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Party Registration Closing Date and Primary Turnout Among Democrats and Republicans[1]

Matthew P. Thornburg
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Abstract

I examine the effect of party registration closing date—the last day a voter can change their party registration and still vote in the new party's upcoming primary—on primary turnout and the party self-identified Democrats and Republicans are registered with in closed primary states. I theorize that early closing dates lead to a greater number of voters having "obsolete registration"—having a party affiliation that does not match their party identification because they have changed party identification and not updated their party registration. I find that states with the earliest party registration closing dates have significantly more Democrats and Republicans registered with a party they do not identify with compared to states with closing dates closer to the primary and that the effect is strongest in counties that have undergone a significant realignment. I also find that this obsolete registration had a modest but significant effect on primary turnout in 2010 and 2014. In addition, I demonstrate that Maryland's decision to move its party registration closing date closer to the primary significantly increased the number of individuals changing party registration as a result.

In 2010, over 80% of Ballard County, Kentucky's citizens who were registered to vote were registered with the Democratic Party. However, in 2008 only 35.2% of Ballard County voters had cast a ballot for Democrat Barack Obama. Long a Democratic stronghold over the 20th century, Ballard County has rapidly moved in a Republican direction in recent decades. Why has the official party registration of the county's voters lagged their change of heart at the ballot box?

Due to state law and Kentucky's closed primaries, Kentuckians registered with a party who wish to switch parties and vote in a different primary face significant costs to do so. They must apply to vote anew by December 31 of the year prior to the primary (approximately 140 days prior) and officially change their party registration. While this law was recently updated to accommodate online changes of affiliation, the switch of a voter's party still requires significant planning ahead. I contend that this cost serves as an important barrier that has impeded changes to party registration in the face of individuals and localities shifting their party identification and distorted the Democratic and Republican primary electorates in the state and elsewhere.

American electoral institutions impose significant costs on citizens wishing to vote. A subsection of the political behavior literature is devoted to documenting the deleterious effects of institutions on turnout, often using interstate variation in laws to show results. Most of this attention has been focused on general election turnout. However, due to differing elite sentiment on the question of who should vote in primary elections and fears of crossover voting (Ware 2002), states have wide-ranging institutions regulating primaries as well.

Among those with the most restrictive of election rules are the fourteen states with closed primaries. In these states, voters are required to affiliate with a party in order to be able to vote in its primary elections. To discourage crossover voting, all but two of these states require

individuals who change party registration to be affiliated with the new party for a period of time before being allowed to vote in its primaries. Party registration closing date (i.e. the date at which a voter must have changed parties in order to vote in the new party's upcoming primary) ranges from Election Day to nearly a year in advance of the primary election.

A well-established finding in the literature on electoral institutions is the effect of voter registration closing date on turnout. States differ in the deadline by which a voter has to register in order to participate in the general election. Beginning with the work of Kelley et al. (1967) and further explored by Wolfinger and Rosenstone (1980), the finding that an early registration closing date leads to lower turnout has proven robust. A related literature on Election Day Registration (EDR) has found that nationwide implementation of EDR would potentially lead to as much as a 7 point boost in turnout nationwide (Brians and Grofman 2001). More recent scholarship revises the size of these effects downward (e.g. Ansolabehere and Konisky 2006) but nonetheless confirms that voter registration and its restrictions serve to lower turnout.

I extend the literature on closing date to primary elections by examining whether party registration closing date affects turnout in primaries. Based on the existing literature, I predict early party registration closing dates to be associated with a greater disconnect between the aggregate party identification and the aggregate party registration of a locality, which will in turn affect turnout in primaries there as an indicator of more voters having "obsolete" registration, now identifying with one party but still being registered with their former party.

I examine aggregate registration figures and turnout at the county level for the 2010 and 2014 primaries in the 14 states that conduct closed primaries with party registration. I test the hypothesis that counties located in states with party registration closing dates further in advance of the primary will have a greater difference between their parties' aggregate party identification

and aggregate party registration and that the size of this difference will be conditioned on changes in partisanship for that county over the previous 14 years. In counties that have moved "away" from a political party over the previous 14 years and are in states with early closing dates, I predict more voters will still be registered with that party than now actually vote for it, indicating that many of its registrants now support the other party but have had difficulty changing registration. In contrast, counties that have moved "towards" a party but have early closing dates are predicted to have a much larger number of voters for the waxing party than share of individuals registered with it, reflecting that many of those new supporters remain registered with their old party. Using causal mediation analysis, I show that party registration closing date also affects primary turnout in counties for the 2010 and 2014 Democratic and Republican primaries through this aforementioned difference between identification and registration.

Finally, to examine the dynamics of the effect of party registration closing date on the number of applications to change party registration, I use Maryland as a case study. I examine monthly changes in party registration in the state in a year before (2006) and after (2010) the state moved its party registration closing date from twelve weeks in advance to just three weeks in advance of the primary. I find that prior to the movement of the closing date closer to the primary, there was relatively little in the way of changes to party affiliation, especially in the critical run-up to the primary election. In contrast, after the closing date was moved to just three weeks ahead of the primary, a large spike in changes to party registration was observed in the run-up to that contest. Largely as a result of this spike, the proportion of the electorate changing party affiliation in 2010 increased by more than 50% compared to 2006.

Overall, I find that party registration closing date, far from being a benign measure to prevent crossover voting, can significantly distort the primary electorate. When a state has undergone an electoral realignment and has an early closing date, such as Kentucky and Oklahoma, this distortion may be particularly severe.

Literature Review and Theory

Starting with Merriam and Gosnell's (1924) survey of the causes of low election turnout, it has been appreciated that many of the rules in place in the U.S. have negative effects on voting. Wolfinger and Rosenstone's (1980) work identifies several aspects of electoral institutions that have deleterious effects on turnout. The authors find the largest single effect is from voter registration closing date. Movement of closing date to the day of the election is projected to increase turnout by 6.1 points. This finding has been confirmed by numerous other studies (Kim et al. 1975, Rhine 1995, Rhine 1996, Rosenstone and Hansen 1993, Squire et al. 1987, Texeira 1992).

A related literature has examined EDR, the growing practice among states of allowing would-be voters to register and vote on Election Day in one trip. While some scholars have treated EDR as a closing date on Election Day (Mitchell and Wlezien 1995, Rhine 1995, Rhine 1996, Rosenstone and Hansen 1993, Teixeira 1992), others have noted EDR is qualitatively different because it allows both registration and voting in one trip (Brians and Grofman 2001, Highton and Wolfinger 1998, Knack 1995). An EDR effect of approximately 7 percentage points has been found (Brians and Grofman 2001).

However, more recent work, using methods other than cross-sectional studies, has shown that while voter registration and its closing date play a role in depressing turnout, the previous estimates of their effects are probably high. This more recent work has noted that previous

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studies suffered from omitted variable bias, specifically failing to account for the endogeneity of a high turnout rate and electoral institutions facilitating turnout. For example, Ansolabehere and Konisky (2006) examine turnout before and after the introduction of voter registration and find that the advent of registration depressed turnout by three to five points. Likewise, Street et al. (2015) use search engine queries on voter registration before and after the deadline to register to vote in their state passed and revise the estimate of closing date's impact downward. However, once again, both studies do acknowledge that the institutions play a role in depressing turnout.

The theory underlying most of the research on voter turnout is derived from the work of Downs (1957) as well as Riker and Ordeshook (1968) positing the decision to vote as one that balances costs against benefits. Early closing dates increase peripheral costs by forcing voters to register before an election becomes salient. Work on the timing of voter registration shows that it occurs most frequently when the election is salient, such as during campaign events or in the final days before an election (Gimpel, Dyck and Shaw 2007). A consistent finding in the literature on economics (Frederick et al. 2002), biology (McClure et al. 2004) and psychology (Ainslie 1975, Trope and Liberman 2003) is that people discount the value of events that take place in the future. Forcing a voter to register a month in advance of the election may lead her to discount the benefits of the action. In contrast, in the midst of the campaign's salience during the final run-up to Election Day, the rewards of registering to vote are more immediate and fully valued.

The present research applies this theory to party registration in primaries. Party registration is unique as an official government record of an informal attitude. One of the assumptions on the part of the policymakers that party registration reflects, is that voter attitudes are difficult to change. While most of the literature on party identification supports this

assumption (e.g. Campbell et al. 1960, Green and Palmquist 1994), no scholars would argue party identification to be immutable. Individuals can and do change party loyalty over the course of their lives. The realignment of the southern U.S., while partially due to generational replacement, is also due to many white southerners changing their party identification from Democratic to Republican (Green, Palmquist and Schickler 2002).

What happens when a voter registered with their party changes party loyalties? Technically this voter should change party registration to match their new identification. However, this is costly, often involving completely reregistering to vote. Having obsolete party registration is not subject to penalty, nor does it prevent a voter from participating in the high-salience general elections; it only restricts participation in low-salience primaries that typically have minimal turnout (Gerber et al. 2016). The costs of changing party affiliation are often as great as registering to vote but the benefits are significantly less—doing so only affects participation in primaries. It is therefore conceivable that the benefits of updating party affiliation do not outweigh the cost for many voters.

Affecting the cost of this change is party registration closing date. Given the evidence that voter registration closing date affects turnout, we expect party registration closing date to have a similar effect. States with party registration closing dates months in advance of the election require voters to make the switch when the primary is still of low salience. There are few reminders of the distant election, and even if voters are aware of the need to change party, they may discount the benefits. Voters fail to change party registration until the primary is salient. Having missed the deadline, they then opt not to undergo the costly process. I expect early party registration closing dates are associated with voters having “obsolete registration”—

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identifying with one party but not registered with it—with an effect on primary turnout among Democrats and Republicans as a consequence.

Are voters who would participate in a primary better equipped to deal with the cost of party registration closing date? For party registration closing date to affect primary turnout, some voters who have obsolete registration must otherwise have the motivation to vote in a primary and only be prevented from doing so by their registration. Because primary elections are relatively low-turnout affairs with perceived lower benefits to participate in (Gerber et al. 2016), those few who habitually participate in primaries may derive greater intrinsic benefit and have motivation sufficient to pay the costs of changing registration. Thus, it may be that even though there are many voters with obsolete registration in states with early closing dates, these voters would not have voted in the primary anyway, and therefore the closing date does not affect primary turnout. While relatively little research has been done on the degree to which eligible registration functions as a proxy for political motivation, Nickerson (2014) finds in field experiments that voter registration drives do increase turnout in a general election. In other words, some voters who are not eligible to participate in an election would do so if the barriers were removed. Therefore, while not every voter deterred by early party registration closing dates from changing parties would have otherwise voted in primaries, it is plausible that some percentage of these voters would have voted in the primary of the party they now identify with were they not prevented from doing so by registration with their old party.

Thornburg (2018) finds supporting evidence of this. Examining voters in Oklahoma who changed address over the three-year period between 2013 and 2016 and thus were forced to reregister to vote, gaining an opportunity to change their party registration, the author finds that voters changing address were seven times as likely to change party registration compared to

those remaining at the same address. Overall, it is estimated that allowing every Oklahoman to reregister free of cost would lead Republicans to more than double their advantage in party registration in the state. Notably, Thornburg finds that a significant number of voters casting ballots in the Democratic primary would change party registration to Republican if given the opportunity to do so free of cost. Oklahoma has a particularly early party registration closing date. This latter finding indicates that voters may continue to vote in the primary of their old party up until the chance to change affiliation presents itself.

The effect of party registration closing date should be particularly strong in localities that are undergoing a realignment, where most changes in party identification are in one direction such as the aforementioned Ballard County, Kentucky. In that county, most shifts in party identification are from the Democratic to the Republican party. The early party registration closing date of Kentucky thus affects the primary electorates of the two parties differently in that county. For the Democrats, many individuals no longer support their party but remain registered with it, unable to change official affiliation. Thus, there are significantly more individuals registered as Democrats than identifying as Democrats. For Republicans, many of their new supporters are not registered with the GOP and cannot participate in its primaries. There are significantly fewer individuals registered as Republicans than Republican voters.

I therefore predict that party registration closing date affects turnout in primaries but does not necessarily *depress* it in every circumstance. In areas that have experienced a significant realignment in one direction, for example with voters moving from Democratic to Republican, an early party registration closing date will keep large numbers of former Democrats—now Republicans—registered with the Democratic Party. Some of these voters will continue to participate in the Democratic primary, given that voting is well documented as a habit (Coppock

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and Green 2016), and thus Democratic primary turnout rate—as measured by the number of voters in the Democratic primary divided by the number of Democratic supporters in the electorate—will be artificially elevated. At the same time, the many Republicans who remain registered with the Democratic Party and unable to vote in the GOP contest will depress turnout in the Republican primary.

Finally, it is worth remembering that party registration closing date is not necessarily exogenous to primary turnout or political conditions in a state. It is potentially correlated with other local factors that could themselves be related to primary turnout. Most important among these possible confounding factors is the strength of the state party system. Ware (2002) identifies state parties as the primary driver of laws making primaries more restrictive. Therefore, early party registration closing dates may be correlated with strong state parties which traditionally advocate for lower turnout in primary elections. I control for party system strength using the categories devised by Morehouse and Jewell (2005).

Analysis

Because party registration closing date is not randomly assigned to voters, establishing this theorized causal chain requires some care. As Ansolabehere and Konisky (2006) show, simply correlating electoral institutions with turnout may overstate the effect of these institutions due to omitted variable bias. It is thus necessary to demonstrate causality using more sophisticated methods than correlation or simple regression.

I theorize that party registration closing date affects primary turnout through a mediator: "obsolete" party registration (i.e. party registration that does not match a voter's party identification). In this article, I demonstrate this theory using causal mediation analysis, showing that party registration closing date affects primary turnout through the difference between

aggregate party identification and party registration in a locality for the 2010 and 2014 midterm elections. I also examine Maryland as a case study, showing that a change to party registration closing date in the 2010 midterm led to very different patterns in the number of applications to change party registration among registered Maryland voters.

I examine, first, the effect of party registration closing date on the calculated difference between aggregate party identification and party registration of counties using a multilevel mixed-effects model for both parties in 2010 and 2014. I then conduct the causal mediation analysis for all four of these elections. I close with the analysis of Maryland.

My units for the aggregate analysis of localities are the 795 counties located in the 14 states with party registration and closed primaries. I exclude states with semi-closed primaries, where unaffiliated voters can participate in either party primary, for several reasons. First, there is some evidence that partisans register as unaffiliated strategically to gain the option to cross over in primary elections and that this decision is based on local partisanship (Thornburg 2014). In addition, some states, such as Rhode Island and Colorado are semi-closed in that they allow unaffiliated voters to vote in primary elections, but once those voters cast their ballots, they are then registered with the party of the primary they voted in. These factors potentially complicate an analysis of the difference between party identification and party registration and the effect of party registration closing date.

I examine the 2010 and 2014 midterm primaries. I exclude presidential election years because some states choose to pair the presidential preference primary with the primary for other offices (typically the states occurring later in the presidential primary calendar) while other states hold the presidential preference primary as its own contest. The effect of the president on the primary ballot is significant enough to complicate an analysis of turnout.

Closing Date and the Difference Between Party Identification and Party Registration

I hypothesize that earlier party registration closing dates, conditioned on recent partisan shift in an area, lead to a greater absolute value difference between aggregate party identification and party registration in the area. The large difference between the 80% of Ballard County voters registered as Democrats and the 35.2% voting for the party, for example, indicates a significant amount of "obsolete" registration in the county. This difference, in turn, affects turnout in primary elections. I thus examine first the effect of closing date and partisan shift on the difference between aggregate party identification and registration at the county level.

To construct the dependent variable, the difference between party identification and party registration for the two major parties in counties, I compute the difference between the estimated percentage of a county identifying with a party and the percentage of the county's voters registered with the party. To compute the percentage of voters registered with a party, I use county party registration statistics from 2010 and 2014, computing the percentages of all registered voters in a county each affiliated with the Democratic and the Republican parties. Estimating county party *identification* is potentially more complicated as it is an internally held attitude and there are no systematic surveys that estimate this quantity for all counties examined. Such estimates of a geography's aggregate partisanship are often used to measure primary turnout at the state or county level. This has been proxied mainly by votes in the locality for candidates for high office, either in the most recent election or over time as a "normal vote" (Norrander 1986). To estimate the party identification of the counties examined in 2010 and 2014, I average together the party presidential candidates' two-party vote percentages in the county from the prior two presidential elections (e.g. 2004 and 2008 for the 2010 midterm and 2008 and 2012 for the 2014 midterm). For example, to estimate the percentage of Democrats in a

county in 2010, I average together Kerry's 2004 vote percentage with Obama's 2008 vote percentage in the county. This measure of a geography's party identification is considered by Norrander (1986) to be among the most accurate when calculating "party following" in primary elections.

The dependent variable is in percentages. Negative values of the partisanship difference indicate that a greater percentage of voters in the county are registered with the party than the percentage that voted for its presidential candidate. Positive values indicate a greater percentage of voters for the party in the electorate than percentage of registrants registered with it. Some descriptive statistics for the dependent variable and Republican shift of counties for Democrats and Republicans in both years are displayed in Table 1. Notably, Republicans average a more positive value on the dependent variable, indicating that on average there are more Republican voters relative to Republican registrants in counties in the sample compared to Democrats. In both 2010 and 2014, over a third of counties had a greater share of registrants affiliated with the Democratic Party than share of voters voting for the Democrats. This percentage is much smaller for Republicans.

Table 1 Republican Shift and Party Identification Minus Party Registration

	% D Identifiers - % D Registrants		% R Identifiers - % R Registrants		Republican Shift of County (Proportion)
	2010	2014	2010	2014	
Mean	1.70	0.89	13.90	16.06	-0.003
Median	6.86	4.58	12.01	13.39	-0.015
Standard Deviation	18.10	18.13	13.30	12.09	0.069
% < 0	34.34	36.23	11.57	3.39	62.57

My independent variable is a transformation of party registration closing date in 2010 and 2014, respectively, for the two analyses. Many states have different party registration closing dates for those switching from major party registration compared to those switching from being unaffiliated. Because I believe the negative effects of party registration closing date are felt most

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keenly by those initially registered with a major party who shift party identification, I use the date for shift from major party registration. The independent variable transforms the number of days this deadline lies in advance of the primary. My theory is partially based on the psychological predilection to discount the benefits of far-off events. Scholarship evaluating the functional form of this discounting rate has consistently found it to be nonlinear and either exponential (Lancaster 1963, Meyer 1976) or hyperbolic (Madden et al. 1999). I thus use a natural log transformation to convert party registration closing date. States with a closing date on Election Day are treated as a closing date of 1.

I believe the effect of party registration closing date on the dependent variable will be conditioned on the change in the county's partisanship over the recent past. For example, a county that has undergone a major recent realignment in partisanship should have an absolute value of the difference between party identification and party registration that is greater in states with early party registration closing dates compared to dates closer to the election. Counties with relatively consistent partisanship should not be affected heavily by the timing of the party registration closing date in their party identification-party registration concordance.

To construct the partisanship change variable for each county, I calculate the change in the vote received by the Republican candidate in the 2012 presidential election compared to the 2000 presidential election. This variable is in proportion. This change is interacted with the natural log of party registration closing date for that state in that election. I also include as control variables a measure for the strength of the state's party system (Morehouse and Jewell 2005) as well as whether that state allowed voters to change their party registration online in that election cycle; this latter variable is also interacted with the partisan shift of the county. To deal

Table 2 Effect of Party Registration Closing Date on Party Identification Minus Registration

		Democratic ID-Reg Difference		Republican ID-Reg Difference	
		2010	2014	2010	2014
Variable		**Coeff. (Std. Error)**	**Coeff. (Std. Error)**	**Coeff. (Std. Error)**	**Coeff. (Std. Error)**
Closing Date	*Ln(Days Between CD and Primary)*	-1.593 (1.025)	-2.172** (0.662)	1.555 (1.118)	2.159* (0.871)
Republican Shift	*County GOP Shift in Presidential Vote 2000-2012*	-22.573 (21.128)	-101.143*** (17.054)	-22.682 (20.507)	51.955** (15.198)
CD x Rep. Shift	*Interaction Term*	-9.537† (5.233)	-6.025 (4.203)	14.121** (5.078)	10.832** (3.750)
State Party Strength (Ref Cat: *Strong*)	*Moderate Strength*	-15.723*** (3.839)	-14.921*** (2.211)	-3.406 (4.184)	-1.553 (2.880)
	Weak Strength	-27.045*** (4.584)	-20.510*** (2.922)	3.628 (4.997)	-0.722 (3.796)
Online Registration	*Voters Could Change Party Reg. Online*	-6.452 (11.125)	3.295 (2.394)	-5.094 (11.284)	-1.781 (3.001)
OR x Rep. Shift	*Interaction Term*	65.377 (156.607)	28.789 (18.990)	-74.492 (151.835)	-24.918 (16.977)
Constant	*Constant*	24.166*** (4.691)	21.546*** (2.742)	8.654† (5.129)	9.851** (3.655)
Random Effects	*State Level Variance*	27.448 (11.056)	8.839 (4.299)	33.439 (13.207)	17.405 (6.975)
	Residual Variance	105.374 (5.332)	69.886 (3.542)	99.049 (5.012)	55.108 (2.789)
	Number of Observations	795	795	795	795
	LR Test	135.72	57.47	168.04	129.94
	Log Likelihood	-2997.684	-2829.94	-2974.796	-2741.291

†$p < 0.1$; *$p < 0.05$; **$p < 0.001$; ***$p < 0.001$
Dependent Variable in Percent; Republican Shift in Proportion
Multilevel mixed-effects model

with unobserved state-level effects, I use a multilevel mixed-effects model rather than the standard OLS model. The second level is the state.

The results of the models are shown in Table 2 for both parties and both elections. The coefficients are in the expected direction and most are either statistically significant or approach significance. To clarify the interaction between party registration closing date and partisan shift, Figures 1 and 2 plot the predicted value of the dependent variable (partisanship difference) and its confidence interval on the y-axis as a function of party registration closing date (x-axis), with Figure 1 showing the data for 2010; Figure 2, for 2014. Because I believe that the effect of party registration closing date on the partisanship difference is dependent on the shift in the county's partisanship recently, I plot two lines with confidence intervals, one for counties shifting 13

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points (2 standard deviations) in a Democratic direction—the blue line—and one for counties shifting 13 points in a Republican direction—the red line.

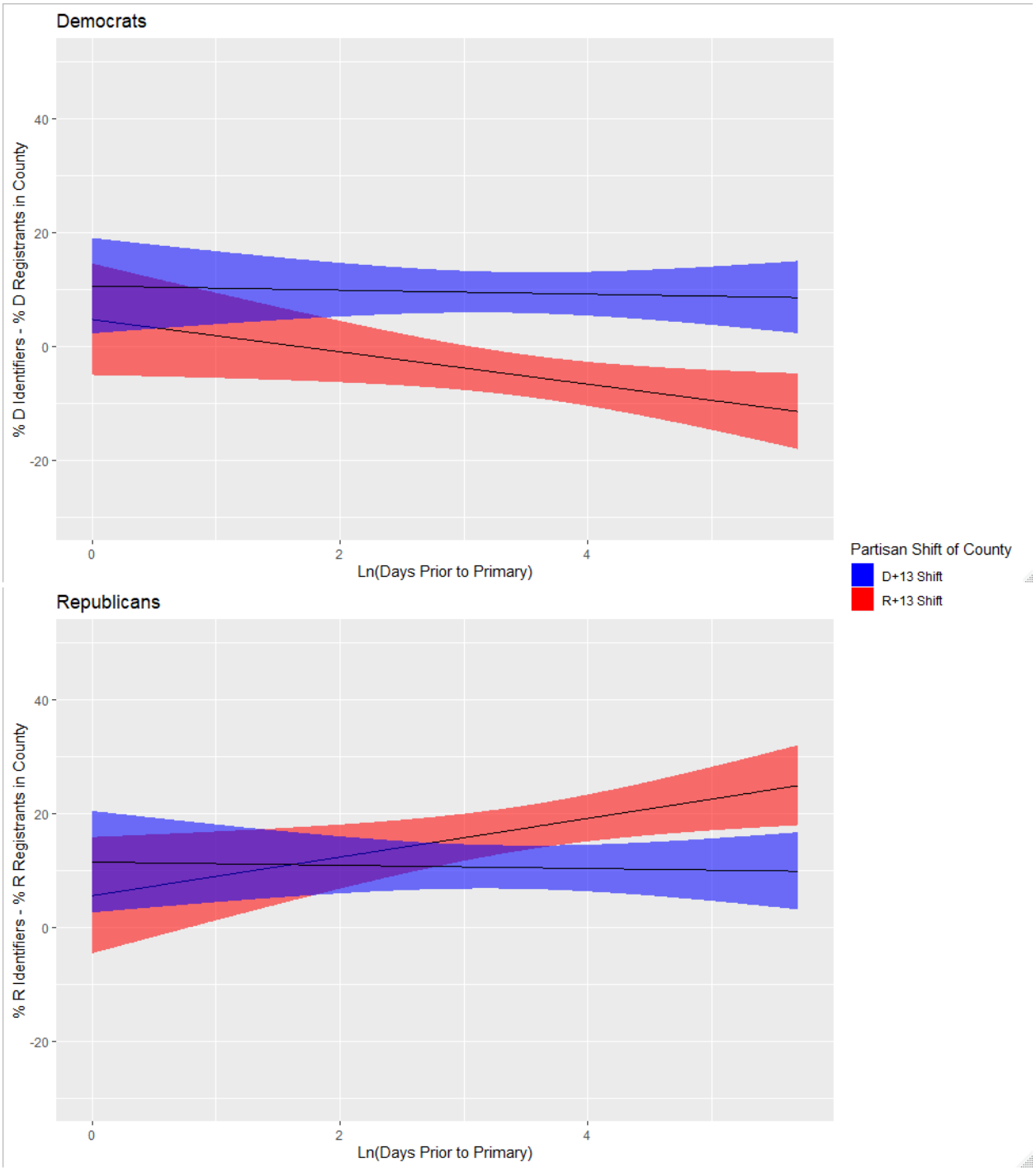

Figure 1 Partisan Shift and Party Registration Closing Date Effect on Party Identification-Party Registration Difference, 2010

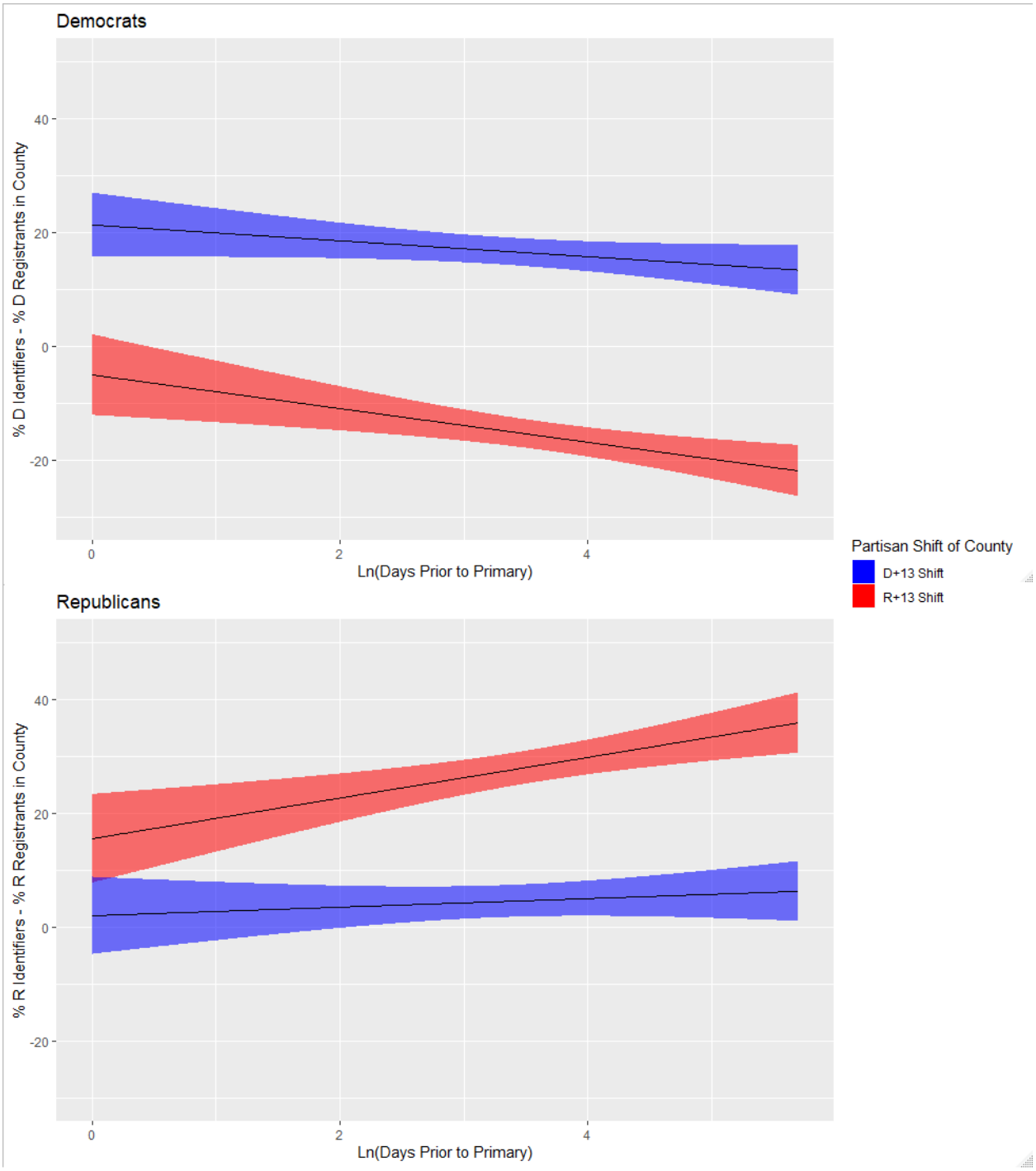

Figure 2 Partisan Shift and Party Registration Closing Date Effect on Party Identification-Party Registration Difference, 2014

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The effect of party registration closing date on the partisanship difference matches my predictions. For both 2010 and 2014 in a hypothetical county in which Democrats move 13 points in a Republican direction over the past 14 years, increasing the closing date further in advance of the primary leads to a larger negative value for the dependent value, indicating a larger number of individuals registered as Democrats relative to the number of people supporting the party at the ballot box (the red line and interval for the Democratic diagrams). This is in keeping with the theory that a closing date further in advance of the primary election in a county moving *away* from the Democrats leads to many individuals "stranded," or registered with the party but not supporting it. In contrast, among Democrats in a county moving 13 points in a Democratic direction over the past 14 years (the blue line and interval for the Democratic diagrams) the values are positive on the dependent variable, indicating that in a county that has been trending Democratic, there is a greater share of individuals voting Democratic than the share registered with the party.

Among Republicans, in a county that has been shifting towards the GOP over the past 14 years, early closing dates increase the difference between the number of Republican voters in a county relative to the number of Republican registrants. This accords with the pattern we should see: As a county trends Republican, an early closing date should be associated with more Republican voters being stranded with their old party and not registered as Republicans.

Mediation Analysis

The regression analysis in the previous section demonstrates that the difference between aggregate party identification and party registration in counties is predicted by an interaction of the party registration closing date and change in partisanship for the county in recent years. The patterns observed are consistent with the idea that party registration closing date affects the

ability of registrants to bring their party registration in line with their party identification. Thus, in counties that have experienced a large shift in partisanship relatively recently, an earlier party registration closing date in their state is associated with a greater absolute value of the difference between aggregate party identification and party registration compared to counties that have had relatively stable partisanship and/or a party registration closing dates near the primary election.

However, our quantity of interest is ultimately not the difference between party identification and party registration but instead turnout in primary elections. My theory postulates that the latter follows from the former, which in turn is driven by partisan shift and party registration closing date. Given the point made by individuals such as Ansolabehere and Konisky (2006) and Burden et al. (2014) that electoral institutions and turnout likely have an endogenous relationship, I use causal mediation analysis to establish that the effect of party registration closing date on primary election turnout occurs *through* the mismatch between party identification and party registration in a county. It remains the case that party registration closing date is not randomly assigned among the counties analyzed. Thus, omitted variable bias is still possible. However, using causal mediation analysis does allow me to estimate how robust my results are to omitted variable bias and correlation among the residuals in the mediation and outcome models.

My measure of primary turnout is based roughly on the measure recommended by Norrander (1986) using the normal vote. My numerator is the number of individuals in the county participating in the primary election in 2010 or 2014 for the respective party. The denominator is measured as the number of registered voters in the county times the average proportion of voters in the county supporting the party's presidential candidates in the previous two presidential elections. Thus, the primary turnout variable measures the number of

participants in the primary out of the estimated number of supporters of that party who are registered to vote.

Various methods of causal mediation analysis exist. I utilize the counterfactual model of causal mediation developed by Imai et al. (2010). This model of causal mediation analysis does require the sequential ignorability assumption, which may not be satisfied. However, results sufficiently robust to omitted variable bias affecting both mediator and outcome will give confidence, along with the results presented in the next section, that the findings obtained are not solely due to a spurious relationship.

Table 3 Causal Mediation Equations, Democrats

		Democratic ID-Reg Difference		Democratic Turnout	
		2010	2014	2010	2014
Variable		Coeff. (Std. Error)	Coeff. (Std. Error)	Coeff. (Std. Error)	Coeff. (Std. Error)
Closing Date	*Ln(Days Between CD and Primary)*	-2.106*	-3.129***	0.148	-2.179***
		(0.992)	(0.830)	(0.434)	(0.548)
Republican Shift	*County GOP Shift in Presidential Vote 2000 to 2012*	-9.265	-66.230†	-39.850	-58.111
		(49.266)	(34.468)	(47.587)	(39.715)
CD x Republican Shift	*Interaction Term*	-25.339	-17.252†	9.944	9.247
		(17.152)	(10.085)	(8.990)	(8.736)
Democratic Reg. Deficit	*Democratic ID-Reg Difference*	-	-	-1.130***	-1.262***
		-	-	(0.131)	(0.083)
State Party Strength	*Moderate Strength*	-14.109***	-12.174***	1.832	-0.179
		(2.561)	(1.654)	(4.302)	(1.851)
(Ref Cat: *Strong*)	*Weak Strength*	-21.079**	-15.536***	-0.337	-2.561
		(6.588)	(3.991)	(3.230)	(3.249)
Online Registration	*Voters Could Change Party Reg. Online*	-2.406	7.141**	-9.910***	4.663
		(3.407)	(2.515)	(1.576)	(3.008)
OR x Republican Shift	*Interaction Term*	132.460**	37.967	-4.867	-119.907***
		(49.981)	(25.408)	(9.026)	(22.603)
Constant	*Constant*	22.731***	20.996***	29.887***	31.770***
		(3.207)	(2.078)	(2.955)	(2.219)
	Number of Observations	795	795	795	787
	R^2	0.613	0.764	0.780	0.764

†p < 0.1; *p < 0.05; **p < 0.001; ***p < 0.001
Dependent Variable in Percent; Republican Shift in Proportion
OLS with Robust Standard Errors Clustered on State

Estimates for the mediation (i.e. party identification-party registration difference) and outcome (i.e. primary turnout) models are shown in Tables 3 and 4. While I used a multilevel mixed-effects model with a second level at the state to initially estimate the partisanship differences in Table 2, I re-estimate the models here using OLS with robust standard errors

clustered on the state. This is done due to the difficulty with applying the Imai et al. (2010) method with mixed models but a desire to account for heterogeneity at the state level.

Table 4 Causal Mediation Equations, Republicans

		Republican ID-Reg Difference		Republican Turnout	
		2010	2014	2010	2014
Variable		Coeff. (Std. Error)	Coeff. (Std. Error)	Coeff. (Std. Error)	Coeff. (Std. Error)
Closing Date	*Ln(Days Between CD and Primary)*	0.993	3.496***	-3.521***	-6.384***
		(1.225)	(0.815)	(0.663)	(1.817)
Republican Shift	*County GOP Shift in Presidential Vote 2000 to 2012*	-25.194	55.512	20.816	91.348**
		(59.637)	(40.624)	(22.048)	(28.795)
CD x Republican Shift	*Interaction Term*	27.505	13.826	1.811	-8.660
		(18.572)	(11.928)	(5.556)	(6.987)
Republican Reg. Deficit	*Republican ID-Reg Difference*	-	-	-0.974***	-0.827***
		-	-	(0.070)	(0.125)
State Party Strength (Ref Cat: *Strong*)	*Moderate Strength*	-2.434	-10.490***	9.915***	15.782*
		(3.392)	(2.854)	(2.821)	(6.330)
	Weak Strength	0.837	-11.641***	13.946***	32.024***
		(6.242)	(3.454)	(2.783)	(7.609)
Online Registration	*Voters Could Change Party Reg. Online*	-4.308	0.717	13.682***	7.373
		(4.736)	(2.294)	(1.894)	(4.832)
OR x Republican Shift	*Interaction Term*	-140.070**	-48.659***	67.224**	-39.521**
		(49.936)	(18.737)	(20.618)	(15.764)
Constant	*Constant*	10.723**	14.287***	43.828***	36.532***
		(3.756)	(1.820)	(2.318)	(3.085)
Number of Observations		795	733	795	733
R^2		0.275	0.576	0.734	0.664

†p < 0.1; *p < 0.05; **p < 0.001; ***p < 0.001
Dependent Variable in Percent; Republican Shift in Proportion
OLS with Robust Standard Errors Clustered on State

Table 5 provides summaries of the causal mediation analysis for all four elections examined. It is important to note that 2010 and 2014 were atypical elections, in that both were regarded as major landslides for the GOP. Unfortunately, at the time of this writing, data for comparably Democratic-leaning elections, such as 2006 or 2018, are not available. We are interested in the average causal mediation effect (ACME), the effect of the treatment (party registration closing date) on the outcome (primary turnout) that works through the mediator (partisanship difference variable). Because the models predicting the mediator in Tables 3 and 4 include an interaction term between party registration closing date and Republican shift of the county, we can examine the ACME and how it differs in counties that had shifted in a Democratic and Republican direction in recent years prior to the 2010 and 2014 primaries.

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Because the effect of party registration closing date on partisanship difference changes with the recent partisan shift of the county (Table 2), we should expect the ACME to as well. For ease of interpretation, the ACMEs are plotted in Figure 3.

Table 5 Mediation Analysis Summary

Primary	Value of Moderator	ACME	ADE	Total Effect	Prop. Mediated	Rho
2014 D	*R+13*	6.792 [4.926] [8.540]	-0.958 [-2.599] [0.840]	5.833 [3.552] [8.210]	1.164 [0.887] [1.700]	-0.74 [-0.75] [-0.72]
	D+13	1.109 [-0.202] [2.320]	-3.348 [-.4.443] [-2.200]	-2.239 [-4.030] [-0.650]	-0.501 [-3.238] [0.070]	
	Difference	5.672 [3.459] [7.896]	2.456 [0.458] [4.418]			
2014 R	*R+13*	-4.362 [-5.543] [-3.140]	-7.508 [-8.945] [-6.110]	-11.870 [-13.709] [-10.140]	0.366 [0.285] [0.450]	-0.62 [-0.65] [-0.59]
	D+13	-1.374 [-2.326] [-0.460]	-5.252 [-6.442] [-4.060]	-6.627 [-8.093] [-5.250]	0.208 [0.080] [0.330]	
	Difference	-2.985 [-4.609] [-1.509]	-2.195 [-4.117] [-0.409]			
2010 D	*R+13*	6.118 [4.276] [8.101]	1.467 [-0.158] [3.073]	7.586 [5.182] [10.187]	0.806 [0.642] [1.030]	-0.76 [-0.78] [-0.74]
	D+13	-1.313 [-2.735] [0.041]	-1.169 [-2.415] [0.029]	-2.482 [-4.444] [-0.687]	0.529 [-0.044] [1.030]	
	Difference	7.511 [5.085] [9.933]	2.595 [0.480] [4.653]			
2010 R	*R+13*	-4.449 [-6.177] [-2.771]	-3.275 [-4.515] [-1.992]	-7.724 [-9.859] [-5.655]	0.576 [0.430] [0.713]	-0.80 [-0.81] [-0.79]
	D+13	2.529 [1.361] [3.737]	-3.738 [-4.660] [-2.833]	-1.211 [-2.719] [0.279]	-1.855 [-23.040] [17.471]	
	Difference	-7.021 [-9.080] [-4.869]	0.479 [-1.072] [2.200]			

95% confidence intervals are in brackets; ACME = average causal mediation effect; ADE = average direct effect; Rho = correlation between residuals of mediation and outcome models where ACME = 0

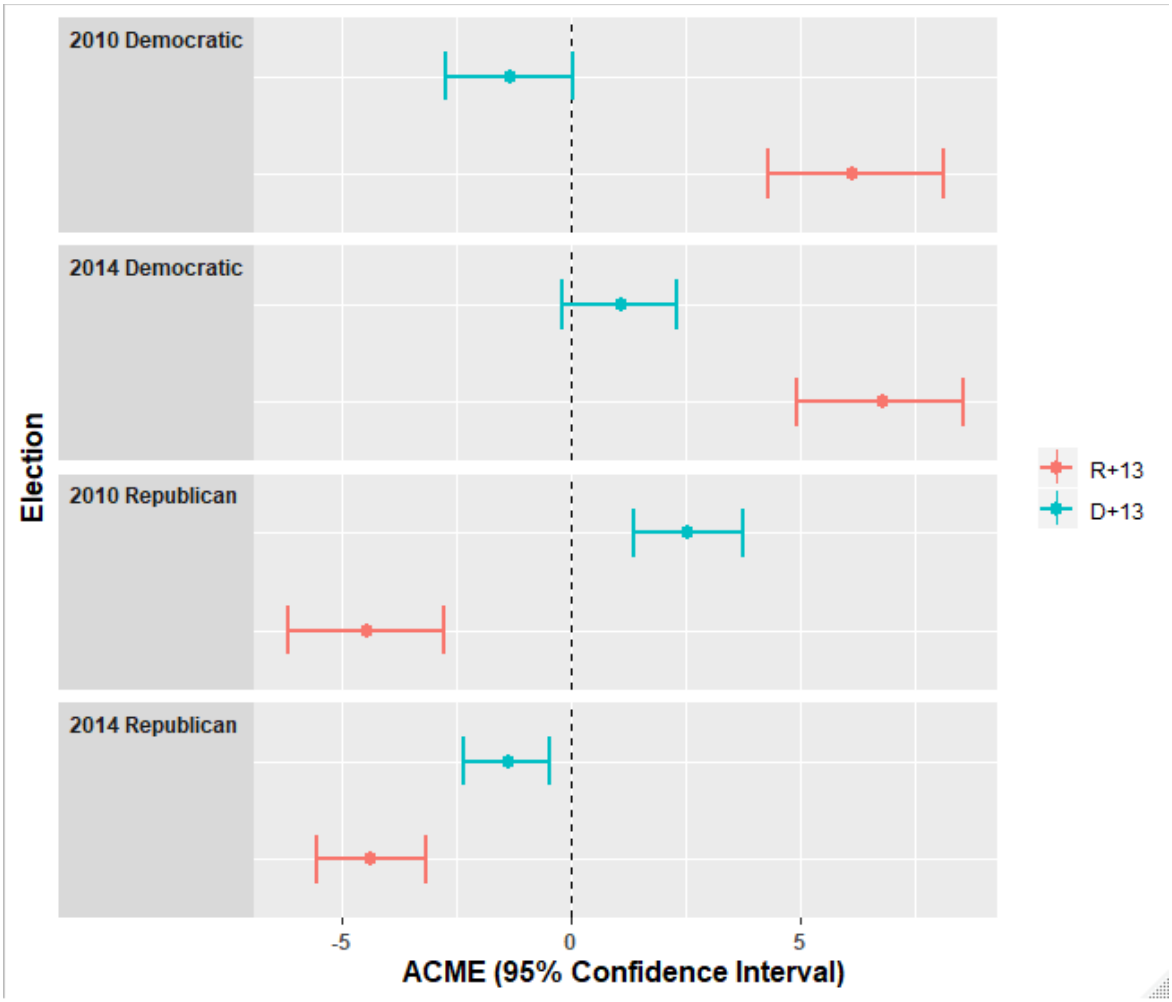

Figure 3 Average Causal Mediation Effects for Democrats and Republicans in 2010 and 2014

We consider first the ACME of Democratic primaries. In a hypothetical county shifting in a Republican direction (R+13), going from a state with a closing date on the day of the election to an early closing date leads to an increase in turnout in the Democratic primary of 6.1 points in 2010 and 6.8 points in 2014. It is important to emphasize this is the effect of the closing date that operates *through* the mediator of partisanship difference. In contrast, the ACME among a hypothetical county that shifted in a Democratic direction (D+13) is not statistically different from zero for either 2010 or 2014 in the Democratic primary. In both years for Democrats, the difference in ACMEs between Republican-shifting and Democratic-shifting counties was

significantly larger than zero. This latter finding simply confirms that the ACME of closing date on turnout changes with the partisan shift of the county.

Put plainly, the ACMEs calculated for the Democrats in 2010 and 2014 measure the effect of going from a state with a party registration closing date on the day of the election, such as Iowa or Wyoming, to a state with a closing date 148 days in advance of the primary, such as Kentucky. Among a hypothetical county that has moved in a heavily Republican direction in recent years, going from a state with an Election Day closing date to a state with an early one will lead to significantly more ex-Democrats in the county "stranded" with their old party, which will in turn translate to an increase in Democratic primary turnout of approximately 6.5 points as some of these individuals vote. This accords with findings that show significant numbers of registered Democrats in Oklahoma that changed party registration when given the opportunity regularly participated in the Democratic primary up until they made the switch (Thornburg 2018) and observations that turnout is a habit (Coppock and Green 2016). For Democrats in a county shifting in a Democratic direction, differences in closing date did not significantly affect primary turnout.

For the Republican primaries in 2010 and 2014, causal mediation shows that in a hypothetical county moving in a Republican direction in the years prior to the primaries, moving from a state with an Election Day closing date to a state with an early one is associated with a decrease in Republican primary turnout of approximately 4.3 points. As before, this is an estimate of the turnout decrease that operates *through* the aggregate difference between Republican party identification and party registration. This is a significantly stronger ACME compared to counties that have moved in a Democratic direction.

Once again, Table 2 shows that counties moving in a Republican direction with an early closing date have a large, positive difference between Republican party identification and party registration, indicating that there are more identifiers with the Republican Party in these counties than individuals registered, in keeping with our predictions. As expected, this leads to lower turnout in Republican primaries in these counties (as a proportion of Republican identifiers) because many of these Republicans are not able to vote in the GOP primary election.

Finally, sensitivity analysis was conducted of all four primary elections analyzed with causal mediation analysis, and a rho and its confidence interval were computed. The rho measures the correlation that would need to exist between the residuals of the mediator and outcome models to cause the ACME to fall to zero (i.e. be a spurious relationship). In all four models, the rho is quite large (> 0.6) with a tight confidence interval, showing that the ACME and model is robust to omitted variable bias.

Party Registration Closing Date and the Timing of Party Affiliation Change: Evidence from Maryland

One of the major drawbacks of the foregoing analysis is that it uses cross-sectional data to describe the role of institutions in a dynamic process. Evidence from voter registration data (Gimpel, Dyck and Shaw 2007) shows that voters register in response to the salience of the election. Overall, there is an increase in voter registration rate as the election grows closer, leading registration closing dates to depress turnout. We should expect to observe a similar pattern in changes to party affiliation as the primary approaches. We should see both that as the primary election gets closer, changes to party registration will increase in frequency and that an early party registration closing date will serve to depress the rate of change overall.

Among the states with party registration, the only one recording and making publicly available data on *changes* in affiliation is Maryland. Maryland provides monthly reports on the

number of already registered voters who choose to change party affiliation in the state. While the data is relatively coarse at the level of months, analysis should show patterns in the rate of party registration change.

Fortuitously, these data also allow us to observe a major change in policy regarding party registration closing date in the state. Previously, voters had to change their party registration prior to twelve weeks before a primary election in order to vote in the primary. While requests for a change to party registration made after the closing date but before the primary were still eventually processed, these late alterations were not made until *after* the primary. Beginning in 2010, Maryland law was amended to change this party registration closing date from twelve weeks to three weeks in advance of the primary. We should therefore be able to use these monthly data to compare patterns in changes to party registration with a short closing date to changes with a lengthy one.

Figure 4 plots the monthly rate of party registration change for the years of the 2006 and 2010 midterms. The x-axis plots the number of days prior to (and after) that year's primary, while the y-axis plots each month's change as a proportion of all voters. 2006 was the last midterm election before the change in law, and 2010 was the first midterm after the change. These elections were chosen to isolate the effect of shortening the party registration closing date on rate of changing party. Two years after the closing date was shortened, in 2012, Maryland also introduced a tool to allow voters to change party affiliation and other information online. Thus, a comparison of similar presidential primary years before and after the change in closing date (i.e. 2008 v. 2016 or 2004 v. 2012) would also be comparing years before and after the advent of online registration, potentially introducing a spurious relationship.

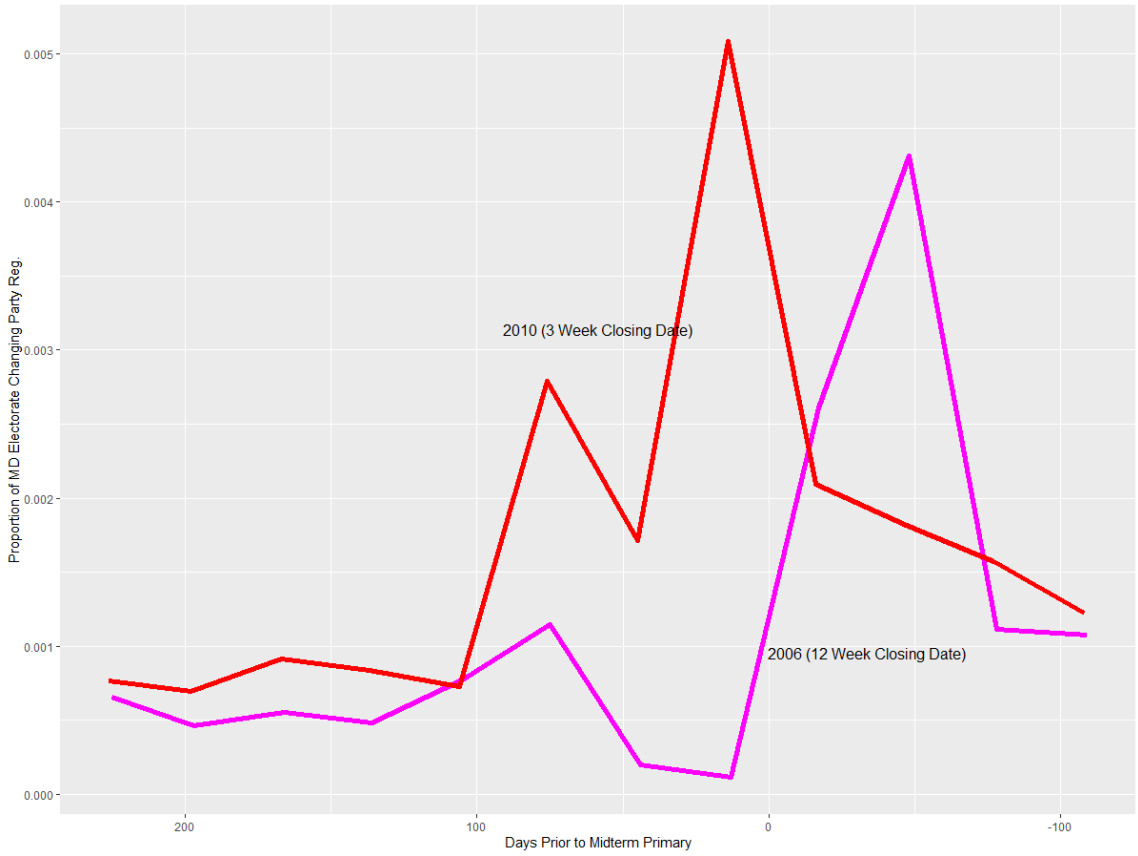

Figure 4 Party Registration Change by Month Before and After Shortening Party Registration Closing Date

Figure 4 clearly shows a divergence in registration patterns in 2006 versus 2010 in the lead-up to the date of the primary (0 on the x-axis). In 2006, with the early party registration closing date in place, as expected, in the three months prior to the primary, the rate of party registration change as a proportion of the total number of registered voters each month drops to nearly zero. This is partially compensated for in the months after the primary when, presumably, registrars processed the change requests that had been made after the closing date but had been held in limbo until after the election. However, overall, during the year, only 1.3% of all registered voters requested a change to their party affiliation.

In contrast, in 2010, with the party registration closing date moved to just three weeks prior to the primary, we see a sharp spike in the months leading up to the primary in the rate of changing party affiliation. Though not as many changes were processed *after* the primary as 2006, the number of registration changes taking place in the months prior to the primary greatly exceeds this. Overall, when looking at the whole year, 2.0% of all voters in 2010 requested a change to their party affiliation, a greater than 50% increase over 2006. Given that the rates of changing affiliation in the early months of the year are quite similar between 2006 and 2010, it seems clear that most of this difference is due to the different patterns of registration change around the primary.

Some voters in 2006 did submit changes to their party affiliation after the closing date, presumably in the hopes of being able to vote in primaries in future years (as evidenced by the spike in the months immediately after the primary when their changes were processed). However, it is clear from the overall rate of change over the whole year that the early closing date in 2006 deterred some voters compared to 2010, given the much greater overall rate of change in the latter year.

Conclusion

For the 2010 Democratic primary in Ballard County, KY, measured using the methodology of this paper, the turnout rate was >70%. The corresponding turnout rate for the Republican primary was less than 7%. In fact, more people voted in the 2010 Ballard County Democratic primary than voted for the Democratic candidate for Senate in the 2010 *general* election. This paper suggests a reason for the disparity in turnout rates and the puzzling difference in support that Democrats had in the primary election versus the general.

Though the voters of the county had long since drifted towards the Republican Party, four out of five registrants there were affiliated with the Democratic Party in 2010, compared to just 15% of voters registered as Republicans. Surely many—perhaps most—of those loyal to the Republican Party in Ballard County remain registered as Democrats. The difficulty in changing party in Kentucky, including a deadline to do so almost half a year before the primary election, contributes to the number of Republicans "stranded" with their old party.

Voter turnout balances costs against benefits. Deadlines to register to vote that are well in advance of the election lead to lower turnout because they increase the marginal cost of voting by forcing voters to plan ahead and decrease the perceived benefits through the human tendency to discount the value of future events. Thus, voter registration closing dates well in advance of an election lead to lower turnout. The present research has extended this literature on closing dates to the institution of party registration in states with closed primaries. While voter registration closing dates are limited by federal law from extending more than one month prior to an election, no such restriction exists for the deadline a voter has to change from one political party to another. This means that in many states with party registration, to change parties, a voter must reregister months in advance if he or she wishes to vote in a different party's primary.

I have proposed here that party registration closing date leads individuals who change party loyalties to fail to update their party registration to match their new self-identification. This obsolete registration, in turn, leads to changes in primary election turnout given that voters identify with one party and are registered with another. In areas that have experienced realignment and most shifts in party identification have been in one direction, the aggregate party registration of an area may significantly differ from the party identification of those same voters.

This will tend to artificially elevate turnout for the party that has lost identifiers and deflate it for the party that has gained support. Early party registration closing dates will exacerbate this issue.

Using aggregate data at the county level for closed primary states in 2010 and 2014, I show that party registration closing date exerts just this effect, first on the difference between county party identification and party registration for Democrats and Republicans and then on the turnout in the primaries. Counties that have experienced a shift in, say, a Republican direction and are located in a state with an early party registration closing date show a significant deficit in registered Republicans compared to the party's electoral support. In contrast, such counties contain large numbers of Democratic registrants, despite the low level of Democratic support that may now exist at the ballot box.

Using causal mediation analysis, I show that in both the 2010 and 2014 elections, early party registration closing date affects aggregate primary turnout via aggregate party registration. In counties that have moved in a Republican direction, the effect of the early closing date led to elevated turnout in the Democratic primary and depressed turnout in the Republican primary. In contrast, the effect was not different from zero among counties that had moved in a Democratic direction prior to the primary.

Finally, examining patterns of change in party registration in Maryland during midterm years before and after an alteration in the party registration closing date, I found different patterns of affiliation change. When Maryland had a party registration closing date twelve weeks in advance of the primary election, the three months immediately prior to the primary election showed almost no changes in party registration and an overall low level of change during the year. In contrast, when the closing date was shortened to just three weeks ahead of the primary, a

clear increase in the rate of changing party registration in Maryland was visible as the primary approached. Overall, the latter year showed a much greater rate of changing party affiliation.

Party registration and closed primaries were initially instituted by policymakers to serve as a barrier to infiltration of primary elections by mischievous voters of the other party. As with many electoral institutions, the strategy undertaken to erect a barrier to this mischief was to raise the costs of voting in the primary for those who were not committed to the party, often including a deadline to change parties well in advance of the election. A critical assumption made by policymakers in doing this was that voters' party identification did not change. Party identification indeed remains a durable political attitude, but it is not immune to change.

When a voter changes party identification and supports a new party, the barriers erected to prevent mischievous crossover voting may perversely serve to trap a voter in the primary electorate of their old party. Thus, in the face of large-scale realignments, early party registration closing dates may ironically lead large numbers of voters to be registered with a party they do not identify with.

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Appendix A: Party Registration Closing Dates for Closed Primary States

State	Days in Advance of 2010 Primary	Days in Advance of 2014 Primary
Connecticut	92	92
Delaware	162	99
Florida	29	29
Iowa	0	0
Kentucky	138	140
Maryland	21	21
Nebraska	18	18
Nevada	21	21
New Mexico	28	28
New York	247	256
Oklahoma	56	85
Oregon	21	21
Pennsylvania	29	30
South Dakota	15	15
Wyoming	0	0

[1] Replication data are available at the author's website: http://www.mthornburg.net.

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