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Title

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Journal

California Journal of Politics and Policy, 10(2)

Author

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Publication Date

2018

DOI

10.5070/P2cjpp10241252

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**Does More Choice Lead to Reduced Racially Polarized Voting?
Assessing the Impact of Ranked-Choice Voting in Mayoral Elections**

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Abstract

Politics in American cities is largely driven by racial group cleavages, and voting in urban elections is polarized along racial lines. Several cities have implemented a relatively new reform to urban elections called ranked-choice voting (RCV), which eliminates the plurality run-off election by giving voters the option to rank-order several vote preferences. This article examines whether the expanded preference choices associated with ranked-choice voting reduce the level of racially polarized voting in mayoral elections. In the first stage of analysis, precinct-level election results from Oakland, CA, and San Francisco, CA, are used to explore variation in racially polarized voting before and after the implementation of RCV. The second stage of analysis uses a difference-in-differences design to analyze racially polarized voting in RCV cities compared to non-RCV cities. The results indicate that racially polarized voting did not decrease due to the implementation of RCV. Rather, the results show that RCV contributed to higher levels of racially polarized voting between white and Asian voters.

Introduction

There is a deep tradition in California politics of changing electoral institutions in order to alter the partisan and ideological balance of power and to open the electoral system to independent voices. In recent years, Californians have approved several initiatives, such as the Top Two primary and the Citizens Redistricting Commission, designed to weaken major party control, increase electoral competitiveness, and reduce polarization. Continuing the California tradition of electoral reform, over the past decade several California cities have adopted a change to electoral rules called ranked-choice voting.¹ Of the eight cities that are currently using ranked-choice voting (RCV) for their municipal elections, four of them are in California.² Implemented as a replacement to the two-round primary run-off form of municipal election, RCV gives voters the option of expressing a preference for more than one candidate by asking them to rank order their

¹ In the U.S., RCV is also commonly referred to as Instant-Runoff Voting (IRV). Outside of the U.S, it is more commonly known as Alternative Voting (AV).

² The eight cities that have implemented RCV in municipal elections as of March 2018: Berkeley, CA; Minneapolis, MN; Oakland, CA; Portland, ME; Saint Paul, MN; San Francisco, CA; San Leandro, CA; Santa Fe, NM. Additionally, the state of Maine has adopted RCV for its election.

candidate preferences. If no candidate receives a majority of first place votes in the initial tally, the candidate with the fewest votes is eliminated. Second and third place votes are reallocated from the eliminated candidate to the remaining candidates according to the rank-ordered voter preferences.³ The tabulation process continues until one candidate obtains a majority of the continuing ballots.⁴

The central question motivating this article is how ranked-choice voting affects voting choices in urban mayoral elections. Voting in urban elections is largely driven by racial group identity and interests (Kaufmann 2004; Oliver, Ha, and Callen 2012; Sonenshein 1993). As a result, racially polarized voting is a common and persistent characteristic of urban politics (Hajnal and Trounstein 2014). Some analysis suggests that RCV can reduce concerns about “wasted” votes on preferred but unviable candidates, thus promoting more sincere vote choices (Blais et al. 2012). Building on this idea, I develop two competing hypotheses for how RCV can be expected to affect urban voting. The racial moderation hypothesis predicts that racially polarized voting will decrease under RCV due to the incentives for candidates to campaign in such a way as to reduce conflict in order to be as broadly acceptable to as many groups of voters as possible. According to the racial competition hypothesis, we should not expect a change to the electoral rules such as ranked-choice voting to reduce voter’s motivation to express racial group identity interests through their vote choice. As such, we should not expect the implementation of RCV to have any substantial impact on the level of racially polarized voting. I evaluate the competing predictions in two stages. First, I analyze precinct-level voting before and after the implementation of RCV in Oakland and San Francisco. Second, I use a difference-in-differences design to estimate the effect of RCV on racially polarized voting. The results of the analysis are most consistent with the racial competition hypothesis, indicating that RCV has very little, if any, effect on racially polarized voting and does not contribute to any moderation of racial conflict and competition.

Electoral Institutions and Urban Politics

Electoral rules and institutions have long been a barrier to political representation of minority racial groups. The history of urban electoral reform is a complex and often-tragic story, one that continually casts a shadow over the motivations of those who seek to alter the rules of voting and elections. Research portrays conflicts over urban electoral reform as a tactic in the competition between groups who attempt to write or rewrite the rules governing urban elections in order to advance the interests and goals of their political coalition and allied groups (Bridges 1999, Bridges and Kronick 1999, Trounstein 2008). From the machine era to the reform era and beyond, efforts to change the institutions of politics and governance have often been motivated by group competition, especially racial and ethnic group conflict.

Institutional rules channel the competition between groups that is the underlying foundation for the politics of most cities in the US (Browning, Marshall, and Tabb 1996; Hajnal and Troun-

³ Some cities that implement RCV limit the number of candidates a voter can rank-order, while others do not. Currently, the four California cities each allow voters to rank up to three candidates.

⁴ Continuing ballots are those that are not “exhausted” due to (1) a voter not including at least one of the final two candidates among their ranked choices; or (2) a disqualifying over-vote ballot error where a voter ranked more than one candidate in a ranking slot. See Burnett and Kogan (2015) for more on ballot “exhaustion.”

stine 2010; Hajnal and Trounstine 2005; Hajnal and Trounstine 2014; Sonenshein 1993; Trounstine and Valdini 2008; Trounstine 2015). As a result, institutional variation across American cities greatly impacts the dynamics of urban racial politics. Which groups get a seat at the table, which groups are relegated to the fringe, which groups are consistently able to come out ahead versus which groups are persistent losers in the process: answers to these questions are closely connected to the electoral rules and institutions governing each city.

Electoral institutions can shape the incentives faced by candidates and their elite allies, as well as how voters consider and perceive the candidates (Bowler, Donovan, and Brockington 2003). Institutions affect local elections by increasing information costs (nonpartisan elections), by increasing perception of benefits of voting (strong mayor vs. weak mayor), or by more effectively channeling group voting power (district vs. at-large elections). “*How* a community chooses its representatives may be just as important as *who* the representatives are” (Bowler, Donovan, and Brockington 2003, 6). The results can be to create more competition between candidates, change the ways that campaigns behave in attempting to attract voters, potentially increase turnout, and potentially increase the level of racial group representation.

Racial Group Competition and Voting in Urban Elections

In the urban context, research shows that racial group identity is the fundamental factor that shapes voting behavior. According to the theory of realistic group conflict and competition, urban electoral behavior is best understood as a function of the conflict and competition between racial groups that results in voting blocs that are polarized along racial groups lines (Hajnal and Trounstine 2014, Kaufmann 2004). Group competition for the limited resources of urban governance provides the underlying structure that links racial identity and group interests (Browning, Marshall, and Tabb 1996; Stone 1989). Electoral rules and institutions that provide clear signals about the stakes of electoral participation in relation to racial group interests will have a strong effect on group participation and voting behavior (Caren 2007; Hajnal and Lewis 2003; Hajnal and Trounstine 2010; Holbrook and Weinschenk 2014; Marschall, Ruhil, and Shah 2010).

When it comes to voting, the salience of racial group identity and interests as a voting cue varies with perceived level of group competition (Kaufmann 2004). Perception of competition increases the salience of racial identity and interests in the voting decision. When voters perceive greater levels of group competition, they are more likely to perceive that racial group interests are at stake in the election, and that makes it more likely that racial group identity will be the most relevant voting cue. Hajnal and Trounstine (2014) illustrate the importance of racial group competition in their study of the racial divide in American cities. Their findings demonstrate that factors associated with realistic group conflict theory consistently drive racial group voting behavior. “Individual members of America’s different racial and ethnic groups do feel a sense of racial competition that can be activated under predictable circumstances” (21).

One of those factors is the relative racial diversity of a city or neighborhood (Kaufmann 2004, Oliver 2010). Increases in group size are often accompanied by increased perceptions of out-group competition, which can spur political participation and polarized voting (Fraga 2015, Fraga 2016). Neighborhood-level racial diversity has been shown to have both positive as well as negative impacts on perceptions of racial competition, political participation, and civic engagement (Ethington and McDaniel 2007, Oliver and Wong 2003; Oliver 2010). Relative group sta-

tus and position with a city's political coalition has also been shown to be a relevant factor to the perception of conflict and competition (Bishin, Kaufmann, and Stevens 2011; Liu 2001).

Candidate race-ethnicity is another such circumstance that impacts racial group voting. The presence on the ballot of a co-ethnic or same-race candidate has been shown to increase turnout and vote share support among in-group members (Barreto, Villarreal, and Woods 2005; Barreto 2007; Barreto and Collingwood 2014; Fraga 2016; Herron 2013; Herron and Sekhon 2005; Matsubayashi and Ueda 2011; McConnaughy et al. 2010). Elite endorsement cues guide racial group identity towards specific candidates (Benjamin 2017). Candidate viability is one consideration that is relevant for elite endorsements. It has been shown to influence voting as well. Liu and Vanderleeuw (2007) show that voters consider the viability of in-group candidates, and that they are more likely to vote across racial lines in multiracial coalitions when an out-group candidate is more viable.

Hajnal and Trounstein (2014) find that variation in local political and electoral institutions, such as nonpartisan elections and mayor-council government structure had substantively small but inconsistent effects on racially polarized voting. They found little evidence that either ideological differences or economic conditions had a strong or consistent impact on voting divisions between racial groups.

Ranked-Choice Voting in Local Elections: More Preferences and More Complexity

The key insight for understanding how ranked-choice voting affects voting is that it allows voters to express more preferences, but “at the cost of increased complexity of the task facing voters” (Bowler, Donovan, and Brockington 2003). The voting decision task under ranking systems like RCV is more complex in at least two ways. First, by being asked to rank-order multiple candidates voters are presented with a cognitively more difficult voting task. Lau and Redlawsk (2006) have shown that the process of ranking is more cognitively demanding than the process of choosing between two options. How might increased complexity affect vote choice? According to Crowder-Meyer et al. (2015), when faced with more cognitively complex tasks, voters are more likely to rely on candidate traits, especially racial identity. In a study of voting and in local, low-information elections using RCV/IRV, Alvarez, Hall, and Levin (2018) find that voters use candidate traits to construct their ranked candidate preferences. However, increased levels of information, primarily partisanship cues, can ameliorate the tendency towards voting based on candidate traits and racial identity (Lau and Redlawsk 2006, Alvarez, Hall, and Levin 2018).

Second, the “instant-runoff” vote tabulation process means that voters will usually be required to make a decisive choice from among a larger field of candidates than they would under a two-round run-off system when the decisive vote would usually be made from a choice of two candidates (Bowler, Donovan, and Brockington 2003). Larger candidate fields potentially may be more diverse along many dimensions, including race, gender, and ideology. Not only will voters be required to make the choice from a larger candidate field, they will have to do so without the clarifying information benefits of a run-off campaign, which often consists of campaigns working to present stark contrasts between the remaining two candidates.

Some of the consequences of the increased complexity of RCV can be seen in studies of ballot errors and participation rates under RCV. Several scholars have examined whether alternate voting systems such as RCV produce more uncounted ballots due to either incompletely marked

ballots (under-votes) or incorrectly marked ballots, called over-votes (Neely and Cook 2008, Neely and McDaniel 2015, Sinclair and Alvarez 2004, Tomz and Van Houweling 2003). Neely and Cook (2008) examine the response of San Francisco voters to the new RCV ballots. They find the ranked-choice ballots tended to increase over-voting, but decrease under-voting. The increase in over-votes occurred despite the use of optical ballot scanning technology designed to catch and correct ballot errors. The resulting error rate was more consistent with punch-card ballot systems. They find positive associations between over-votes and percentage foreign-born population and those with language difficulties particularly disadvantaged ethnic minority groups. Neely and McDaniel (2015) confirm the previous finding by showing very high rates of disqualified ballots due to individual voter errors in RCV elections.

McDaniel (2016) shows that voter turnout rates declined among some groups in RCV elections compared to non-RCV elections. The decline was especially evident among African-American and Asian portions of the electorate. Moreover, RCV increased disparities in turnout between groups who are more likely to vote and those who are less likely to vote. The conclusion is that RCV tends to exacerbate differences between sophisticated voters and those that are less sophisticated.

In contrast to the consequences of increased complexity, research also demonstrates the benefits of expanded preferences under RCV. On one hand, the ability to express more choices may lead voters to express greater levels of satisfaction with the process. In surveys of voters after using RCV, researchers find that voters did indeed express high levels of satisfaction with it (Neely, Cook, and Blash 2006). In addition, they find that voters express confidence in their understanding of how the system works. However, Nielson (2017) finds that those who used an RCV system of voting did not prefer it to plurality or majoritarian systems, and that they expressed doubts about the fairness of election outcomes under RCV.

According to some scholars, the primary benefit to expanded preference is that it will encourage candidates to campaign on the basis of cooperation rather than conflict (Horowitz 2004, Horowitz 2007, Reilly 1997). Because of the “preference swapping” inherent to voters expressing second- and third-choice preferences, campaigns will try to broaden their base of appeal, potentially attempting to moderate group conflict-based campaigning (Reilly 2018). According to Donovan, Tolbert, and Gracey (2016), the implementation of RCV does indeed reduce voter perception of campaign negativity.

As a consequence of encouraging more cooperation and civility in electoral campaigns, many express hope that ranked-choice voting style elections can foster the moderation of political conflict, be it along partisan or racial-ethnic lines (Horowitz 2004, Horowitz 2007, Reilly 1997, Reilly 2018). Studies focused on these claims have tended towards theoretical investigation, with empirical analysis being fairly limited. Reilly’s (1997) analysis of the use of the Alternative Vote system in Papua, New Guinea found some evidence of ethnic moderation through the election of candidates who campaigned with ethnic accommodation strategies. Fraenkel and Grofman (2004, 2007) develop formal theoretical models that cast significant doubt on whether RCV-style electoral systems such as AV can indeed moderate ethnic conflict and competition.

In their analysis, Fraenkel and Grofman (2007) point out that the debate over the moderating effects of AV centers upon whether voter preferences formed on the basis of ethnic identity are relatively fixed and stable across time and political context, or whether voter preferences are relatively weak and dynamic over time. They argue convincingly that such voter preferences are strong and stable, rather than weak. They conclude that there should be little expectation of conflict moderation in societies where political conflict and competition are structured around racial

and ethnic identities. As with the importance of racial group identity preferences to urban voting, it is clear that while the salience of racial or ethnic identity can vary over time and political context, those identities are still central to the formation of voting preferences (Kaufmann 2003, Hajnal and Trounstein 2014, Benjamin 2017).

The question these studies are not able to adequately address is whether voters will make different choices when they use a system such as ranked-choice voting compared to the choices they would make in plurality first-past-the-post style systems (FPTP)? In an experimental study comparing RCV-style Alternative Voting to FPTP and proportional voting systems, Blais et al. (2012) find that about 12 percent of those studied would switch votes under RCV compared to other systems.⁵ When examining the cause of vote switching, they find that vote-switchers worry less about “wasting” their votes under RCV, and so are more likely to vote for candidates who were previously deemed unviable under plurality or majoritarian voting processes. Additionally, they find that RCV style systems do reward those candidates or parties that are deemed to have a broad-based appeal. Yet, they find that this is a mechanical aggregation effect caused by tabulation of second and third place vote rankings rather than an effect of individual voters having conflicting preferences or changing their preferences to more moderate candidates. RCV does not alter voter preferences, but rather facilitates more sincere voting based on relatively fixed and stable voter preferences.

RCV and Racially Polarized Voting: Hypothetical Expectations

In order to answer the central question of how the electoral institution of ranked-choice voting affects racially polarized voting in urban elections, it is necessary to consider in what ways voter perception of the group and individual benefits at stake in an election will be influenced by both the increased complexity and the expanded preference options associated with RCV. Based on my review of the previous research, I develop two competing hypotheses about how RCV should be expected to affect racial vote polarization.

The *racial moderation* hypothesis argues that the expanded preference options associated with RCV will reduce racially polarized voting. The opportunity to benefit from preference swapping will advantage candidates who campaign in such a way as to build a broad base of support, working to build bridges across racial lines in order to attract as many second and third place votes as possible. Those candidates who seek to garner strong first-choice support in one racial-ethnic community by campaigning in a racially divisive way will be disadvantaged by RCV. Voters will respond positively to the reduction in racially divisive campaigning, and they will be more open to candidates who make appeals to multiracial support. Because voters have fewer concerns about “wasted” votes under RCV, their racial group interests will be less salient to their vote.

In contrast, the *racial competition* hypothesis argues that expanded preference options associated with RCV should not be expected to diminish the relationship between racial group interests and voting in urban elections. Although candidates may form cross-racial alliances and encourage their supporters to use their second and third place ranking slots on out-group candidates, there is no reason to expect that RCV will alter or weaken the central importance of racial identi-

⁵ It should be noted that, like most of the studies that explore the international comparative aspects of electoral systems, the Blais et al. (2012) study uses the name Alternative Vote instead of Ranked-Choice Voting.

ty to voter preferences. In combination with fewer reasons to worry about wasting their vote, voters will continue to be guided by racial group identity cues when choosing to express expanded preferences. Further, based on the increased complexity of the voting task under RCV, there is reason to expect that voters will rely even more on candidate racial group identity as a cue to guide the choice; especially in low-information and nonpartisan elections (Crowder-Meyer et al. 2015, Alvarez, Hall, and Levin 2018). Given this line of argument, there is no reason to expect a reduction in racially polarized voting related to the implementation of RCV.

Measuring Racially Polarized Voting

I utilize two different datasets of racial group voting behavior in the analysis below. The first, which I call the Bay Area Elections Dataset, contains precinct-level estimates of racial group candidate vote share in Oakland and San Francisco mayoral elections from 1995 to 2015. Pre-election and exit poll surveys are one way to estimate racial group vote choice in elections. However, such surveys have rarely been conducted for mayoral elections in Oakland or San Francisco, and thus do not provide consistent measurement over the five elections. Given the absence of adequate individual-level survey data, I use an ecological inference procedure to estimate racial group candidate vote share at the precinct level (Calvo and Escobar 2003, King 1997).⁶

The second dataset, called the Mayoral Elections Dataset, contains city-level estimates of racial group voting for 128 separate mayoral elections in 29 cities from 1989 to 2017.⁷ In this dataset, racial group vote choice was derived from publicly available exit poll surveys. Where multiple surveys are available, poll averages were used to estimate racial group vote shares for each candidate.

In order to measure racially polarized voting, I rely on the concept of the racial group vote divide, which was developed principally in Hajnal (2009) and Hajnal and Trounstein (2014) in order to measure the underlying racial divisions in American politics. The racial group vote divide measures the average absolute difference between the percentages of each group that voted

⁶ Ecological inference is known to produce biased estimates in the presence of spatially auto-correlated data (Anselin and Cho 2002, Cho 1998, King 2000). Spatial autocorrelation is a very common occurrence in precinct-level election returns for racially diverse cities such as Oakland and San Francisco. Fortunately, there are methods to account for such spatial autocorrelation in order to provide unbiased estimates of racial group voting behavior that are suitable for further analysis (Adolph et al. 2003). One such method is the use of a Geographically-Weighted Ecological Inference model (GWR-Ei), which incorporates a spatial covariate to adjust for spatial autocorrelation in precinct-level racial group turnout (Calvo and Escobar 2003). Utilizing the GWR-Ei approach, I develop an R x C Multinomial-Dirichlet ecological inference model to estimate racial group vote choice (King and Roberts 2012; Lau, Moore, and Kellermann 2007). The GWR-Ei model estimates utilized US Census block level percentages of the Citizen Voting Age Population for racial groups that are Asian, black, Hispanic/Latino, and non-Hispanic white. Data Sources: 1990 US Census (SF1 and PL94-171), 2000 US Census (STP 76, SF1, and PL94-171), 2005–2009 American Community Survey, 2010 US Census (SF1), and the 2009–2016 American Community Survey 5-year data. Block level measures were aggregated and geographically joined to voting precincts in Oakland and San Francisco.

⁷ This dataset is an updated version of the Mayoral Elections Data Set used in Hajnal and Trounstein (2014), which Trounstein graciously agreed to share with me. The dataset was updated with the addition of publicly available exit poll survey data for elections after 2009.

for the winning candidate in each election. For example, in the 2015 San Francisco mayoral election, the winning candidate was incumbent Ed Lee. According to my estimates, 77 percent of Asian-American voters supported Ed Lee, while 48 percent of white voters supported Ed Lee. In this case, the citywide Asian-white vote divide comes out to 29 percent. I use the precinct-level ecological inference estimates of racial group candidate vote share from the Bay Area Elections Dataset to calculate a total of six racial group vote divide measures for the elections in San Francisco and Oakland from 1995–2015. The average citywide racial group vote divide measures from before and after the implementation of RCV can be seen in Table 1.

The analysis of racially polarized voting proceeds in three steps. First, I use data from the Bay Area Elections Dataset to conduct citywide comparisons of racially polarized voting in the Oakland and San Francisco before and after the implementation of ranked-choice voting. Next, I analyze the precinct-level variation in racially polarized voting in those two cities, and develop regression models of the six racial group vote divide measures, controlling for across-election variation in candidate characteristics (incumbency status and candidate race-ethnicity) and population demographic variables (Asian-American population, black population, Latino population, white population, population educational attainment with a B.A. degree or more, and median household income). Finally, I use the city-level data from the Mayoral Elections Dataset to conduct a quasi-experimental comparison of racially polarized voting in RCV cities and non-RCV cities, before and after the implementation of RCV. Specifically, I estimate difference-in-differences models for the six racial group vote divide measures for the “treatment group” of RCV cities and the “control group” of non-RCV cities. The resulting difference-in-differences estimates amount to an average treatment effect of RCV on racially polarized voting in the “treated” RCV cities.

Racially Polarized Voting in Oakland and San Francisco Mayoral Elections

The data in Table 1 show the average levels of racially polarized voting before and after the implementation of ranked-choice voting in mayoral elections in Oakland and San Francisco. In Oakland, there are significant decreases in five of the six vote divide measures in the post-RCV elections compared to pre-RCV elections. In Oakland, the Black-Latino vote divide declined by 0.34 from a pre-RCV high of 0.39 to 0.04 in elections after RCV. The black-Asian and Latino-Asian vote divides in Oakland also declined significantly, by 0.21 and 0.16 respectively. The Oakland white-black vote divide exhibited only a moderate post-RCV decline of 0.07. The white-Asian vote divide in Oakland showed a significant post-RCV increase of 0.15. In San Francisco, there are significant decreases in all six measures of racially polarized voting after the implementation of RCV in 2007. The largest post-RCV decrease is in the Latino-Asian vote divide, which decreased by 0.41, from 0.55 in elections before RCV, to 0.14 after 2007. At only 0.05, the post-RCV white-black vote divide in San Francisco is particularly notable, representing a total post-RCV decrease of 0.32. Similarly, the black-Latino vote divide decreased by 0.24 after RCV.

Comparing the level of racial polarization in the two cities before RCV, San Francisco voters were more divided than Oakland voters on three of the measures (Latino-Asian, white-Asian, and white-black) where Oakland voters were more divided on the other three (black-Asian, black-Latino, and white-Latino). After the implementation of RCV, San Francisco voters are significantly less polarized compared to Oakland voters on all three of the group vote divide

Table 1. Racially Polarized Voting in Elections before (1995–2006) and after RCV (2007–2015)

Vote Divide	Oakland			San Francisco		
	Pre-RCV	Post-RCV	Difference	Pre-RCV	Post-RCV	Difference
Black-Asian	0.35	0.14	-0.21*	0.25	0.16	-0.09*
Black-Latino	0.39	0.04	-0.34*	0.38	0.14	-0.24*
Latino-Asian	0.32	0.15	-0.16*	0.55	0.14	-0.41*
White-Asian	0.11	0.26	0.15*	0.36	0.17	-0.19*
White-Black	0.28	0.21	-0.07*	0.37	0.05	-0.32*
White-Latino	0.38	0.21	-0.17*	0.28	0.15	-0.13*
Average Divide	0.30	0.17	-0.13*	0.37	0.14	-0.23*

Note: Cells entries represent the vote divide for each two-group pair. The vote divide is the average difference in each group’s support for the winning candidate in each election. Larger proportions indicate greater levels of racially polarized voting between the two groups. Data source: Bay Area Elections Dataset.

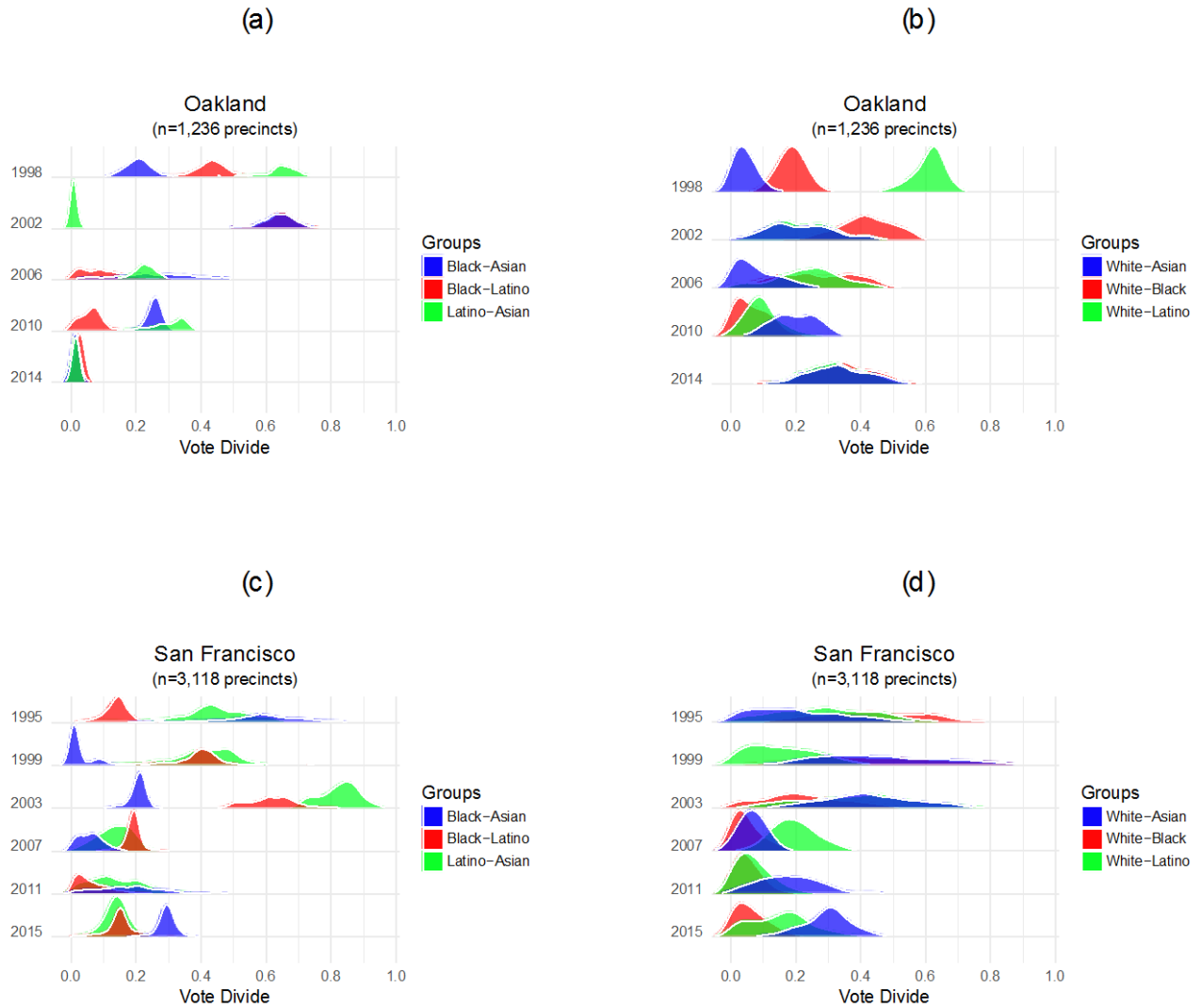
* $p < 0.05$

measures that involve white voters. In the pre-RCV period, the average vote divide among San Francisco voters was 0.37, compared to 0.30 among Oakland voters. In the post-RCV period, San Francisco has seen a larger average decrease of 0.23 compared to an average decrease of 0.13 in Oakland.

The exploratory before-and-after analysis contained in Table 1 is strongly suggestive of a racial moderation effect related to the adoption of Ranked-Choice Voting. However, the inconsistent patterns of variation from city to city and from group to group suggest that factors other than ranked-choice voting may be the root cause. To shed further light on these patterns, I turn now to a closer examination of the year-by-year precinct-level distribution of the racial group vote divide measures.

The data displayed in Figure 1 provide a more detailed picture of the precinct-level variance and patterns of change over time in the levels of racially polarized voting in both cities. In general, the patterns seen in the Figure 1 data complicate the idea that the decline in racially polarized voting in the two cities is caused by the implementation of ranked-choice voting. Starting with the vote polarization measures for Oakland voters depicted in panel (a), it can be seen that both the 1998 election and the 2002 election were particularly racially divisive for Asian, black, and Latino voters, potentially skewing the pre-RCV means upwards. The dramatic change in the Latino-Asian vote divide from 1998 to 2002, before the implementation of RCV, is strongly suggestive of confounding factors. Further examination of the year-to-year variation in panel (a) indicates that the distributions for the 2006 and 2010 elections are very similar, suggesting little change caused by the implementation of RCV starting in 2010. It appears that much of the shift in the black-Asian and black-Latino racial vote divides began in 2006, four years before the implementation of RCV in Oakland. Panel (b) tells a similar story, with no stark differences in racial polarization before and after RCV. The white-Latino vote divide declines sharply after 1998, and has remained fairly stable since that time. With the exception of 2002, the white-black has

Figure 1. Distribution of Racial Group Vote Divides in Elections Before and After RCV



Note: Distributions closer to zero represent lower levels of racially polarized voting; distributions farther away from zero represent higher levels of racially polarized voting. Each racial group divide measure estimated at the precinct level using Geographically-Weighted Ecological Inference models. Panel (a) represents the vote divides between non-white voters in Oakland. Panel (b) represents the vote divides between white voters and non-white voters in Oakland. Panel (c) represents the vote divides between non-white voters in San Francisco. Panel (d) represents the vote divides between white voters and non-white voters in San Francisco. Each racial group vote divide measure estimated at the precinct level using geographically-weighted ecological inference models. In Oakland, ranked-choice voting implemented for elections starting in 2010. In San Francisco, ranked-choice voting implemented for elections starting in 2007. Data source: Bay Area Elections Dataset.

also remained remarkably stable. Since 1998, white-Asian polarization has slowly but steadily increased, while there has been little change in white-black polarization over the same time. Finally, the distributions for the 2014 election are worth noting, especially those in panel (a), which overlap considerably with each other, and indicate a very low level of vote polarization between the groups. The distributions in panel (b) also overlap, but indicate a higher level of polarization.

For San Francisco elections, the data in Figure 1 illustrate a clearer association with the implementation of RCV in 2007. Elections held before RCV show both more extreme levels of racial polarization and wider variance than those after RCV. Panel (c) shows increasing black-Latino polarization from 1995 to 2003, but dramatic decline starting in 2007. However, putting aside the 1999 and 2003 elections, black-Latino vote polarization in San Francisco has been quite consistent. The pattern for Latino-Asian polarization is similar, with high levels of division before RCV, compared to the much-reduced levels after.

Panel (d) shows wide variation across precincts in white-Asian and white-black polarization from 1995 to 2003, whereas in elections from 2007 to 2015, white-Asian and white-black polarization is greatly reduced with less variance. Although the post-RCV variance in White-Latino vote polarization is narrower, the year-to-year pattern is remarkably consistent.

The data in Figure 1 clearly indicate that the amount of change in racially polarized voting and the direction of that change varies greatly from city to city, from election to election, and from group to group. There is evidence that implementation of ranked-choice voting may have altered the patterns of racially polarized voting in these two cities. However, the pattern of variation in the racial polarization data does not consistently conform to the implementation of RCV. This suggests that other factors, most likely those related to realistic group competition and conflict may be driving the year-to-year shifts in the level of racially polarized voting. The most likely confounding factors to explain the observed decline in racially polarized voting after the implementation of RCV are candidate characteristics, particularly candidate racial-ethnic identity and incumbency status.

In terms of racial-ethnic identity, the candidate pool in both cities has been quite diverse, with every election since 1995 featuring matchups between candidates with different racial group identities. Despite the diversity of the candidate pools in both cities, none of the elections in either city since the implementation of RCV have featured an African-American candidate. The last black candidate in Oakland ran in 2006. In San Francisco, none of the elections from 1999–2015 featured a black candidate. Conversely, all but one of the elections since the adoption of RCV has featured at least one Asian-American candidate, whereas no viable candidates of Asian descent ran in any of the elections prior to RCV.

Table 2 contains measures of intragroup vote cohesion, the proportion of each group that voted for the group's favorite candidate. Both cities feature diverse, multiracial electoral coalitions that rely on shifting combinations of black, white, and Asian voters, with Latino voters most often supporting the losing candidates. The data indicate that in Oakland elections since 1998, black and Latino voters have supported the winning candidates in only two of the five elections, whereas Asian-American and white voters have supported the winning candidates in four of the five elections. In San Francisco elections, black voters have supported the winning candidate in every election from 1995–2015, and Asian-American voters have supported the winner in five of the six elections. In San Francisco white voters shift between winning and losing electoral factions, with Latino voters most often supporting the losing side, supporting the winning candidate in only three of the six elections.

Table 2. Average Racial Group Support for Each Group’s Favorite Candidate in Mayoral Elections

Oakland						
Year	Asian	Black	Latino	White	Winner	Candidate Race
1998	0.67^w	0.46^w	0.86	0.65^w	Jerry Brown	White
2002	0.98^w	0.64	0.99^w	0.76^w	Jerry Brown	White
2006	0.43^w	0.68^w	0.66^w	0.43^w	Ronald Dellums	Black
2010	0.45^w	0.47	0.63	0.26	Jean Quan	Asian
2014	0.38	0.19	0.39	0.37^w	Libby Schaaf	White
Pre-RCV Avg	0.68	0.59	0.83	0.61		
Post-RCV Avg	0.41	0.43	0.51	0.32		

San Francisco						
Year	Asian	Black	Latino	White	Winner	Candidate Race
1995	0.55	0.98^w	0.84^w	0.55^w	Willie Brown	Black
1999	0.95^w	0.93^w	0.54^w	0.51	Willie Brown	Black
2003	0.92^w	0.72^w	0.89	0.50	Gavin Newsom	White
2007	0.69^w	0.74^w	0.55^w	0.75^w	Gavin Newsom	White
2011	0.42^w	0.24^w	0.37	0.23^w	Ed Lee	Asian
2015	0.77^w	0.49^w	0.63	0.48^w	Ed Lee	Asian
Pre-RCV Avg	0.82	0.88	0.75	0.52		
Post-RCV Avg	0.63	0.52	0.52	0.52		

Note: cells represent citywide average intragroup vote cohesion, the proportion of each group that voted for the group’s most preferred candidate. Entries marked with a ^w in bold indicate that a group supported the winning candidate. Data source: Bay Area Elections Dataset.

In regards to racially polarized voting, two noteworthy patterns emerge from the data in Table 2. First, it provides some evidence of how the dynamics of racial group vote divides can shift between elections, driven by different candidates and changes in electoral context. In Oakland, black and Latino voters often support different candidates, but each group occasionally joins with white and Asian voters to support the winning candidates. During the 1998 election in Oakland, the data indicate that Latino voters strongly opposed Jerry Brown, with 84 percent voting for his opponent, Ignacio De La Fuente, a Latino candidate. Strong support by Latino voters for the Latino candidate put them at odds with other voters who supported Jerry Brown at high rates. However, in the 2002 election, Latino voters switched to strongly support Jerry Brown, who was now a popular incumbent, thus reducing the vote divide between them and both their Asian-American and white counterparts. In 2002, about 36 percent of black voters supported Jerry Brown, a 10 percent decline in their level of support in 1998. The cause of that shift was the presence on the ballot of Wilson Riles, an African-American candidate who received 64 percent of black voters. This shift in vote share leads to high levels of polarization between black voters

and their Asian, Latino, and white counterparts, who each supported the incumbent Brown at very high rates.

Candidate factors also offer some explanation for the relatively low levels of racially polarized voting seen in the elections after the implementation of RCV. The first post-RCV election in San Francisco featured popular incumbent, Gavin Newsom, who ran essentially unopposed by other viable candidates. Newsom easily won re-election with majority support from each of the four racial groups. The low levels of racially polarized voting in the 2014 Oakland election seem possibly related to the relative unpopularity of incumbent candidate, Jean Quan, who had won the first RCV election in 2010 despite having fewer first place votes than one of her opponents. In that election, Asian-American voters were the only group to support Quan with even a plurality. Perhaps unsurprisingly, then, Quan would go on to be defeated in 2014 by Libby Schaaf who won despite only having plurality support from white voters.

The second pattern to emerge from the data in Table 2 is the relatively low levels of intragroup vote cohesion seen after the implementation of RCV. In pre-RCV elections, the average of all four intragroup cohesion measures is 0.74 in San Francisco and 0.71 in Oakland. In post-RCV elections, the average cohesion is 0.39 in Oakland and 0.45 in San Francisco. Post-RCV elections saw statistically significant decreases in intragroup cohesion for all groups except white voters in San Francisco ($p < 0.001$). The greatest declines occurred among black voters in San Francisco (0.36), and Latino voters in Oakland (0.32). Among Asian voters, cohesion declined by 0.27 in San Francisco and 0.19 in San Francisco. The low intragroup cohesion is particularly notable given that two post-RCV elections in both cities featured historic victories by Asian-American candidates, Jean Quan in 2010 and Ed Lee in 2011. And yet, both candidates received relatively low levels of support from Asian-American voters, 0.45 for Quan and 0.42 for Lee. These levels of support for in-group candidates are strikingly low compared to the very high level of support from black voters for African-American candidates Willie Brown and Ronald Dellums in pre-RCV elections. They are also low compared to Latino voter support for two non-winning Latino candidates in pre-RCV elections, such as a vote share of 0.86 for De La Fuente in 1998 and 0.89 for Matt Gonzalez in 2003.

The relatively lower levels of intragroup vote cohesion in post-RCV elections plus the shifts in racial group voting associated with candidate characteristics suggest that it may be these factors driving the post-RCV decline in racially polarized voting rather than the implementation of RCV itself. In order to assess the independent effect of intragroup cohesion and candidate characteristics, I develop regression models for each of the six racial group vote divide measures. The mixed-effects linear regression models include random intercepts at the city-level, year fixed-effects, and controls for population demographic variables (population percent Asian, black, Latino, and non-Hispanic white, median household income, and population educational attainment of at least a B.A. degree or more). All variables are scaled from 0 to 1. The results are presented in Table 3.

Looking first at the candidate characteristics, the results indicate that all six racial group vote divide measures are significantly correlated with some combination of candidate racial identity and incumbency status. The presence of an Asian candidate on the ballot is correlated with significant decreases in racial vote polarization in two of the three vote divide measures that involve Asian voters (black-Asian and Latino-Asian), and correlated with significant increases in two of the other models. A black candidate on the ballot is correlated with significantly lower levels of racially polarized voting in four of the six models, including the black-Latino vote divide. However, the presence of a black candidate on the ballot significantly increases black-Asian and white-black vote polarization. This result suggests that in Bay Area elec-

Table 3. Understanding Variation in Racial Group Vote Divide in Bay Area Mayoral Elections

	Black-Asian	Black-Latino	Latino-Asian	White-Asian	White-Black	White-Latino
Incumbent Candidate	-0.116*** (0.012)	0.184*** (0.01)	-0.210*** (0.012)	-0.023 (0.017)	-0.013 (0.018)	0.102*** (0.013)
Asian Candidate	-0.105*** (0.016)	-0.265*** (0.014)	-0.146*** (0.011)	0.310*** (0.020)	0.367*** (0.03)	0.020 (0.018)
Black Candidate	0.357*** (0.009)	-0.611*** (0.005)	-0.327*** (0.009)	-0.217*** (0.015)	0.093*** (0.008)	-0.181*** (0.009)
Latino Candidate	-0.245*** (0.007)	0.023*** (0.006)	-0.203*** (0.005)	-0.039*** (0.009)	0.018 (0.012)	-0.099*** (0.009)
White Candidate	-0.265*** (0.013)	-0.148*** (0.009)	-0.099*** (0.013)	0.162*** (0.019)	0.319*** (0.018)	0.071*** (0.014)
Post-RCV	0.094*** (0.025)	-0.484*** (0.021)	-0.634*** (0.021)	-0.119*** (0.035)	0.264*** (0.042)	-0.498*** (0.031)
Asian Cohesion	0.617*** (0.016)		0.801*** (0.015)	0.167*** (0.026)		
Post-RCV*Asian Cohesion	0.041 (0.028)		-0.222*** (0.028)	0.283*** (0.046)		
Black Cohesion	-0.031 (0.018)	0.488*** (0.017)			0.442*** (0.03)	
Post-RCV*Black Cohesion	-0.010 (0.038)	-0.801*** (0.035)			-0.670*** (0.067)	
Latino Cohesion		-0.577*** (0.014)	-0.553*** (0.014)			0.008 (0.023)
Post-RCV*Latino Cohesion		0.471*** (0.023)	0.564*** (0.024)			-0.032 (0.038)
White Cohesion				0.558*** (0.0142)	0.363*** (0.015)	-0.500*** (0.013)
Post-RCV*White Cohesion				-0.681*** (0.039)	-0.042 (0.041)	0.451*** (0.036)
Constant	0.148*** (0.030)	0.888*** (0.025)	0.870*** (0.029)	-0.126** (0.044)	-0.569*** (0.050)	0.635*** (0.037)
Demographic controls?	y	y	y	y	y	y
Year fixed-effects?	y	y	y	y	y	y
Wald χ^2	47539.5	65490.3	87041.2	11646.6	11465.7	11556.2
Precincts	4,316	4,316	4,316	4,316	4,316	4,316

Note: Cell entries represent coefficients from multilevel mixed-effects linear regression with random intercepts for city and year fixed-effects. Standard errors in parentheses. Demographic controls include population percent Asian, black, Latino, Non-Hispanic white, B.A. degree or more, and median household income. Data source: Bay Area Elections Dataset.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

tions, black candidates bring Latino voters closer to black voters, but increase the distance between black voters and Asian and white voters.

The presence of a Latino candidate on the ballot is correlated with significantly lower vote divides in four of the six measures, including Latino-Asian and white-Latino. Although none of the Latino candidates who have run in mayoral elections in these two cities have actually won,

their presence on the ballot brings some Asian and white voters closer to Latinos. Interestingly, the presence of a white candidate is correlated with significant increases in the three vote divide measures involving white voters, and significant decreases in the three vote divide measures that do not involve white voters. This indicates that white candidates further divide white voters and nonwhite voters, but bring nonwhite voters closer together. Incumbent candidates lead to lower vote polarization on average for two of the vote divide measures (black-Asian and Latino-Asian), and higher vote polarization in two others (black-Latino and white-Latino).

For all six of the vote divide measures, there is a significant correlation with at least one measure of intragroup vote cohesion, according to the regression results in Table 3. The results also indicate that in several instances, the direction and/or size of the intragroup cohesion is significantly different in the Post-RCV time period compared to the Pre-RCV time period. In order to more clearly highlight the post-RCV time period, Table 4 presents the average marginal effects of the intragroup vote cohesion measures on racial group vote divide in post-RCV elections. These results indicate that in three of the six measures, there is a significant correlation between intragroup vote cohesion and lower levels of polarized voting. Black voter cohesion is significantly correlated with lower levels in two of the three vote divide measures (black-Latino and white-black). Latino voter cohesion is also significantly correlated with lower levels of black-Latino vote polarization. White voter cohesion is significantly correlated with lower levels of white-Asian vote polarization. Conversely, Asian voter cohesion is significantly correlated with higher levels of voter polarization in all three of the vote divide measures that involve Asian voters, and there is a positive correlation between white voter cohesion and the white-black voter divide.

The results of the regression analysis clearly illustrate that variation in racially polarized voting is related to candidate characteristics and intragroup vote cohesion. In many instances, there is a greater amount of variation associated with candidate characteristics and intragroup cohesion than with RCV. The pattern of these results complicates any conclusion that the post-RCV decrease in racially polarized voting is caused by ranked-choice voting.

Racially Polarized Voting in RCV Cities Compared to Non-RCV Cities

The preceding analysis illustrated that racially polarized voting declined significantly after the implementation of RCV in Oakland and San Francisco. However, further exploratory analysis plus the fixed-effects regression results provide compelling evidence that calls into doubt the causal impact of RCV towards racial moderation. In order to more confidently assess whether the observed racial moderation was caused by RCV, I employ a difference-in-differences design to examine changes in racially polarized voting over time in RCV cities compared to non-RCV cities. Difference-in-differences is a common quasi-experimental research design that can be used to estimate the causal effect of a policy change when it is not possible to randomly assign cases to treatment and control groups (Angrist and Pischke 2008). The difference-in-differences design leverages the panel data structure with observations before and after the implementation of the policy “treatment” to estimate the average effect on the treated units while controlling for unobserved variables that are omitted from the model. The difference-in-difference models for each of the racial group vote divide measures can be expressed in the form of the following equation, where j indexes each city and t indexes election year:

$$Y(\text{Vote Divide})_{jt} = \alpha + \beta_1 RCV_j + \beta_2 \text{Post-RCV}_t + \delta(RCV_j \cdot \text{Post-RCV}_t) + \varepsilon_{jt} \quad (1)$$

Table 4. Average Marginal Effect of Vote Cohesion on Variation in Racial Group Vote Divide in Post-RCV Elections

	Black-Asian	Black-Latino	Latino-Asian	White-Asian	White-Black	White-Latino
Asian Cohesion	0.66*** (0.02)		0.58*** (0.02)	0.45*** (0.04)		
Black Cohesion	-0.04 (0.03)	-0.31*** (0.03)			-0.23*** (0.06)	
Latino Cohesion		-0.11*** (0.02)	0.01 (0.02)			-0.02 (0.03)
White Cohesion				-0.12*** (0.03)	0.32*** (0.04)	-0.05 (0.03)

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In this equation, RCV is a dummy indicator that describes whether or not a city has implemented RCV, and Post-RCV is a dummy indicator that describes whether an election takes place before or after the implementation of RCV. The model also includes an interaction-term for elections in RCV cities that take place in the Post-RCV time period. The difference-in-differences estimate is represented as δ , which functions as the average treatment effect of RCV on the treated RCV cities (ATT).

Table 5 contains the difference-in-differences estimates from the baseline difference-in-differences model (DID 1) of the six racial group vote divide measures with no covariates.⁸ The baseline difference-in-differences estimates (DID 1) indicate a positive “RCV treatment effect” for all six racial group vote divide measures. However, the positive “RCV treatment effect” estimate is statistically significant for only two of the vote divide measures (white-Asian, white-black). The DID 1 estimate for the white-black vote divide indicates an increase in polarization between white and black voters of 15.1 percentage points and an increase of 24.1 percentage points between white and Asian voters.

Although the level of racially polarized voting generally decreased in RCV cities after the implementation of RCV, it decreased by even more in the non-RCV cities in the same time period. Implementation of ranked-choice voting did not cause the previously observed decline in racially polarized voting in the post-RCV time period. These results provide strong evidence against the racial moderation hypothesis. Rather than moderation of racially polarized conflict at the ballot box, these results suggest that, if it has any effect on racial group voting, RCV may contribute to higher levels of racial polarization.

However, before assessing whether the observed difference in racially polarized voting is truly an “RCV treatment effect,” the potential effect of confounding variables should be accounted for. If, after controlling for candidate race, variation in electoral institutions, and demographic factors, we still see statistically significant positive DID estimates, then we can more confidently call them “RCV treatment effects.” If, on the other hand, the DID estimates move closer to zero

⁸ The simple baseline difference-in-differences estimates shown in Table 5 can be calculated as the difference in average racial group vote divide outcome in the RCV treatment group before and after RCV treatment minus the difference in average outcome in the non-RCV control group before and after RCV treatment: $(RCV_Post-RCV - RCV_Pre-RCV) - (Non-RCV_Post-RCV - Non-RCV_Pre-RCV)$.

Table 5. Baseline Difference-in-Differences Model (DID 1) of Racial Group Vote Divide

	Before RCV			After RCV			Diff-in-Diff	
	Non-RCV	RCV	Difference	Non-RCV	RCV	Difference	DID 1	R ²
Black-Asian	0.284	0.304	0.020 (0.045)	0.130	0.160	0.030 (0.029)	0.010 (0.063)	0.14
Black-Latino	0.366	0.286	-0.080 (0.072)	0.134	0.099	-0.035 (0.05)	0.045 (0.102)	0.22
Latino-Asian	0.184	0.215	0.031 (0.05)	0.076	0.146	0.070 (0.015)	0.039 (0.051)	0.09
White-Asian	0.237	0.128	-0.109 (0.03)	0.083	0.215	0.132 (0.035)	0.241** (0.057)	0.18
White-Black	0.490	0.263	-0.227 (0.05)	0.192	0.116	-0.076 (0.061)	0.151* (0.079)	0.31
White-Latino	0.256	.167	-.088 (0.109)	0.134	0.169	0.034 (0.034)	0.123 (0.089)	0.09

Note: Robust city-clustered standard errors in parentheses.

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

and are not statistically significant, we can assess that the observed differences in racially polarized voting were not caused by RCV.

Table 6 contains difference-in-differences estimates of the “RCV treatment effect” on racially polarized voting from models that include several different types of covariates. The second and third models in the table include variables that assess realistic group conflict. DID 2 includes an indicator variable for whether the election featured a “biracial” competition between candidates of at least two different racial group identities. DID 3 includes three variables measuring for the percentage of the population that is Asian, black, and Latino. The DID 2 estimates indicate that five of the six vote divide measures are not statistically significant. In comparison to the DID 1 estimates, all but one of the DID 2 estimates move closer to zero by about 3 to 5 points, and the R^2 for each of these models increases substantially. Importantly, however, the DID 2 white-Asian vote divide estimate remains statistically significant and positive decreasing by only one percentage point. This result indicates a 23.1 percentage point increase in the racial vote divide between white and Asian voters due to the implementation of ranked-choice voting. The DID 2 result for the white-black vote divide shows a not statistically significant increase of .104, which is five percentage points smaller than the DID 1 estimate. This result indicates that we cannot be certain of a positive “RCV treatment effect” on the white-black vote divide because a substantial portion of the observed effect appears to be related to candidate racial identity.

The DID 3 estimates, which control for racial population, show similar results, with all of the estimates moving about one to two points closer to zero compared to the DID 1 estimates, and with all but one showing substantially improved model R^2 . White-Asian and white-black are both

Table 6. Difference-in-Differences Estimates of Racial Group Vote Divide in Mayoral Elections

	DID 1		DID 2		DID 3		DID 4		DID 5		DID 6		N
	Base	R ²	Biracial	R ²	Race Pop	R ²	Educ & Income	R ²	Non-partisan	R ²	Primary Election	R ²	Treat/Control
Black-Asian	0.010 (0.063)	0.14	-0.015 (0.06)	0.18	0.005 (0.07)	0.15	0.007 (0.08)	0.18	0.011 (0.06)	0.15	0.019 (0.06)	0.15	13/86
Black-Latino	0.045 (0.102)	0.22	-0.014 (0.08)	0.34	0.020 (0.11)	0.29	0.023 (0.12)	0.29	0.045 (0.10)	0.22	0.047 (0.09)	0.22	13/97
Latino-Asian	0.039 (0.051)	0.09	0.018 (0.05)	0.12	0.032 (0.05)	0.38	-0.019 (0.05)	0.13	0.037 (0.05)	0.10	0.045 (0.05)	0.09	13/87
White-Asian	0.241** (0.057)	0.18	0.231** (0.06)	0.19	0.233** (0.06)	0.28	0.251** (0.07)	0.23	0.247** (0.05)	0.30	0.256** (0.07)	0.21	13/86
White-Black	0.151* (0.079)	0.31	0.104 (0.08)	0.36	0.127* (0.07)	0.39	0.175* (0.07)	0.37	0.155* (0.07)	0.40	0.143* (0.07)	0.32	13/108
White-Latino	0.123 (0.089)	0.09	0.089 (0.08)	0.14	0.109 (0.09)	0.17	0.105 (0.10)	0.10	0.125 (0.09)	0.13	0.131 (0.08)	0.10	13/96

Note: Robust city-clustered standard errors in parentheses. Data source: Mayoral Elections Dataset.

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

positive and statistically significant, which indicates that some portion of the “RCV treatment effect” for these two vote divide measures is related to racial group population dynamics.

The results for the DID 4 models, which account for city-level variation in educational attainment and median household income, are very similar to the DID 3 estimates. Accounting for these factors improved model fit in every instance compared to the DID 1 estimates. Not only do the white-Asian and white-black estimates remain statistically significant, they are also each slightly larger compared to the DID 1 estimates. This result indicates that accounting for city-level variation in education and income in a city increases the estimate of the “RCV treatment effect” for the white-Asian and white-black vote divides.

The final two columns contain models that account for some of the institutional variation between cities. DID 5 accounts for variation in nonpartisan versus partisan elections. The DID 5 estimates are very similar to the baseline DID 1 estimates, with two of the estimates being statistically significant and positive and with nearly identical model fit statistics. The DID 6 estimates account for differences between primary elections and general or run-off elections. These estimates are fairly similar to the previous estimates, and statistically significant estimates remain for white-Asian and white-black vote divides. The White-Black estimate moves very slightly closer to zero compared to DID 1 estimate. The results of the DID 5 and DID 6 models suggest that electoral institutions have very little impact on the relationship between Ranked-Choice Voting and the level of racially polarized voting.

Overall, these results provide no evidence to support the *racial moderation* hypothesis. Rather than reduce racial divisions, the evidence suggests that Ranked-Choice Voting has resulted in greater racial divisions at the ballot box between white and Asian voters, and quite possibly also between white and Black voters. The results indicate that small portion amount of the “RCV treatment effect” on racially polarized voting is actually related to variation in candidate race and demographic changes in racial group population. Rather than being caused by the implementation of Ranked-Choice-Voting, a portion of the higher levels of racially polarized voting in RCV cities was most likely caused by these realistic group conflict factors. As suggested by the *racial competition* hypothesis, implementation of RCV does not substantially alter the way that racial group competition is expressed through voting in urban mayoral elections.

Conclusion

Those who study electoral reform, especially in California, have long been interested in ways to reduce polarization in politics. Scholars of urban politics continue to explore the prospects for the moderation of enduring racial cleavages in American cities. In this article, I have contributed to both of these bodies of research by assessing whether a relatively new electoral reform adopted in several California cities, Ranked-Choice Voting, could lead to a reduction in racially polarized voting. The results presented here suggest that the hopes of reformers for the potential of RCV to reduce polarized voting are misplaced. Racially polarized voting did not decrease due to the implementation of RCV. Racial competition at the ballot box persists, and voters continue to use their vote choices to express their racial group identity interests.

There are several limitations in the particular data used in the study that potentially circumscribe the interpretation of the findings. First, despite efforts to overcome the ecological problem, the use of ecological inference models to estimate racial group vote choice in the Oakland and San Francisco elections may cast doubt on the precision of the vote choice data (Achen and

Shively 1995; Calvo and Escobar 2003; Cho and Manski 2008; Herron and Shotts 2004). Studies have also suggested that exit poll surveys can be biased when it comes to estimating vote by racial group (Barreto et al. 2006). The inherent difficulties in estimating racial group voting behavior suggest caution when interpreting the results presented here.

Additionally, the generalizability of the conclusions is limited by the fact that this article is based on low-information, non-partisan mayoral elections. It is quite possible that RCV would have a greater impact on polarized voting in the context of state or federal elections where we might expect voters to be more interested in and informed about the relevant candidates and issues. However, in situations where partisan labels provide clear signals for voters, we might expect RCV to increase polarized voting.

Some studies raise concerns about how Ranked-Choice Voting may complicate the legitimacy and fairness of election results. Burnett and Kogan (2015) document a problem called “ballot exhaustion” where ballots are discarded due to the process of tabulating ranked vote preferences. Because of this, the winner of all of the RCV elections they study received less than a majority of total votes cast. Additionally, Nielson (2017) finds that some voters express doubts about the legitimacy and fairness of RCV elections. Given the findings presented here that RCV has limited promise with respect to reducing polarized voting, more research is needed to further assess the relationship between RCV elections and voter’s perception of the legitimacy of the results.

Contrary to the expectation that Ranked-Choice Voting may have a moderating effect on racially polarized voting, the results of this study suggest some reason for caution. Rather than helping to smooth the path towards effective urban coalition politics, the results of this study raise the question of whether RCV may, in fact, add an additional barrier to the process of building and maintaining multiracial coalitions. The opportunities and barriers to building and maintaining multiracial coalitions are still present, and at best they are left unaffected by RCV. It will be up to political leaders, elites, and candidate campaigns to leverage the positive aspects of RCV, especially the incentives to build broad-based electoral coalitions in order to advance the possibilities for multiracial democracy.

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