Appendix to: "Polling Place Changes and Political Participation: Evidence from North Carolina Presidential Elections, 2008-2016"

Joshua D. Clinton Nick Eubank Adriane Fresh Michael Shepherd

Date: December 23, 2019

Note that this Appendix is to be published online only.

Appendix Contents

A. Data Sources, Measurement, and Summary Statistics

In this appendix, we provide additional details about the data sources and measurement as well as comprehensive summary statistics.

Snapshots of the North Carolina Voter Roll provided by North Carolina State Board of Election (NCSBE) between 2008 and 2016 was downloaded by the authors from the NCSBE data site `http://dl.ncsbe.gov/index.html` in November of 2017. Data for the 2016 presidential election comes from the November 8th, 2016 snapshot, data for the 2012 presidential election comes from the November 6th, 2012 snapshot, and data for the 2008 presidential election comes from the November 4th, 2008 snapshot.

To be included in our analyses, voters had to have a voter status of "Active," "Temporary," or "Inactive" according to the voter file. "Inactive" is a label used by the NCSBE for voters who have failed to vote in several past elections, and who *will be* (but are not yet) eligible for removal if they continue to not vote. in both 2008 and 2012. Two years of eligibility are required as a first time voter cannot, by definition, experience a *change* in polling place location.

Note, however, that as the ability to vote in 2012 may impact subsequent eligibility to vote, subsetting for voters who are *also* eligible in 2016 could potentially create bias due to selection after treatment. Note that reducing our sample to only those active in 2008 would not reduce any post-treatment bias. If a voter is active in 2008 and were to experience a polling place change between 2008 and 2012, that cannot make the voter *inactive* in the voter roll in 2012 *even if* they fail to vote in 2012. If the voter is active in 2008, the soonest they can become inactive is 2016. There is no mechanism that can result in ineligibility/inactive status in 2012 as a result of a polling place change that takes place between 2008 and 2012.

Our panel covers two different partisan regimes of election administration appointments — changes made in 2012 were made by local administrators appointed by a Democratic administration and changes made in 2016 were made by Republican appointees — but there is actually little theoretical reason to expect that polling place changes made under each of these regimes would produce different *overall* turnout effects. If the effect of a polling place change is driven by the confusion and habit disruption of a *per se* change, the partisanship of administrators should not matter. If these *per se* costs can be offset by an increase or decrease in travel times to the polls, then local election administrators' choices might increase turnout for those moved closer to polling places, while decrease turnout for those moved further away. Yet, unless there is important heterogeneity in how partisan voters respond to a change, we would expect the depressive effect of being moved further from a polling place to offset the increased turnout of those moved closer. In evaluating heterogeneity in turnout effects by race (as well as income and age in an Appendix D), we implicitly evaluate this potential heterogeneity. (In Appendix M we also show that while for some outcomes there are small differences in turnout under different partisan regimes, these are both extremely small (approximately half of one percentage point) and unfortunately confounded by the fact that there are other differences between the years besides partisan regime that may have played a role in participation.).

To identify the location of voters' residences in our panel, we geocode voter addresses using the `geocod.io` geocoding service[1], and we link voters to their precincts and Election Day polling places for the three presidential elections that we examine. Polling place locations were also geocoded using the `geocod.io` geocoding service and merged with shapefiles of election precinct boundaries (see Appendix L for details). We also use this spatial information to exclude people from our analysis have moved. Focusing on the 2,350,731 unique individuals (69.9%

[1]This generates a total of 4,253,361 voters who we can geocode in at least two sequential elections — 95.9% of those possible. The reasons for failed geo-codes — e.g. typos in voter roll addresses — are likely to be idiosyncratic and unrelated to turnout decisions.

of all geocoded, eligible voters with polling places) ensures that the effects of polling place changes we identify are a consequences of polling places being moved, rather than the movements of voters.

Table A1 presents the data sources and measurement information for the covariates used in the paper's analysis. Table A2 presents summary statistics for all variables used in the analysis.

TABLE A1 *Measurement and Data Sources for Covariates*

Variable	Measurement	Source
Race	Individual self-identification of race. The race categories are: $White$, $black$, $hispanic$, $unknown$, $other$, $NativeAmerican$, $asian$ and $multi-race$. Individuals who self-identify with different racial categories in different years are assigned their modal selected category. We allow hispanic identification to supersede all others given the way that it is measured. All racial categories are measured as indicators.	Self-identification, North Carolina State Board of Elections voter rolls.
$NonWhite$	Indicator for whether the individual is non-white (all non-white racial categories combined, including hispanics) as compared to white.	Self-identification, North Carolina State Board of Elections voter rolls.
$Income$	Median household income measured at the census block group, 0,000s of inflation adjusted dollars.	2006-2010 American Community Survey obtained from NHGIS.
Partisanship	Individual party registration at the time of voter registration. The partisan categories are: $Republican$, $Democrat$, $Unaffiliated$ and $Libertarian$. Each are measured as indicators.	North Carolina State Board of Elections voter rolls.
Age and Age^2	Individual age reported at the time of voter registration.	North Carolina State Board of Elections voter rolls.
$Female$	Indicator for whether the individual self-identifies as female as compared to male at the time of voter registration.	North Carolina State Board of Elections voter rolls.
Lagged Vote	Set of categorical variables for how the voter voted in the last election: on Election Day, mail in, early, or provisional.	North Carolina State Board of Elections voter rolls.
$EarlyLocs$	Number of early voting locations by county.	County Board of Elections.
$EarlyHours$	Total number of early voting hours by county, measured in thousands.	County Board of Elections.
$EarlyHoursWeekends$	Total number of early voting hours on Saturday and Sunday only by county, measured in thousands.	County Board of Elections.
$EarlyHoursEvenings$	Total number of early voting hours in the evenings by county, measured in thousands.	County Board of Elections.

Table A3 compares our panel to the set of all eligible voters according to the 2008-2016 voter rolls (additional summary statistics and details of data sources can be found in Appendix A). Our panel restrictions alter our sample in predictable ways. Our sample is on average more white, more partisan (i.e., more likely to include registered Republicans and Democrats) and older than the universe of eligible voters in the voter rolls. These traits all correlate

TABLE A2 *Summary Statistics*

Variable	Mean	Std. Dev.	Min	Max	N
Voted	0.80	0.403	0.000	1.000	4,681,792
VotedEarly	0.46	0.498	0.000	1.000	4,681,792
VotedElecDay	0.30	0.457	0.000	1.000	4,681,792
VotedMailIn	0.04	0.185	0.000	1.000	4,681,792
VotedLastElec	0.89	0.313	0.000	1.000	4,681,792
$\Delta PollingPlace$	0.16	0.368	0.000	1.000	4,681,792
$\Delta DriveTime$	0.02	1.135	-23.217	22.717	4,681,792
EarlyLocs	9.24	7.710	1.000	25.000	4,681,792
EarlyHours	0.97	0.893	0.100	2.780	4,681,792
EarlyHoursWeekends	0.17	0.194	0.004	0.594	4,681,792
EarlyHoursEvenings	0.14	0.162	0.000	0.528	4,681,792
Income	5.44	2.673	0.250	25.000	4,680,586
Age	57.02	16.221	20.000	116.000	4,681,792
Age^2	3514.55	1895.658	400.000	1.3e+04	4,681,792
Female	0.55	0.510	0.000	2.000	4,681,792
White	0.76	0.426	0.000	1.000	4,681,792
NonWhite	0.24	0.426	0.000	1.000	4,681,792
Black	0.24	0.426	0.000	1.000	4,681,792
Hispanic	0.00	0.047	0.000	1.000	4,681,792
Unknown	0.01	0.115	0.000	1.000	4,681,792
Other	0.01	0.111	0.000	1.000	4,681,792
Asian	0.01	0.080	0.000	1.000	4,681,792
NativeAm	0.01	0.074	0.000	1.000	4,681,792
MultiRace	0.00	0.053	0.000	1.000	4,681,792
Republican	0.35	0.476	0.000	1.000	4,681,792
Democrat	0.44	0.497	0.000	1.000	4,681,792
Unaffiliated	0.21	0.406	0.000	1.000	4,681,792
Libertarian	0.00	0.030	0.000	1.000	4,681,792

Notes: The unit of analysis for all variables is the voter-election, except for *income* which is measured at the census block group. Summary statistics are calculated for 2012 and 2016, pooled.

TABLE A3 *Our Sample Compared to Voter Roll-Eligible Voters*

Variable	Our Balanced Panel	Voter Rolls
VotedAny	0.80	0.72
Movers	0.00	0.31
Age	57.02	50.49
Female	0.55	0.57
White	0.76	0.66
NonWhite	0.24	0.35
Republican	0.35	0.29
Democrat	0.44	0.39
Unaffiliated	0.21	0.23
Voter-Election Obs	4,681,792	12,860,588

Notes: The unit of analysis is the voter-election. Summary statistics are pooled means for 2012 and 2016 — i.e. an individual voter enters once for 2012 and once for 2016. The Voter Rolls column includes voters eligible to vote in at least one of the three presidential elections in our sample.

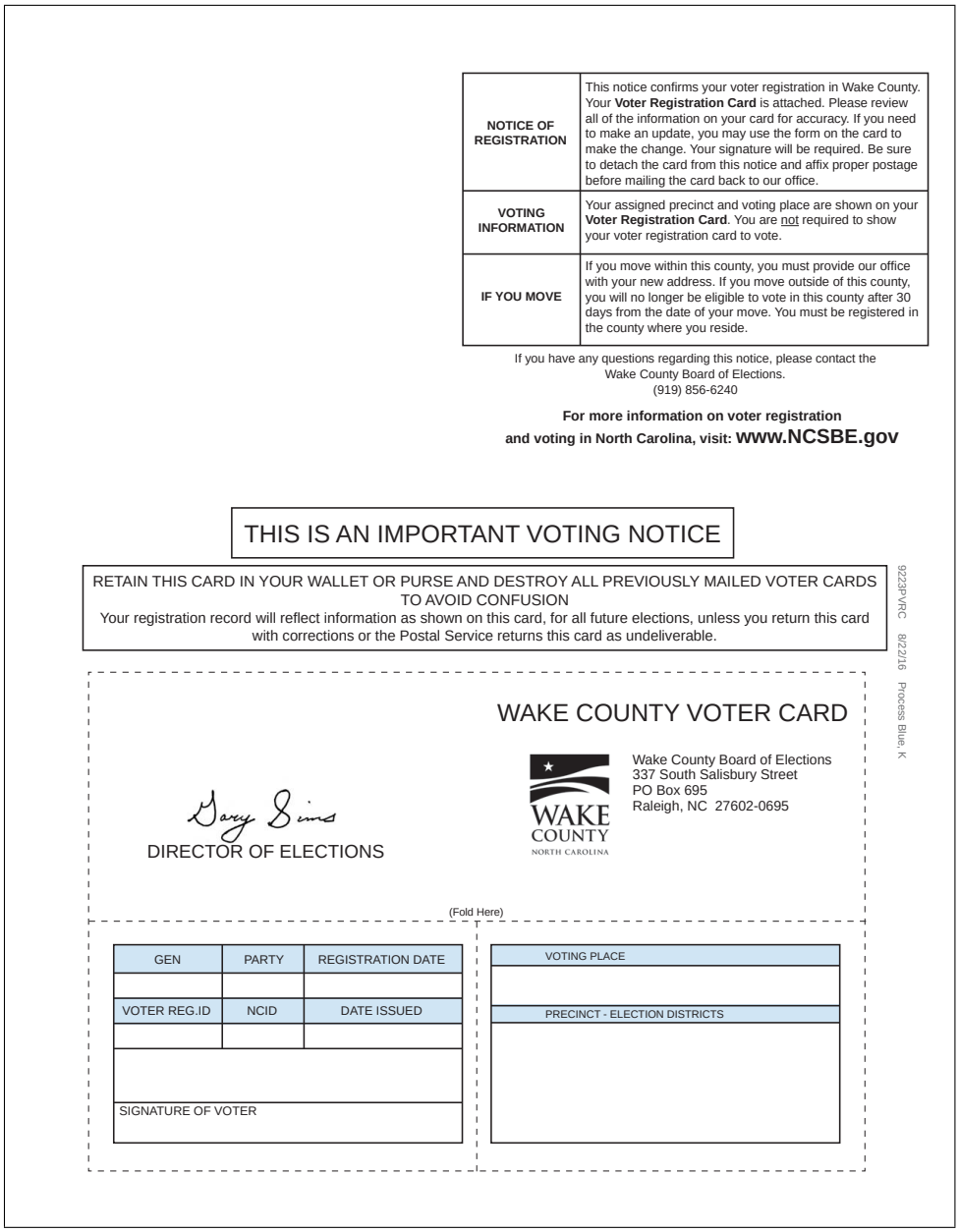
with political participation (Leighley and Nagler 2013), and the turnout rate of our balanced panel is subsequently and unsurprisingly roughly 8 percentage points higher than the voter file. However, scholarship on the relationship between voter mobility and voter turnout reassuringly finds estimated mobility effects that are roughly comparable to the turnout differences we observe between our panel and the voter roll (Squire, Wolfinger, and Glass 1987; Highton

2000).

B. Polling Place Change Informational Mailer

This appendix presents an example (from Wake county) of the information mailer sent to voters when either their polling place or precinct changes. The inside of the mailer also contains a single slip of paper on which the new polling place is written in very large bold letters.

Figure B1. Mailer sent to voters when their polling place or precinct changes



C. Full Results with Covariate Coefficients

This appendix presents the results from the main tables in the paper with the coefficient estimates for the control variables. We omit those coefficients from the tables in the main tables in the paper for the sake of space.

TABLE C1 *The Average Effect of Polling Place Changes and Drive Time on Voter Turnout With Controls*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.0073**	-0.0067*	0.0063*	0.0058	-0.0015	-0.0015
	(0.0037)	(0.0037)	(0.0037)	(0.0038)	(0.0015)	(0.0016)
Black·2016	0.076***	0.076***	-0.12***	-0.12***	-0.028***	-0.028***
	(0.0025)	(0.0025)	(0.0031)	(0.0031)	(0.0018)	(0.0018)
Hispanic·2016	-0.094***	-0.094***	0.14***	0.14***	0.040***	0.040***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.0094)	(0.0094)
Unknown·2016	-0.063***	-0.063***	0.095***	0.095***	0.024***	0.024***
	(0.0043)	(0.0043)	(0.0048)	(0.0048)	(0.0040)	(0.0040)
Other·2016	-0.071***	-0.071***	0.14***	0.14***	0.060***	0.060***
	(0.0052)	(0.0052)	(0.0056)	(0.0056)	(0.0043)	(0.0043)
NativeAm·2016	-0.042***	-0.042***	0.11***	0.11***	0.070***	0.070***
	(0.016)	(0.016)	(0.013)	(0.013)	(0.011)	(0.011)
Asian·2016	-0.057***	-0.056***	0.14***	0.14***	0.068***	0.068***
	(0.0070)	(0.0070)	(0.0076)	(0.0076)	(0.0064)	(0.0064)
MultiRace·2016	-0.057***	-0.057***	0.083***	0.083***	0.018**	0.018**
	(0.0083)	(0.0083)	(0.0092)	(0.0092)	(0.0080)	(0.0080)
$\Delta MuchCloser$ ($\hat{\lambda}$)		0.014		-0.011		0.0022
		(0.012)		(0.013)		(0.0059)
$\Delta MuchFurther$ ($\hat{\delta}$)		-0.031**		0.027*		-0.0026
		(0.014)		(0.014)		(0.0054)
Individual FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
County x Year FE	✓	✓	✓	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel	Full Panel	Full Panel	Full Panel
Observations	4681792	4681792	4681792	4681792	4681792	4681792
Mean of DV	0.30	0.30	0.46	0.46	0.80	0.80
SD of DV	0.25	0.25	0.26	0.26	0.21	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??** both with and without the drive time indicators. The unit of analysis is the voter-election. This table presents the full covariates from Table **??** in the paper. The SD of the DV is the average of the within-i standard deviations of the outcome variable.

TABLE C2 *The Average Effect of Polling Place Changes by Year With Covariate Coefficient Estimates*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.016***	-0.028***	0.019***	0.023***	0.0020	-0.0037**
	(0.0035)	(0.0059)	(0.0045)	(0.0055)	(0.0024)	(0.0018)
LagElecDayVoter	0.20***	0.37***	-0.053***	0.14***	0.096***	0.50***
	(0.0086)	(0.0063)	(0.0040)	(0.0067)	(0.011)	(0.012)
LagEarlyVoter	-0.15***	0.032***	0.32***	0.52***	0.13***	0.54***
	(0.0039)	(0.0066)	(0.0069)	(0.0048)	(0.011)	(0.011)
LagMailInVoter	-0.21***	-0.021***	-0.013*	0.12***	0.031***	0.36***
	(0.0049)	(0.0065)	(0.0070)	(0.0058)	(0.0099)	(0.015)
LagProvisionalVoter	-0.011	0.16***	-0.017	0.15***	-0.064***	0.32***
	(0.016)	(0.012)	(0.011)	(0.012)	(0.017)	(0.014)
Age	0.0065***	0.0036***	0.023***	0.027***	0.027***	0.030***
	(0.00078)	(0.00043)	(0.00085)	(0.0016)	(0.0012)	(0.0017)
Age^2	-0.000070***	-0.000037***	-0.00017***	-0.00024***	-0.00021***	-0.00027***
	(0.0000072)	(0.0000041)	(0.0000074)	(0.000014)	(0.000010)	(0.000015)
Female	-0.0079***	-0.0049***	0.0075***	0.018***	0.0036***	0.017***
	(0.0010)	(0.0013)	(0.0013)	(0.0014)	(0.0010)	(0.00075)
Black	-0.090***	-0.010**	0.12***	-0.011**	0.024***	-0.029***
	(0.0056)	(0.0049)	(0.0056)	(0.0043)	(0.0030)	(0.0039)
Hispanic	0.049***	-0.029***	-0.17***	-0.00025	-0.11***	-0.023**
	(0.011)	(0.0065)	(0.0086)	(0.0076)	(0.0099)	(0.0087)
UnknownRace	0.024***	-0.018***	-0.16***	-0.032***	-0.13***	-0.047***
	(0.0058)	(0.0043)	(0.0045)	(0.0042)	(0.0066)	(0.0049)
OtherRace	0.044***	-0.0055	-0.15***	-0.0015	-0.10***	-0.0028
	(0.0057)	(0.0078)	(0.0037)	(0.0052)	(0.0054)	(0.0061)
NativeAm	0.074***	0.049***	-0.15***	-0.031***	-0.073***	0.023**
	(0.0072)	(0.016)	(0.0063)	(0.0079)	(0.0072)	(0.0094)
Asian	0.025***	-0.012	-0.18***	-0.0052	-0.14***	-0.012
	(0.0074)	(0.0098)	(0.013)	(0.010)	(0.018)	(0.014)
MultiRace	-0.0027	-0.031***	-0.14***	-0.026***	-0.13***	-0.051***
	(0.0063)	(0.0046)	(0.0062)	(0.0058)	(0.0081)	(0.0061)
Income	-0.0021***	-0.0030**	0.0084***	0.0064***	0.0077***	0.0040***
	(0.00069)	(0.0015)	(0.00093)	(0.0016)	(0.00050)	(0.00041)
Republican	-0.0077***	0.028***	0.024***	-0.010*	0.036***	0.021***
	(0.0019)	(0.0041)	(0.0035)	(0.0061)	(0.0024)	(0.0029)
Unaffiliated	-0.011***	0.0091***	-0.013***	-0.0059	-0.019***	0.0073***
	(0.0025)	(0.0023)	(0.0031)	(0.0038)	(0.0016)	(0.0022)
Libertarian	-0.0070	0.014	-0.055***	-0.034***	-0.058***	-0.016
	(0.011)	(0.0086)	(0.014)	(0.0097)	(0.010)	(0.010)
County FE	✓	✓	✓	✓	✓	✓
Year Sample	2012	2016	2012	2016	2012	2016
Observations	2340293	2340293	2340293	2340293	2340293	2340293
Mean of DV	0.33	0.26	0.47	0.45	0.84	0.75
SD of DV	0.46	0.44	0.49	0.49	0.36	0.43

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation 1 without the drive time indicators. The unit of analysis is the voter. The SD is the average of the within-county standard deviations of the outcome.

TABLE C3 *The Average Effect of Changes in Travel Time to Polling Places by Year With Covariate Coefficient Estimates*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta MuchCloser$ ($\hat{\lambda}$)	0.017	0.026***	-0.013	-0.033***	0.00016	-0.0039
	(0.015)	(0.0087)	(0.014)	(0.0093)	(0.0048)	(0.0050)
$\Delta MuchFurther$ ($\hat{\delta}$)	-0.0077	-0.045***	0.0095	0.039**	0.0044	-0.0073
	(0.0075)	(0.016)	(0.0075)	(0.019)	(0.0048)	(0.0045)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.017***	-0.027***	0.019***	0.023***	0.0018	-0.0033*
	(0.0034)	(0.0055)	(0.0045)	(0.0051)	(0.0025)	(0.0018)
LagElecDayVoter	0.20***	0.37***	-0.053***	0.14***	0.096***	0.50***
	(0.0086)	(0.0063)	(0.0040)	(0.0067)	(0.011)	(0.012)
LagEarlyVoter	-0.15***	0.032***	0.32***	0.52***	0.13***	0.54***
	(0.0039)	(0.0066)	(0.0069)	(0.0048)	(0.011)	(0.011)
LagMailInVoter	-0.21***	-0.021***	-0.013*	0.12***	0.031***	0.36***
	(0.0049)	(0.0065)	(0.0070)	(0.0058)	(0.0099)	(0.015)
LagProvisionalVoter	-0.011	0.16***	-0.017	0.15***	-0.064***	0.32***
	(0.016)	(0.012)	(0.011)	(0.012)	(0.017)	(0.014)
Age	0.0065***	0.0036***	0.023***	0.027***	0.027***	0.030***
	(0.00078)	(0.00043)	(0.00085)	(0.0016)	(0.0012)	(0.0017)
Age^2	-0.000070***	-0.000037***	-0.00017***	-0.00024***	-0.00021***	-0.00027***
	(0.0000072)	(0.0000041)	(0.0000074)	(0.000014)	(0.000010)	(0.000015)
Female	-0.0079***	-0.0049***	0.0075***	0.018***	0.0036***	0.017***
	(0.0010)	(0.0013)	(0.0013)	(0.0014)	(0.0010)	(0.00075)
Black	-0.090***	-0.010**	0.12***	-0.011**	0.024***	-0.029***
	(0.0056)	(0.0049)	(0.0056)	(0.0043)	(0.0030)	(0.0039)
Hispanic	0.049***	-0.028***	-0.17***	-0.00035	-0.11***	-0.023**
	(0.011)	(0.0065)	(0.0086)	(0.0076)	(0.0098)	(0.0087)
UnknownRace	0.024***	-0.018***	-0.16***	-0.032***	-0.13***	-0.047***
	(0.0058)	(0.0043)	(0.0045)	(0.0042)	(0.0066)	(0.0049)
OtherRace	0.044***	-0.0054	-0.15***	-0.0015	-0.10***	-0.0028
	(0.0057)	(0.0077)	(0.0037)	(0.0052)	(0.0054)	(0.0061)
NativeAm	0.074***	0.048***	-0.15***	-0.030***	-0.073***	0.023**
	(0.0072)	(0.016)	(0.0063)	(0.0078)	(0.0072)	(0.0094)
Asian	0.025***	-0.012	-0.18***	-0.0052	-0.14***	-0.012
	(0.0074)	(0.0098)	(0.013)	(0.011)	(0.018)	(0.014)
MultiRace	-0.0028	-0.031***	-0.14***	-0.026***	-0.13***	-0.051***
	(0.0063)	(0.0046)	(0.0062)	(0.0058)	(0.0081)	(0.0061)
Income	-0.0021***	-0.0030**	0.0084***	0.0064***	0.0077***	0.0040***
	(0.00068)	(0.0015)	(0.00092)	(0.0016)	(0.00050)	(0.00041)
Republican	-0.0077***	0.028***	0.024***	-0.010*	0.036***	0.021***
	(0.0019)	(0.0041)	(0.0035)	(0.0061)	(0.0024)	(0.0029)
Unaffiliated	-0.011***	0.0091***	-0.013***	-0.0059	-0.019***	0.0073***
	(0.0025)	(0.0023)	(0.0031)	(0.0038)	(0.0016)	(0.0022)
Libertarian	-0.0070	0.014	-0.055***	-0.034***	-0.058***	-0.016
	(0.011)	(0.0086)	(0.014)	(0.0097)	(0.010)	(0.010)
County FE	✓	✓	✓	✓	✓	✓
Year Sample	2012	2016	2012	2016	2012	2016
Observations	2340293	2340293	2340293	2340293	2340293	2340293
Mean of DV	0.33	0.26	0.47	0.45	0.84	0.75
SD of DV	0.46	0.44	0.49	0.49	0.36	0.43

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation 1. The unit of analysis is the voter. The SD is the average of the within-county standard deviations of the outcome.

TABLE C4 *The Differential Effects of Polling Place Changes by Race With Controls*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.0085**	-0.0077*	0.0089**	0.0082**	-0.00032	-0.00041
	(0.0041)	(0.0041)	(0.0041)	(0.0041)	(0.0018)	(0.0019)
$\Delta PollingPlace{\cdot}NonWhite$	0.0048	0.0042	-0.010**	-0.0095*	-0.0049	-0.0043
	(0.0044)	(0.0045)	(0.0052)	(0.0053)	(0.0030)	(0.0031)
Black·2016	0.076***	0.076***	-0.12***	-0.12***	-0.028***	-0.028***
	(0.0025)	(0.0025)	(0.0031)	(0.0031)	(0.0018)	(0.0018)
Hispanic·2016	-0.094***	-0.094***	0.14***	0.14***	0.040***	0.040***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.0094)	(0.0094)
Unknown·2016	-0.063***	-0.063***	0.095***	0.095***	0.024***	0.024***
	(0.0043)	(0.0043)	(0.0048)	(0.0048)	(0.0040)	(0.0040)
Other·2016	-0.071***	-0.071***	0.14***	0.14***	0.060***	0.060***
	(0.0052)	(0.0052)	(0.0056)	(0.0056)	(0.0043)	(0.0043)
NativeAm·2016	-0.042***	-0.042***	0.11***	0.11***	0.070***	0.070***
	(0.016)	(0.016)	(0.013)	(0.013)	(0.011)	(0.011)
Asian·2016	-0.057***	-0.056***	0.14***	0.14***	0.068***	0.069***
	(0.0069)	(0.0069)	(0.0076)	(0.0076)	(0.0064)	(0.0064)
MultiRace·2016	-0.057***	-0.057***	0.083***	0.083***	0.018**	0.018**
	(0.0083)	(0.0083)	(0.0092)	(0.0092)	(0.0080)	(0.0080)
$\Delta MuchCloser$ ($\hat{\lambda}$)		0.016		-0.011		0.0051
		(0.013)		(0.014)		(0.0069)
$\Delta MuchFurther$ ($\hat{\delta}$)		-0.034**		0.029*		-0.0021
		(0.015)		(0.015)		(0.0058)
$\Delta MuchCloser{\cdot}NonWhite$		-0.011		-0.0012		-0.018
		(0.017)		(0.016)		(0.013)
$\Delta MuchFurther{\cdot}NonWhite$		0.017		-0.022		-0.0050
		(0.021)		(0.019)		(0.012)
Individual FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
County x Year FE	✓	✓	✓	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel	Full Panel	Full Panel	Full Panel
Observations	4681792	4681792	4681792	4681792	4681792	4681792
Mean of DV	0.30	0.30	0.46	0.46	0.80	0.80
SD of DV	0.25	0.25	0.26	0.26	0.21	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??** without the drive time indicators. The unit of analysis is the voter-election. This table presents the full covariates from Table I3 in the paper. The SD is the average of the within-i standard deviations of the outcome.

D. Alternative Travel Time Changes Specifications

In the main paper we probe the effect of changes in the costs associated with traveling to the polls by estimating a model in which we compare level differences between those people moved more than 5 minutes closer or more than 5 minutes further from their polling place to those who had a smaller move (regardless of whether that move was closer or further).

In this appendix, we present additional results that model the relationship between changing drive time to polling place and voter turnout differently. Specifically, we estimate a model similar to the model from the main paper (in which we trichotomize travel time changes into 5+ minutes closer, 5+ minutes further, and under 5 minutes closer or further) but allow the slope of the effects in those bins to vary. That is, we interact the indicators for the general distance of a move with drive time change. As compared to the main results in the paper, this accounts both for intercept differences and linear slope differences.

The results are presented in Table D1. The excluded category are people who experience a polling place change of under 5 minutes (whether closer or further; this is why $\delta DriveTime$ is not included in the regression). We find that there is a differential linear slope in the effect of polling place change when voters are moved much further away. The slope of the effect for Election Day voting is more negative relative to those who had smaller changes, and the slope of the effect for early voting is more positive. These results indicate that the effect of a change in drive time does depend on whether that change is large or small when it comes to the choice of mode of vote. However, critically, there is no differential overall turnout effect.

TABLE D1 *The Average Effect of Changes in Travel Time to Polling Place on Turnout Using Linear Fits*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.0052	-0.0011	-0.0079
	(0.028)	(0.038)	(0.017)
$\Delta Closer$	-0.014	0.021	0.0077
	(0.028)	(0.038)	(0.017)
$\Delta Closer \cdot \Delta DriveTime$	-0.0017	0.00085	-0.0012
	(0.0021)	(0.0027)	(0.0012)
$\Delta Further$	0.0017	0.0061	0.0090
	(0.028)	(0.038)	(0.017)
$\Delta Further \cdot \Delta DriveTime$	-0.0075***	0.0076***	0.00071
	(0.0027)	(0.0027)	(0.00089)
Individual FE	✓	✓	✓
Year FE	✓	✓	✓
County x Year FE	✓	✓	✓
Race x Year FE	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel
Observations	4681792	4681792	4681792
Mean of DV	0.30	0.46	0.80
SD of DV	0.25	0.26	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??** with additional interactions. The unit of analysis is the voter-election. The SD is the average of the within-i standard deviations of the outcome. (either closer or further)

In Table D2 we further allow the relationship between turnout and drive time to be non-linear – specifically, to follow

a quadratic functional form. We do not find differential qualitative evidence that turnout changes as a (quadratic) function of the drive time to the new polling place. The joint significance of the linear and quadratic terms for either the closer interactions or the further interactions are not significant. Overall, the table suggests that differential linearity within the 5 minute bins constructed by our dummy accounts well for the relationship.

TABLE D2 *The Average Effect of Changes in Travel Time to Polling Place on Turnout Using Quadratic Fits*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.0095	0.0056	-0.0066
	(0.029)	(0.038)	(0.017)
$\Delta Closer$	-0.0100	0.018	0.0084
	(0.028)	(0.038)	(0.017)
$\Delta Closer{\cdot}\Delta DriveTime$	-0.0025	0.0041	0.00066
	(0.0035)	(0.0047)	(0.0021)
$\Delta Closer{\cdot}\Delta DriveTime^2$	-0.000087	0.00038	0.00022
	(0.00034)	(0.00053)	(0.00022)
$\Delta Further$	0.0023	0.0029	0.0071
	(0.028)	(0.038)	(0.017)
$\Delta Further{\cdot}\Delta DriveTime$	-0.0038	0.0041	0.0013
	(0.0046)	(0.0042)	(0.0019)
$\Delta Further{\cdot}\Delta DriveTime^2$	-0.00041	0.00039	-0.000065
	(0.00055)	(0.00045)	(0.00017)
Individual FE	✓	✓	✓
Year FE	✓	✓	✓
County x Year FE	✓	✓	✓
Race x Year FE	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel
Observations	4681792	4681792	4681792
Mean of DV	0.30	0.46	0.80
SD of DV	0.25	0.26	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??** with additional interactions. The unit of analysis is the voter-election. The SD is the average of the within-i standard deviations of the outcome. The excluded category are voters who had their polling place moved under five minutes from them (either closer or further).

We also estimate a specification that restricts the sample of voters to those who experience a polling place change of less than 10 minutes closer and less than 10 minutes further away. This restriction better reflects what we plot in the scatter plots of the relationship between drive time and turnout. And it also reflects the fact that there are extremely few observations in these far tails of the distribution. And given that we use OLS, we want to be sensitive to the effect that extreme outliers might have on our results.

Table D3 presents our results for the restricted sample. These are slightly smaller in magnitude, and less significant than the results in the paper. But the sign and pattern of magnitudes is very similar.

Finally, we note that our results are robust to other models that readers might think capture the relationship between drive time and turnout — specifically, models that simply dichotomize the closer/further relationship and model that relationship as linear, and models that dichotomize but model the model relationship as quadratic. We do not present these results for the sake of space, but they are available upon request. By robust, we mean that we find slightly

TABLE D3 *The Average Effect of Changes in Travel Time to Polling Place on Turnout for the Restricted Sample*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta MuchCloser$ ($\hat{\lambda}$)	0.016	-0.018	-0.0022
	(0.013)	(0.012)	(0.0056)
$\Delta MuchFurther$ ($\hat{\delta}$)	-0.026**	0.022*	-0.0028
	(0.013)	(0.013)	(0.0055)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.0070*	0.0062*	-0.0015
	(0.0037)	(0.0038)	(0.0016)
Individual FE	✓	✓	✓
Year FE	✓	✓	✓
County x Year FE	✓	✓	✓
Race x Year FE	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel
Observations	4675138	4675138	4675138
Mean of DV	0.30	0.46	0.80
SD of DV	0.25	0.26	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

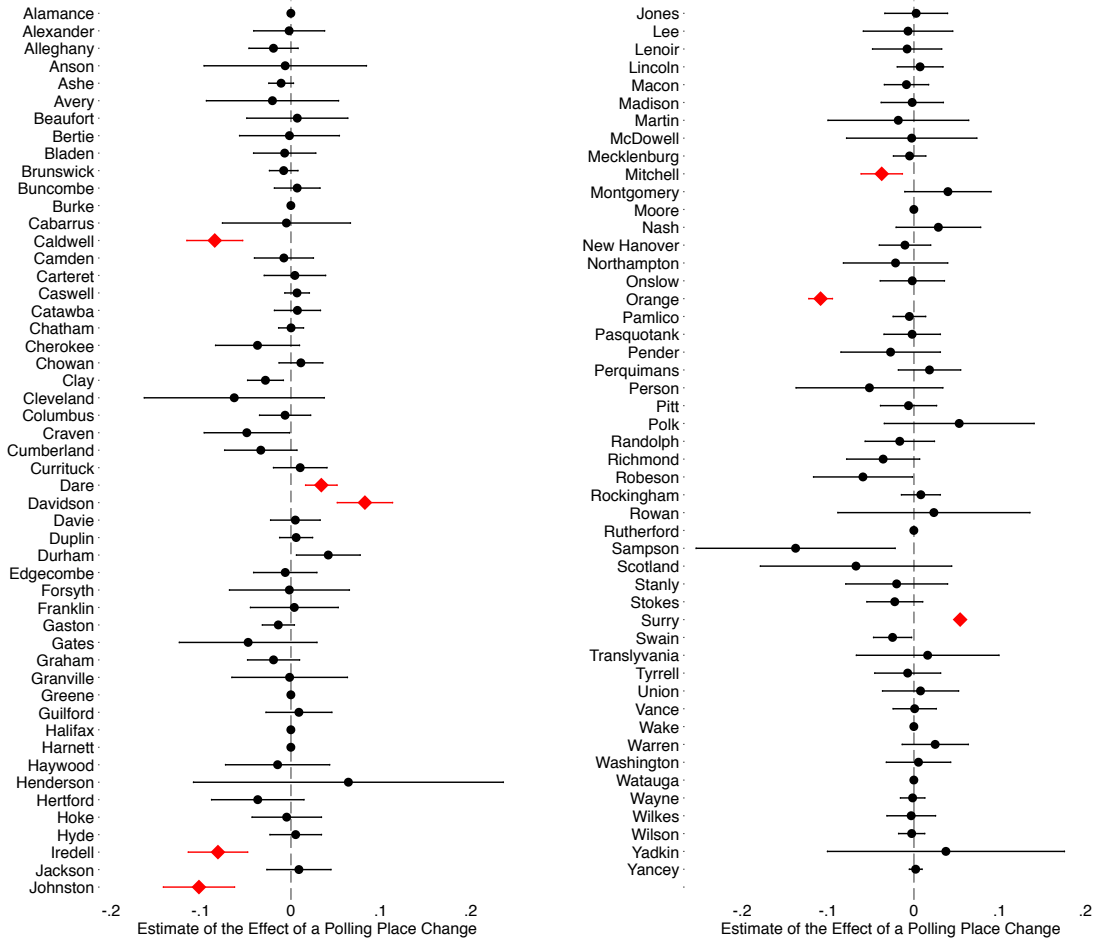
Notes: The table presents coefficients from estimating Equation **??**. The unit of analysis is the voter-election. The sample is restricted to those individuals in our sample who experienced drive time changes of less than 10 minutes closer or further away. The SD is the average of the within-i standard deviations of the outcome.

more evidence of substitution when people are moved further from their polling place (as compared to closer), but that these substitution effects offset such that there is no differential overall turnout effect conditional on drive time.

E. Individual County Estimates

In this appendix, we present estimates of the effect of a polling place change for each county in North Carolina and for each the main modes of voting that we study: Election Day voting (Figure E1), early voting (Figure E2), and overall voter turnout (Figure **??**).

Figure E1. County-Specific Estimates of the Effect of a Polling Place Change on Election Day Voting

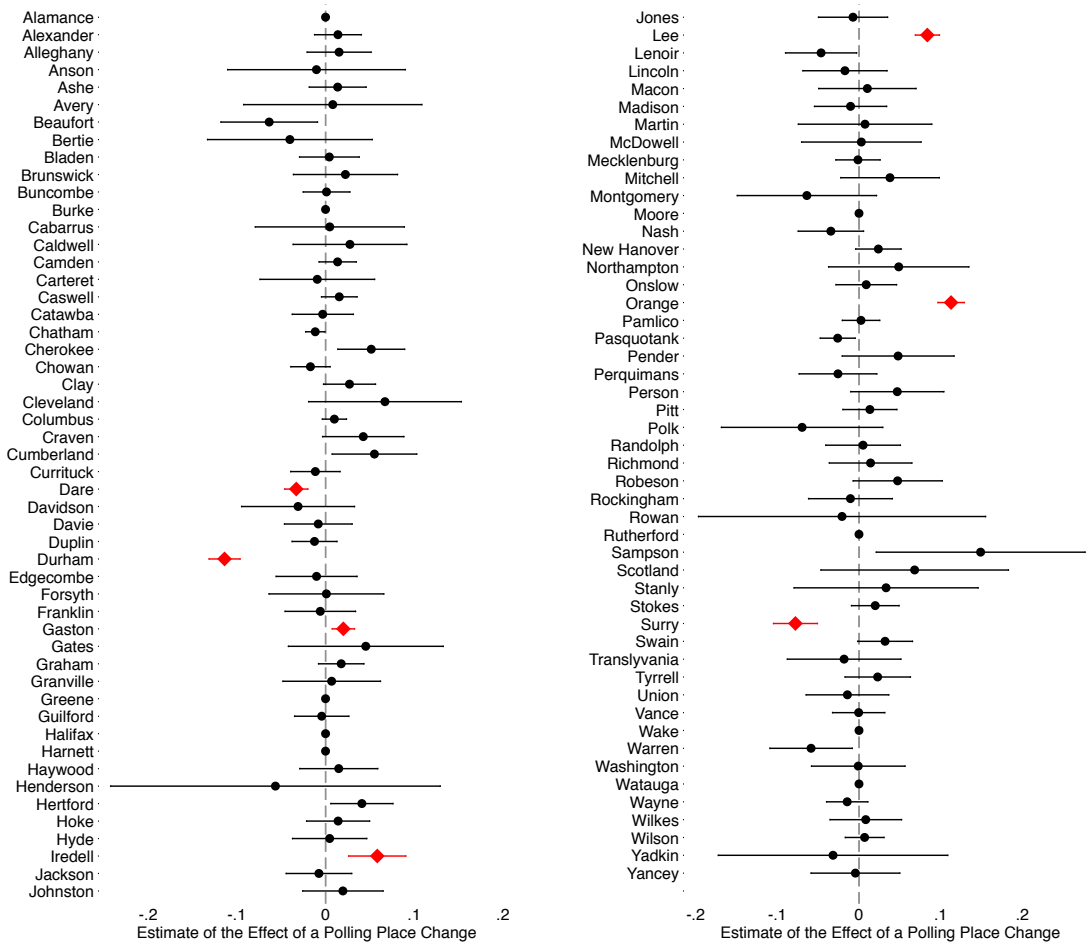


Notes: The above plot presents estimates of Equation **??** for each county individually along with 95% confidence intervals. The outcome is $Pr(VoteElecDay)$. Statistically insignificant estimates are presented with a black dot, those estimates statistically different from zero are presented with a hollow diamond. Some county estimates cannot be estimated because no precincts in those counties experienced a polling place change.

Given that the existing literature has estimated effects for counties alone, we present these county-specific estimates to highlight the fact that there is substantial heterogeneity in the effect across counties. For example, in the case of Election Day voting, we can recover estimates of the effect of a polling place change that are both positive, negative and indistinguishable from zero (with varying degrees of precision). Recall that we use a 10% sample of from our sample of voters to estimate our effects for computational reasons. This increases the imprecision of our estimates, but *not* the coefficient estimate itself.

The fact that there is variation across counties highlights the importance of our statewide estimates for understanding how polling place location changes affect statewide contests. These results suggest that results from a single county

Figure E2. County-Specific Estimates of the Effect of a Polling Place Change on Early Voting

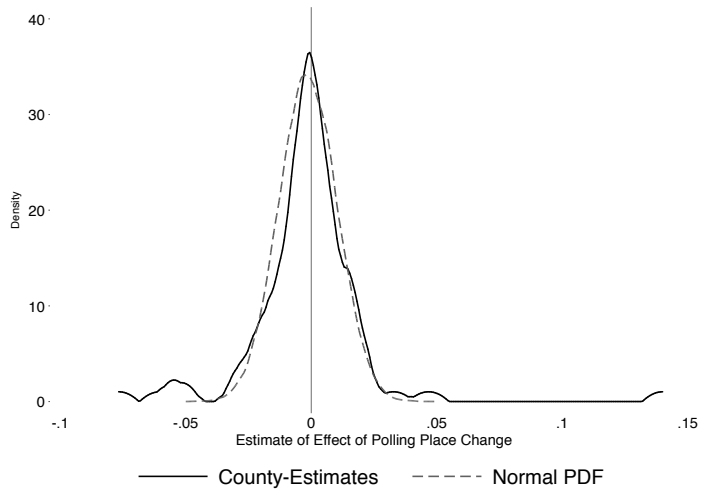


Notes: The above plot presents estimates of Equation **??** for each county individually along with 95% confidence intervals. The outcome is $Pr(VoteEarly)$. Statistically insignificant estimates are presented with a black dot, those estimates statistically different from zero are presented with a hollow diamond. Some county estimates cannot be estimated because no precincts in those counties experienced a polling place change.

cannot be generalized to the state level, and doing so would likely lead to deeply erroneous conclusions.

That there is variation in the estimates is quite interesting, however we note that the purpose of our paper is not to theorize and test why the effects of polling place changes differ by counties (although we note that our results in the main paper suggest that it is *not* a function of differences in the availability of early voting hours and locations). Our purpose is to estimate the effect of polling place changes across an entire state (and to do so more rigorously and precisely than even county-level estimates have previously been estimated). Of note is that the distribution of the estimates follows a normal distribution as indicated by Figure E3, which suggests that variation may be due to voter-level shocks rather than systematic county-level differences.

Figure E3. Distribution of the County-Specific Estimates of the Effect of a Polling Place Change on Overall Voter Turnout



Notes: The above plot presents estimates of Equation **??** for each county individually along with 95% confidence intervals. The outcome is $Pr(VoteAny)$.

F. Substitution versus Composition

In order to establish whether the decline in Election Day voting and rise in early voting is the result of *substitution* of Election Day voters into early voting or alternatively a decline in Election Day voting by one group of individuals and a rise in early voting *by a different* group of previous non-voters, we examine two empirical patterns.

First, we estimate whether the effect of a polling place change on voting early varies by whether the voter voted on Election Day in the previous presidential election. Vote history can be thought of as a proxy for vote intention (absent a polling place change), and so if polling place changes are driving substitution into early voting by voters *who would otherwise vote on Election Day*, we should see a *larger* effect of polling place changes on early voting within this population. As shown in Table F1, this is precisely what we observe – voters who voted on Election Day in the last election and are impacted by a polling place change are almost 150% more likely to vote early than other voters who experience a polling place change.

TABLE F1 *The Differential Effect of Polling Place Changes on Voter Turnout by Past Voting Mode*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.011***	0.012***	0.00034
	(0.0023)	(0.0027)	(0.0018)
$LagElecDayVoter{\cdot}\Delta PollingPlace$	-0.032***	0.025***	-0.0053**
	(0.0034)	(0.0035)	(0.0022)
Individual FE			
Indiv. Controls	✓	✓	✓
Year FE	✓	✓	✓
County x Year FE	✓	✓	✓
Race x Year FE	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel
Observations	4680586	4680586	4680586
Mean of DV	0.30	0.46	0.80
SD of DV	0.45	0.49	0.40

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating a version of Equation **??** with no travel time coefficients, no fixed effects, and demographic controls from Equation 1. Omission of individual fixed effects is necessary as use of lagged dependent variables in a short panel results in Nickell bias (Nickell 1981). The unit of analysis is the voter-election.

As an additional test, we examine whether the *composition* of voters varies between precincts with polling place changes and precincts without polling place changes. If mailers are inducing what would otherwise be non-voters to vote, and preventing election-day voters from voting, then we would expect the overall composition of voters who cast a ballot to change as well.

Table F2 correlates overall turnout with voter party and polling place change. Note that these estimations exclude individual fixed effects, which is necessary when including lagged dependent variables in a short panel to avoid Nickell bias. In general, the results tend to support the idea of substitution — while there is some change in the composition of the electorate, the estimates are inconsistent across specifications and small in comparison to the degree of substitution observed — about one-half percentage point change in composition versus -0.7 and 0.6 percentage point changes in Election Day and early voting respectively. Combined with the fact that the largest effects of a polling place change occur among those who previously voted on Election Day – a reasonable proxy for vote intention absent a polling place change — it seems reasonable to conclude that the offsetting effects that we

TABLE F2 *Polling Place Changes and Voter Composition*

	$Pr(VoteAny)$	$Pr(VoteAny)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.0033	0.0032	-0.0066***
	(0.0020)	(0.0026)	(0.0020)
$\Delta PollingPlace \cdot Rep$	0.0022	-0.0026	0.0042
	(0.0026)	(0.0025)	(0.0028)
$\Delta PollingPlace \cdot Unaffil$	0.0048	-0.0017	0.0065**
	(0.0032)	(0.0020)	(0.0026)
Individual FE	✓		
Year FE	✓		
County x Year FE	✓		
Race x Year FE	✓		
County FE		✓	✓
Controls		✓	✓
Year Sample	Full Panel	2012	2016
Observations	4677529	2338392	2337937
Mean of DV	0.80	0.84	0.75
SD of DV	0.21	0.36	0.43
Party Joint Sig	0.32	0.50	0.050

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

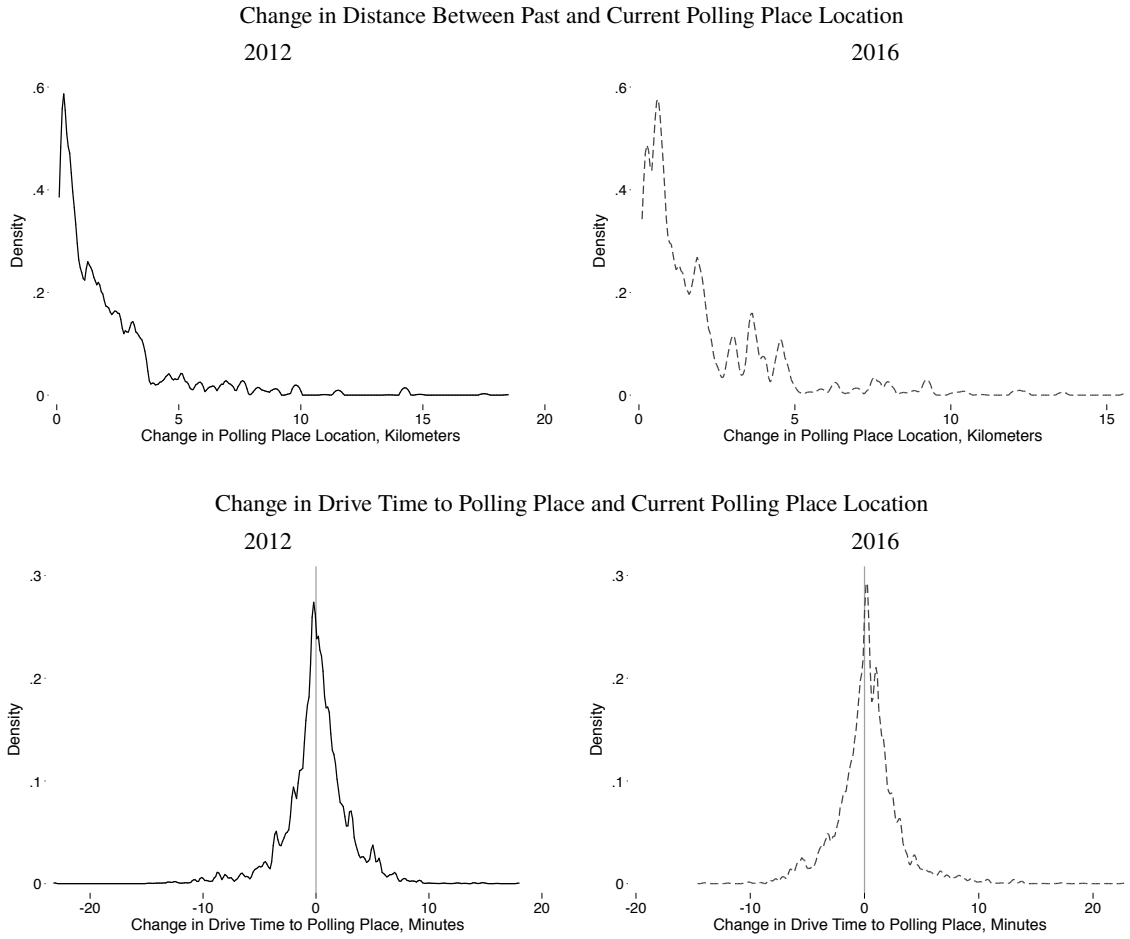
Notes: Omitted party ID is Democrat. A very small quantity of libertarians have been excluded for ease of interpretation. The table presents coefficients from estimating Equation **??** without travel time coefficients. The unit of analysis is the voter-election. The SD of the DV in the panel is the average of the within-i standard deviations of the outcome variable.

identify are a consequence of voters reacting to a change in polling place location by voting early rather than staying home.

G. Additional Plots for Travel Time Changes

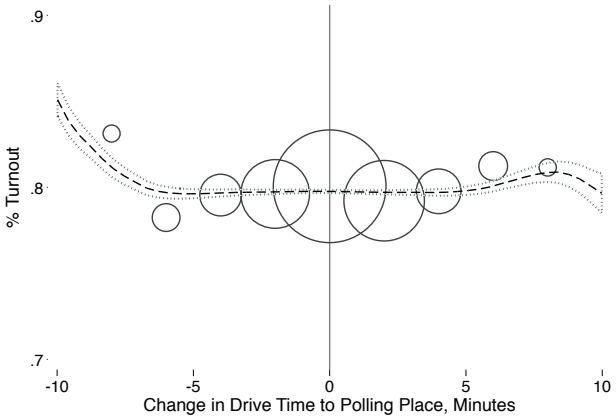
In the main paper, we pool the distributions of polling place distance changes and changes in drive time across our period. In this appendix, we present the distributions separately for each year. The separate distributions reveal little difference in either measure across years with the following exception — in 2016, there were fewer people moved *significantly* closer (> 10 minutes) closer to their polling place (lower right plot). But the number of individuals in the tail of the distribution there is extremely small.

Figure G1. Distribution of Distance of Polling Place Changes and Changes in Drive Time by Year



Notes: The upper two presents the distribution of the distance between a precinct's polling place location in a given election year relative to its location in the previous election year, conditional on a voters' polling place having moved. The unit of analysis in plot (a) is a voter; therefore, distance changes are weighted by the number of voters experiencing the change. Polling place changes can result from the movement of a given individual's polling place, or from a voter being moved into a new precinct by a precinct boundary change. Plot (b) presents the distribution of changes in drive time to a polling place for voters who experienced a polling place change. Note that some voters can experience a polling place change without a change in drive time.

Figure G2. Relationship Between the Change in Driving Time to Polling Place and Overall Turnout



Notes: The above scatter plot presents the bivariate relationship between the change in drive time to polling place (measured in minutes) from the previous presidential election year and total voter turnout. Change in drive time is conditional on a voter not having moved and having had their polling place change. Hollow circles are binned averages of the outcome for every 2 minute interval of drive time change. The circles are sized relative to the population in the bin. We do not plot the very few observations at the tails of the distribution (those with drive time changes that are greater than 1.5 times the 99th percentile of drive time changes). The dashed line represents a local polynomial fit (bandwidth = 3). The fit lines are fit to all of the data, not just the bins. However, we restrict the fits to within 10 minutes since the confidence intervals in the tails are extremely large as a consequence of the limited number of observations with large drive time changes. Circles to the left of the vertical line at zero represent voters who had a polling place moved *closer* to them; circles to the right of the vertical line at zero represent voters who had a polling place moved *farther* away. Data is pooled across 2012 and 2016.

H. Differential Effects by Early Voting Availability

In this appendix, we present additional results related to the availability of early voting.

All North Carolina counties had at least one early voting site in each of the presidential elections that we study. However, the number of those sites, and the hours that those sites were open differed between counties and over time. Although the stability of the location of early voting sites is also of interest, the fact that there is not a one-to-one mapping of voters to early voting locations, and the fact that voters can use any early voting location in a county makes it more challenging to construct a simple voter-level indicator for change. The average effects we identify in Section **??** control for these differences using voter-level fixed effects and interactions between county fixed effects and year indicators, but we might expect that variation in early voting availability would moderate the effect of polling place changes and the magnitude of the substitution effects we identify. Increased access to early voting might increase the likelihood of substituting into early voting, although there is disagreement in the literature about how beneficial early voting is (Burden et al. 2017, 2014; Herron and Smith 2015; Fullmer 2015a).[2]

To evaluate whether the effects of polling place changes depend on the availability of early voting, we estimate a cross-sectional version of our panel specification (equation **??**) without the travel time indicators. We do this separately for each county and the outcome $Pr(VoteEarly)$. We then compare the resulting coefficients on the impact of a polling place change ($\hat{\beta}$) with measures of early voting availability. Figure H1 summarizes the relationship between the county-level effects of a polling place change ($\hat{\beta}$) and the number of early voting locations in a county (a) and the total number of hours that early voting is available in a county (b).[3]

Again highlighting the difficulty of generalizing from specific localities when assessing the effects of polling place changes on turnout and outcomes, Figure H1 reveals tremendous variation not only in the availability of early voting across counties, but also in the estimated effects of a polling place change on the likelihood of voting early (as Figure E1 documents). Because we are interested in the average statewide effect of polling place changes, we use the county-level estimates to examine whether the county-level substitution effects vary depending on the relative availability of early voting in the county.

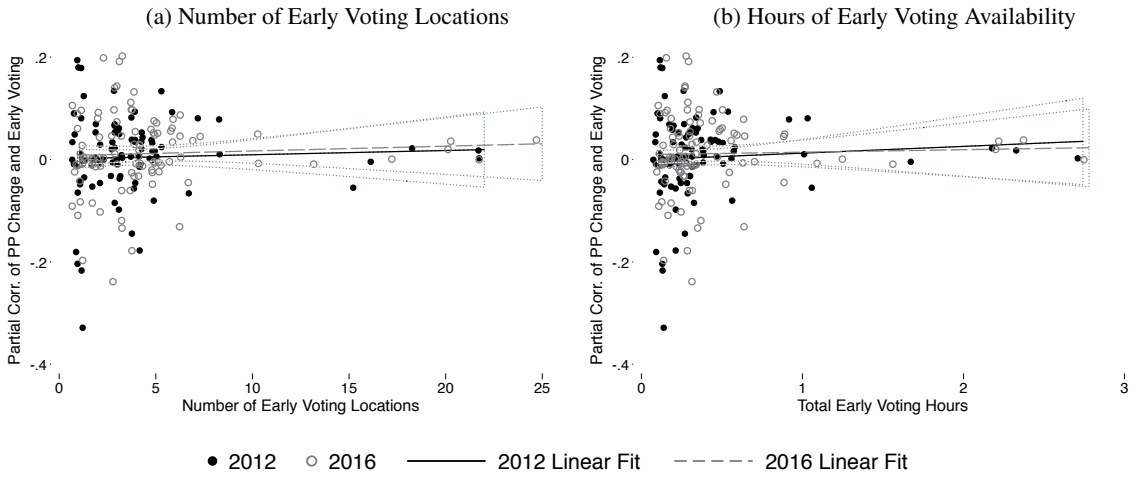
The plotted regression lines reveal that the variation in the county-level substitution effects we estimate do not correlate meaningfully with early voting availability in either 2012 or 2016 — a result borne out by formal regression estimates and investigations that disaggregate early voting hours by weekends and evenings. The results are also qualitatively the same as estimates that normalize all measures of early voting availability by county population to ensure that variation in the characteristics of differently populated counties do not account for the lack of correlation (see below). With the qualification that our analysis of early voting does not account for early voting location movement (a fruitful avenue for future research), our results suggest that other mechanisms other than the availability of early voting must be responsible for the substitution effects that we identify.

Figure H2 presents the distribution of early voting availability (total hours in plot (a), locations in plot (b), weekend hours specifically in plot (c), and evening hours specifically in plot (d)) by year. Overall, despite frequent discussions about partisan manipulation of early voting, there is little difference in availability between 2012 (Democrats) and

[2]The availability of other forms of "convenience voting" have also been associated with mixed results (Gronke, Galanes-Rosenbaum, and Miller 2007; Karp and Banducci 2000; Kousser and Mullin 2007; Gerber, Huber, and Hill 2013).

[3]This data was obtained from the county boards of election for both 2012 and 2016 from `https://dl.ncsbe.gov/?prefix=One-Stop_Early_Voting/2016/`.

Figure H1. Relationship Between Early Voting Availability and Early Voting by Year



Notes: Plot (a) represents the relationship between the number of early voting locations and the average effect of a polling place change on early voting by county. Plot (b) represents the relationship between the total number of early voting hours (in thousands) and the average effect of a polling place change on early voting by county. The average effect of a polling place on early voting by county is obtained by estimating Equation **??** as a cross-section separately for each county using the outcome of $Pr(VoteEarly)$. Points are jittered to aid visualization and linear fits are plotted with 95% confidence intervals. Identical relationships that normalize early voting availability are found in Appendix J.

2016 (Republicans). If anything, Republicans added a few early voting locations in 2016.

Of course, we note that locations might be moved within counties to favor co-partisans without changing the overall distribution. Because of that, Figure H3 presents scatterplots that relate early voting availability in 2012 to 2016. We note that there does not appear to be substantial changes by year. Instead, most counties are clustered at the 45 degree line of no change.

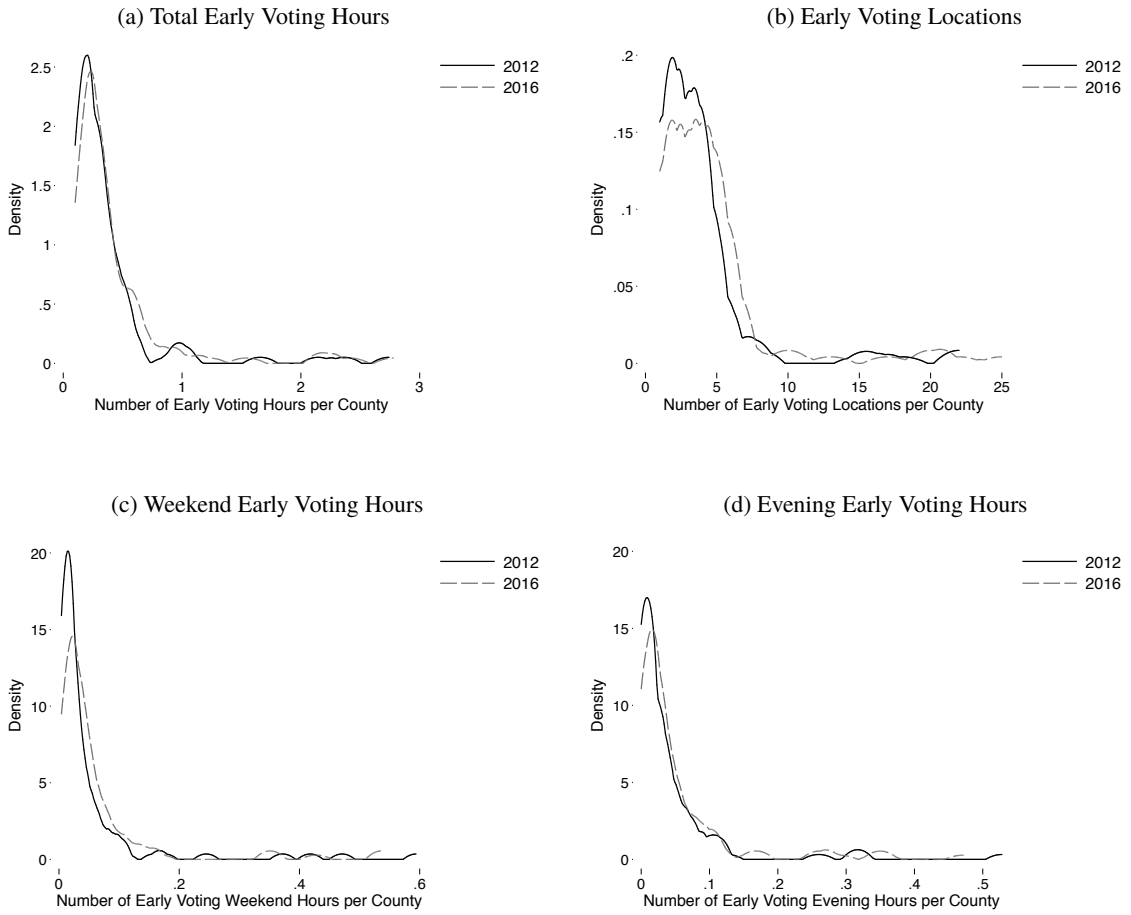
Given that evening and weekend hours are particularly important for early voting, we re-present the Figure H1 from the main paper, but examine the relationship between early voting and early voting weekend hours (plot (a)) and early voting evening hours (plot (b)). (For a thorough description of how the plot is constructed, please see the description in the main body of the paper.) We see little evidence that more evening early voting hours nor more weekend early voting hours are associated with higher rates of early voting when voters experience a polling place change.

Because neither the scatterplots presented in the paper, nor the plots here show any evidence of a statistically significant relationship between early voting availability and the probability of early voting, we forgo formally estimating the relationship.

Lastly, we investigate whether normalizing our measure of early voting availability affect our conclusions about whether early voting availability moderates the effect of a polling place change. One early voting site in a populous county might have less of an effect than one early voting site in a less populous county. The same is true of hours. Voters might face longer lines, for instance, if there are few locations or few hours relative to the population size. We present the scatter plots in Figure H1 from the main paper, along with the plots from Figure H4 in Figure H5 below. The measures of early voting availability below are normalized by the number of registered eligible voters (from our sample) in the county (i.e. hours per voter, etc.).

Although we observe more variation in the normalized versions of our early voting variables, we do not observe a different pattern in the relationship between early voting availability and early voting conditional on having a polling

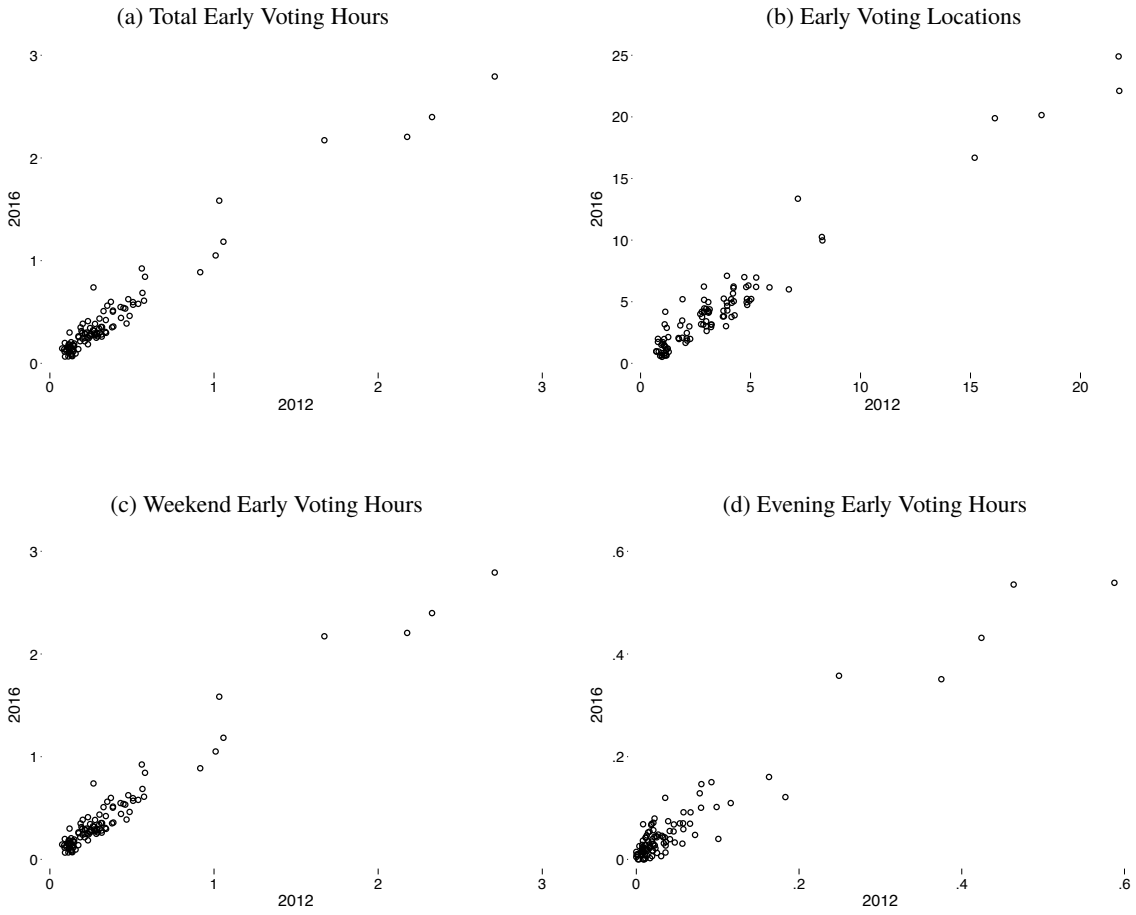
Figure H2. Distribution of Early Voting Availability by Year



Notes: The above plots present the availability of early voting hours by year (plot (a)) and early voting location by year (plot(b)). Solid lines are for 2012 (Democrats), and dashed lines are for 2016 (Republicans). Early voting hours are measured in thousands.

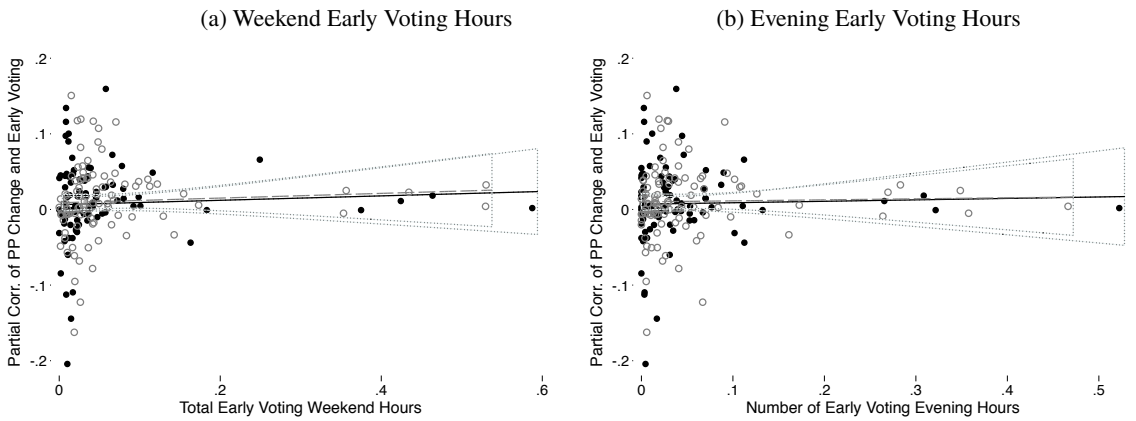
place change. From these plots and those presented in the main paper, we cannot but conclude that we cannot detect a statistically significant conditioning effect of early voting availability on early voting turnout. In the discussion section of the main paper, we consider why that might be the case.

Figure H3. Scatterplot of the Relationship Between 2012 and 2016 Early Voting Availability



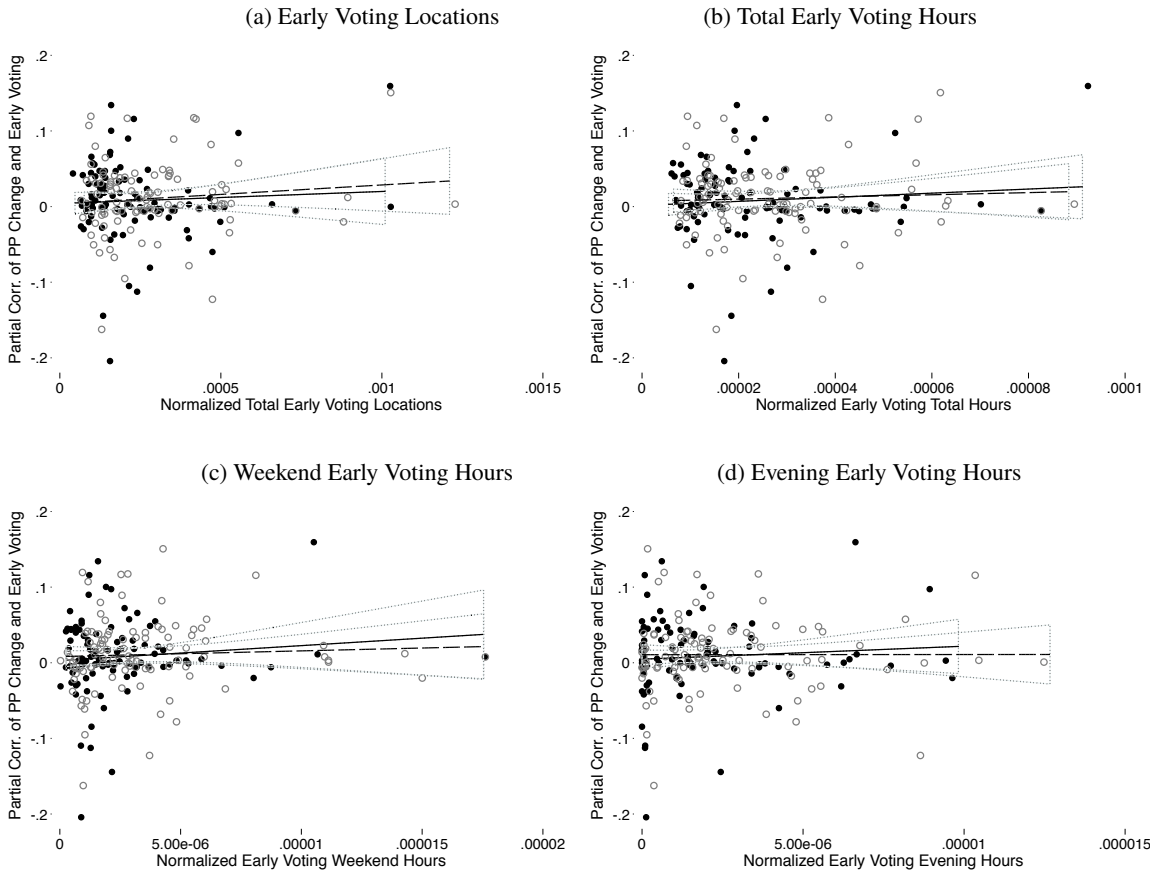
Notes: The above plots present scatterplots relating the availability of early voting in 2012 to 2016. Early voting hours are measured in thousands.

Figure H4. Relationship Between Weekend and Evening Early Voting Hours and Early Voting by Year



Notes: Plot (a) represents the relationship between the number of weekend early voting hours and the average effect of a polling place change on early voting by county. Plot (b) represents the relationship between the number of evening early voting hours and the average effect of a polling place change on early voting by county. Early voting hours are measured in thousands. The average affect of a polling place on early voting by county is β obtained by estimating 1 separately for each county using the outcome of $Pr(VoteEarly)$. Points in the plots are jittered slightly to aid visualization. Linear fits are plotted with 95% confidence intervals.

Figure H5. Relationship Between Early Voting and Normalized Early Voting Availability by Year



Notes: Plot (a) represents the relationship between the number of early voting locations normalized by the number of registered voters and the average effect of a polling place change on early voting by county. Plot (b) represents the relationship between the total number of early voting hours normalized by the number of registered voters and the average effect of a polling place change on early voting by county. Plot (c) represents the relationship between the number of weekend early voting hours normalized by the number of registered voters and the average effect of a polling place change on early voting by county. Plot (d) represents the relationship between the number of evening early voting hours normalized by the number of registered voters and the average effect of a polling place change on early voting by county. Early voting hours are measured in thousands. The average affect of a polling place on early voting by county is β obtained by estimating 1 separately for each county using the outcome of $Pr(VoteEarly)$. Points in the plots are jittered slightly to aid visualization. Linear fits are plotted with 95% confidence intervals. We exclude Tyrrell county from the top two plots because it is an extreme outlier given its small population.

I. Differential Effects by Race

In this appendix, we present additional results that examine heterogeneity in the effect of polling place changes by race.

The history of race and disenfranchisement in North Carolina is long and fraught. That recent battles over election administration have frequently centered on race-based voter suppression suggests that which voters of which race vote is of critical contemporary importance in the state (insightus 2016; Vasilogambros 2018; Michaelson 2016; Roth 2015; Berman 2016). In this section we explore potential differences in our effects by race. Doing so helps us to understand some aspects of the historical legacy of voter disenfranchisement, as well as speaking to the ability of different voters to overcome the costs associated with polling place changes.

Our expectations regarding the differential effects of polling place changes by race are ambiguous. On the one hand, the effects of polling place changes may be larger, on average, among black voters because of differences in material resources that allow voters to overcome costs (Verba, Schlozman, and Brady 1995; Wolfinger and Rosenstone 1980; Leighley and Nagler 2013), or the availability of early voting by race (Fullmer 2015b). However, the effect of limited resources may be mitigated by greater value placed on voting by groups with a past history of struggling to secure voting rights (Anoll 2018) or by other social norms that tend to incentivize turnout in high salience elections (Doherty et al. 2017). Race-related mobilization efforts such as "souls to the polls" events may also differentially moderate the effect of polling place changes.

To investigate whether polling place changes have larger or smaller effects depending on the race of the affected voters, we estimate our panel with the addition of an interaction between polling place change and an indicator for non-white voters — classifying a voter as non-white if they ever indicate that they are such in the voter rolls. We collapse racial categories into a binary "white" and "non-white" (including hispanics) category to aid interpretability, but similar effects are obtained by estimating separate effects by disaggregated race. Blacks by far constitute the largest group of non-whites in North Carolina and our racially disaggregated results suggest our effect is primarily a function of the voting behavior of blacks.

Table I1 presents the estimated differential substitution effects by race. We present estimates of these interaction effects rather than sub-sample analysis to allow us to assess the statistical significance of the differential effects. We find that non-white voters are less likely to substitute between Election Day voting and early voting when their polling place changes. The estimated coefficient on $\Delta PollingPlace \cdot NonWhite$ is positive (though not significant) in model 1, indicating that non-white voters are more likely than white voters to continue voting on Election Day when their polling place is changed. That coefficient becomes negative and significant in model 3, indicating that non-white voters are less likely, relative to white voters, to vote early when their polling place is changed. Overall, we do not find statistically significant evidence that there is an overall turnout effect for non-white voters that differs from white voters, although the coefficient on the interaction is negative, suggesting that polling places changes could differentially deter non-whites from voting, on the order of approximately one half of one percentage point.

When we examine heterogeneity in the effect of polling place changes by race *and* by the distance the polling place was moved, we find no evidence that non-white voters are differentially sensitive to how far their polling place is moved. None of the estimated coefficients on the interactions between non-white and the change in distance to the Election Day polling place is statistically different from zero. Overall, this indicates that while non-white voters substitute less into early voting as a consequence of a polling place change, how far the polling place is moved does not further condition the relationship.

TABLE I1 *The Differential Effects of Polling Place Changes by Race*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.0085**	-0.0077*	0.0089**	0.0082**	-0.00032	-0.00041
	(0.0041)	(0.0041)	(0.0041)	(0.0041)	(0.0018)	(0.0019)
$\Delta PollingPlace{\cdot}NonWhite$	0.0048	0.0042	-0.010**	-0.0095*	-0.0049	-0.0043
	(0.0044)	(0.0045)	(0.0052)	(0.0053)	(0.0030)	(0.0031)
$\Delta MuchCloser$ ($\hat{\lambda}$)		0.016		-0.011		0.0051
		(0.013)		(0.014)		(0.0069)
$\Delta MuchFurther$ ($\hat{\delta}$)		-0.034**		0.029*		-0.0021
		(0.015)		(0.015)		(0.0058)
$\Delta MuchCloser{\cdot}NonWhite$		-0.011		-0.0012		-0.018
		(0.017)		(0.016)		(0.013)
$\Delta MuchFurther{\cdot}NonWhite$		0.017		-0.022		-0.0050
		(0.021)		(0.019)		(0.012)
Individual FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
County x Year FE	✓	✓	✓	✓	✓	✓
Race x Year FE	✓	✓	✓	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel	Full Panel	Full Panel	Full Panel
Observations	4681792	4681792	4681792	4681792	4681792	4681792
Mean of DV	0.30	0.30	0.46	0.46	0.80	0.80
SD of DV	0.25	0.25	0.26	0.26	0.21	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??** with the addition of $\Delta PollingPlace$ interacted with voter race. The unit of analysis is the voter-election. Table C4 in Appendix C reports the coefficient estimates. The SD of the DV is the within-i standard deviation of the outcome. $Pr(VoteAny)$ includes non-in-person modes of voting and thus the mean of the $VoteElecDay$ and $VoteEarly$ do not sum to the mean of $VoteAny$. "Full panel" refers to regressions using our balanced panel of voters.

These results might reflect subtle changes to early voting availability by county that differentially affect voters by race, or different habits of voting by race. If early voting is more difficult in minority communities — as some anecdotal evidence from North Carolina suggests — but the value of voting amongst minority groups remains high, this could account for the small overall turnout effect and the more limited substitution that we find. Most existing evidence suggests that convenience forms of voting, like early voting, tend to make it easier for white and well-resourced voters to vote, rather than reducing inequalities (Karp and Banducci 2000; Berinsky 2005; Gronke 2008). Similarly, if minority voters are motivated to overcome costs but have a habit of voting by a particular mode (rather than simply a habit of voting *at all*), they might differentially turn out on Election Day rather than substitute into early voting. Although beyond our capacity to explore, we offer these as potential explanations that additional research could fruitfully explore.

In addition to those results, Table I2 then shows that the effects of polling place changes by race do not vary by how those changes impact travel costs, nor are the results different in the panel analysis either overall (Table I3) or depending on drive time (Table I4). Finally, we present the main table polling place change table from the paper but with the non-white category broken out into each race indicator (Table I5). Because we observe no differential travel time effects for white as compared to non-white, and given the heinousness of a table with interactions across two distances for six races, we do not present the table for drive times interacted with each individual race.

Table I2 examines different travel time changes by race. We see no evidence that changes in travel time — either increases or reductions — under different partisan regimes differentially affected non-white voters.

TABLE I2 *The Differential Effects of Changes in Travel Time to Polling Places by Year and Race*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.020***	-0.031***	0.022***	0.029***	0.0012	-0.0024
	(0.0042)	(0.0059)	(0.0051)	(0.0055)	(0.0026)	(0.0019)
$\Delta PollingPlace{\cdot}NonWhite$	0.014***	0.016***	-0.015**	-0.023***	0.0022	-0.0041
	(0.0049)	(0.0048)	(0.0063)	(0.0053)	(0.0037)	(0.0034)
$NonWhite$	-0.085***	-0.014***	0.091***	-0.011**	-0.0021	-0.032***
	(0.0044)	(0.0041)	(0.0045)	(0.0043)	(0.0029)	(0.0034)
$\Delta MuchCloser$ ($\hat{\lambda}$)	0.016	0.028***	-0.0095	-0.035***	0.0032	-0.0022
	(0.016)	(0.0098)	(0.014)	(0.010)	(0.0048)	(0.0057)
$\Delta MuchFurther$ ($\hat{\delta}$)	-0.0087	-0.046***	0.011	0.040**	0.0047	-0.0065
	(0.0099)	(0.017)	(0.0092)	(0.019)	(0.0062)	(0.0047)
$\Delta MuchCloser{\cdot}NonWhite$	0.0084	-0.0022	-0.030*	0.00041	-0.021	-0.0077
	(0.015)	(0.021)	(0.017)	(0.013)	(0.013)	(0.016)
$\Delta MuchFurther{\cdot}NonWhite$	0.0079	0.013	-0.0056	-0.025	0.0039	-0.0099
	(0.018)	(0.017)	(0.026)	(0.017)	(0.017)	(0.012)
County FE	✓	✓	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓	✓	✓
Year Sample	2012	2016	2012	2016	2012	2016
Observations	2340293	2340293	2340293	2340293	2340293	2340293
Mean of DV	0.33	0.26	0.47	0.45	0.84	0.75
SD of DV	0.46	0.44	0.49	0.49	0.36	0.43

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation 1 with voter-race interactions. The unit of analysis is the voter. The SD is the average of the within-county standard deviations of the outcome.

Our panel results in Table I3 indicate that non-white voters are slightly more likely to continue voting on Election Day when they experience a polling place change, and less likely to vote early. The net effect of this substitution is that they are less likely to turnout in general when they experience a polling place change. The results in

TABLE I3 *The Average Effect of Polling Place Changes on Voter Turnout by Race*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.0085**	0.0089**	-0.00032
	(0.0041)	(0.0041)	(0.0018)
$\Delta PollingPlace{\cdot}NonWhite$	0.0048	-0.010**	-0.0049
	(0.0044)	(0.0052)	(0.0030)
Individual FE	✓	✓	✓
Year FE	✓	✓	✓
County x Year FE	✓	✓	✓
Race x Year FE	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel
Observations	4681792	4681792	4681792
Mean of DV	0.30	0.46	0.80
SD of DV	0.25	0.26	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??** without the travel time indicators. The unit of analysis is the voter-election. The SD is the average of the within-i standard deviations of the outcome.

TABLE I4 *The Average Effect of Changes in Travel Time to Polling Place on Turnout by Race*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.0077*	0.0082**	-0.00041
	(0.0041)	(0.0041)	(0.0019)
$\Delta PollingPlace{\cdot}NonWhite$	0.0042	-0.0095*	-0.0043
	(0.0045)	(0.0053)	(0.0031)
$\Delta MuchCloser$ ($\hat{\lambda}$)	0.016	-0.011	0.0051
	(0.013)	(0.014)	(0.0069)
$\Delta MuchFurther$ ($\hat{\delta}$)	-0.034**	0.029*	-0.0021
	(0.015)	(0.015)	(0.0058)
$\Delta MuchCloser{\cdot}NonWhite$	-0.011	-0.0012	-0.018
	(0.017)	(0.016)	(0.013)
$\Delta MuchFurther{\cdot}NonWhite$	0.017	-0.022	-0.0050
	(0.021)	(0.019)	(0.012)
Individual FE	✓	✓	✓
Year FE	✓	✓	✓
County x Year FE	✓	✓	✓
Race x Year FE	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel
Observations	4681792	4681792	4681792
Mean of DV	0.30	0.46	0.80
SD of DV	0.25	0.26	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??**. The unit of analysis is the voter-election. The SD is the average of the within-i standard deviations of the outcome.

We note that there is little consistent evidence that our results for non-white vary meaningfully by specific races. We might be interested in whether the effects for black are distinct from other races that are a smaller part of the population or have a less fraught history with voting rights in North Carolina. But Table I5 provides little evidence of this.

TABLE I5 *The Differential Effects of Polling Place Changes by Year and Race*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.020***	-0.032***	0.023***	0.029***	0.0017	-0.0026
	(0.0044)	(0.0063)	(0.0053)	(0.0060)	(0.0024)	(0.0019)
$\Delta PollingPlace \cdot Hispanic$	0.025	0.028*	-0.011	-0.0016	0.010	0.014
	(0.019)	(0.016)	(0.015)	(0.018)	(0.014)	(0.012)
$\Delta PollingPlace \cdot Black$	0.013**	0.018***	-0.015**	-0.026***	0.00023	-0.0052
	(0.0056)	(0.0054)	(0.0069)	(0.0059)	(0.0033)	(0.0033)
$\Delta PollingPlace \cdot Unknown$	0.017**	-0.0062	-0.017	0.0050	0.0030	0.0017
	(0.0075)	(0.011)	(0.012)	(0.0098)	(0.011)	(0.0077)
$\Delta PollingPlace \cdot Other$	-0.0036	-0.011	-0.00098	0.0085	-0.0068	-0.0019
	(0.0066)	(0.0077)	(0.012)	(0.0100)	(0.0083)	(0.0080)
$\Delta PollingPlace \cdot NativeAm$	0.011	-0.012	0.015	0.021	0.028	0.0055
	(0.022)	(0.027)	(0.017)	(0.026)	(0.025)	(0.0093)
$\Delta PollingPlace \cdot Asian$	0.0064	-0.0061	0.0062	0.028**	0.023	0.013
	(0.010)	(0.010)	(0.024)	(0.013)	(0.019)	(0.014)
$\Delta PollingPlace \cdot MultiRace$	-0.0030	0.0019	-0.019	-0.0071	-0.0097	-0.0027
	(0.012)	(0.012)	(0.015)	(0.016)	(0.018)	(0.016)
Black	-0.092***	-0.013**	0.13***	-0.0067	0.024***	-0.028***
	(0.0054)	(0.0050)	(0.0056)	(0.0044)	(0.0031)	(0.0040)
UnknownRace	0.021***	-0.017***	-0.15***	-0.033***	-0.13***	-0.048***
	(0.0055)	(0.0051)	(0.0053)	(0.0045)	(0.0076)	(0.0055)
OtherRace	0.044***	-0.0038	-0.15***	-0.0027	-0.10***	-0.0025
	(0.0056)	(0.0081)	(0.0047)	(0.0058)	(0.0056)	(0.0059)
NativeAm	0.073***	0.050***	-0.15***	-0.034***	-0.078***	0.022**
	(0.0063)	(0.017)	(0.0067)	(0.0091)	(0.0048)	(0.0095)
Asian	0.024***	-0.011	-0.18***	-0.0093	-0.14***	-0.014
	(0.0077)	(0.011)	(0.016)	(0.012)	(0.020)	(0.015)
MultiRace	-0.0023	-0.031***	-0.13***	-0.025***	-0.13***	-0.050***
	(0.0066)	(0.0053)	(0.0075)	(0.0064)	(0.0100)	(0.0071)
Hispanic	0.045***	-0.033***	-0.16***	-0.000079	-0.11***	-0.025***
	(0.011)	(0.0068)	(0.0091)	(0.0087)	(0.010)	(0.0088)
County FE	✓	✓	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓	✓	✓
Year Sample	2012	2016	2012	2016	2012	2016
Observations	2340293	2340293	2340293	2340293	2340293	2340293
Mean of DV	0.33	0.26	0.47	0.45	0.84	0.75
SD of DV	0.46	0.44	0.49	0.49	0.36	0.43

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation 1 without the travel time indicators but with $\Delta PollingPlace$ interacted with voter race. The unit of analysis is the voter. The SD is the average of the within-county standard deviations of the outcome.

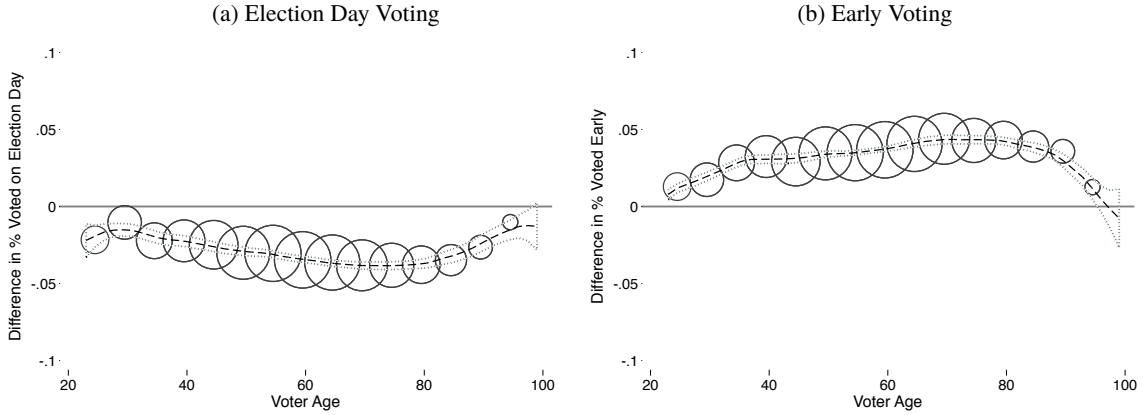
J. Differential Effects by Age

In this appendix, we examine whether the effects that we estimate in the main paper depend on the age of voters.

The expected effects of age on polling place changes are uncertain. If older voters have a longer habit of voting a specific way — e.g., at a specific Election Day polling place — then they may be more impacted by a change in the location of their polling place relative to a younger voter with weaker voting habits tied to a particular polling place or mode. However, if older voters have a stronger habit of voting *generally* regardless of mode, polling place changes may be *less* impactful because of their increased motivation to overcome the costs of polling place changes, or because they do not require a prime to remember to vote. The youngest voters may also have higher expectations of costs associated with voting (precisely because they have not developed a habit of voting by a particular mode or at all), making a polling place change less disruptive because it is already factored into expectations.

Age-related differences may also impact the relative importance of priming, search costs and travel costs in uncertain ways. Younger voters may be more attuned to technology and better able to locate new polling places than older voters, but they may also be better able to locate early voting locations when informed of a change in their polling place location by an official notification. The willingness to risk a new polling place on Election Day rather than vote early may also vary by age if employed individuals are more likely to vote early than try to find a new polling place on Election Day.

Figure J1. Relationship Between Age, Mode of Voting and Polling Place Change



Notes: The graphs present the relationship between age (in 2016) and the difference in turnout between those who do and do not experience a polling place change for Election Day voting (a) and early voting (b). The hollow circles are sized relative to the population in the bin (at 5 year intervals). The dashed line represents a local polynominal (bandwidth = 3) fit to all of the data, not just the bins, pooled across 2012 and 2016. The gray horizontal line denotes no difference in turnout – circles above (below) zero represent instances of higher (lower) turnout amongst those who experience a polling place change relative to those who do not.

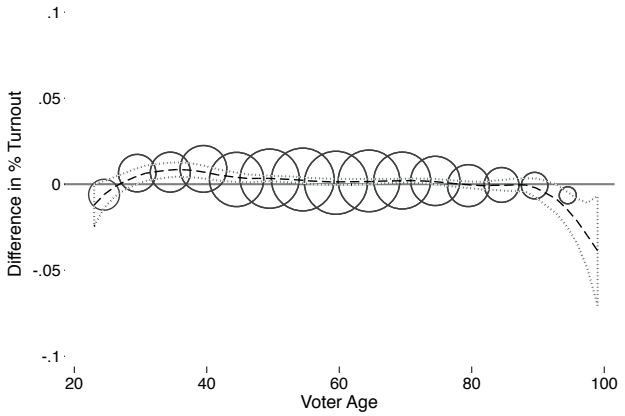
Figure J1 plots the difference in voting behavior by age in 2016 for those who did and did not experience a change in polling place. Voters are binned into 5 year age bins where the size of the bins corresponds to the sample size. Points above (below) zero indicate instances when voters of a given age turnout more on average when they experience a polling place relative to those who do not.

The plots in Figure J1 provide some evidence that the substitution into early voting in response to a polling place change varies by age. In particular, the youngest and oldest voters have the smallest declines in Election Day voting and the smallest increases in early voting — indicating that polling place changes are less likely to affect how they vote relative to middle-aged voters affected by a polling place change. Voters in the middle of the distribution — voters who are also most likely to be employed and invested in the community — are the voters who are most likely

to substitute to early voting in response to a polling place change. That said, the net effects of these two effects completely offset and overall turnout does not vary by age in response to a polling place change (figure J2).

The fact that the youngest voters are the least likely to substitute into early voting suggests that they may be the most responsive to the informational mailers that remind them of their new polling place. They may also better able to overcome the search and confusion costs associated with finding a new polling place given technological changes (e.g., smartphones). Although the information mailers lack the emotional appeals found in much of the GOTV literature in political science (Gerber et al. 2017; Gerber, Green, and Larimer 2008), the information provided may be sufficiently informative and the election competitive enough that the mailer is enough to mobilize younger voters who are less likely generally to participate (Arceneaux and Nickerson 2009). Middle-aged voters may fear the uncertainty of a change in polling place location – especially if they are motivated to vote in the high-stakes competitive presidential election contest – and they may choose to vote early rather that risk the consequences of trying to cast an Election Day vote at a new polling place. Although our investigations are not well-positioned to identify the particular mechanisms responsible for the substitution patterns we characterize, our results do suggest that age (or age-correlated characteristics) has only a limited impact of the effects of polling place changes.

Figure J2. Relationship Between Age, Overall Turnout and Polling Place Change



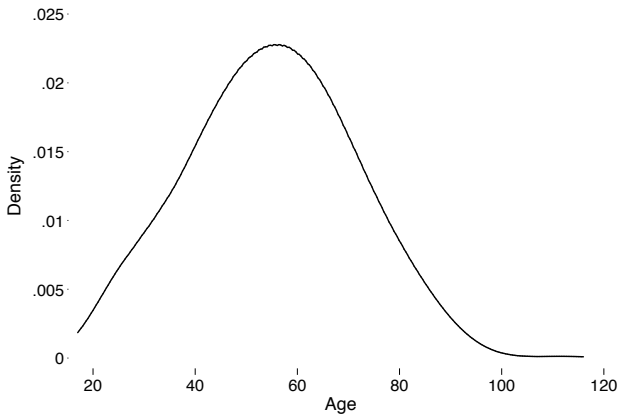
Notes: The above scatter plot presents the simple bivariate relationship between age and the difference in turnout between those who experience a polling place change and those who do not for all modes of voting (overall turnout). The hollow circles are sized relative to the population in the bin (at 5 year intervals). The dashed line represents a local polynominal fit (bandwidth = 3). The fit lines are fit to all of the data, not just the bins. Data is pooled across 2012 and 2016. The gray horizontal line is at zero; no difference in turnout. Circles above zero represent instances of higher turnout amongst those who experience a polling place change relative to those who do not, while circles below zero represent instances of lower turnout amongst those who experience a polling place change relative to those who do not.

The distribution of ages in our sample of voters is presented in Figure J3.

To more formally investigate the relationship between age, polling place change and voter turnout, we estimate the specifications from the main paper. We trichotomize age to make it easier to interpret differential effects. In particular, we construct an $Age < 26$ category (dummy) for the youngest voters in our sample, and an $Age > 76$ category (dummy) for the oldest voters in our sample. These categorical variables allow us to estimate intercept shifts for the group, but constrain the slope of the effect by age. The residual, or base category, is for voters between 26 and 76.

Table J1 suggests no differential effects across any of our three outcome variables by age. Similarly, when we

Figure J3. Distribution of Age



Notes: The above plot is the distribution of voter age in our sample for all years.

TABLE J1 *The Differential Effect of Polling Place Changes on Voter Turnout by Age*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.0065*	0.0055	-0.0018
	(0.0039)	(0.0048)	(0.0026)
$\Delta PollingPlace{\cdot}Age<26$	0.0017	-0.0054	-0.0017
	(0.0097)	(0.0098)	(0.011)
$\Delta PollingPlace{\cdot}Age\ 76+$	-0.0049	0.0059	0.0018
	(0.0056)	(0.016)	(0.014)
Individual FE	✓	✓	✓
Year FE	✓	✓	✓
County x Year FE	✓	✓	✓
Race x Year FE	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel
Observations	4681792	4681792	4681792
Mean of DV	0.30	0.46	0.80
SD of DV	0.25	0.26	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??** without the travel time indicators but with the addition of age dummies. The unit of analysis is the voter-election. The SD of the DV is the average of the within-i standard deviations of the outcome.

examine differential effects in drive time in our panel in Table J3 none of the interactions are statistically significant.

When we turn to examining heterogeneity by age and by partisanship in our cross-sectional regressions there is some evidence that younger voters are differentially failing to show up at the polls in 2016 (as a consequence of Republican-controlled polling place changes), relative to 2012 when younger voters appear slightly more likely to turnout. There are no consistent statistically significant effects for older voters. Nor in Table J4 do we see consistent patterns that would indicate that voters of different ages responded differently to polling place changes in different years (i.e. under different partisan regimes). Thus, consistent with our cross-sectional estimates for year in the main paper, we do find some evidence that Republican changes depressed turnout. And in this case we show that that depression was more substantial for younger voters.

TABLE J2 *The Differential Effect of Changes in Travel Time to Polling Place on Turnout by Age*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.0065*	0.0055	-0.0018
	(0.0039)	(0.0048)	(0.0026)
$\Delta PollingPlace{\cdot}Age<26$	0.0041	-0.0045	-0.00021
	(0.0100)	(0.0100)	(0.011)
$\Delta PollingPlace{\cdot}Age\ 76+$	-0.0034	0.0041	0.00085
	(0.0059)	(0.016)	(0.014)
$\Delta MuchCloser{\cdot}Age<26$	-0.055	0.020	-0.0089
	(0.041)	(0.039)	(0.048)
$\Delta MuchCloser{\cdot}Age<26$	-0.032	-0.041	-0.038
	(0.039)	(0.038)	(0.042)
$\Delta MuchCloser{\cdot}Age\ 76+$	0.0015	0.016	0.024
	(0.017)	(0.046)	(0.038)
$\Delta MuchCloser{\cdot}Age\ 76+$	-0.040**	0.034	0.0041
	(0.017)	(0.037)	(0.041)
Individual FE	✓	✓	✓
Year FE	✓	✓	✓
County x Year FE	✓	✓	✓
Race x Year FE	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel
Observations	4681792	4681792	4681792
Mean of DV	0.30	0.46	0.80
SD of DV	0.25	0.26	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??** with the addition of age dummies. The unit of analysis is the voter-election. The SD of the DV is the average of the within-i standard deviations of the outcome.

TABLE J3 *The Differential Effect of Polling Place Changes by Year by Age*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.016***	-0.029***	0.018***	0.025***	0.0025	-0.0027
	(0.0035)	(0.0062)	(0.0048)	(0.0058)	(0.0029)	(0.0021)
$\Delta PollingPlace{\cdot}Age<26$	-0.00079	0.019**	-0.025**	-0.015*	-0.017	0.0031
	(0.013)	(0.0073)	(0.012)	(0.0077)	(0.020)	(0.0099)
$\Delta PollingPlace{\cdot}Age\ 76+$	-0.0036	0.0060	0.011***	-0.0090**	0.0031	-0.0052
	(0.0031)	(0.0046)	(0.0037)	(0.0043)	(0.0032)	(0.0045)
$Age<26$	-0.091***	-0.030***	-0.19***	-0.15***	-0.26***	-0.17***
	(0.0042)	(0.0033)	(0.0098)	(0.0033)	(0.011)	(0.0039)
$Age\ 76+$	-0.053***	-0.028***	0.017***	-0.17***	0.0035	-0.19***
	(0.0030)	(0.0050)	(0.0021)	(0.0046)	(0.0032)	(0.0043)
County FE	✓	✓	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓	✓	✓
Year Sample	2012	2016	2012	2016	2012	2016
Observations	2340293	2340293	2340293	2340293	2340293	2340293
Mean of DV	0.33	0.26	0.47	0.45	0.84	0.75
SD of DV	0.46	0.44	0.49	0.49	0.36	0.43

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation 1 without the travel time indicators and with the addition of age dummies. The unit of analysis is the voter. The SD of the DV is the average of the within-county standard deviations of the outcome.

TABLE J4 *The Differential Effect of Changes in Travel Time to Polling Places by Year by Age*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.016***	-0.029***	0.018***	0.025***	0.0025	-0.0027
	(0.0035)	(0.0062)	(0.0048)	(0.0059)	(0.0029)	(0.0021)
$\Delta PollingPlace \cdot Age$ <26	0.0021	0.019**	-0.025**	-0.014*	-0.016	0.0023
	(0.014)	(0.0081)	(0.012)	(0.0075)	(0.021)	(0.011)
$\Delta PollingPlace \cdot Age$ 76+	-0.0029	0.0077*	0.011***	-0.011**	0.0035	-0.0055
	(0.0034)	(0.0044)	(0.0039)	(0.0050)	(0.0032)	(0.0044)
Age <26	-0.091***	-0.030***	-0.19***	-0.15***	-0.26***	-0.17***
	(0.0042)	(0.0033)	(0.0098)	(0.0033)	(0.011)	(0.0039)
Age 76+	-0.053***	-0.028***	0.017***	-0.17***	0.0035	-0.19***
	(0.0030)	(0.0050)	(0.0021)	(0.0046)	(0.0032)	(0.0043)
$\Delta MuchCloser \cdot Age$ <26	-0.074	0.037	-0.00037	-0.0029	-0.065	0.051
	(0.047)	(0.030)	(0.031)	(0.040)	(0.062)	(0.044)
$\Delta MuchCloser \cdot Age$ <26	0.0064	-0.022	0.0093	-0.027	0.042	-0.013
	(0.031)	(0.041)	(0.031)	(0.023)	(0.036)	(0.050)
$\Delta MuchCloser \cdot Age$ 76+	0.0044	0.025	-0.0060	-0.00076	-0.0035	0.032***
	(0.015)	(0.016)	(0.012)	(0.016)	(0.0065)	(0.011)
$\Delta MuchCloser \cdot Age$ 76+	-0.018	-0.060***	0.0038	0.043**	-0.0047	-0.023**
	(0.011)	(0.017)	(0.012)	(0.017)	(0.0075)	(0.0096)
County FE	✓	✓	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓	✓	✓
Year Sample	2012	2016	2012	2016	2012	2016
Observations	2340293	2340293	2340293	2340293	2340293	2340293
Mean of DV	0.33	0.26	0.47	0.45	0.84	0.75
SD of DV	0.46	0.44	0.49	0.49	0.36	0.43

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation 1 with the addition of age dummies. The unit of analysis is the voter. The SD of the DV is the average of the within-county standard deviations of the outcome.

K. Differential Effects by Income

In this appendix, we examine whether there is heterogeneity in the effects we estimate in the main paper by the median household income of the census block group. Our expectation is that voters with lower incomes will have fewer resources to contend with the disruption of a polling place change, and therefore turnout less than voters with higher incomes. Lacking data on income at the individual level, we use income data at the census block group level. Although not ideal, this is a very small geographic unit.

Table K1 estimates average effects in our panel by mode of voting. We find that voters with higher incomes (as measured by the median in the census block group), are more likely to vote on Election Day when their polling place has changed, relative to a voter with lower income. There is no statistically significant effect for early voting over overall turnout. These results indicate that while there might be a slight differential response in terms of Election Day voting, there is no difference in overall turnout effects that differ by voter resources.

TABLE K1 *The Differential Effect of Polling Place Changes on Voter Turnout by Income*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.019***	0.013*	-0.0047
	(0.0069)	(0.0070)	(0.0033)
$\Delta PollingPlace \cdot Income$	0.0021	-0.0013	0.00059
	(0.0013)	(0.0012)	(0.00056)
Individual FE	✓	✓	✓
Year FE	✓	✓	✓
County x Year FE	✓	✓	✓
Race x Year FE	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel
Observations	4680586	4680586	4680586
Mean of DV	0.30	0.46	0.80
SD of DV	0.25	0.26	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??** without the travel time indicators. The unit of analysis is the voter-election. The SD is the average of the within-i standard deviations of the outcome.

When we turn to examining drive time, we see that there are some differential effects (Table K2). Those with higher incomes are more likely to turn out on Election Day when their polling place is moved much further away than those with lower incomes who have their polling place moved no more than 5 minutes closer or further from them (column 1). This results in higher turnout for those with higher incomes who have their polling place moved further away. Again, this is suggestive that resources allow voters to continue voting on Election Day and continue to turnout in general.

The results in Table K3 indicate little evidence that income allowed voters to differentially overcome the costs of polling place changes by year. The interaction between polling place change and income is very small and insignificant in all models. Although we don't estimate the interacted model to determine if the coefficient on the interaction is statistically *different* between 2012 and 2016, even if it were, the magnitudes would be exceedingly small.

The results from Table K4 are similar and suggest that partisan changes between years were moderated by the

TABLE K2 *The Differential Effect of Changes in Travel Time to Polling Place on Turnout by Income*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.016**	0.012*	-0.0039
	(0.0069)	(0.0070)	(0.0034)
$\Delta PollingPlace{\cdot}Income$	0.0018	-0.0011	0.00045
	(0.0013)	(0.0012)	(0.00057)
$\Delta MuchCloser$ ($\hat{\lambda}$)	-0.013	0.0030	-0.0099
	(0.022)	(0.021)	(0.0099)
$\Delta MuchFurther$ ($\hat{\delta}$)	-0.059**	0.039	-0.021**
	(0.029)	(0.027)	(0.0100)
$\Delta MuchCloser{\cdot}Income$	0.0048	-0.0024	0.0022*
	(0.0038)	(0.0033)	(0.0012)
$\Delta MuchFurther{\cdot}Income$	0.0056	-0.0026	0.0036**
	(0.0043)	(0.0042)	(0.0016)
Individual FE	✓	✓	✓
Year FE	✓	✓	✓
County x Year FE	✓	✓	✓
Race x Year FE	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel
Observations	4680586	4680586	4680586
Mean of DV	0.30	0.46	0.80
SD of DV	0.25	0.26	0.21

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??**. The unit of analysis is the voter-election. The SD is the average of the within-i standard deviations of the outcome.

differential ability of higher relative to lower income voters to overcome costs associated with drive time to their new polling place.

TABLE K3 *The Differential Effect of Polling Place Changes by Year by Income*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.022***	-0.034***	0.023**	0.029***	0.0027	-0.0070
	(0.0085)	(0.0086)	(0.011)	(0.0094)	(0.0051)	(0.0048)
$\Delta PollingPlace{\cdot}Income$	0.0011	0.0012	-0.00088	-0.0010	-0.00013	0.00062
	(0.0015)	(0.00079)	(0.0023)	(0.0013)	(0.00089)	(0.00093)
$Income$	-0.0022***	-0.0032**	0.0085***	0.0065***	0.0077***	0.0039***
	(0.00062)	(0.0015)	(0.00084)	(0.0015)	(0.00053)	(0.00043)
County FE	✓	✓	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓	✓	✓
Year Sample	2012	2016	2012	2016	2012	2016
Observations	2340293	2340293	2340293	2340293	2340293	2340293
Mean of DV	0.33	0.26	0.47	0.45	0.84	0.75
SD of DV	0.46	0.44	0.49	0.49	0.36	0.43

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation 1 without the travel time indicators. The unit of analysis is the voter. The SD is the average of the within-county standard deviations of the outcome.

TABLE K4 *The Differential Effect of Changes in Travel Time to Polling Places by Year by Income*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.013	-0.018*	-0.012	-0.00044	-0.029***	-0.022***
	(0.0091)	(0.0097)	(0.011)	(0.012)	(0.0056)	(0.0049)
$\Delta PollingPlace{\cdot}Income$	-0.00061	-0.0017	0.0056**	0.0044**	0.0056***	0.0036***
	(0.0016)	(0.0012)	(0.0025)	(0.0021)	(0.00097)	(0.00098)
$\Delta MuchCloser$ ($\hat{\lambda}$)	0.0091	0.0044	-0.0022	-0.0081	0.0028	-0.00036
	(0.021)	(0.019)	(0.020)	(0.014)	(0.012)	(0.0082)
$\Delta MuchFurther$ ($\hat{\delta}$)	-0.0060	-0.029	0.012	0.018	0.0070	-0.0075
	(0.016)	(0.033)	(0.016)	(0.038)	(0.011)	(0.012)
$\Delta MuchCloser{\cdot}Income$	0.0011	0.0036	-0.0014	-0.0042**	-0.00017	-0.00071
	(0.0034)	(0.0022)	(0.0040)	(0.0018)	(0.0014)	(0.0012)
$\Delta MuchFurther{\cdot}Income$	-0.00042	-0.0036	-0.000035	0.0047	-0.00021	0.00025
	(0.0021)	(0.0050)	(0.0027)	(0.0055)	(0.0018)	(0.0018)
County FE	✓	✓	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓	✓	✓
Year Sample	2012	2016	2012	2016	2012	2016
Observations	2340293	2340293	2340293	2340293	2340293	2340293
Mean of DV	0.33	0.26	0.47	0.45	0.84	0.75
SD of DV	0.46	0.44	0.49	0.49	0.36	0.43

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating equation 1. The unit of analysis is the voter. The SD is the average of the within-county standard deviations of the outcome.

L. Details of the Geocoding Procedure

Data on 2008 polling places come from the NCSBE data archives – snapshot date: April 3rd, 2008 – data on 2012 polling places come from the Data Director of the North Carolina Democratic Party, and data on 2016 polling places were collected from the mid-2017 Internet Archives image of the NCSBE Polling Place Search website.

Shapefiles of precinct boundaries were collected from the NCSBE website for 2012 and 2016 – snapshot dates: October 4th, 2016 for 2016 election; September 1st, 2012 for 2012 – and from the NCSBE 2008 precinct boundary shapefile submitted to the 2011 redistricting database to associate polling places and precincts. In some cases, poor record keeping combined with the fact that not all polling places are located with the borders of the precinct they serve makes it impossible to ascertain the precinct served by a given polling places. When a precinct's polling place cannot be ascertained with certainty, we drop that precinct from the analysis. This generates a sample of 3,362,808 voters with a geolocated polling place, or 79.1% of voters with accurate residence geocodes.

M. Partisan-Controlled Polling Place Changes

Polling place changes made between 2008 and 2012 were made by Democrat-selected local election administrators, while polling place changes made between 2012 and 2016 were made by Republican-selected administrators. In the main manuscript, we suggest why there is limited theoretical expectation that polling place changes made under different partisan regimes should impact turnout. However, we might expect the intentions to differ by these partisan administrators, the voters targeted to differ, their resources to overcome the imposed costs to differ, and therefore the state-wide turnout effects to differ as well. If so, the average effects we identify may obscure important differences in the effects of the polling place changes made by different regimes of partisan-appointed election administrators.

Even if such partisan motivations exist, however, the ability of such changes to differentially affect turnout is theoretically unclear. If, for example, search costs, confusion, and habit disruption are more consequential than travel costs, than *any* change in polling place location may produce similar turnout effects. Put differently, attempts to increase turnout by decreasing travel costs by moving or adding polling places may be undermined by the the resulting search costs, confusion, and habit disruption produced by such changes.

To estimate the impact of polling place changes under different election administration regimes, we separately estimate the impact of polling place changes made between 2008 and 2012 on 2012 turnout and the effects of changes made between 2012 and 2016 on 2016 turnout. We estimate these cross-sectional regressions using a comprehensive set of voter-level covariates and county fixed effects to leverage within-county variation and control for stable county-level features such as population, density, and urban/rural composition that may affect turnout decisions.

Because of our balanced panel, we analyze the same voters in each time period — an important consideration that helps eliminate any confounding effects caused by *compositional* changes in the electorate over time. Even so, comparing the impact of polling place changes between the two time periods is unfortunately and unavoidably confounded by the potential impact of other temporal differences that may be correlated with polling place changes. It is unclear what these time-varying and highly correlated factors might be, but we acknowledge that factors other than partisanship may affects the effect of the polling place changes we examine.

To estimate the effects of Democrat-led and Republican-led polling place changes we estimate the following equation separately for 2012 and 2016:

$$\begin{aligned} Pr(Vote_{i,c}) = \eta_c + \beta \Delta PollingPlace_{i,c} + \delta \Delta MuchFurther_{i,c} + \lambda \Delta MuchCloser_{i,c} \\ + \boldsymbol{\psi} \boldsymbol{Vote}_{i,c,t-1} + \boldsymbol{\kappa} \boldsymbol{X}_{i,c} + \epsilon_{i,c} \end{aligned} \tag{1}$$

where η_c are county-level fixed effects, and $\boldsymbol{X}$ is a vector of covariates that we use to account for individual characteristics affecting the decision to turnout, including race, partisan identification, age, age squared, gender, and median household income at the 2010 census block. The remaining variables are measured as in equation **??**. We cluster our robust standard errors at the county level to account for common shocks to individuals within the same county and the heteroskedasticity of the linear probability model we employ. As before, we estimate equation 1 for each mode turnout, and with and without the travel time indicators.

Table M1 presents the results of the effect of a polling place change unconditioned by changing travel time. As in our panel results (Table **??**), both Democrat and Republican-led polling place changes decrease Election Day turnout, although the decline is much larger for Republican-led changes. Comparing the effects of Democrats (column 1) and

TABLE M1 *The Differential Effects of Polling Place Changes by Year*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.016***	-0.028***	0.019***	0.023***	0.0020	-0.0037**
	(0.0035)	(0.0059)	(0.0045)	(0.0055)	(0.0024)	(0.0018)
County FE	✓	✓	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓	✓	✓
Year Sample	2012	2016	2012	2016	2012	2016
Observations	2340293	2340293	2340293	2340293	2340293	2340293
Mean of DV	0.33	0.26	0.47	0.45	0.84	0.75
SD of DV	0.46	0.44	0.49	0.49	0.36	0.43

Standard errors clustered at the individual level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation 1 without the drive time indicators. The unit of analysis is the voter-election. See Table C2 in Appendix C for the full set of coefficient estimates.

Republicans (column 2) reveals a decline of -1.6 percentage points under Democrats and -2.8 percentage points under Republicans.

Consistent with our previous panel findings, the decrease in Election Day vote that we identify is accompanied by a similarly sized increase in early voting across *both* years (columns 3 and 4) — 1.9 percentage points under Democrats and 2.3 percentage points under Republicans. However, the Election Day and early voting effects are not completely offsetting for Republican-led changes. Columns 5 and 6 reveal that although voters substitute from Election Day voting to early voting occurs in response to both partisan changes, the Republican-controlled changes were substantial enough to reduce *overall* voter turnout by -0.4 percentage points (column 6). Estimating a model that interacts the effect of polling place change with year (as opposed to splitting the sample) allows us to reject the null hypothesis that the effect of a polling place change in Election Day voting and on overall turnout is the same between the two years. We fail to reject that null hypothesis for early voting. If Democrat-led changes were attempting to increase Election Day turnout by moving polling place locations closer to likely supporters, our results indicate that these attempts were unsuccessful.

Because search costs, confusion, and habit disruption arguably occur whenever a polling place change occurs, we might expect the largest differences in partisan effects to occur in terms of the effects of travel costs. (Table F2 in Appendix G already suggests that there are not different overall average effects on turnout by party registration.) In particular, Democratic supporters tend to be concentrated amongst racial minorities and less resourced voters who arguably benefit more from a polling place being moved closer to them than rural Republican voters who live in more expansive precincts — if so, the effects of travel costs may vary depending on the party in control of the process of selecting polling places.

Table M2 presents the results from estimating equation 1 with indicators for travel time. We find some evidence that the impact of travel costs depends on the party in control of the process. Election Day voting increases when polling places are moved much closer to voters, and declines when they're moved much further away (relative to small changes in travel time), but only for Republican-led changes in 2016 (column 2). But even though the differential effects ($\hat{\lambda}$) are distinguishable from zero, the net effect of a polling place being moved much closer on Election Day voting, even in 2016, (i.e., $\hat{\beta} + \hat{\lambda}$) is still nearly exactly zero.

The results for early voting reverse this pattern and again show evidence of substitution. But again, this substitution is only evident for Republican-led changes (column 4). Voters moved much closer to their polling place in 2016 are less

TABLE M2 *The Differential Effects of Changes in Travel Time to Polling Places by Year*

	$Pr(VoteElecDay)$		$Pr(VoteEarly)$		$Pr(VoteAny)$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta MuchCloser$ ($\hat{\lambda}$)	0.017	0.026***	-0.013	-0.033***	0.00016	-0.0039
	(0.015)	(0.0087)	(0.014)	(0.0093)	(0.0048)	(0.0050)
$\Delta MuchFurther$ ($\hat{\delta}$)	-0.0077	-0.045***	0.0095	0.039**	0.0044	-0.0073
	(0.0075)	(0.016)	(0.0075)	(0.019)	(0.0048)	(0.0045)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.017***	-0.027***	0.019***	0.023***	0.0018	-0.0033*
	(0.0034)	(0.0055)	(0.0045)	(0.0051)	(0.0025)	(0.0018)
County FE	✓	✓	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓	✓	✓
Year Sample	2012	2016	2012	2016	2012	2016
Observations	2340293	2340293	2340293	2340293	2340293	2340293
Mean of DV	0.33	0.26	0.47	0.45	0.84	0.75
SD of DV	0.46	0.44	0.49	0.49	0.36	0.43

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation 1. The unit of analysis is the voter. See Table C3 in Appendix C for the full set of coefficient estimates. The SD of the DV is the average of the within-county standard deviations of the outcome.

likely to vote early, while those moved much further away are more likely to do so. However, even given differential substitution, we find no differential net turnout effects conditional on drive time between the two partisan regimes (column 5 and 6). Although the fact that the effect of a polling place change of any kind ($\hat{\beta}$) is distinguishable from zero for Republican-led changes in 2016 (column 6) reveals that the polling place changes introduced by Republicans slightly decreased overall turnout. Estimating an interacted model to assess whether the coefficients are the same across years further reveals that only in the case of the probability of early voting and a polling place being moved much further is there statistically significant difference in the effects under partisan regimes — voters are slightly more likely to turnout early when their polling place is moved much further in 2016 (by Republicans) than in 2012 (by Democrats).

N. Predicting 2012 Turnout with Future Polling Place Changes

In this appendix we offer one additional test to provide additional evidence on the strength of our counterfactual assumption — that is, that the behavior of individuals who experienced a polling place change prior to a given election *would have been the same* had they not experienced that change. Although a standard test for parallel trends in our setting without a discrete pre and post treatment period is not possible, we can nevertheless examine whether future polling place changes are correlated with past turnout behavior, after accounting for past polling place changes, county characteristics, and individual level characteristic. Once we have taken into account past and fixed behavior, we should not expect future changes to be related to past behavior.

With only two time periods of polling place changes — 2008-2012 and 2012-2016 — we can only provide evidence on whether changes from 2012-2016 predict 2012 behavior, after accounting for county fixed effects and individual covariates. This cross-sectional specification is not our preferred specification, as it does not allow us to use our most rigorous set of fixed effects (e.g. individual voter fixed effects), but it still provides potentially useful, albeit imperfect, evidence.

TABLE N1 *Predicting 2012 Turnout with Preceding and Future Polling Place Changes*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.016***	0.018***	0.0022
	(0.0035)	(0.0044)	(0.0024)
Δ*Polling Place (lead, 2012-2016)*	-0.011**	0.0066	-0.0035
	(0.0049)	(0.0055)	(0.0021)
County FE	✓	✓	✓
Individual Controls	✓	✓	✓
Year Sample	2012	2012	2012
Observations	2340293	2340293	2340293
Mean of DV	0.33	0.33	0.47
SD of DV	0.46	0.46	0.49

Robust standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation 1 without the travel time indicators and including a lead variable for future polling place changes made from 2012-2016. The SD of the DV is the average of the within-county standard deviations of the outcome.

Table N1 presents our results. In two of the three specifications, future polling place changes are statistically and substantively unrelated to previous turnout choices. Those who vote early are no more nor less likely to have their Election Day polling place changed in the subsequent period. And those who vote at all, by any method, are no more nor less likely to have their polling place changed in the subsequent period.

However, our results do suggest that those who voted on Election Day in 2012 were less likely to have their Election Day polling place changed before the 2016 election, after accounting for whether they had experienced a polling place change between 2008 and 2012 (as well as county and individual characteristics).

If those who are already more likely to vote on Election Day are those who are less likely to see their polling places changed (and thus, those are are less likely to vote on Election Day are those more likely to see their polling places changes) we may over-estimate the extent to which having your Election Day polling place changed *causes* a reduction in turnout. Given that theory and existing evidence in the literature strongly suggests that polling place changes should depress turnout, the fact that Table N1 suggests we might be *over*estimating the relationship is quite interesting. In general, it comports with our overall results which suggest that the negative effects of polling place

changes (in this context) are not as pronounced as we would have expected.

Finally, we note that it may be the case that this statistically significant correlation is a function of our inability to use our preferred set of fixed effects and fixed effect interactions in this single cross-sectional specification. If polling place changes are related to unobservable fixed features of voters or shocks unique to 2012, our estimation of this lead may be biased. Moreover, we lack the data to know whether this correlation in Election Day voting is unique to 2012 or more generally representative of how Election Day polling places are changed. However, even if our main results reflect selection in Election Day voting, the fact that we over estimate the negative effect of a polling place change is interesting and important.

O. Effects of Polling Place Changes on Movers with Stable Assignments

Because precinct boundaries are not stable over time, in our analysis we identify changes in polling place assignments by tracking the actual polling place assignment of voters in each election, and classify changes in those assignments as "polling place changes." However, while this interpretation works for non-moving voters, it does not work for many voters who have *themselves* moved residences between elections. This is because the change in polling places is simply the result of the voter moving (i.e. selecting into a new polling place), not administrative changes.

There is, however, a small population of voters who move between elections for whom this is not true. Some voters move to new residences that, in the election after their move, share the same polling place assignments as their previous residences. In these situations, one can still identify situations in which these voters can be said to have experienced *administrative* changes in their polling places.

These voters make up only about 10% of voters who move in our data (115,500 of our 1,012,077 movers), and because their moves tend to be much shorter than average, they are also not representative of the average mover. Moreover, while we can estimate the effects of changes in polling place locations due to administrative changes on these voters, we are unable to estimate the effects of changes in *distance* to polling places, as these are related to the move the voter has chosen to make and not just administrative changes on the part of election officials.

TABLE O1 *The Average Effect of Polling Place Changes and Drive Time on Voter Turnout*

	$Pr(VoteElecDay)$	$Pr(VoteEarly)$	$Pr(VoteAny)$
	(1)	(2)	(3)
$\Delta PollingPlace$ ($\hat{\beta}$)	-0.017***	0.020***	0.0022*
	(0.0033)	(0.0037)	(0.0012)
StableAssignmentMove x $\Delta PollingPlace$	0.0046	-0.013**	-0.0091**
	(0.0046)	(0.0051)	(0.0038)
StableAssignmentMove	0.048***	0.033***	0.077***
	(0.0019)	(0.0023)	(0.0017)
Individual FE	✓	✓	✓
Year FE	✓	✓	✓
Race x Year FE	✓	✓	✓
Year Sample	Full Panel	Full Panel	Full Panel
Observations	4912156	4912156	4912156
Mean of DV	0.30	0.46	0.80
SD of DV	0.45	0.49	0.40

Standard errors clustered by precinct assignment history.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table presents coefficients from estimating Equation **??** with and without the travel time indicators. The unit of analysis is the voter-election. See Table C1 in Appendix C for the full set of coefficient estimates. The SD of the DV is the average of the within-i standard deviations of the outcome variable. $Pr(VoteAny)$ includes non-in-person modes of voting, like mail-in voting, and thus the mean of the $VoteElecDay$ and $VoteEarly$ do not sum to the mean of $VoteAny$. The residual category for $MuchCloser$ and $MuchFurther$ are voters whose polling place is moved less than 5 minutes drive *either* closer or further. "Full panel" refers to panel regressions estimated on our balanced panel of voters, as opposed to cross-sectional regressions estimated on voters from that panel.

In Table O1 we estimate our main specification (without the travel time indicators as explained above) with the addition of an interaction between those individuals who move (effectively) within-precinct and having a polling place *administratively* moved. We call these local moves a $StableAssignmentMove$ (because the voters assigned polling place in the previous election is the same both for their old and new residence). That is, augment our sample to include those voters who move a small distance and whose new residence has the same polling place assignment as their previous residence did in the previous election. And then we evaluate whether this population of very local

movers responds differently when their polling place is moved by election officials. We also include a separate regressor for experiencing a move *independent* of whether a polling place changes. This is a time varying measure (as voters can move in one or the other election), and thus we can still include individual fixed effects.

We find that the differential effect (our interaction term) are slightly (but not significantly different from zero) more likely to continue to vote on election day (relatively to non-movers) (model 1), to be less likely to turn out to vote early (model 2), and to be slightly less likely to turnout overall (model 3) when their polling place is changed. Table O1 thus confirms the expectation that people who move are those more likely to forgo casting a ballot when they experience a polling place change. In magnitude, this is about a 1 percentage point reduction in turnout.

Note that $StableAssignmentMove$ estimates the relationship between moving and not having a polling place change (for these close movers). Across our specification, this estimate is positive. While this may surprise some readers familiar with literatures that note how movers are often less-resourced, more likely to rent, and so forth, we think that these results are a function of the fact that for these movers to appear as eligible in our voter rolls, they must take the initiative to update their voter registration information. Someone who moves a short distance *and* takes this initiative, is likely to be a voter who is committed to turning out.

References

Anoll, Allison. 2018. "What Makes a Good Neighbor? Race, Place, and Norms of Political Action." *American Political Science Review* (NY, NY).

Arceneaux, Kevin, and David W Nickerson. 2009. "Who is Mobilized to Vote? A Re-analysis of 11 Field Experiments." *American Journal of Political Science* 53 (1): 1–16.

Berinsky, Adam J. 2005. "The Perverse Consequences of Electoral Reform." *American Politics Research* 33 (4): 471–491.

Berman, Ari. 2016. *There Are 868 Fewer Places to Vote in 2016 Because the Supreme Court Gutted the Voting Rights Act.* Accessed February 18, 2018. https://www.thenation.com/article/there-are-868-fewer-places-to-vote-in-2016-because-the-supreme-court-gutted-the-voting-rights-act/.

Burden, Barry C, David T Canon, Kenneth R Mayer, and Donald P Moynihan. 2014. "Election Laws, Mobilization, and Turnout: The Unanticipated Consequences of Election Reform." *American Journal of Political Science* 58 (1): 95–109.

———. 2017. "The Complicated Partisan Effects of State Election Laws." *Political Research Quarterly* 70 (3): 564–576.

Doherty, David, Conor M Dowling, Alan S Gerber, and Gregory A Huber. 2017. "Are Voting Norms Conditional? How Electoral Context and Peer Behavior Shape the Social Returns to Voting." *The Journal of Politics* 79 (3): 1095–1100.

Fullmer, Elliott B. 2015a. "Early Voting: Do More Sites Lead to Higher Turnout?" *Election Law Journal* 14 (2).

———. 2015b. "The Site Gap: Racial Inequalities in Early Voting Access." *American Politics Research* 43 (2).

Gerber, Alan S, Donald P Green, and Christopher W Larimer. 2008. "Social pressure and voter turnout: Evidence from a large-scale field experiment." *American Political Science Review* 102 (1): 33–48.

Gerber, Alan S, Gregory A Huber, Albert H Fang, and Andrew Gooch. 2017. "The Generalizability of Social Pressure Effects on Turnout Across High-Salience Electoral Contexts: Field Experimental Evidence From 1.96 Million Citizens in 17 States." *American Politics Research* 45 (4): 533–559.

Gerber, Alan S, Gregory A Huber, and Seth J Hill. 2013. "Identifying the Effect of All-Mail Elections on Turnout: Staggered Reform in the Evergreen State." *Political Science Research and Methods* 1 (1): 91–116.

Gronke, Paul. 2008. "Early Voting Reforms and American Elections." *Wm. & Mary Bill Rts. J.* 17:423.

Gronke, Paul, Eva Galanes-Rosenbaum, and Peter A Miller. 2007. "Early Voting and Turnout." *PS: Political Science & Politics* 40 (4): 639–645.

Herron, Michael C., and Daniel A. Smith. 2015. "Race, Shelby County, and the Voter Information Verification Act in North Carolina." *Fla. St. UL Rev.* 43:465.

Highton, Benjamin. 2000. "Residential Mobility, Community Mobility, and Electoral Participation." *Political Behavior* 22 (2): 109–120.

insightus. 2016. *Voter Suppression's Last Stand: North Carolina's new Jim Crow counties.* Accessed April 22, 2018. http://insight-us.org/fair-places-2016-pt-1.html.

Karp, Jeffrey A, and Susan A Banducci. 2000. "Going postal: How All-Mail Elections Influence Turnout." *Political Behavior* 22 (3): 223–239.

Kousser, Thad, and Megan Mullin. 2007. "Does Voting by Mail Increase Participation? Using Matching to Analyze a Natural Experiment." *Political Analysis* 15 (4): 428–445.

Leighley, Jan E, and Jonathan Nagler. 2013. *Who Votes Now?: Demographics, Issues, Inequality, and Turnout in the United States.* Princeton, NJ: Princeton University Press.

Michaelson, Jay. 2016. *North Carolina GOP Brags Racist Voter Suppression is Working—and They're Right.* Accessed February 20, 2018. https://www.thedailybeast.com/north-carolina-gop-brags-racist-voter-suppression-is-workingand-theyre-right.

Nickell, Stephen. 1981. "Biases in Dynamic Models with Fixed Effects." *Econometrica* 49, no. 6 (November): 1417.

Roth, Zachary. 2015. *Study: North Carolina Polling Site Changes Hurt Blacks.* Accessed February 18, 2018. https://www.nbcnews.com/news/nbcblk/study-north-carolina-polling-site-changes-hurt-blacks-n468251.

Squire, Peverill, Raymond E Wolfinger, and David P Glass. 1987. "Residential Mobility and Voter Turnout." *American Political Science Review* 81 (1): 45–65.

Vasilogambros, Matt. 2018. *Voting Lines Are Shorter ? But Mostly For Whites.* Accessed February 18, 2018. https://www.huffingtonpost.com/entry/voting-lines-are-shorter-but-mostly-for-whites%5C_us%5C_5a85a1bbe4b00e7aba2d2978.

Verba, Sidney, Kay Lehman Schlozman, and Henry E Brady. 1995. *Voice and Equality: Civic Voluntarism in American Politics.* Cambridge, MA: Harvard University Press.

Wolfinger, Raymond E, and Steven J Rosenstone. 1980. *Who Votes?* New Haven, CT: Yale University Press.