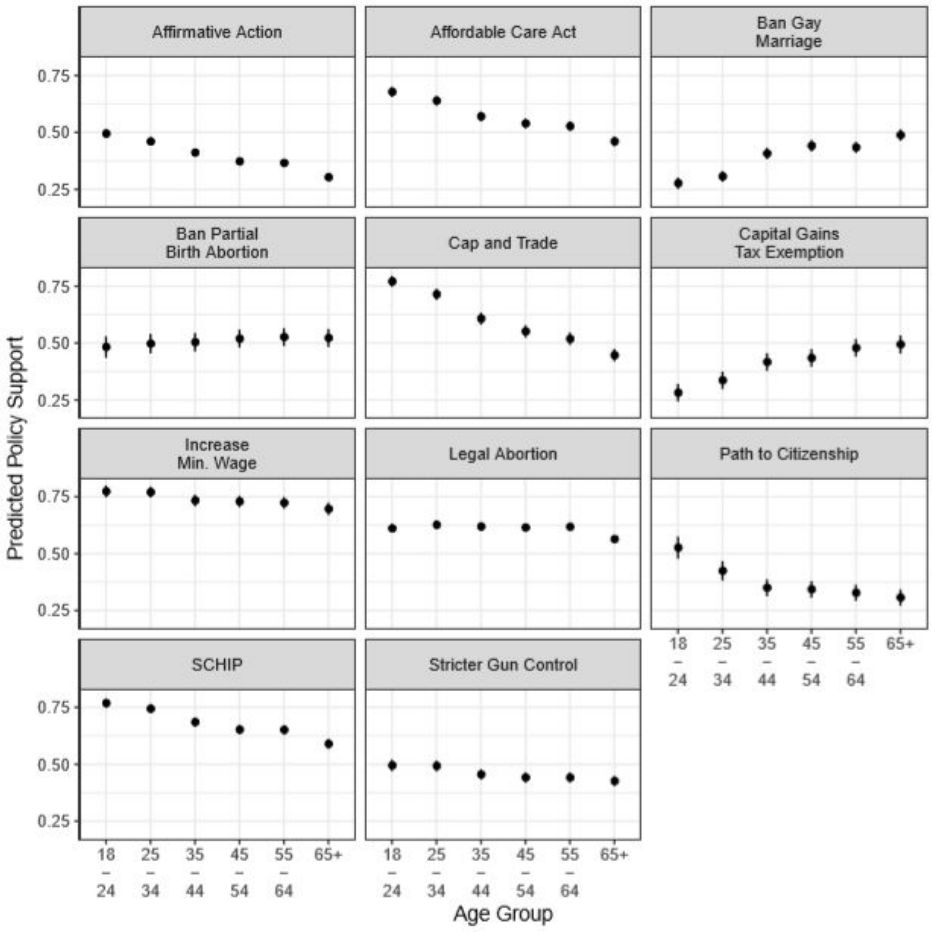
Figure A9: Difference-in-Differences Replication Excluding Refused to Answer



Note: Marginal effect estimates with 95% confidence intervals are derived from individual level models that interact SDR with each age category. The control specification adjusts for race, gender, income, and education. Robust standard errors are clustered by state.

Policy Attitudes by Age

Figure A10: Policy Attitudes by Age



Note: Estimates are predicted probability of policy support (binary questions) from logit models that adjust for race, gender, income, and education. Covariate values are set at their means. Data are from the CCES.

We show in Figure A10 that policy attitudes vary greatly by age. The present generation of young people is considerably more supportive of affirmative action, the Affordable Care Act, cap and trade, increasing the minimum wage, SCHIP, and a path to citizenship for undocumented immigrants, and less supportive of banning same-sex marriage and extending the 2003 tax cuts for capital gains. There are also statistically significant but substantively marginal age differences in attitudes on abortion policy and gun control. To the extent that politicians are

responsive to the policy attitudes of voters relative to non-voters (Griffin and Newman 2005), the age-variant turnout effect of SDR may have important downstream policy effects.[7]

Full Interaction Model Results on Presidential vs. Non-Presidential SDR Effect

Table A14: Age-SDR-Presidential Election Interaction Model

term	estimate	std.error	statistic	p.value
(Intercept)	0.285704	0.01202	23.76907	3.37E-28
sdr	0.002338	0.01286	0.181766	0.856532
age_group18.24	-0.46199	0.004892	-94.4483	3.51E-56
presidential_year	-0.20864	0.010604	-19.6748	1.28E-24
age_group25.34	-0.3705	0.004421	-83.8091	1.05E-53
age_group35.44	-0.25215	0.004196	-60.0994	7.73E-47
age_group45.54	-0.16702	0.0038	-43.9496	1.98E-40
age_group55.64	-0.07272	0.003653	-19.9099	7.69E-25
factor(race)200	0.053864	0.008217	6.555321	3.54E-08
factor(race)300	-0.05325	0.012104	-4.39914	6.02E-05
factor(race)650	-0.15966	0.030616	-5.21483	3.86E-06
factor(race)651	-0.17674	0.009037	-19.5567	1.66E-24
factor(race)652	-0.12871	0.018548	-6.93954	9.10E-09
factor(race)700	-0.08556	0.022838	-3.7464	0.000481
sex	0.023581	0.001722	13.69313	3.38E-18
faminc	0.008942	0.000172	51.94717	7.62E-44
educ	0.022566	0.000403	56.02959	2.14E-45
sdr:age_group18.24	0.040587	0.014464	2.806109	0.007223

[7] Existing policy attitudes may be cohort-specific, with the next generation of young people holding different preferences; as such, we cannot as readily predict the future effects of SDR on public policy.

sdr:presidential_year	-0.01497	0.010641	-1.40662	0.165982
age_group18.24:presidential_year	0.086515	0.005642	15.33297	3.99E-20
sdr:age_group25.34	0.015895	0.012412	1.280624	0.206479
presidential_year:age_group25.34	0.097228	0.004739	20.51501	2.12E-25
sdr:age_group35.44	0.005383	0.011317	0.475692	0.636452
presidential_year:age_group35.44	0.06312	0.003914	16.12741	5.20E-21
sdr:age_group45.54	0.002494	0.008063	0.309314	0.758422
presidential_year:age_group45.54	0.038074	0.004045	9.411806	1.77E-12
sdr:age_group55.64	-0.01001	0.007401	-1.35229	0.18262
presidential_year:age_group55.64	0.011276	0.004053	2.782033	0.007699
sdr:age_group18.24:presidential_year	0.044025	0.015661	2.811221	0.007125
sdr:presidential_year:age_group25.34	0.031846	0.013919	2.287876	0.026592
sdr:presidential_year:age_group35.44	0.019507	0.010307	1.89251	0.064462
sdr:presidential_year:age_group45.54	0.007828	0.009779	0.800476	0.427379
sdr:presidential_year:age_group55.64	0.00757	0.007612	0.994564	0.324936

Note: Model includes state and year fixed effects. Standard errors are clustered by state.

Additional Robustness Check with Alternative Covariate Coding

Table A15: Diff-in-Diff with Alternative Covariate Coding

term	estimate	std.error	statistic	p.value
sdr	-0.00143	0.012224	-0.11681	0.907494
age_group18.24	-0.43476	0.005684	-76.4855	8.20E-52
age_group25.34	-0.33639	0.003982	-84.4816	7.17E-54
age_group35.44	-0.23195	0.003478	-66.6924	5.54E-49
age_group45.54	-0.15688	0.003514	-44.6401	9.53E-41
age_group55.64	-0.07206	0.003308	-21.7851	1.56E-26
factor(race)200	0.054779	0.008276	6.618906	2.83E-08
factor(race)300	-0.04975	0.012011	-4.14224	0.000139
factor(race)650	-0.15906	0.031085	-5.11692	5.41E-06
factor(race)651	-0.1747	0.008643	-20.2119	4.03E-25
factor(race)652	-0.12509	0.016769	-7.45943	1.46E-09
factor(race)700	-0.08392	0.022957	-3.6556	0.000635
sex	0.021083	0.001795	11.74353	1.02E-15
factor(faminc)2	-0.11691	0.006826	-17.1265	4.41E-22
factor(faminc)3	-0.06895	0.009199	-7.49563	1.28E-09
factor(faminc)4	-0.03845	0.006804	-5.65142	8.51E-07
factor(faminc)5	-0.02685	0.006285	-4.27246	9.10E-05
factor(faminc)6	-0.02475	0.00772	-3.20617	0.002395
factor(faminc)7	0.010516	0.003255	3.231035	0.00223
factor(faminc)8	-0.00212	0.008893	-0.23885	0.81224
factor(faminc)9	0.014176	0.009236	1.534838	0.131389

factor(faminc)10	0.025317	0.003929	6.443527	5.25E-08
factor(faminc)11	0.050214	0.003515	14.28371	6.58E-19
factor(faminc)12	0.045278	0.006221	7.277682	2.76E-09
factor(faminc)13	0.073838	0.006415	11.50965	2.08E-15
factor(faminc)14	0.063157	0.003617	17.46184	1.97E-22
factor(faminc)15	0.078827	0.003443	22.89193	1.77E-27
factor(faminc)16	0.079454	0.006493	12.23735	2.29E-16
factor(faminc)17	0.097676	0.005101	19.14969	4.06E-24
factor(faminc)18	0.095749	0.003558	26.90726	1.32E-30
factor(faminc)19	0.078306	0.011059	7.08106	5.52E-09
factor(faminc)20	0.117478	0.004103	28.63508	7.88E-32
factor(faminc)21	0.131753	0.003895	33.82756	3.84E-35
factor(faminc)22	0.142465	0.004246	33.55506	5.57E-35
factor(faminc)23	0.160719	0.004552	35.30386	5.34E-36
factor(faminc)24	0.059895	0.013304	4.501931	4.29E-05
factor(faminc)25	0.165188	0.006647	24.84968	4.66E-29
factor(faminc)26	0.172765	0.004619	37.40434	3.66E-37
factor(faminc)27	0.194186	0.004669	41.59245	2.61E-39
factor(faminc)28	0.199915	0.005122	39.03068	5.06E-38
factor(faminc)29	0.211196	0.005752	36.71871	8.65E-37
factor(faminc)30	0.229538	0.005536	41.46342	3.02E-39
factor(faminc)31	0.232334	0.005853	39.69593	2.30E-38
factor(educ)2	0.099631	0.012699	7.84564	3.77E-10
factor(educ)3	0.023846	0.026571	0.897426	0.373971

factor(educ)4	0.062201	0.022447	2.771064	0.007926
factor(educ)5	0.057516	0.018724	3.071826	0.0035
factor(educ)6	0.062488	0.02006	3.115105	0.0031
factor(educ)7	0.141657	0.013709	10.33327	8.56E-14
factor(educ)8	0.083806	0.018483	4.534231	3.86E-05
factor(educ)9	0.118284	0.015306	7.727846	5.69E-10
factor(educ)10	0.156579	0.015188	10.30947	9.25E-14
factor(educ)11	0.124236	0.015486	8.022542	2.04E-10
factor(educ)12	0.157752	0.01625	9.707931	6.62E-13
factor(educ)13	0.166648	0.014837	11.23178	4.93E-15
factor(educ)14	0.190673	0.015699	12.14582	3.01E-16
factor(educ)15	0.22097	0.015959	13.84635	2.20E-18
factor(educ)16	0.268304	0.016998	15.78437	1.24E-20
factor(educ)17	0.321009	0.016656	19.27248	3.09E-24
factor(educ)18	0.329078	0.015589	21.10908	6.16E-26
factor(educ)19	0.405153	0.01425	28.43194	1.09E-31
factor(educ)20	0.440774	0.015222	28.95589	4.75E-32
factor(educ)21	0.424055	0.014519	29.20702	3.21E-32
factor(educ)22	0.436653	0.016534	26.40958	3.05E-30
factor(educ)23	0.478516	0.015623	30.62918	3.67E-33
factor(educ)24	0.446936	0.014015	31.89016	5.78E-34
factor(educ)25	0.493531	0.013972	35.32252	5.21E-36
factor(educ)26	0.527993	0.015326	34.45123	1.65E-35
factor(educ)27	0.534746	0.015109	35.39193	4.76E-36

factor(educ)28	0.532432	0.014646	36.35271	1.38E-36
factor(educ)29	0.559204	0.015474	36.13804	1.81E-36
factor(educ)30	0.537959	0.01565	34.37416	1.83E-35
factor(educ)31	0.544551	0.014871	36.61771	9.83E-37
sdr:age_group18.24	0.053131	0.009168	5.795204	5.14E-07
sdr:age_group25.34	0.026369	0.007449	3.539751	0.000901
sdr:age_group35.44	0.011115	0.008242	1.348562	0.183806
sdr:age_group45.54	0.002766	0.0068	0.406703	0.686034
sdr:age_group55.64	-0.00951	0.00609	-1.56099	0.125095

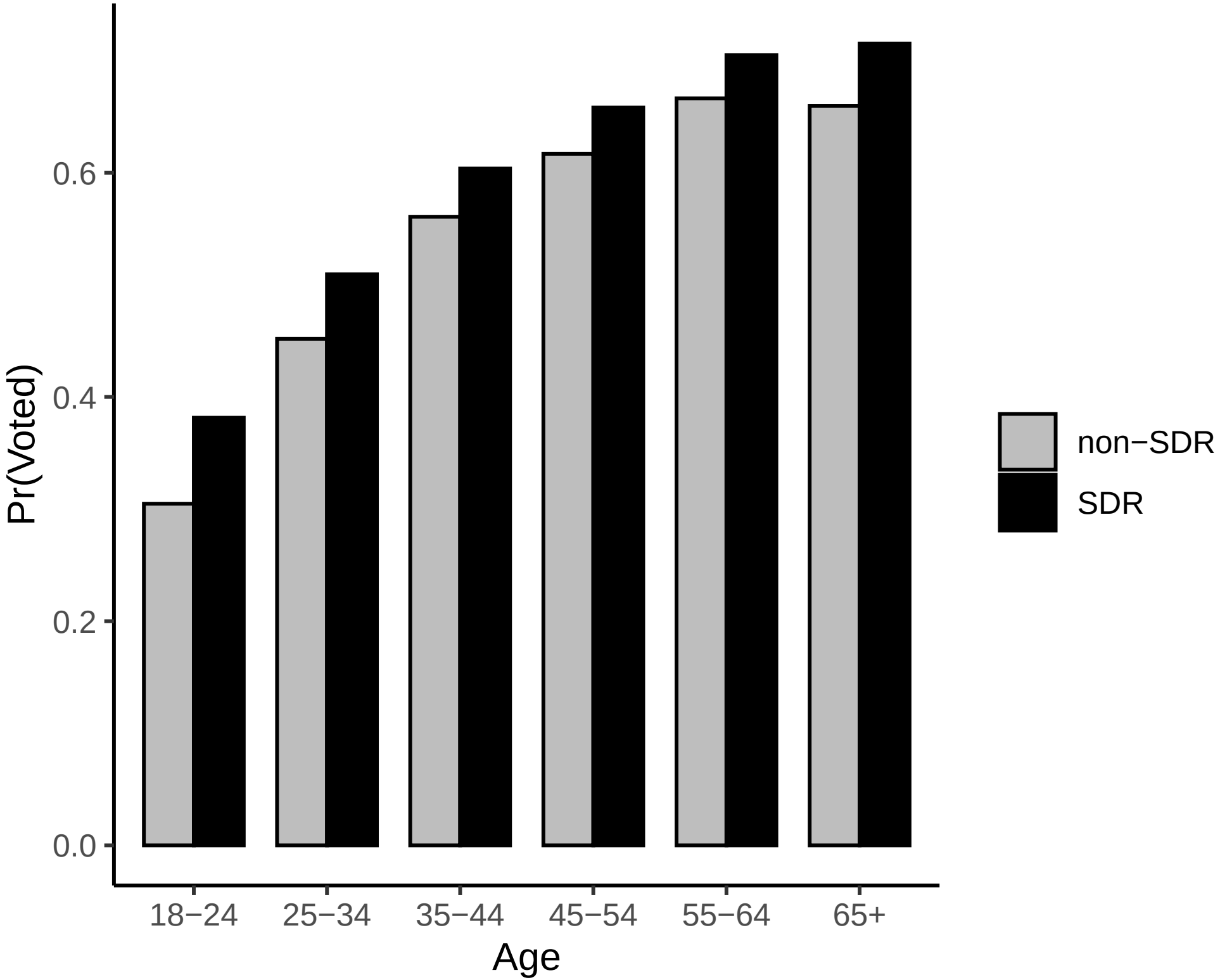
Table A16: Diff-in-Diff with State-Specific Time Trends and Alternative Covariate Coding

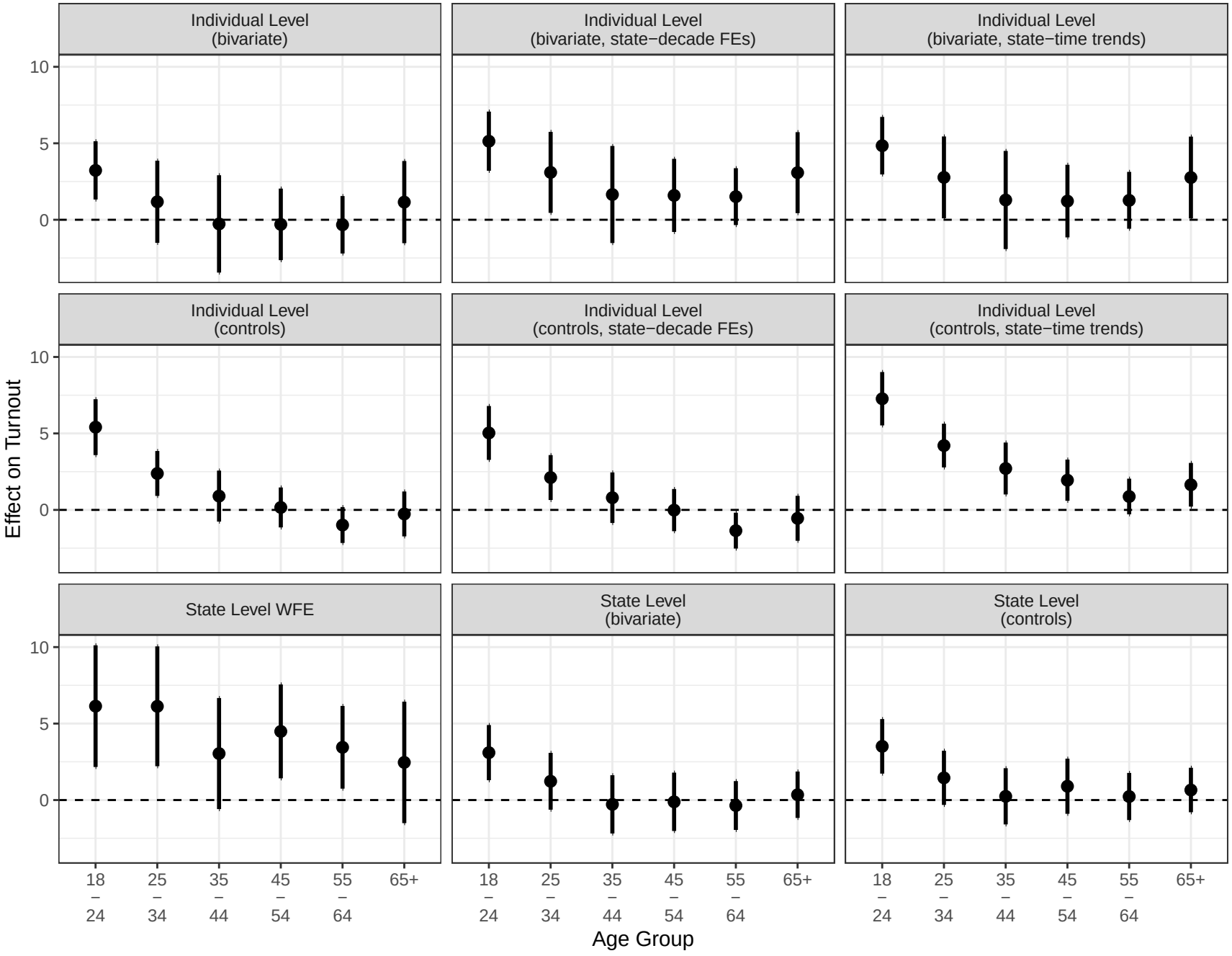
term	estimate	std.error	statistic	p.value
sdr	0.018212	0.008844	2.059167	0.044926
age_group18.24	-0.43429	0.005768	-75.2867	1.74E-51
age_group25.34	-0.33582	0.004057	-82.7692	1.90E-53
age_group35.44	-0.23158	0.003522	-65.7575	1.08E-48
age_group45.54	-0.15664	0.003534	-44.3248	1.33E-40
age_group55.64	-0.07176	0.003293	-21.7948	1.53E-26
factor(race)200	0.054516	0.008261	6.59931	3.03E-08
factor(race)300	-0.04683	0.011993	-3.90452	0.000294
factor(race)650	-0.16554	0.0277	-5.97615	2.73E-07
factor(race)651	-0.16782	0.011662	-14.3905	4.92E-19

factor(race)652	-0.10535	0.013336	-7.89929	3.13E-10
factor(race)700	-0.10578	0.016635	-6.35922	7.07E-08
sex	0.021118	0.001795	11.76287	9.59E-16
factor(faminc)2	-0.11651	0.006681	-17.4389	2.08E-22
factor(faminc)3	-0.06925	0.008893	-7.78661	4.63E-10
factor(faminc)4	-0.039	0.006517	-5.98418	2.65E-07
factor(faminc)5	-0.02691	0.006101	-4.41076	5.80E-05
factor(faminc)6	-0.02466	0.00756	-3.26259	0.002037
factor(faminc)7	0.010174	0.003233	3.146698	0.002836
factor(faminc)8	-0.00305	0.008554	-0.35678	0.722818
factor(faminc)9	0.014103	0.009169	1.538154	0.130578
factor(faminc)10	0.024861	0.003929	6.327702	7.90E-08
factor(faminc)11	0.050008	0.003509	14.24931	7.23E-19
factor(faminc)12	0.043833	0.006357	6.894901	1.07E-08
factor(faminc)13	0.073697	0.00655	11.25151	4.64E-15
factor(faminc)14	0.062893	0.003655	17.20892	3.62E-22
factor(faminc)15	0.078809	0.003575	22.04158	9.35E-27
factor(faminc)16	0.078762	0.006444	12.22307	2.39E-16
factor(faminc)17	0.097223	0.005118	18.99702	5.71E-24
factor(faminc)18	0.095542	0.003664	26.07262	5.43E-30
factor(faminc)19	0.077855	0.010888	7.150715	4.32E-09
factor(faminc)20	0.117368	0.004238	27.69511	3.58E-31
factor(faminc)21	0.131699	0.004045	32.55645	2.24E-34
factor(faminc)22	0.14249	0.004429	32.1734	3.85E-34

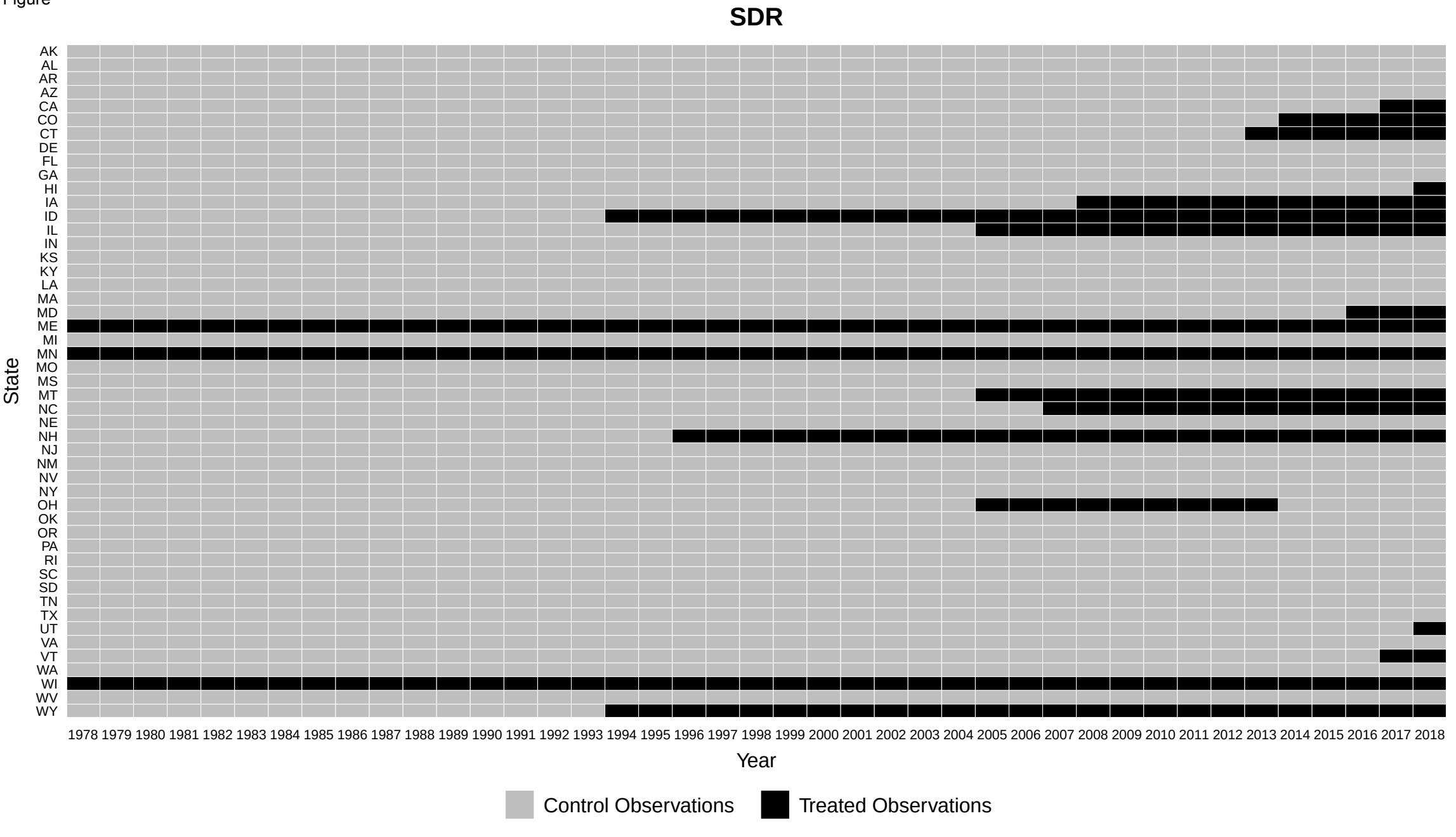
factor(faminc)23	0.160834	0.004746	33.88575	3.55E-35
factor(faminc)24	0.060156	0.012938	4.649505	2.63E-05
factor(faminc)25	0.165514	0.006755	24.50292	8.72E-29
factor(faminc)26	0.172923	0.004777	36.19825	1.68E-36
factor(faminc)27	0.194345	0.004815	40.36074	1.06E-38
factor(faminc)28	0.199902	0.005317	37.59379	2.90E-37
factor(faminc)29	0.211493	0.005771	36.64999	9.43E-37
factor(faminc)30	0.229758	0.005385	42.66396	7.94E-40
factor(faminc)31	0.232589	0.005254	44.27257	1.40E-40
factor(educ)2	0.098657	0.012696	7.770484	4.90E-10
factor(educ)3	0.028822	0.026834	1.07408	0.288157
factor(educ)4	0.066249	0.022369	2.961628	0.004747
factor(educ)5	0.061495	0.018704	3.287764	0.001894
factor(educ)6	0.064859	0.019646	3.301403	0.001821
factor(educ)7	0.140588	0.013653	10.29692	9.63E-14
factor(educ)8	0.08655	0.01819	4.758055	1.83E-05
factor(educ)9	0.118783	0.015108	7.862478	3.56E-10
factor(educ)10	0.154181	0.015116	10.19993	1.32E-13
factor(educ)11	0.126099	0.015326	8.227887	9.99E-11
factor(educ)12	0.153995	0.015591	9.87739	3.79E-13
factor(educ)13	0.164474	0.014677	11.20597	5.35E-15
factor(educ)14	0.188368	0.01563	12.05182	3.99E-16
factor(educ)15	0.218571	0.01587	13.77231	2.70E-18
factor(educ)16	0.265898	0.016747	15.87738	9.79E-21

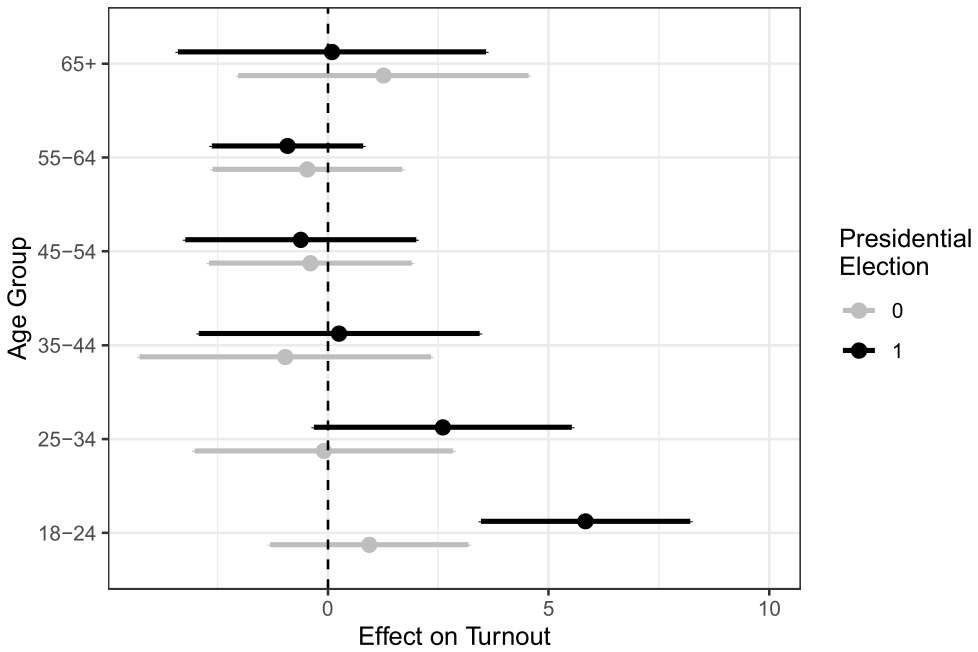
factor(educ)17	0.317925	0.016487	19.28394	3.02E-24
factor(educ)18	0.326594	0.015562	20.98634	7.93E-26
factor(educ)19	0.400573	0.014263	28.08383	1.90E-31
factor(educ)20	0.438745	0.015099	29.0579	4.05E-32
factor(educ)21	0.420239	0.01455	28.8816	5.34E-32
factor(educ)22	0.434757	0.016439	26.44601	2.87E-30
factor(educ)23	0.476314	0.015603	30.52724	4.27E-33
factor(educ)24	0.442744	0.013868	31.92652	5.49E-34
factor(educ)25	0.489922	0.013904	35.23673	5.83E-36
factor(educ)26	0.525763	0.015241	34.49734	1.55E-35
factor(educ)27	0.530571	0.015117	35.09765	7.00E-36
factor(educ)28	0.528536	0.014543	36.34236	1.39E-36
factor(educ)29	0.556663	0.015459	36.00859	2.14E-36
factor(educ)30	0.53583	0.015649	34.24145	2.19E-35
factor(educ)31	0.541711	0.014711	36.82422	7.57E-37
sdr:age_group18.24	0.052454	0.008709	6.022937	2.31E-07
sdr:age_group25.34	0.02526	0.007204	3.506614	0.000995
sdr:age_group35.44	0.00983	0.008369	1.174685	0.245915
sdr:age_group45.54	0.001308	0.006968	0.187664	0.851931
sdr:age_group55.64	-0.01008	0.006026	-1.67325	0.100784

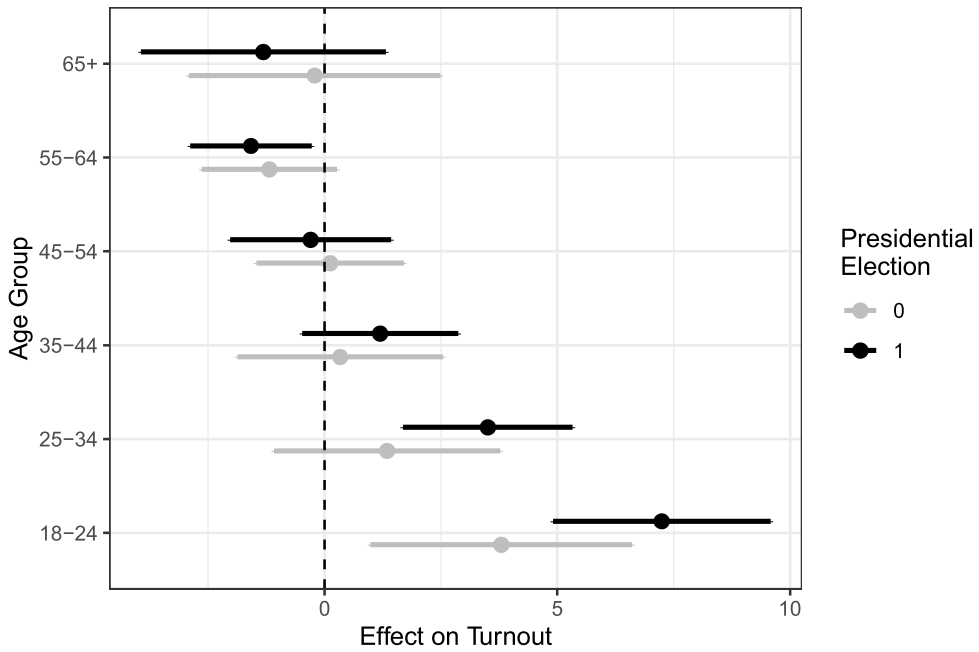

Pr(Voted)
0.0
0.2
0.4
0.6
18−24
25−34
35−44
45−54
55−64
65+
Age
non−SDR
SDR

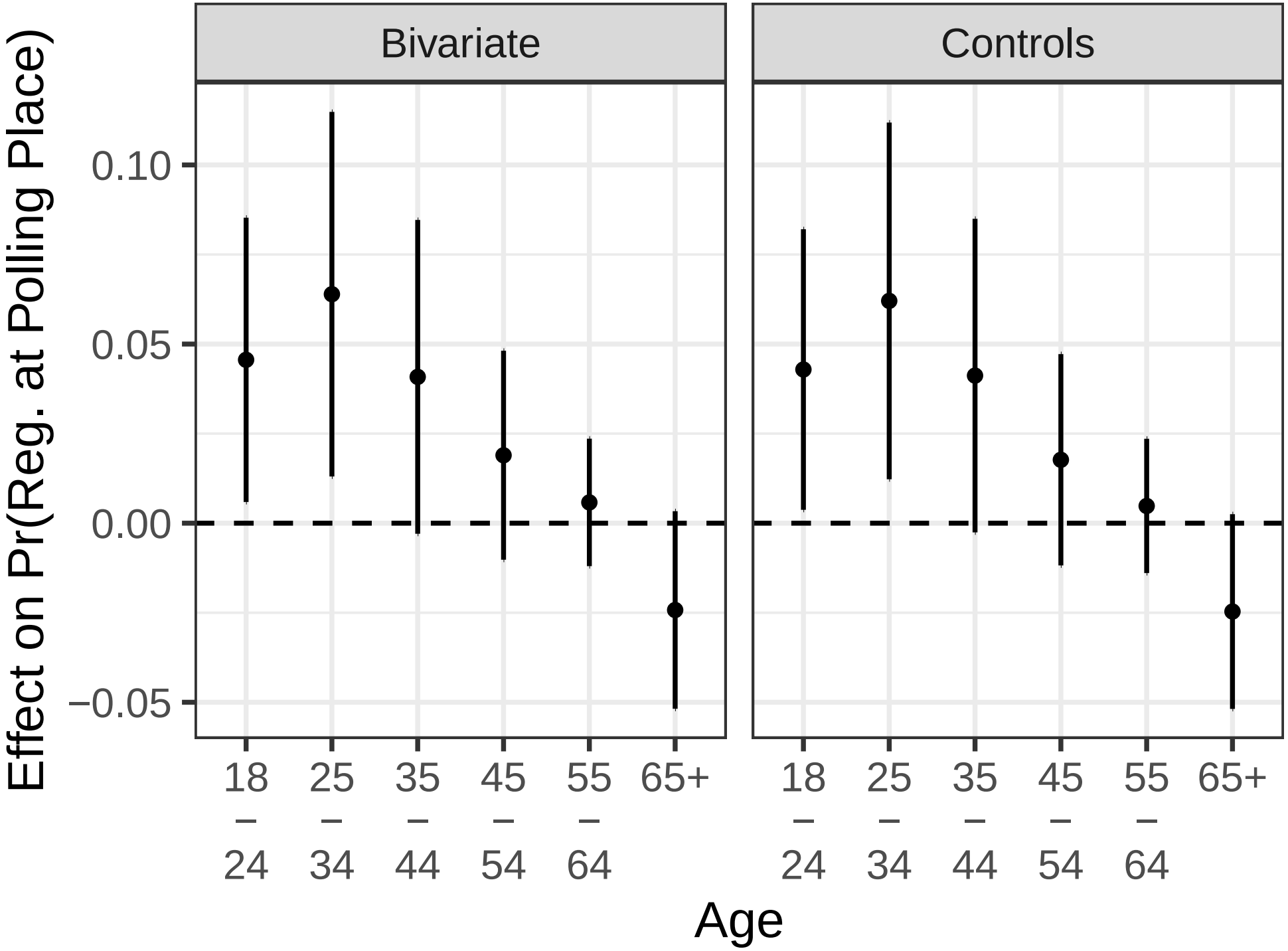

Individual Level
(bivariate)
Individual Level
(bivariate, state−decade FEs)
Individual Level
(bivariate, state−time trends)
Individual Level
(controls)
Individual Level
(controls, state−decade FEs)
Individual Level
(controls, state−time trends)
State Level WFE
State Level
(bivariate)
State Level
(controls)
Effect on Turnout
10
5
0
18 – 24
25 – 34
35 – 44
45 – 54
55 – 64
65+
Age Group

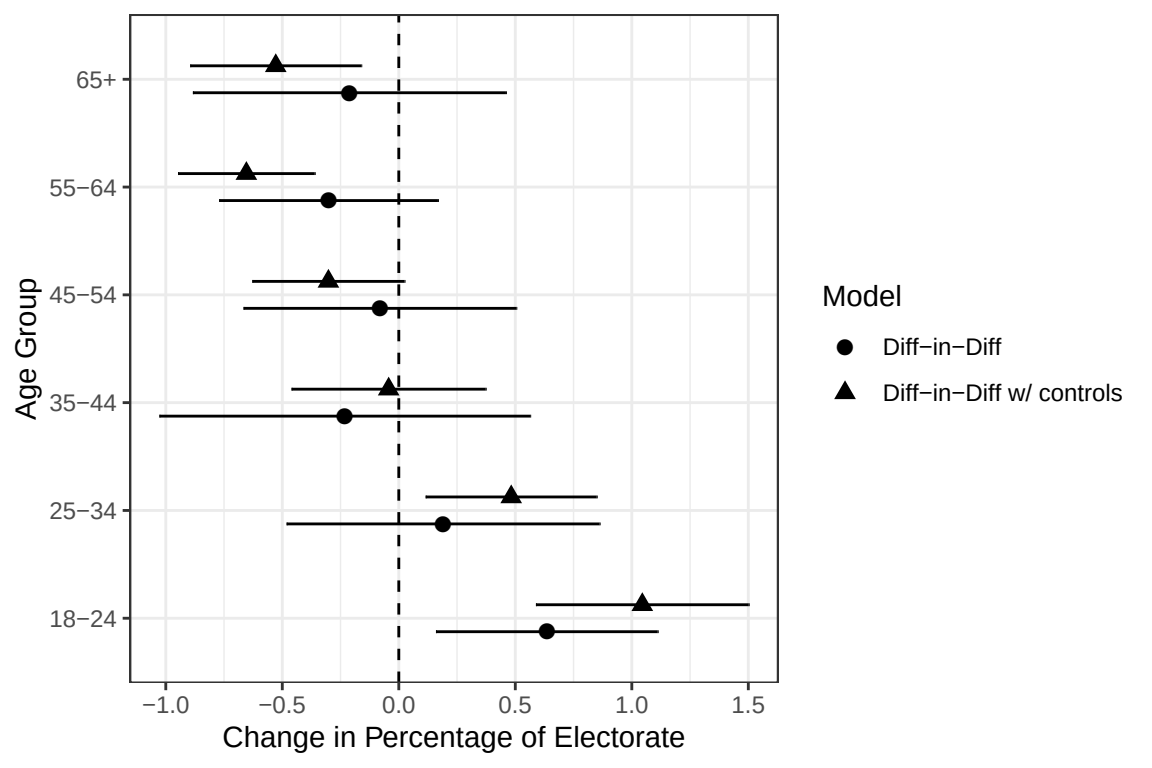
Figure


SDR
State
AK
AL
AR
AZ
CA
CO
CT
DE
FL
GA
HI
IA
ID
IL
IN
KS
KY
LA
MA
MD
ME
MI
MN
MO
MS
MT
NC
NE
NH
NJ
NM
NV
NY
OH
OK
OR
PA
RI
SC
SD
TN
TX
UT
VA
VT
WA
WI
WV
WY
1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018
Year
Control Observations
Treated Observations


65+
55–64
45–54
35–44
25–34
18–24
Age Group
0
5
10
Effect on Turnout
Presidential Election
0
1


65+
55–64
45–54
35–44
25–34
18–24
Age Group
0
5
10
Effect on Turnout
Presidential Election
0
1


Bivariate
Controls
Effect on Pr(Reg. at Polling Place)
0.10
0.05
0.00
−0.05
18 – 24
25 – 34
35 – 44
45 – 54
55 – 64
65+
Age


65+
55–64
45–54
35–44
25–34
18–24
Age Group
−1.0
−0.5
0.0
0.5
1.0
1.5
Change in Percentage of Electorate
Model
Diff−in−Diff
Diff−in−Diff w/ controls