

Analyzing the Effects of a Switch to By-District Elections in California*

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Abstract: Literature finds that an underrepresented group’s comparative share of the population may moderate the effects of the California Voting Rights Act of 2001 on descriptive representation. Little attention has been devoted to the potential mechanisms driving these effects. Previous research suggests that electoral influence, conceptualized as an underrepresented group’s relative size in a given political unit, can lead to an increase in turnout and subsequent descriptive representation. This paper leverages ecological inference with nearest-neighbor matching and difference-in-differences methods to determine whether increased electoral influence following a switch from at-large to by-district elections as a result of the CVRA increased turnout among underrepresented groups.

1. Introduction

The tension between the ideals of equal representation and the realities of the electoral institutions that formalize political representation into government is the identity crisis at the center of American democracy. At the time of its ratification, the United States Constitution only granted voting rights to property-owning white males, just six percent of the population.¹ The right to vote was extended to formerly enslaved males with the Fifteenth Amendment in 1870, and to women with the Nineteenth Amendment in 1920.

But voting rights, while extended to racial minorities in theory, were often restricted in practice, particularly in the post-Reconstruction era. Black voters in particular were deliberately disenfranchised through poll taxes, literary tests, and a glut of methods meant

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¹https://web.archive.org/web/20160706144856/http://www.archives.gov/exhibits/charters/charters_of_freedom_13.html

to dilute and diminish their voting power, leading to decades of legal struggles. Perhaps the most notable reforms and protections for racial minority voting rights were established by the Voting Rights Act of 1965, passed at the height of the civil rights movement. The legislation's general provisions established a legal framework to establish cases of vote dilution and litigate solutions.

Vote dilution claims under the Voting Rights Act have often centered on a particular electoral system: at-large voting. In an at-large election, voters in the entire jurisdiction decide on all of the jurisdiction's legislative seats. Under this system, if voting preferences are split along racial lines, a cohesive majority group will win all the available seats, effectively disenfranchising the minority. In contrast, by-district elections divide the jurisdiction into districts and grant each district a legislative seat. If minorities are sufficiently geographically compact, districts can be drawn to grant them a local majority and consequently improve their representation in the legislative body.

Much like the federal Voting Rights Act, California's Voting Rights Act (CVRA) aims to reduce legal barriers and racial discrimination facing minority groups in the electoral process. The CVRA, passed in 2001, primarily does so through restrictions on at-large elections that “impair the ability of a protected class to **elect candidates of its choice or its ability to influence the outcome of an election** [emphasis added].” Additionally, the CVRA eliminates the geographic concentration requirement of its federal counterpart. In this way, the CVRA reduces the burden of proof against at-large city elections such that plaintiffs need only to provide evidence of racially polarized voting. The CVRA also orders city governments to pay attorney fees, expert expenses, and other court costs to the plaintiff in cases where the plaintiff wins and in cases where the city government settles before a verdict is reached.

Thus, by design, the CVRA encourages a switch to by-district elections in two ways. The CVRA lowers costs and the threshold for success to plaintiffs, while also incentivizing city governments to preemptively switch to by-district elections to avoid costly legal battles and

maintain a degree of control over the redistricting process. Its implementation was delayed by a number of legal challenges, and several cities that faced CVRA lawsuits initially responded with prolonged legal defenses. This led to a number of high-profile legal losses, after which many cities began to voluntarily switch to by-district elections when threatened with a lawsuit. As a result, more than 80 California cities have begun or completed a switch from at-large to by-district elections as a result of the CVRA since its passage, mostly in the last two years. This shift has not come without controversy; the defense attorney for the city of Modesto argued that the CVRA fails to establish that minority groups will benefit from the switch to by-district elections², and others suggest that an adoption of by-district elections has led to fewer minority elected officials than expected.³

These criticisms, as well as the magnitude of this institutional reform, raise a simple question: has a switch to by-district elections increased minority influence on election outcomes? This question has been the focus of a debate in the scholarship that remains inconclusive. Many find that by-district elections lead to better Black and Latino representation in legislative bodies (Berry and Dye 1979; Bledsoe 1986; Davidson and Grofman 1994; Davidson and Korbel 1981; Engstrom and McDonald 1981; Grofman, Handley and Lublin 2001; Grofman 1992; Karnig and Welch 1982; Leal, Martinez-Ebers and Meier 2004; Lublin 1997*b*, 1999; Lublin and Voss 2000; Marschall, Ruhil and Shah 2010; Meier et al. 2005; Molina and Meier 2016; Moncrief and Thompson 1992; Polinard 1994; Robinson and England 1981; Stewart, England and Meier 1989). Some, however, find no effect or mixed effects between by-district elections and minority representation (Bullock and MacManus 1993; Cole 1974; Fraga and Elis 2009; Fraga 2015; MacManus 1978; Trounstone and Valdini 2008; Welch 1990) and still others find a negative relationship (Meier and Rutherford 2016; Welch and Karnig 1978).

The apparent incongruence in the literature is reconciled somewhat by Trounstone and Valdini (2008)'s findings that by-district elections increase representative diversity only when a minority group is highly concentrated and is a relatively large share of the population.

²<https://www.sfgate.com/politics/article/MODESTO-Minority-voting-rights-law-declared-2688758.php>

³<https://www.latimes.com/politics/la-pol-ca-voting-rights-minorities-california-20170409-story.html>

Additionally, Fraga (2016) argues that much of the research focused on descriptive representation fails to disentangle the effects of candidate race/ethnicity from the effects of a jurisdiction's racial/ethnic composition. Taken together, these findings suggest a shortcoming in the literature examining the benefits of a switch to by-district elections; because observable changes in descriptive representation are mediated by geographic concentration and relative population size, a switch to by-district elections may not produce a measurable result.

Instead, voter turnout is a potential measure of minority group influence on election outcomes that is not constrained by these limitations. Drawing on the empowerment theory conceptualized by Bobo and Gilliam (1990), a robust body of work suggests that minority empowerment is a critical determinant of minority voter turnout (Barreto 2010; Fraga 2016, 2018; Gay 2001; Leighley 2001; Tate 2003). In an analysis of congressional districts, Fraga (2018) finds that minority turnout is higher when a given minority group is a substantial portion of the potential electorate, even when controlling for co-ethnic candidates, electoral competition, or other demographic factors. Additionally, Fraga finds a causal relationship between an increase in turnout and assignment to a jurisdiction where a given minority group is a majority of the potential electorate.

Using a conceptualization of empowerment theory, which suggests that voters' perceptions of their electoral environment and electoral influence shape their political behavior, Fraga establishes a causal link between districting and a reduction in the turnout gap as well as the role turnout plays in attempts to reduce disparities in minority representation. By using congressional districts as the electoral jurisdiction of interest, however, Fraga's findings are limited to federal elections. Additionally, work by Hajnal (2009) suggests that the impacts of uneven turnout are particularly pronounced at the city council level. As the CVRA expressly prohibits at-large elections that impair the ability of minority groups to influence election outcomes, this work provides a convincing argument to use minority turnout as a measure of the CVRA's efficacy in improving minority electoral influence.

To this point, there has been little investigation as to the effect a switch from at-large to by-district elections has on turnout in local elections. As a result, I hope to investigate what relationship, if any, exists between the CVRA-induced change in electoral institution and minority turnout. Building on previous research, I find that a switch from at-large to by-district elections led to a decrease in the Hispanic-White and Asian-White turnout gaps.

My work improves on previous empirical scholarship in at least three ways. First, I add to the growing literature that operationalizes minority empowerment as dependent on relative group size and uses turnout, rather than candidacy or officeholding as a measure. In doing so I find further evidence to support the findings of previous work, such as Collingwood and Long (2019), that suggest policies like the CVRA can improve descriptive representation, while my novel approach addresses potential oversights in their methodological approaches. Critically, using turnout as a measure of minority group empowerment accounts for cases that previous models may fail to account for, such as elections where a minority group's preferred candidate is not a coethnic one.

Second, much of the literature on by-district elections is limited by model-based methodological approaches whose findings are potentially confounded by selection effects. By employing a difference-in-differences approach, I address potential concerns about selection effects and endogeneity, and begin to contribute to potential links between CVRA-related redistricting and reductions in the minority turnout gap.

Finally, I extend Fraga (2018)'s theory of electoral influence, a relatively novel theory with deep normative implications, to local elections. Previous work by Hajnal (2009) suggests that differences in minority turnout at the city council level lead to especially striking imbalances in minority representation and uneven distribution of public goods. My findings provide evidence that redistricting as a result of the CVRA can begin to address these inequities and may pave the path toward more responsive and equitable local government.

2. Theory

Much of the literature on minority representation operationalizes minority representation in terms of descriptive representation, defined as a coethnic candidate of a given minority group. At first blush this seems like a natural choice; coethnic candidates are a quantifiable measure with little ambiguity. Additionally, descriptive representation often improves representation in a myriad of ways: it has been shown to increase minority groups' trust in government, lead to higher quality legislative support for constituent minority groups, and provide other substantive benefits (Brown and Banks 2013; Brown 2014; Dovi 2002; Hero and Preuhs 2013; Mansbridge 1999; Phillips 1995).

The work investigating a link between a switch to by-district elections and increased descriptive representation fails to reach a definitive conclusion. While some find null, mixed, or negative links between a switch to by-district elections and minority representation, most find that by-district elections systematically increase minority representation (e.g, Berry and Dye 1979; Bledsoe 1986; Davidson and Korbel 1981; Welch 1990). These studies are limited by their methodological approach; by using model-based analyses they insufficiently consider confounding variables and potential selection effects that might drive the switch from at-large to by-district elections.

The literature is additionally complicated by Trounstine and Valdini (2008), who find that by-district elections only improve minority representation in cases where a minority group is both geographically concentrated and makes up substantial portions of the population, a critical finding that explains some of the ambiguity in the literature. The implication is that a shift from at-large to by-district elections may not immediately produce the intended result, and any findings would be most pronounced where minority groups are a considerable share of the electorate. As a result, considering population share in the overall jurisdiction and a given district becomes essential for research hoping to establish any causal relationship. Much of the previous scholarship relies on data sets that fail to account for these effects,

which intuitively would blunt any findings on the relationship between a switch to by-district elections and minority representation.

Given these complications, there is still a notable dearth of scholarship that attempts to address these concerns while specifically investigating whether a mechanistic link between the switch to by-district elections and increased racial and ethnic representation at the local level exists. One such study, Collingwood and Long (2019), examines whether a switch to by-district elections as a result of the CVRA increased descriptive representation on city councils. Collingwood and Long find that CVRA-induced switches to by-district elections lead to a 10 percent improvement in minority representation, and a 20 percent increase in cities with large Latino populations. Consequently, Collingwood and Long reinforce previous findings as to the importance of minority population share while highlighting another important limitation of the current literature, which almost exclusively uses descriptive representation as a measure. Because city council seats are all-or-nothing, if a CVRA-induced switch to by-district elections leads to a 10 percent increase, equivalent to half a city council seat, using descriptive representation to measure the success of the CVRA will miss potential positive effects. Even absent a minority electoral victory, the CVRA could increase council responsiveness to minority concerns by creating jurisdictions where minority groups are a larger share of the electorate and have increased electoral influence.

Furthermore, the CVRA's definition of "candidates of [a protected class]' choice" as co-ethnic candidates fails to consider potential VRA violations where racially polarized voting exists, yet there are no coethnic candidates and thus no chance to measure descriptive representation. This consideration is especially important given the fact that minority groups remain underrepresented among candidates for office (Hajnal and Trounstein 2007; Shah 2014). There are other limitations to descriptive representation's ability to measure minority groups' political power: the stark ideological difference between minority groups and elected officials only becomes significantly reduced when minority groups compose majorities of a city council (?) and because turnout shapes local officials' behavior (Hajnal 2009), non-coethnic

candidates could be responsive to an engaged minority group. “Latino voters get to elect a candidate of their choice. That’s not always a Latino candidate,” noted Thomas Saenz, head of the Mexican American Legal Defense and Educational Fund. Furthermore, activists have noted that a number of CVRA suits have occurred in jurisdictions that lack the organization to immediately field a minority candidate following the switch to by-district elections.⁴ Taken together, these considerations suggest that descriptive representation, while certainly an important measure of representation, is an incomplete lens through which to evaluate the California VRA. This is not to downplay the importance of descriptive representation; indeed, its benefits are well documented (Mansbridge 1999; Brown and Banks 2013; Brown 2014; Hero and Preuhs 2013). Rather, I suggest that descriptive representation provides an incomplete picture of minority representation. I hope to emphasize its role as a first step towards substantive representation that provides a useful but limited measure to evaluate minorities’ ability to influence election outcomes and improves minority participation.

Hajnal and Trounstein (2007) identify voter turnout as a notable barrier to minority representation in local politics, and argue that a move to district elections would substantially decrease minority underrepresentation and boost minority participation. Beyond descriptive representation, ? find that Black and Latino voters receive much better ideological representation when they make up a very significant share of the electorate. These findings are supported by Fraga (2018)’s theory of electoral influence, which suggests that minority voters turn out to vote at higher rates in places where they form a substantial share of the potential electorate and can therefore control election outcomes. Fraga’s model provides compelling evidence to use minority turnout as a measure to gauge minority electoral influence. To support this model, Fraga’s main measure of interest is the turnout gap between a given minority group and the white population in a jurisdiction.

Why use the turnout gap, rather than raw turnout rates, as a measure of political participation? There is of course the normative concern that disparities in political participation

⁴<https://www.latimes.com/politics/la-pol-ca-voting-rights-minorities-california-20170409-story.html>

ought to be reduced, a concern that is reinforced by scholarship that finds disparities in turnout impact both minority representation and the distribution of public goods. This effect is magnified at the local level (Hajnal 2009).

There are also several advantages to using the turnout gap. As a measure, it accounts for trends that apply across racial/ethnic groups, reducing the influence of non-racial factors. Second, because the data is drawn from several different sources, the turnout gap as a relative rate minimizes the impacts of these potential differences. And finally, the complex context which race and voting occupies in American history and politics necessitates turnout to be considered as a comparison across racial/ethnic groups at a given moment in time.

When considering the mechanics through which a switch to by-district elections might affect the minority turnout gap, Fraga's 2018 theory of electoral influence identifies three main mechanisms. The first is the Downsian calculus of voting (Downs 1957). The Downsian calculus of voting expresses the probability of voting as a consideration of the probability of an individual's vote being decisive, balanced against the benefits and costs of voting. Scholars have suggested that group dynamics and the consideration of collective benefits can shift the individual cost-benefit calculation toward participation when the individual's group is determinative in election outcomes (Uhlener 1989*a,b*). Morton (1991) and Fraga (2018) extend this logic to race/ethnicity, stating that groups' influence on the individual voting calculus is tied to the size of the group in question being large enough to impact outcomes.

The second is Empowerment Theory, first posited by Bobo and Gilliam (1990), which suggests that voters in a racial/ethnic group react to their political context and are more likely to turn out when they have "achieved significant representation and influence in political decision making". Some scholars have conceived of empowerment as minority officeholding or candidacy (Griffin and Keane 2006; Tate 2003; Henderson, Sekhon and Titiunik 2016). But others have operationalized empowerment as the relative size of a minority in a given jurisdiction to relative further success (Lublin 1997*a,b*; Spence and McClerking 2010; Fraga 2016).

Finally, Fraga points to scholarship that suggests elite mobilization plays an important part in leading to racial differences in who votes. In particular, Leighley (2001) establishes that elite mobilization is crucial to supporting turnout concurrently with her evidence that relative group size is an important factor in determining who is targeted. Thus, we would expect a redistricting process that deliberately increases a minority group's relative share of the electorate to increase elite mobilization of that minority group and boost its relative turnout rates.

These three theories, when applied across groups to relative rates of participation, create a strong argument to conceive of individual political behavior as a product of electoral context and a group's electoral influence. While the three mechanisms are endogenous and their effects may seem difficult to differentiate, among all three theoretical perspectives group size serves as a key predictor. Given the three theories above, in a jurisdiction where a given racial/ethnic group size is a larger share of the population, the group will be seen as more relevant to political outcomes, group members will feel more empowered, and there will be a greater incentive for elites to mobilize the racial/ethnic group. This should create a decrease in the disparity between participation for the given racial/ethnic group with other groups, when considered in comparison to jurisdictions where the racial/ethnic group is a smaller size in the population.

3. Hypothesis

As a result, I expect that a minority group's percent share of the electorate will be positively correlated with the minority turnout gap, defined as the difference between the turnout rate for a given minority group and the turnout rate for non-Hispanic whites. I predict these trends will play out in cities that undergo a switch from at-large to by-district elections as a result of the CVRA. I state this hypothesis, H_i , as follows.

H_i : The turnout gap between minority groups and non-Hispanic whites **will be**

smaller in California cities that switched from at-large to by-district elections than in demographically similar cities.

Additionally, I believe the turnout gap will decrease for minority groups whose share of the potential electorate increase as a result of a switch to by-district elections. This can be operationalized as H_{ii} through the following hypothesis:

H_{ii} : If a minority group is a relatively larger share of the electorate following the switch from at-large to by-district elections, **their relative rate of participation will increase** in comparison to non-Hispanic whites and **the turnout gap will decrease** compared to jurisdictions where minority groups did not increase as a relative share of the electorate.

Evidence from Trounstine and Valdini (2008) and Collingwood and Long (2019) suggests that these effects may be most pronounced in cities with high-density minority populations, particularly for Latinos. In cities where Whites are a commanding majority of the population, the white population will be perceived as most relevant for political outcomes and have greater electoral influence. Furthermore, when the white population is an especially large majority I expect the creation of district maps to be subject to majoritarian manipulation of electoral rules (Trebbi, Aghion and Alesina 2008). Therefore, I expect to observe a decrease in the turnout gap in city council districts where a minority group composes a larger share of the population, since elite mobilization as well as individual empowerment will increase when population share increases and the minority group will be perceived as more politically relevant. I hypothesize that a diminution of the turnout gap will be most realized in cities where a minority group composes a higher than average share of the population in comparison to cities where a minority group composes an average or lower than average share of the population. I structure this hypothesis as H_{iii} .

H_{iii} : In California cities that switched from at-large to by-district elections where a minority group is a higher than average share of the total population, the

turnout gap between minority groups and non-Hispanic whites will be **smaller on average** than in demographically similar cities.

4. Data and Methods

To investigate the effects on the turnout gap of a CVRA-induced switch from at-large to by-district city council elections, I need to define my treatment universe. I use the word ‘city’ to refer to any incorporated municipality in the state of California. I first identified which California cities underwent the transition from at-large to by-district elections after 2001, following the passage of the CVRA. I then used media coverage and other public records to verify that cities transitioned to by-district city council elections as a direct result of potential or actual CVRA lawsuits. This list was then refined to only include cities that had fully completed a switch to by-district elections. A city is considered to have completed the transition from at-large to by-district elections if each city council seat has a member elected through a by-district election. Applying these criteria leads to a list of 30 cities that have undergone a CVRA-related switch to by-district elections.

To prepare a causal inference matching design and perform a successful difference-in-differences (DiD) analysis, I defined a politically and demographically similar control group of cities that use at-large elections to pair to the cities in my treatment group. Here, I benefit from previous work by Collingwood and Long (2019) as our treatment universes are the same 30 cities. Collingwood and Long created a list of every city in California using data from the California Secretary of State’s office. They defined city-level demographics, including percentage Black, percentage Asian, percentage Hispanic, percentage change in Latino population from 2000 to 2010, percentage 4-year college education or higher, median household income, median age, and city population, using data from the 2010 Census. They also included party registration using data from the California Secretary of State. Finally, they performed a nearest neighbor match fitting these demographic data between the treat-

ment cities and all other cities in California. This produces a control group of 30 cities that use at-large voting in city council elections and are comparable to the treatment group along political and demographic factors. I used this control group as the basis of my analysis. I have included a matched list of the control and treatment groups in the appendix.

Having identified the treatment and control groups, I then collected turnout data for both groups at the city and district level. To start, I turned to the [California Elections Data Archive \(CEDA\)](#), a joint project of the Center for California Studies and the Institute for Social Research (ISR) at the California State University, Sacramento, and the office of the California Secretary of State, for vote counts. This dataset is an archive of vote totals at the city and district level for California elections dating back to 1995, which provided me with the numerator for turnout data. To fully calculate turnout rates, however, I had to find a measure to quantify the denominator: potential voters in a given jurisdiction.

I defined the turnout rate denominator using the citizen voting-age population (CVAP) in a given jurisdiction. Doing so at the district-level presented a potential challenge. The American Community Survey (ACS) is perhaps the most complete data source for CVAP counts. The ACS is a continuing monthly survey that produces period demographic estimates and uses estimates of the adult population to weight the sample and produce high quality data. I was able to obtain district-level CVAP estimates and other demographic data constructed from ACS data from the [National Demographics Corporation](#), an organization that worked directly with 23 of the 30 cities to leverage ACS data into district-level demographic data. As a result, my treatment and control groups were limited to 23 pairs of cities, but this limitation allows me to be confident in the demographic measures used.

Having obtained both vote totals and CVAP estimates, I was able to calculate turnout rates at the city and district level for the 23 pairs of cities in my sample. To calculate turnout gaps between minority groups and White voters, I needed to measure city and district-level turnout by racial group. I used [ecological inference](#) to leverage the vote totals from CEDA with the CVAP totals and demographic data from NDC and construct district-

level turnout by race. Finally, I was able to use the racial turnout levels generated through ecological inference to calculate the minority turnout gaps for any given group and district. The turnout gaps, per Fraga (2018), are defined as the difference between the turnout rate for a given minority group and the turnout rate for non-Hispanic Whites. Consequently, the turnout gap is 0 if a minority group and non-Hispanic Whites turn out at the same rates, positive if the minority group turns out at a higher rate than non-Hispanic Whites in the jurisdiction, and negative if the minority group turns out at lower rates than non-Hispanic Whites. Because the turnout gap is generally negative, a positive increase in the measured value of the turnout gap will generally lower the distance between minority and White turnout rates.

I employ a difference-in-differences fixed effects regression to estimate the average treatment effect of a shift from at-large to by-district elections has on the turnout gap. I stack the data into a panel where there is a pre-treatment and post-treatment observation for the treatment and control groups. Following the model outlined in Bertrand, Duflo and Mullainathan (2004), I then estimate the following equation for the Hispanic-White, Black-White, and Asian-White turnout gaps, clustering standard errors by city and controlling for election year and city effects:

$$\mathbf{Y} = \mathbf{A}_s + \mathbf{B}_t + \mathbf{cX}_{ist} + \beta \times \mathbf{I}_{st} + \epsilon_{ist}$$

In this equation, Y = the quantity of interest: the turnout gap between a given minority group and non-Hispanic whites given as a percentage difference. A_s represents the fixed effects for a city, B_t represents fixed effects for election years, X_{ist} are relevant individual controls and ϵ_{ist} is an error term. I_{st} is a dummy variable indicating whether a city has undergone redistricting at time t . I use this equation to create three fixed effect linear regression models and test H_1 .

I use another equation and the stacked panel data to test H_{ii} . Once again, I estimate

the following equation for the Hispanic-White, Black-White, and Asian-White turnout gaps, clustering standard errors by city and controlling for election year and city effects:

$$\mathbf{Y} = \mathbf{A}_s + \mathbf{B}_t + \mathbf{cX}_{ist} + \beta_0 \times \mathbf{I}_{st} + \beta_1 \times \mathbf{G} + \epsilon_{ist}$$

This equation is similar to the first, but includes the dummy binary variable G to indicate whether the minority group of interest increased in relative population share as a result of the switch to by-district elections. For cities that transition to by-district elections, G shows if a minority group is a larger share of the CVAP within a particular district than within the CVAP of the city at large. Specifically, $G = 1$ if an electoral observation is in the treatment group, postdates the switch to by-district elections, and the minority group in question increased in relative population share in comparison to their relative population share before the treatment under the at-large system. In all other cases, $G = 0$.

Finally, I calculate the mean population share for Hispanics, Blacks, and Asians in the panel data. Because Hispanics are the only minority group that compose a meaningfully large mean share of the electorate, I limit a test of H_{iii} to Hispanics. I create two subsets of each observation in the treatment group and its equivalent city from the control group, divided by whether the treated city has a CVAP percentage above or below the mean value of 38.2 percent. Thus cities (and their paired control) with a Hispanic CVAP population greater than 38.2 percent are considered “High Hispanic population” and cities (and their paired control) with a Hispanic CVAP population less than 38.2 percent are considered “Low Hispanic population”. I then repeat the DiD analysis above on the two subsets.

5. Results

Table 1 presents the results of my post-match OLS DiD regression test of H_i . I analyze my panel data with the equation specified above, adjusting for robust clustered standard

Table 1: Difference-in-Differences Regression Estimating Causal Relationship Between Cities Switching to By-District Elections Under the CVRA (Treatment) and the Turnout Gap by Race.

	Hispanic turnout gap	Black turnout gap	Asian turnout gap
	(1)	(2)	(3)
Treatment	0.056** (0.026)	-0.007 (0.018)	0.257*** (0.051)
N	190	179	186
R ²	0.715	0.773	0.835
Adjusted R ²	0.591	0.674	0.765
Residual Std. Error	0.067 (df = 132)	0.042 (df = 124)	0.103 (df = 130)

*p < .1; **p < .05; ***p < .01

Note: Robust clustered standard errors.

Differences in n due to jurisdictions with extremely low minority group populations.

errors by city. I find evidence that a switch to by-district elections as a result of the CVRA reduces turnout disparities between Hispanics and Asians in comparison to Whites, though I cannot conclude that a switch to district elections under the CVRA reduces the Black-White turnout gap.

In my analysis, I estimate the average effect of a CVRA-induced switch from at-large to by-district elections on the Hispanic-White turnout gap to be a shift of 5.6 percentage points in the turnout difference. This finding is statistically significant at the 5 percent confidence level ($p=0.0375$). Table 1 also shows that a switch to by-district elections has an average effect of a nearly 26 percentage point decrease in the difference between Asian and White turnout. This finding was statistically significant at the 1 percent confidence level ($p<0.001$). Finally, my results suggested that a switch to by-district elections actually led to an increase of 0.7 percentage points in the difference between Black and White turnout, though this finding was not statistically significant ($p=0.70$). The mean Black percentage of a jurisdiction's CVAP was only 5.6 percent, and there are no jurisdictions in the sample where Blacks exceed 25 percent of the potential electorate. Because I expect the effects of a switch to by-district elections to be most pronounced when a minority group comprises a

Table 2: Difference-in-Differences Regression Estimating Causal Relationship Between Cities Switching to By-District Elections Under the CVRA (Treatment) and the Turnout Gap by Race, Controlling for an Increase in Relative Group Size.

	Hispanic turnout gap (1)	Black turnout gap (2)	Asian turnout gap (3)
Treatment	0.077*** (0.027)	-0.004 (0.018)	0.262*** (0.050)
Increased relative group size	-0.044*** (0.014)		
Increased relative group size		-0.011 (0.009)	
Increased relative group size			-0.012 (0.015)
N	190	179	186
R ²	0.738	0.775	0.835
Adjusted R ²	0.622	0.675	0.764
Residual Std. Error	0.064 (df = 131)	0.041 (df = 123)	0.104 (df = 129)

*p < .1; **p < .05; ***p < .01

Note: Robust clustered standard errors.

Differences in n due to jurisdictions with near-zero minority group populations.

large share of the population, I am not surprised by the small coefficient and statistically insignificant findings when examining the Black-White turnout gap.

Table 2 presents the results of my DiD regression, when including a dummy variable for a minority group’s relative share of the population increasing as a result of CVRA-induced redistricting. I use these models to test H_{ii} .

These models produce several notable findings. The treatment effect on the Hispanic turnout gap becomes stronger, with an average treatment effect of a 7.7 percentage point decrease in the magnitude of the Hispanic-White turnout gap ($p = 0.007$). But an increase in relative group size as a result of CVRA-induced redistricting leads to a 4.4 percentage point increase in the distance between Hispanic and White turnout rates ($p = 0.004$).

The treatment effect on the Asian turnout gap remains similar, with an average treatment effect of 26.2 percentage points ($p < 0.001$). While the data also suggests that an increase in relative group size as a result of redistricting under the CVRA increases the distance between

Table 3: Difference-in-Differences Regression Estimating Causal Relationship Between Cities Switching to By-District Elections Under the CVRA (Treatment) and the Hispanic-White Turnout Gap for Cities with Above and Below Mean Hispanic Populations.

	Hispanic turnout gap	
	High percent Hispanic	Low percent Hispanic
	(1)	(2)
Treatment	0.001 (0.033)	0.092** (0.036)
N	63	127
R ²	0.606	0.731
Adjusted R ²	0.373	0.601
Residual Std. Error	0.061 (df = 39)	0.070 (df = 85)

*p < .1; **p < .05; ***p < .01

Note: Robust clustered standard errors.

Asian and White turnout rates, the magnitude of the effect is smaller, just 1.2 percentage points, and statistically insignificant ($p = 0.42$).

Finally, controlling for relative group size leads to similar findings when examining the Black turnout gap. The magnitude of the average treatment effect decreases slightly, to an expected 0.4 percentage point increase in the difference between Black and White turnout ($p = 0.84$). An increase in relative group size finds an additional 1.1 percentage point increase in the difference between Black and White turnout rates, though this, too, is statistically insignificant ($p=0.25$).

Table 3 displays the results of my test of H_{iii} on the data after it has been subsetting into a group of cities (and their paired control) where Hispanics compose a higher share of the CVAP than the mean and cities (and their paired control) where Hispanics compose an even or lower share of the CVAP than the mean. For cities where Hispanics compose a higher share of the city's CVAP, I estimate the average treatment effect of a shift to by-district elections to be quite small: a shift of about 0.1 percentage points in the turnout gap. This finding is statistically insignificant ($p=0.97$). Unexpectedly, I find a larger and statistically significant average treatment effect ($p=0.02$) of a CVRA-induced switch to district elections

Table 4: Difference-in-Differences Regression Estimating Causal Relationship Between Cities Switching to By-District Elections Under the CVRA (Treatment) and the Hispanic-White Turnout Gap for Cities with Above and Below Mean Hispanic Populations, Controlling for an Increase in Relative Group Size.

	Hispanic turnout gap	
	High percent Hispanic	Low percent Hispanic
	(1)	(2)
Treatment	0.014 (0.034)	0.114*** (0.035)
Increased share of CVAP	-0.023 (0.013)	-0.056** (0.021)
N	63	127
R ²	0.618	0.761
Adjusted R ²	0.376	0.642
Residual Std. Error	0.061 (df = 38)	0.067 (df = 84)

*p < .1; **p < .05; ***p < .01

Note: Robust clustered standard errors.

on the turnout gap among cities where Hispanics are a lower than average share of the CVAP. For these cities, the average treatment effect is a 9.2 percentage point decrease in the magnitude of the Hispanic-White turnout gap.

I complete my analysis of the subsetted data by controlling for cities where Hispanic share of the population increased as a result of the switch to by-district elections. The results of these models is displayed in Table 4. As in Table 3, the effects in cities with higher than average Hispanic shares of the CVAP are muted. I find an average effect of a 1.4 percentage point decrease in the difference between Hispanic and White turnout, though this effect is not statistically significant ($p=0.69$). My model suggests that among cities with higher than average Hispanic CVAP, an increase in relative group size as a result of CVRA-induced redistricting leads to a 2.3 percentage point increase in the distance between Hispanic and White turnout rates, though this finding is also statistically insignificant ($p = 0.10$).

The counterintuitive results of a stronger treatment effect of a CVRA-induced switch to district elections among cities with lower Hispanic CVAP shares plays out in this model

as well. I observe an average treatment effect of an 11.4 percentage point decrease in the magnitude of the Hispanic-White turnout gap among these cities, a trend that is significant at the .01 significance level ($p=0.003$). For these cities, an increase in relative group size leads to a statistically significant 5.6 percentage point increase in the distance between Hispanic and White turnout rates ($p = 0.01$).

6. Conclusion

Does a switch to by-district elections under the CVRA increase minority turnout? I find initial evidence suggesting that there is indeed a causal link between a CVRA-induced change in electoral institution and a reduction in the turnout gap. I do not find evidence to support my hypothesis that an increase in relative group size leads to a decrease in the turnout gap. I also do not find evidence to support my hypothesis that the effects of a switch to by-district elections on the turnout gap are more pronounced in cities where a minority group is a higher than average share of the total population.

Instead, I find evidence that the treatment effects are more pronounced in cities where Hispanics are a lower than average share of the total population. A few limitations of my dataset may explain these findings. Primarily, as Trounstine and Valdini (2008) note, group size *in combination with geographic concentration* moderates the effect of district elections. They find that district elections only impact Hispanic representation when Hispanics are extremely geographically concentrated. It is possible that cities with smaller Hispanic populations more easily create districts with geographically compact Hispanic populations. My data does not include a measure of geographic concentration, however, and therefore I cannot account for geographic concentration as a possible mediating variable. In future work, I hope to incorporate geographic concentration and candidate ethnicity into my dataset to create a more robust analysis.

Dozens of cities are currently in the process of completing a switch to by-district elections

under the CVRA. The resulting increase in the treatment universe may produce stronger and more conclusive findings in further studies. By taking advantage of the expanded dataset in future years, research may be able to address concerns about potential nonrandom selection causing an overestimation of the average treatment effect.

Finally, while analyses are currently limited by the relatively short period during which CVRA-induced switches to by-district elections have been implemented, the recent proliferation sets the ground for work investigating whether the reform has led to a measurable improvement of representation at the policy level. These future analyses will clarify the CVRA's role in improving racial representation and inform states considering similar policies.

7. Appendix

Table 5: Paired list of control and treatment groups

City	Complete Switch to Districts	Paired City
Anaheim	2018	Ontario
Banning	2018	Moorpark
Buena Park	2018	Blythe
Chino	2018	Tulelake
Eastvale	2018	Clovis
Hemet	2018	Roseville
Highland	2016	Fowler
King City	2018	Delano
Los Banos	2018	Folsom
Madera	2014	Apple Valley
Menifee	2014	Redding
Merced	2018	La Habra
Modesto	2011	Shafter
Palmdale	2016	Norwalk
Patterson	2018	Grand Terrace
Riverbank	2018	Orange Cove
Sanger	2014	McFarland
Santa Barbara	2017	Brentwood
Tulare	2016	Lancaster
Turlock	2016	Victorville
Visalia	2018	Orange
Wildomar	2018	Fountain Valley

City	Complete Switch to Districts	Paired City
Yucaipa	2018	Yorba Linda

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