# The Unanticipated Inequalities of Electoral Reform:
# Racial and Ethnic Disparities in Voting Behavior under Oakland's Ranked Choice Voting Program

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**Abstract:**

Several cities have recently replaced two-round runoff election systems, in which, if no candidate achieves a majority in the first round, there is a later runoff between the top two candidates, with ranked choice voting (RCV), in which voters rank up to three candidates on a single ballot. Although reformers have argued that this change benefits turnout because participation in second-round run-off voting is often low, the complexity of the RCV system presents its own challenges. Voters from some minority groups do not make full use of their three choices – either voting for fewer than three choices or voting for the same candidate multiple times. RCV goes through "rounds," dropping the candidate with the fewest votes in each round and transferring votes for that candidate to the next candidate listed on each ballot. Voters who choose only one candidate, or who vote for the same candidate three times, effectively have only one chance to affect the election, and their ballots are therefore more likely to be exhausted, meaning their choices will not be reflected in the later rounds.

This thesis examines two questions: (1) does the complexity of rank choice voting deter minorities from going to the polls in the first place; and (2) does RCV disadvantage minority voters because their votes are not as effective as non-minority voters? I measure the effects of RCV on minority and non-minority voting in Oakland, California, which recently held its first RCV election. Using Long Beach, California, as a comparison case, RCV had a negative overall effect on Oakland's turnout in its first RCV election. While Asian and Latino turnout also declined during the transition, the Long Beach counterfactual indicates that RCV actually helped to mitigate the turnout gap for minority groups. In short, the increased complexity of RCV appears not to have discouraged minority turnout. However, the failure of certain minority voters to make full use of their ballot choices counterbalances this positive effect. Voters in

high Asian and high Latino precincts generally used their RCV ballots less fully than did voters in precincts with low minority populations. While RCV may not depress minority turnout, it may result in less meaningful participation for some minority groups. With RCV, we must consider not just turnout, but also the extent to which the right to vote is fully exercised.

## Preface and Acknowledgements:

The campaign media tends to focus on the horse-race elements of elections. Much of the coverage implicitly assumes a straight line between voter preferences and election outcomes. Every elections system in some way translates voter preferences into election outcomes, and the outcomes through different systems vary. This project is, at its core, an examination of how one system – ranked choice voting – mediates this relationship. I am from San Francisco, one of the early adopters of ranked choice voting. It seems that everyone in San Francisco has an opinion on RCV with strong proponents and vocal opponents flinging assertions at one another about RCV's effects. I was eager to see which of these claims were testable to move the debate beyond theoretical claims. This thesis does that testing in the limited setting of Oakland for the claim that RCV increases voter turnout.

This thesis would not have been possible without the enormous help of others more knowledgeable about ranked choice voting and political science methods. My advisor, Professor Clayton Nall, helped at every stage of the process. I am particularly thankful to him for helping me to develop the difference-in-difference model used to evaluate the effect of RCV on turnout. Early in the process, I worked with Professor Jonathan Wand, and his guidance on social choice theory underlies the work here. I am thankful to the other members of my senior thesis class and to our undergraduate department chair Professor Beatriz Magaloni for telling me when I needed to explain my argument further, as with an earlier iteration of the difference-in-difference model. I am immensely grateful to my graduate thesis mentor Molly Cohn who has been a source of guidance on methods ever since I learned to use the statistical software R in her section of Political Science 350A. The electoral and demographic data presented in this thesis are in three different units of observation: the block, the block group, and the precinct. Considering the

relationship between demographic and electoral factors requires all information to be at the same unit of observation. Before starting this project, I had never used ArcGIS, so Molly, Clayton, and the staff at Branner Earth Sciences Library helped me along in the process of joining all of the data for the cities. I am grateful to Alameda Registrar of Voters Dave Macdonald for his assistance in locating and making sense of almost 8,000 pages of RCV ballot image data and to the UC Berkeley Statewide Database for the use of their statewide precinct borderline files and statements of vote. Conversations with Professors Gary Cox, Jon Krosnick, Tammy Frisby, and Justin Grimmer developed my approach to testing the implications of RCV. Floyd Huen, field director for Oakland Mayor Jean Quan, took the time to talk with me about how RCV played a role in Oakland's 2010 mayoral election. Hana Meckler, the political science undergraduate program administrator, has shepherded the thesis process and we meet deadlines because of her emails. In many ways, this thesis was born in a lunchtime talk with my father when I was in high school, and my parents have been a sounding board for late-night RCV conversation all along.

# Table of Contents

# I. Introduction

*Ranked choice voting is "a pretty simple, straightforward way of enhancing voter choice,"* – Curt Fisher, Common Cause Vermont (Gram 2008).

Typically, voters in local, state, and national elections vote for a single candidate. State and national systems tend to use plurality systems in which the candidate with the most votes wins. Many cities require the plurality choice to receive a majority. If no candidate receives a majority in the first round of voting, the jurisdiction holds a runoff election between the top two candidates.

Plurality and two-round runoff systems only allow voters to support a single candidate in an election even though those voters may have preferences among the remaining candidates. Traditional economic theory posits that consumers can readily compare goods and rank those goods in order of preference. Systems that only provide voters with a single choice, then, cannot capture the full complexity of voters' views. By allowing voters to come back a second time, two-round runoff incorporates more of the voters' preferences, but the second election is expensive and turnout tends to be lower than in the first election.

To overcome these challenges, Fisher and others have encouraged the spread of voting systems that allow citizens to rank candidates in order of preference. Preferential systems can capture more of each voter's set of candidate preferences without the cost or turnout declines associated with holding a second election. These systems are attractive to political scientists, particularly social choice scholars, because they can reveal relationships among candidates in the mind of the voter (Maskin 2012). Ranked choice voting, which asks voters to list their first, second, and third choice candidates, is the most common manifestation of preferential voting

systems for a single office in the United States.[1] As of August 2011, nine cities used RCV to elect officeholders.[2] Unrestricted ranked choice, where voters can rank all of the candidates instead of being limited to three, has not been implemented in the United States because of the limitations of voting equipment.

RCV proponents point to four primary benefits of ranked choice voting: no spoiler effect, majority support, cost savings, and greater turnout ("How Instant Runoff Works"). Theoretical claims about how RCV ought to work underlie these asserted virtues based on homogeneity of voters. The virtues of a voting system are only meaningful, however, if they appear in practice. Most analysis of RCV compares it to plurality voting. Few scholars have considered the impacts of the transition from two-round runoff to RCV because it adds a layer of complexity in the depth and breadth of preferences that the voter can express.

This thesis examines the claim that RCV increases voter turnout from ranked choice voting, specifically focusing on how the system affects voting by different ethnic communities.

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[1] Ranked choice voting is part of a larger family of preferential voting systems all of which provide voters with methods of expressing more than the selection of a single candidate. The system most like ranked choice is single transferrable vote (STV), used currently in Australia, Ireland, and Cambridge, Massachusetts. Unlike ranked choice, STV elects multiple candidates who pass a certain threshold of support and is used most often in at-large elections for legislative bodies. Like ranked choice, single transferrable vote only considers one candidate from each ballot in any given round, but redistributes ballots both from the bottom (losers) and from the top (winners). Several other preferential voting systems including Borda, Condorcet, and range voting, replace the elimination rounds of RCV or STV with consideration of a weighted list or matrix of preferences.

[2] In March 2002, an initiative to make ranked choice voting the means of electing candidates for the Board of Supervisors and most citywide offices in San Francisco won with 55 percent of the vote (Craig, DeLeon, and Melbostad 2003, 25).[2] San Francisco voters first used RCV to elect supervisors in 2004. Exit polls by San Francisco State University showed strong support for the new system from voters of different ages, incomes, and ethnicities (Neely, Cook, and Blash 2006). San Francisco has used Ranked Choice Voting (RCV) since 2004 to elect its Board of Supervisors and major citywide offices (Gonzales 2004). Following San Francisco's adoption of RCV, Oakland, Berkeley, San Leandro, and Saint Paul, Minnesota, and other cities also adopted the system. These cities all limit voters to ranking their top three choices for each office. Appendix B is a table of the cities that had implemented RCV as of August 2011.

Turnout with RCV involves both the threshold decision to vote and the subsequent decision of how many of the three possible ballot choices to use. This thesis examines participation under RCV in the context of the 2010 mayoral election in Oakland, California. Oakland consistently faces low turnout by minorities but the effect of RCV on the threshold decision to vote by citizens from different ethnic communities is unclear. Analysis of Oakland turnout alone highlights a decline in turnout in high minority precincts. Including Long Beach as a comparison city suggests instead that RCV reduced an even greater turnout disadvantage for minorities that would have occurred without RCV. The ballot usage analysis shows that while voters generally use the three possible choices, voters in high Latino and Asian precincts tend to use fewer ballot options than those in other precincts.

### a. Understanding the claims of RCV advocates

RCV changes each step of the election for the voter and counting process. The voter in a plurality system or single round in a two-round runoff selects one candidate to support, a parallel process to selecting the first choice for the ranked choice voting ballot. RCV, however, also gives voters the opportunity to select a second and third choice candidate in lieu of returning to the polls a second time for a runoff election between the two candidates with the greatest support in the first round. The rankings allow for virtual runoffs among the candidates.

From the perspective of voters, the largest change in switching from two-round runoff to RCV is the opportunity to rank up to three candidates. This change dramatically increases the number of options available to each voter and requires knowledge of the candidate pool beyond a single preferred candidate.[3] In most RCV cities, voters use a paper ballot with columns for each

[3] With three-option ranked choice voting, the number of possible ordered candidate selections with $n$ candidates is $n*(n-1)*(n-2)$. This number of possible ordered selections rises quickly with the number of candidates.

choice that a machine scans at the polling place. Each column has the names of all of the candidates in the race, and voters must connect an arrow next to the name of their chosen candidates (see Appendix C for an example RCV ballot from Oakland). Voters may select one candidate in each of the columns. RCV does not allow voters to give two candidates the same ranking to indicate indifference. Columns on a ballot that list more than one candidate, overvotes, are invalid. If a voter inserts a ballot with an overvote into a polling place optical scan machine, the machine returns the ballot with an error message, giving the voter a chance to correct the error. Absentee ballots are more likely to have overvotes since there is no opportunity to verify the ballot's validity. In ranking the candidates, the voter receives little elite support. Even with the introduction of RCV, political clubs and newspapers still have typically endorsed a single candidate. The candidates are generally wary of expressing support for other candidates since the election is for a single seat.

While the candidates and endorsements may not offer much help for voters in forming their rankings, RCV proponents argue that the system permits more honest voting by solving the "spoiler problem" ("New Victories for Spoiler-Free Elections with IRV"). One of the fears of third parties in plurality systems is that support for their candidates may inadvertently undermine the candidate of the major party closest in position to that third party. Had the voters who supported Ralph Nader in the Florida 2000 election instead supported Al Gore, he would have won the election and the presidency. Voters sometimes feel, then, that they cannot vote their true preferences and must instead strategically support a less-favored candidate to help prevent an even less preferable candidate from prevailing. This "spoiler effect" has affected the outcome of the U.S. presidential contest in 11 percent of past elections (Poundstone 2008). John B. Anderson, a former Illinois congressman and chair of the voting advocacy organization FairVote,

claims, “The real culprit is America's practice of plurality voting, by which candidates win without an absolute majority. In this system, third-party hopefuls can rarely aspire to be more than ‘spoilers.’ Worse, the one-third of all voters who are not registered as Republican or Democrat feel pressured to vote against their worst nightmare rather than their best hope” (Anderson 2007). RCV supporters argue that the system allows voters to put their favorite candidate in the first-choice slot without hurting the chances of a more popular choice ranked second.

Yet, RCV only solves the spoiler problem in cases in which there are only two viable candidates and some minor candidates. Instead of accurately representing voters’ desires in the counting process, RCV could result in electing the candidate who is the second least-favored among all voters and give the major political party whose voters are less likely to list third-party candidates a better chance of winning (see Footnote 7). This bias would create particular issues if voters incorrectly believe that RCV provides an opportunity to put a third-party candidate as their first choice without hurting their major party favorite (Poundstone 2008).

While elections departments typically release the first choice totals on election night, it often takes several days for the departments to release further results because of the computerized runoff process. The key to understanding this process is that at any round, a ballot can only count for a single candidate. Though, in reality, the process is computerized, it can be visualized as shifting ballots among stacks for each candidate. First, all ballots are counted as one vote for the top choice given. If, at the end of the first round, a candidate holds a majority of the ballots, that candidate wins. Otherwise, the candidate in last place is eliminated.[4] Each

[4] In a slight change on this elimination rule in San Francisco, if two or more of the last place candidates have support that sums to less than the next highest candidate, then these candidates are eliminated together in a single round.

ballot cast for the eliminated candidate is moved to the pile of the highest-ranked choice that has not been eliminated. If a ballot has all of its ranked candidates eliminated, it is "exhausted" and no longer counts towards any candidate in subsequent rounds. The runoff process is repeated with the elimination of the last place candidate and shifting of the ballots to the voters' next preferences among the remaining candidates until one candidate has a majority of the remaining ballots.

Because the system is iterative, ranked choice proponents argue that it leads to majority support for the winning candidate. Plurality elections do not require that the winner get a majority of the votes. Providing a winning candidate with majority support underlies both two-round and RCV systems where the argument is that a plurality does not constitute a sufficient mandate. Ballot exhaustion challenges the majority winner argument for RCV, since exhausted ballots are no longer considered in later counting rounds. This thesis more fully discusses exhausted ballots in Chapter Four.

RCV supporters propose cost savings as a major benefit in comparison to a two-round runoff system. They argue that a second round increases costs because of the additional expense of the added runoff election. This thesis does not discuss election costs, but other work has provided mixed evidence on this claim.[5] Moreover, cost is not a core feature of the democratic value of an elections system. If it were, arguments for eliminating elections altogether would be valid for their cost savings.

Finally, proponents point to decreased turnout in runoff elections as evidence that ranked choice increases involvement. Rather than needing to come back to the polls a second time,

[5] RCV proponents argue that over ten years, San Francisco will save $15 million by switching to RCV despite upfront costs paid to change the system ("Costs and Benefits of Instant Runoff Voting," FairVote)

voters in an RCV election can express their preferences on a single ballot. While this ease of access argument makes sense theoretically, two key concerns arise: (1) Does RCV actually increase overall turnout, and (2) does RCV affect turnout equally for all types of voters? Equal participation lies at the heart of the democratic system and assessing the effects of RCV on turnout across the electorate is the focus of this thesis.

### b. Chapter outline

Cognitive challenges form the key juncture to consider in comparing the theoretical understanding of RCV's effects on turnout with its actual effects on implementation. Chapter Two examines the expected causes and duration of cognitive challenges with ranked choice voting within the framework of electoral systems in general. Cognitive challenges, the difficulty of finding and retaining the necessary information about all the candidates, play a major role in the turnout decision and therefore likely affect changes in participation in the switch from one electoral system to another. Anecdotal and survey evidence points to of voter confusion with and dislike of ranked choice voting. While Malta stands out as an example of a country with a preferential voting system and almost universal turnout, the situation differs from that of municipal ranked choice voting elections in ways that actually underline the cognitive challenges of RCV.

Having developed some mechanisms by which actual turnout effects of RCV might differ from proponent's argued effects, the thesis then shifts to testing the effects of RCV in the context of the 2010 mayoral election in Oakland. The excitement created by the magnitude of a mayoral election and absence of an incumbent generally favors strong turnout and limits the possibility that voters decided to abstain because of election importance or level of certainty about the election's outcome.

Chapter Three uses two methods to estimate the effect of RCV on turnout and minority participation. The first method, using data from Oakland alone, demonstrates low minority turnout before and after RCV's introduction. Since minority turnout fell in Oakland between 2006 and 2010, RCV appeared to have depressed minority turnout. A difference-in-differences model, which relies on different and less strong assumptions than the within-city comparison, indicates instead that RCV had a positive effect, mitigating the diminished minority turnout.

RCV gives voters the opportunity to support three candidates, in essence to vote three times, but voters do not all rank three candidates. Chapter Four demonstrates that ballot usage differed according to precinct demographics among those who decided to turn out. Oakland voters tended to cast votes for three different candidates, but there was a great deal of variation. The total percent minority population was negatively related to the number of candidates supported and this trend was particularly pronounced for Asian and Latino populations though it was statistically significant for African American precinct population as well. The strength of the trend for the Asian community is underlined by two high Asian precincts with lower ballot usage seemingly due to voters' approach to ranked choice voting rather than support for any particular candidate. Ballot usage also differed in the manner in which the voters used ranking options not taken up with unique candidates either by not listing a candidate or duplicating a candidate already supported. Higher Latino and African population precincts had a higher prevalence of duplicate voting. Finally, ballot usage is inextricably connected to whether a ballot makes it to the final counting round. Having one's ballot in the decisive round is a central argument for listing three candidates since ballots with more candidates listed are more likely to remain by the decisive round. Nevertheless, the particular candidates supported matters for a ballot remaining in the counting in that final round. Both the differences among exhausted

ballots and the effect of ethnicity on unique candidates supported highlight concerns about whether RCV gives each voter an equal vote.

# II. The significance of cognitive burdens in the operation of the ranked choice ballot

## a. Introduction

The nonparticipation of a large percentage of citizens in elections challenges the quality of American democratic life (Crotty 1991, vii). If anything, the situation may be worsening. Sociodemographic factors play a role in turnout rates, making the electorate systematically non-representative of the citizen pool at large (e.g. Citrin and Highton 2002). Models cannot offer a full picture of effects upon implementation. Changes in turnout rates for different ethnic, income, language, and education groups provide strong tools for evaluating elections systems. Cognitive challenges, challenges relating to obtaining the necessary information about all of the candidates, play a major role in the turnout decision. Greater cognitive challenges depress participation in the switch from one electoral system to another. RCV generally confuses voters, which leads them to report dislike for the system in surveys. On first glance, Malta, a small country that uses single transferrable vote and has near universal non-compulsory turnout, seems to indicate that any declines in turnout due to cognitive challenges will be temporary. Nevertheless, large differences between Maltese and local RCV elections argue against this claim.

## b. The neglect of cognitive challenges in voting systems

Analyses of electoral systems emerge from the reality that voting systems matter for electoral outcomes. Although elections focus attention on the competition among the candidates, elections operations play an important embedded role in determining turnout and candidate

success. Poundstone (2008) uses spatial analysis to demonstrate that different systems elect different candidates while holding voter policy preferences and candidate positions constant. There is a substantial literature about why and how citizens participate in elections. Based on this variation, the choice of an electoral system is democratically relevant. Differences in candidates and time often hide the significant tradeoffs involved, but the tradeoffs are nonetheless profound.

Cox (1997, 10) observed that the study of mass voting systems has generally fallen into two traditions. Theoretical voting system analysis such as social choice theory (Arrow 1951; Sen 1970; Fishburn 1973; Gibbard 1973; Schwartz 1986), public choice theory (Buchanan and Tullock 1962; Mueller 1989), and spatial theory (Downs 1957; Hinich, Davis, and Ordeshook 1970; Romer and Rosenthal 1979; Palfrey 1984; Cox 1990; Enelow and Hinich 1990) is characterized by an assumption that voters are rational actors weighing all of the advantages and disadvantages of each candidate. To these scholars, voters all have single-peaked preferences meaning that they have a single ideal ideological position and candidates further from that position are less favored. Practical voting system analysis, exemplified by the work of Duverger (1954), Rae (1971), Sartori (1976), Lijphart (1984; 1994), and Taagepera and Shugart (1989), is less formal and more focused on the empirical implications of theoretical models.

Mathematical models and formal theories provide rigor and precision but are ambiguous guides to policy. The Arrow Impossibility Theorem declares that when voters have three or more distinct alternatives, no voting system can convert the ranked preferences of individuals into a complete and transitive ranking of the candidates while also meeting a certain set of democratically relevant criteria (Arrow 1951). Furthermore, Gibbard (1973) and Satterthwaite (1975) formally showed that incentives to vote strategically could arise in any minimally

democratic voting system. Given that some electoral system is necessary, Arrow, Gibbard, and Satterthwaite's proofs that no "perfect electoral system" is possible do not offer a way forward for voting system policy. Since no perfect system is possible, democratic communities need to decide which characteristics they most value in reference to outcomes and adopt a system that meets those needs.

### c. The limitations of a naïve approach to electoral systems

Theoretical voting system analysis provides little help in ascertaining which system will work best. Choice theorists assume a complete set of utility rankings in the head of the voter when many voters know little or nothing about the issue positions even of a single chosen candidate (Popkin 1994, 44). Choice theorists are concerned with the level of opportunity afforded each voter to express those complete preferences, while voters themselves are more concerned about whether they can understand how the ballot works and how the system counts their ballots (Chisnell 2012). Finally, and perhaps most importantly, social choice theory does not even claim to account for the vast differences in ethnicity, education, income, peer groups, language-proficiency, and age that affect how voters cast their ballots. Theoretically, a cognitively challenging ballot is equally challenging for everyone. In reality, that ballot is more challenging for some voters than others based upon the above factors.

### d. How cognitive challenges produce disparate costs for different groups

At the individual level the propensity to vote is associated with several sociodemographic characteristics, including ethnicity, age, and education (Blais, 2000; Wolfinger and Rosenstone, 1980). In a study of turnout in the 2002 elections, David Hill (2006, 107) found that the percentage African American population and Latino population were both negatively correlated

with turnout. African American population, Latino population, and education were the three variables most strongly related to voter turnout.

Looking specifically at California, there are large differences between the composition of the overall population and the voting population. Caucasians will soon lose their majority status among California adults but continued to make up 70 percent of the voters in the 2000 election (Citrin and Highton, 2002, vii). While differences in citizenship status account for some of the disparity, the gap remains considerable even among citizens. Between 1990 and 2000, white turnout was approximately 10 percentage points higher than that of blacks and 18 percentage points higher than that of Latino and Asian citizens.

Latinos register and vote at lower levels than Caucasians (Arvizu and Garcia, 1996; Calvo and Rosenstone, 1989; Shaw, de la Garza, Rodolfo O., and Lee, 2000; Verba, Schlozman, and Brady, 1995; Wolfinger and Rosenstone, 1980). Garcia and Arce (1988) wrote, "as a result of research efforts on voting behavior of Chicanos, several patterns have been identified. The more consistent findings have been significantly lower rates of voter registration and turnout than Anglo and black voters." Barretto, Villarreal, and Woods (2005) indicate, instead, that such studies miss the effect of having a Latino candidate in the race. By studying the mayoral race in Los Angeles between former State Assembly Speaker Antonio Villaraigosa and City Attorney James K. Hahn, the authors illuminate the impact of electoral circumstances and the power of co-ethnic participation to cause greater participation by Latinos as compared to other ethnicities.

Beyond ethnic group variation, different educational levels can also affect turnout. Campbell and Converse wrote of the significance of formal education in politics, saying, "Whether one is dealing with cognitive matters such as level of factual information about politics or conceptual sophistication in its assessment; or such motivational matters as degree of attention

paid to politics and emotional involvement in political affairs; or questions of actual behavior, such as engagement in any of a variety of political activities from party work to vote turnout itself: education is everywhere the universal solvent, and the relationship is always in the same direction" (Campbell and Converse 1972, 324). Education lowers the material and cognitive costs of participation, providing a mechanism for the strong effect of levels of formal education (Wolfinger and Rosenstone, 1980, 35-36). Education increases cognitive skills, facilitates learning about politics, and reduces the costs of voting by giving people the skills necessary for processing political information.

**e. Turnout is a powerful measure of RCV**

Whether voters have an equal opportunity to turn out and to use their ballots equally forms a widely understood and unbiased metric for evaluating a democratic system such as RCV. The decision to vote is among the most important acts of a citizen in a democratic society (Magaloni 1994, 309). Indeed political scientists tend to see electoral participation as an indirect measure of the degree of democracy in a country (Grilli Di Cortona 1999, 33). Courts have struck down race, income, education, and age-based barriers to voting from landownership requirements to literacy tests and poll taxes. The Supreme Court has read the Fourteenth Amendment to enshrine voting equality for citizens in the United States Constitution.[6] The Voting Rights Act of 1965 attempts to ensure equal access to the ballot. The preclearance

[6] *Wesberry v. Sanders* (1964) and *Reynolds v. Sims* (1964) interpreted the Fourteenth Amendment's Equal Protection Clause as requiring the states to apportion congressional districts and state legislative seats according to "one man, one vote." The Court has also enjoined redistricting plans that hinged on race including in *Shaw v. Reno* (1993) in which the Court rejected a North Carolina redistricting plan creating majority-black districts to balance historic underrepresentation in the state's congressional delegations. In *League of United Latin American Citizens v. Perry* (2006), the Court ruled that a Texas redistricting plan intentionally diluted the votes of Latinos in the formation of one district and therefore violated the Equal Protection Clause.

requirement, whereby some areas with a history of race-based impediments to voting must receive approval from the Justice Department to make changes to elections timing and procedures, recognizes the importance that changes in the operation of voting can have on participation and therefore on fair representation.

High voter participation is widely understood to be a sign of a strong society. Very low turnouts could "conceivably cause democracy to break down" (Downs 1957, 268). Chapman and Palda (1983, 337) observed, "Democratic institutions owe their survival to the keen participation of citizens in the life of the polity." Looking specifically at local elections, high levels of turnout indicate the existence of "communication of political information to voters both about the particular election and about the political system of which elections form a part" (Alford and Lee 1968, 797).

Analysis of turnout provides a balanced measure of the democratic function of the system, not biased towards or against any particular candidates. Weisberg and Grofman (1981) and Schram (1989) support a model of the voting decision in which individuals first decide whether or not to vote and then decide on the candidates they support. Especially within that framework, all candidates ought to have an incentive to promote turnout.

Like turnout, the use of all three possible ballot options in RCV is a measure of voice in the democratic system. RCV "provides voters with three chances to express their preferences for candidates for a single office" (City's Response 2010, 14). Just as a ballot in a plurality or runoff election allows a citizen a single chance to express a candidate preference, RCV allows voters three opportunities to support a candidate. Voting for three unique candidates in each race – one in each of the ballot's three ranked spots – only adds to a voter's voice in the election. Among voters uncertain about the mechanics of RCV, a common fear is that voting for three different

candidates will hurt the voter's first choice candidate. This fear gives rise to "bullet voting," in which voters vote three times for the same candidate. Receiving all of a voter's choices would help a candidate in weighted preferential systems such as Borda count, a system that apportions points based on a candidate's ranking on each ballot. Bullet voting in an RCV system adds no support to the favored candidate. Voting for a candidate in the second choice spot on the ballot can neither harm nor help the electoral chances of the candidate in the voter's first choice spot.[7] The elections department only counts the ballot's second choice if the first choice candidate is

[7] While it is true in all cases that bullet voting does not help the preferred candidate, the impacts of different orderings are complex with ranked choice. Ranking a preferred candidate higher could cause the candidate to lose under RCV. In mathematics, a function f is monotonic if for all $x \leq y$, $f(x) \leq f(y)$. Ranked choice voting is non-monotonic because raising a candidate's rank on one's ballot does not always increase that candidate's chances of winning and in fact may decrease a candidate's chance to win (Woodall 1996).

| #voters | Votes 1st/2nd/3rd |
|---|---|
| 6 | B>A>C |
| 5 | C>B>A |
| 4 | A>C>B |

Candidate C wins here because candidate A is eliminated in round 1, giving 4 more votes to candidate C, leading to 6 votes for B and 9 votes for C in round 2.

If two additional new voters whose actual preferences are B > A > C vote their real preferences:

| #voters | Votes 1st/2nd/3rd |
|---|---|
| 8 | B>A>C |
| 5 | C>B>A |
| 4 | A>C>B |

Then candidate A is eliminated first and their *least* favorite candidate C wins with 8 votes for B, and 9 votes for C.

However, if these same two voters voted A>C>B (ranked their second favorite candidate A first, their least favorite candidate second, and their favorite candidate last) then their favorite candidate B wins:

| #voters | Votes 1st/2nd/3rd |
|---|---|
| 6 | B>A>C |
| 5 | C>B>A |
| 6 | A>C>B |

This time C, their least favorite candidate loses the first round, resulting in 11 votes for B and 6 votes for candidate A, and their favorite candidate wins.

eliminated. For that reason, the voter maximizes his or her voice in the election by voting for three unique candidates.

One way to examine the reasons for selecting three unique candidates is through rational choice theory. The completeness assumption holds that humans can rank all actions in terms of their preferences. Therefore, the theory assumes that voters have preferences over the entire set of candidates. Having overcome the costs of getting to the polling place, the only rational reason to support only one candidate would be if the voter were truly indifferent among all the other candidate choices. Since candidates are multidimensional in terms of platforms and personalities, true indifference seems unlikely.

**f. Understanding the turnout decision**

Several avenues exist for understanding of the key decision to vote or abstain in different voting systems. Early understandings of the decision to vote focused on social-psychological studies, which argued that people voted if they had developed the appropriate mental inclinations, the strongest of which was a sense of citizen duty. This approach was unsuccessful in explaining participation as it became clear that measured political attitudes were unstable and the relationship of these attitudes to participation varied over time (Aldrich and Simon 1986; Nie, Verba, and Petrocik 1979).

Scholars changed direction from a mental inclination model to a rational voter approach, which assumes that citizens are rational, voting only if the benefits exceed the costs (Austen-Smith and Banks 1999). Exploring the incentives faced by a rational voter, Downs (1957) encountered a voting paradox. The chances of changing an election result were similar to the odds of winning the lottery while the costs of voting including registration, transportation to a polling place, and learning about the candidates and issues were non-negligible according to the

literature. Nevertheless, Downs observed, large percentages of the population voted. In a seminal text on positive political theory elaborating on Downs, Riker and Ordeshook (1973, 63) wrote that if P is the probability of casting a decisive vote, B is the expected benefit of changing the outcome of the election, D is the consumption benefit to voting which includes all the civic and personal benefits an individual derives from voting apart from the chance of changing the election result, and C is the cost of voting, then a person votes if $PB + D > C$. This formulation provides a useful framework for orienting arguments about impacts on each side of the equation. Switching to a voting system that raises the costs of casting a ballot or limits the civic and personal benefits of voting should reduce participation

Out of this rational conception of the voter came an institution-based understanding that electoral systems have an impact on voter turnout. For example, Jackman (1987) looked at mean turnout in 19 countries in the 1970s, finding that five institutional variables affected turnout: nationally competitive districts, electoral disproportionality, multipartyism, unicameralism, and compulsory voting. Though Jackman did not consider RCV explicitly, ranked choice affects several of the institutional factors he examines. By increasing uncertainty about the election outcome, the complex vote-counting mechanism of RCV increases the perceived competitiveness of elections. To the extent that the media and public estimate competitiveness in terms of proximity of leading candidates in polling data, the almost complete absence of polling data that simulates the RCV counting mechanism further increases perceived competitiveness.[8] Rusk (1974, 1044) observed that "the theory postulates that legal-institutional properties of the electoral system – ballot and registration systems, voting systems (e.g. plurality,

[8] In the San Francisco 2011 mayoral election, only one public poll, from University of San Francisco, simulated the counting and elimination process. In an interview, Floyd Huen, field director for successful Oakland mayoral candidate Jean Quan, said that no public Oakland polling data used the elimination rounds in predictions.

proportional representation), suffrage requirements, and the like – have important effects in influencing and shaping voter behavior."

Even within a voting system, the design of the ballot can have profound effects on outcomes because of cognitive burdens on voters. Wand et al. (2001) found that the butterfly ballot used in Palm Beach County, Florida, in the 2000 presidential election caused more than 2,000 voters who intended to cast their ballots for Al Gore to vote by mistake for Reform candidate Pat Buchanan. Sinclair et al. (2000) support this finding in reporting experimental evidence that two-column ballots can cause voter confusion.

### g. The impact of choices on voter information, satisfaction, and motivation

Sponsors tout ranked choice voting for increasing the extent of choices offered to voters by allowing them to rank three choices. In a 16-candidate race as in the San Francisco 2011 Mayoral Election, RCV offered voters 3,360 possible configurations of the three selected candidates (16*15*14) assuming they maximized their votes by putting a different candidate in each slot. Research suggests that the magnitude of these choices may actually impede turnout by requiring greater voter information, reducing the satisfaction derived from voting, and reducing voter motivation.

The information theory of voting attempts to resolve the Downsian voter paradox and rests on two key observations. First, most citizens are predisposed to vote. Brody (1978) found that approximately 90 percent of Americans believed they should vote even if their preferred candidate were certain to lose. Second, some citizens abstain because they are unable to evaluate the candidates. This is evident in blank ballots in many less-known local races. Citizens may know nothing about the candidates or issues involved. Those who abstain from voting sometimes explain that they feel too uninformed about the issues to vote. In particular, Palfrey

and Poole (1987) found a positive correlation between the information a voter had and that person's probability of voting in the 1980 presidential election although these people were likely more politically motivated as well.

Matsusaka (1995, 94) uses information theory to claim that even when voters believe they have a duty to vote, they sometimes abstained if they are not confident they are making the right choice. With incomplete information about the candidates, a voter may fail to select the preferable candidate. The more confidence a voter has about the voting decision, the greater the expected value of changing the election outcome. Voters unsure about their chosen candidates will put less value on shifting the election to favor those candidates. Traditional social choice theory shows that value placed on changing the election outcome increases the benefits associated with voting. One might postulate, then, that ranked choice voting would cause citizens in general to abstain from voting because the greater range of decisions in selecting and ranking three candidates would have the effect of decreasing confidence. Since RCV increases the information a voter needs in order to confidently vote, it introduces cognitive challenges. Confidence is not consistent across the electorate since some neighborhoods and communities receive more information. Since voters need more information to use all three choices in RCV than to make one selection in a two-round runoff system, RCV would seem to make those with limited access to information worse off. Those with less information comparing the candidates will be less certain about their choices and therefore less likely to vote.

Paradoxically, more choice can lead to worse decision-making. Schwartz (2004) shows that eliminating consumer choices can greatly reduce anxiety for shoppers and improve satisfaction with selections. He writes, "though modern Americans have more choice than any group of people ever has before, and thus, presumably, more freedom and autonomy, we don't

seem to be benefiting from it psychologically" (Schwartz 2004, 99). RCV is one source of these expanding choices in modern life in a number of cities. Sethi (1998) looks at limiting choice through the lens of motivation, finding that too much choice can attenuate motivation. Though Sethi does not consider voting, the same mechanisms that caused students presented with fewer extra credit essay prompt choices to complete the essay more often and write higher quality essays could also cause voters presented with fewer potential choices to vote more often and to make higher quality decisions.

**h. Ranked choice voting in the context of an individual's experience of the ballot**

San Francisco activist George Wooding writes, "We voters must be very wise with all three of our votes. Vote for the three mayoral candidates who represent your interests and points-of-view. It is our responsibility to understand the vagaries of San Francisco's Ranked Choice Voting system" (Wooding 2011). Bartholdi and Orlin (1991) suggest that these vagaries may be impossible to understand. Their examination of single transferable vote shows mathematically that casting an effective strategic vote is nearly impossible in a preferential system. While many would claim that being unable to vote strategically is an advantage of the system, this inability also reveals the complexity of the RCV runoff process.

Steven Hill, who helped draft the ranked choice voting system for San Francisco and Oakland, rejects criticism of RCV based on its complexity, saying, "Most people don't understand how your car works, or how your computer works or how your phone works... but they know how to use it, and they're comfortable with it" (Coté 2011). It seems important to ask if democracy is analogous to computers and phones. Particularly if citizens are not voting because of uncertainty, understanding how an electoral system works would take on a much greater significance.

"It's clear that San Francisco voters understand ranked-choice voting about as well as they understand quantum physics," remarked Nathan Ballard, a Democratic strategist and spokesman for the first San Francisco mayor elected under RCV (Coté, 2011). "It's cloaked in mystery to the degree that most voters find it indecipherable, and will have no idea of the impact of their votes on election day," Ballard said. Even strong supporters of RCV seem confused by the system. In attempting to describe the simplicity of the system, journalist Damon Eris (2011) wrote, "On November 8th, Democratic incumbent Ed Lee won the mayoral election on the second round tally. After the elections department counted the first-ranked choices, Lee and Supervisor John Avalos were at the top of the pack, with 31 percent and 19 percent of the vote, respectively. After the second round runoff tally between Lee and Avalos, Lee ended up besting the Supervisor 60 percent to 40 percent." In reality, the mayoral race in San Francisco continued for 12 elimination rounds before Ed Lee received a majority of the remaining ballots ("RCV Mayor" 2011). This is more than a simple mistake of counting rounds because Eris' conception of the RCV system makes it appear far more analogous to the two-round runoff system than it was in practice.

The copious evidence of frustrations with RCV does not suggest, however, a path to understanding its effects on turnout and ballot usage. With ranked choice voting, the dichotomous vote-abstain decision is replaced with the much more complex question of ballot usage. A voter can select one to three candidates. One possible way of understanding ballot usage effects would be through similar phenomena, such as ballot roll-off, with plurality and runoff elections. Roll-off traditionally measures the tendency of the electorate to vote for high profile office but not for less known offices on the same ballot and in the same election because of a lack of knowledge about candidates (Darcy and Schneider 1989, 348). Studies have

indicated that African American voters tend to have a higher roll-off rate than white voters do. The difference in roll-off rates increases for less important contests found later in the ballot (Vanderleeuw and Engstrom 1988; Vanderleeuw and Sowers 2007). This difference is likely attributable to a lack of information about the candidates reported by African American voters (Darcy and Schneider 1989, 350). While all three choices in an RCV race are for the same elected position, voters may attach a range of importance levels to the successive rankings. The first choice candidate is the most important and it requires comparatively little attention to find a single candidate to support. As enthusiasm for the remaining candidates drops off, the likelihood of maintaining the attention necessary to identify one's second or third choice candidate declines. Finding the right second and third choice candidates may be difficult and would likely increase RCV "roll-off" in the form of skipping later rankings.

**i. Survey evidence demonstrates uncertainty and discomfort with RCV**

Survey evidence provides a window on how these challenges affect voters in the ranked choice voting system. Steven Hill (2008) wrote in an op-ed for the *San Francisco Chronicle* that ranked-choice voting and runoff style elections are the same, except that RCV costs less money and has higher turnout because it requires only one election. Yet, a poll conducted a month before the 2011 San Francisco mayoral election shows increasing levels of uncertainty about second and third choices. The USF/Bay Citizen poll found that 21.1 percent were undecided on a first choice for mayor, 39.8 percent were undecided on a second choice, and 56.2 percent were undecided on a third choice (MOE +/- 4.2%) (*Bay Citizen*/University of San Francisco 2011).

Following the November 2005 election in San Francisco, the second use of RCV in San Francisco, San Francisco State University conducted a study of ranked-choice voting (Neely, Cook, and Blash 2006). Though proponents of RCV point to the survey as evidence of RCV's

success and popularity, the study suggested significant flaws in the public's understanding of RCV. Only 54 percent of voters surveyed said they knew before voting that the ballot would ask them to rank candidates for City Treasurer and Assessor. If nearly half of the electorate did not know beforehand that the ballot asked for three choices and yet voted anyways, this suggests randomness in voters' last two choices. Moreover, there were significant racial and language-based disparities to knowledge about RCV. Only 41.9 percent of African American voters knew they would be ranking choices for those offices. While 61.3 percent of voters who reported speaking Spanish as a first language said they had prior knowledge of RCV, only 47.4 percent of voters speaking languages other than English, Chinese, or Spanish reported knowing that they would be asked to rank choices. Income made a difference as well, with 49 percent of those earning less than $10,000 reporting prior knowledge compared to 59.3 percent of those earning between $75,000 and $99,999. Many voters may not have understood how to use RCV to express their vote effectively since 13 percent reported significant difficulties understanding how RCV worked. Though some of the voters who reported not knowing that they would be voting using RCV claimed to have learned how to vote via instructions at the polling place, one must question the ability of a voter who did not prepare to vote for multiple candidates to intelligently choose second and third choices.

The situation has not improved with time. A study conducted in San Francisco in March of 2011 showed continued confusion about RCV. When asked if their vote continued to count even when the three candidates listed were eliminated, 55 percent of respondents were unsure, and 29 percent thought their votes still counted, when, in reality, a ballot is excluded or "exhausted" once all three choices are eliminated (Binder 2011).

This uncertainty has resulted in growing discomfort with RCV in surveys. In 2006, more

than three times as many San Francisco voters preferred RCV (55 percent) as preferred a two-round runoff system (17 percent) (Neely, Cook, and Blash 2006, 25). By 2011, 52 percent of respondents preferred two-round runoff compared to 42 percent who preferred RCV (Binder 2011). One year later, after the 2011 RCV mayoral election in San Francisco, 58 percent of survey respondents prefer runoff elections and 31 percent prefer RCV (Binder 2012).

Dana Chisnell, a usability-testing expert developed perhaps the most illustrative examination of the individual experience of RCV by approaching the question of RCV challenges from the ballot design perspective (Chisnell 2012). While her analysis is not yet complete, some clear trends emerge. She found that voters do not read instructions and that even reading the instructions on an RCV ballot did not necessarily help people to vote as they intended because the instructions only explained how to mark the ballot, not how those votes were counted. She further found that the instructions and explanations were too far away from where the ballot asked voters to make their ranking decisions. Ballot design can help convince voters to act in a certain way, and Chisnell found that an RCV ballot from Portland, Maine was more effective than the one from Oakland in causing voters to select three unique candidates. In terms of the relative importance of the three votes, Chisnell found that many participants described their third choice vote on the Oakland ballot as "'throw-away'" (Chisnell 2012).

Chisnell dedicated the most in-depth analysis to how perceived understanding of the RCV system affected attitudes towards it. The study found that very few people could accurately describe the RCV vote-counting process (Chisnell 2012). Indeed, "one participant in Oakland was a congressional aide who was tentative about his understanding of how ranked choice voting worked" (Chisnell 2012). While challenges in describing how the system works cut across education and socioeconomic levels, participants in poorer neighborhoods had even greater

difficulty describing the counting process. In terms of common errors, many participants erroneously theorized that ranked choice operates by weighting or allocating points based on the rankings. Many participants talked themselves into corners as they tried to describe the counting process and most explanations ended with "'I don't know'" (Chisnell 2012). Of those who described RCV correctly, few were confident in their knowledge.

Participants responded differently to their own lack of knowledge and to RCV once the experimenters explained the counting process to them. Some respondents said that they trusted the system even though they did not understand the vote-counting process since they believed that election officials would count the votes appropriately. Others felt that understanding the system was an important part of trusting the outcomes. Once they learned how counting worked, some participants were put off by the system, with several participants saying that RCV seemed almost undemocratic. This reaction was almost visceral, with one participant exclaiming, "'I *hate* ranked choice voting!'" as soon as he saw the ballot (Chisnell 2012).

Even if one agrees that RCV is currently creating cognitive challenges for voters, however, one possible rebuttal would be that these effects are only temporary while voters get accustomed to the RCV system. Even if many voters in early RCV elections do not vote for a full complement of three candidates, ballot usage may increase as more voters come to expect to rank candidates as in Malta.

### j. Malta's successful implementation of single transferrable vote actually suggests permanence of cognitive challenges with RCV

On first glance, Malta stands out as an example of why the cognitive challenges associated with ranked choice voting might be only temporary. While Malta enjoys the highest non-compulsory participation rates among democracies, the reasons for that high participation are not present in RCV systems and indeed highlight persistent challenges with RCV.

Malta uses single transferrable vote (STV), which, like RCV, is a preferential voting system. In addition, like RCV, STV allows voters to choose among individual candidates rather than political parties, as is often the case with proportional representation systems common in Europe. Yet, like proportional representation systems, STV elects candidates from multi-seat rather than single-seat districts.[9]

Malta stands out for its near 100 percent turnout rates without compulsory voting. In 1987, 96 percent of the registered voters (236,719 of 246,292) turned out to vote. The highly contested 1987 election had the highest participation rate for a Maltese election, but turnout has not dropped below 90 percent since 1966 (Hirczy 1995, 255). The most recent election in 2008 had 93 percent turnout (Malta Department of Information).

The high turnout levels in Malta would suggest that any cognitive challenges faced by Maltese voters are not preventing them from voting, and that any turnout challenges with RCV in the United States will be temporary. With some time to acclimate, the argument goes, voters in Oakland and elsewhere will come to understand how RCV works and participation rates will grow (Cox 2012).

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[9] In an STV election, a candidate requires a certain minimum number of votes, known as the quota or threshold, to be elected. The quota in most STV elections is the number of valid votes cast divided by one more than the seats available plus one:

$$votes\ needed\ to\ win = \left(\frac{valid\ votes\ cast}{seats\ to\ fill+1}\right) + 1$$

This formula is the equivalent of the 50 percent plus one majority necessary in single seat majority elections. In counting the votes, any candidate who reaches or exceeds the quota on the first count is elected. For any candidate that has more votes than the quota, surplus votes are transferred to other candidates proportional to the preferences of the voters. For example, if the quota is five and Candidate A receives 10 votes with 5 listing Candidate B in second place and five listing Candidate C in second place, then of the five surplus votes are allocated 2.5 to Candidate B and 2.5 to candidate C. If no candidate meets the quota, the candidate with the fewest votes is eliminated and that candidate's votes are transferred to the next choice on each voter's ballot. This process repeats until there is a winner for every seat or are as many seats as remaining candidates.

The reasons given for the high turnout in Malta vary, but they tend to center around the relationship between the partisanship of Maltese elections and the STV structure in Malta, neither of which apply in the RCV context.

One explanation for high turnout in Malta is the intense partisanship of Maltese voters. Literature on partisanship and voting indicates that strength of partisan identification has a strong positive effect on turnout (Budge et al. 1976). Strong partisan affiliations eliminate information and decision-costs and motivate voters to go to the polls to support their own party and beat the opposition. The largest challenge in assessing Maltese partisan identification is the absence of political opinion polling (Howe, 1987, 237). Yet partisanship in Malta is "so pervasive, ingrained, and linked to class, ideology, and locality that preference patterns are known by street (Hirczy 1995, 258). Party loyalties are "strong, stable, and rooted in social and family background" (Hirczy 1995, 258). While Malta allows access to the ballot for a range of parties, it has a durable two-party system and, since 1966, no third party has won a seat in parliament. While Malta's STV system allows voters to spread their votes across party lines, there is virtually no ticket splitting, meaning that the vast majority of voters only support candidates from a single party (Howe, 1987, 240). In the 1987 general election, only 1,464 votes (0.62 percent) transferred from candidates of one party to candidates of another (Hirczy 1995, 258). The rise in turnout matched the timing of the disappearance of other political parties and the solidification of the electorate into two competing factions (Hirczy 1995, 267). The decrease in the number of political parties as well as the increase in partisanship eased the informational task of voters (Cox 2012).

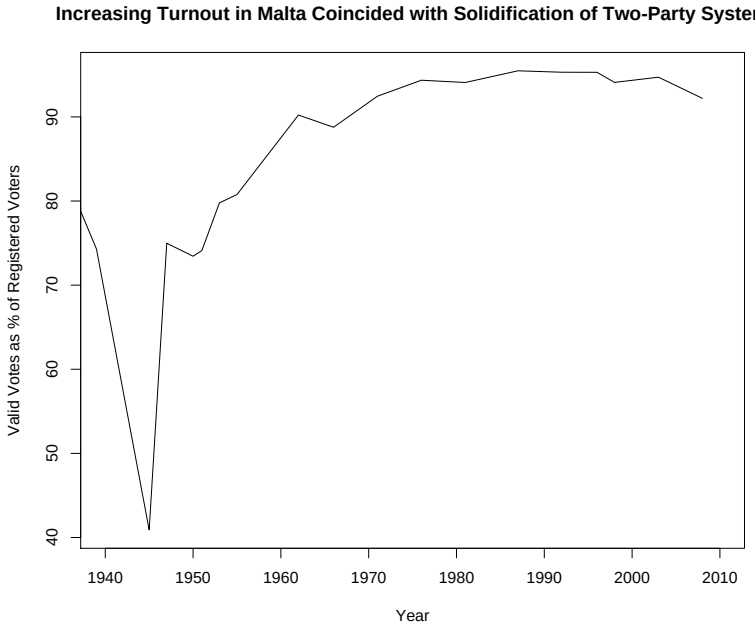


Figure 2-1 – Increasing turnout in Malta from 1940s through 1976 (maltadata.com).

STV promotes the development of strong political parties. Like other proportional representation systems, STV elects representatives to multimember districts, meaning that multiple candidates from the same party can win election. A vote for one candidate is therefore not necessarily a vote against another, but may just represent ordering on the voter's ballot. This multimember district structure promotes the development of strong parties to build mutual support, which in turn foster political advancement through a party structure. Candidates see representing the party as an honor and the several unsuccessful elections are a prelude to later advancement. Both candidates and voters understand this process of advancement (Cox 2012). The local party chief, who has a very low chance of election, instructs local voters about the party's preferred choices and the order in which they should appear. With the success of higher party officials, the local chief can advance. Because voters get their information from the local party chief, there is a very low information cost to the voter in working with a preferential voting

system. High levels of partisanship with low ticket splitting mean that the voters already know which party they will support and can just turn to the local boss for the ordering of candidates.

The contrast with Maltese elections actually highlights the information challenges of RCV because the factors that enable high Maltese participation are not present in RCV systems. Information costs are much higher in RCV local elections in Oakland because single seat, non-partisan elections preclude the development of factions. This is consistent with Lee (1960) who found in a study of nonpartisan elections and politics in California cities that nonpartisanship tended to reduce voter participation. In contrast to the Maltese STV system used to choose the members of multi-member parliamentary districts, RCV elections choose a single winner. It is hard for the candidates to campaign together, because their interests are at odds since only one wins. Moreover, Oakland, San Francisco, and other cities both with and without RCV run nonpartisan elections, which prevents the candidates from listing a political party on the ballot. This increases the information and decision costs to the voter, who cannot use party identification as a heuristic. Nor can voters become motivated by supporting their party over another, so any outcome-oriented motivation must come from enthusiasm about individual candidates. Because of the absence of effective, durable factions, the Maltese process of political advancement does not occur. Candidates in an RCV system do not enter the race to symbolically support candidates that are more senior. Because each candidate hopes to win, he or she can only assist their core supporters in limited ways about how to cast later choices.

### k. Conclusion

Before launching into empirical testing of the implications of RCV, it is important to build a framework for why the actual implementation of RCV might differ from theoretical expectations. First, this chapter outlined highlighted some of the ways in which existing literature has approached voting systems from the direction of what they have the potential to do

rather than how they work in practice. While the theoretical underpinnings of elections systems provide a strong framework, actual implementation may reveal different effects, particularly in the realm of cognitive challenges with different voting systems that may produce disparate costs for different ethnic, age, education, and income groups. Turnout forms a strong basis for testing these cognitive challenges and disparate effects as there is a strong literature describing these effects in other voting systems. Particularly relevant for RCV, cognitive challenge theorists say that more choices while theoretically increasing a voter's voice may actually depress satisfaction and motivation. Since the public does not generally understand how RCV works, proponents and critics debate whether understanding how a voting system works is important in using that system. Opinion surveys and a usability study provide one answer to this question, revealing discomfort with uncertainty about RCV. Finally, one might respond that this discomfort is merely temporary in cities that have newly adopted RCV. This thesis cannot disprove this claim, but the common reference to Malta as a country with high turnout in a preferential system actually highlights reasons to believe that cognitive challenges with RCV may last.

## Testing Empirical Claims about RCV in Oakland

### a. Why Oakland

Oakland provides an ideal setting to study RCV because it had a competitive RCV election with more than two strong candidates and had two consecutive mayoral elections without incumbents, without RCV in 2006 and with RCV in 2010.[10] RCV elections are difficult

[10] The first RCV mayoral election in Oakland indicates the profound effect RCV can have on elections outcomes. The winner, City Councilmember Jean Quan, went from a deficit in first place votes to a two-point victory against the presumptive frontrunner, Don Perata, who was president pro tempore of the California Senate before running for mayor.

Quan's victory is widely attributed to an "Anyone but Don" coalition she composed with other candidates to oppose Perata. The possibility for this coalition came with the implementation of RCV. The ability to rank multiple candidates on a single ballot meant that a

to generalize in the two other prominent California cities with RCV – San Francisco and Berkeley – because San Francisco has not had an RCV mayoral election without an incumbent and Berkeley has not yet elected a mayor using RCV.

Gavin Newsom, the popular sitting mayor of San Francisco, won the 2007 mayoral election in San Francisco in the first round with 74 percent of the vote ("City and County of San Francisco Municipal Election November 6, 2007: Election Summary"). His next closest competitor, Quintin Mecke, received six percent of the vote. While the 2011 mayoral election was more competitive, extending for 12 rounds of vote counting and candidate elimination, it once again featured a sitting mayor who won the election. Edwin Lee received 31 percent of the votes on the first count and led his nearest opponent by more than 11 percentage points in every round of counting ("Official Ranked-Choice Results Report, November 8, 2011 Consolidated Municipal Election Mayor"). Neither of Oakland's last two mayoral elections have had an incumbent candidate. Future research should examine how the presence of an incumbent changes the dynamic of the election, but, for this preliminary inquiry, limiting the scope of examination to races without an incumbent focuses the analysis on the dynamics of the RCV system. Incumbents typically dominate elections in which they appear.[11] The lack of perception of a close race lowers voter motivation to turn out or to vote for multiple candidates. High name recognition of the incumbent versus other candidates likewise changes the circumstances of the election.

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voter with a different favorite could nonetheless put Quan second or third. Indeed, Quan's field director and husband, Floyd Huen, commented in a conversation that he attributed Quan's win to her persistence in talking with voters who supported other candidates to encourage them to put her second or third (Huen 2012). The transfer of votes from other candidates and particularly from Rebecca Kaplan, another city councilmember and third-place candidate in the 2010 election, made Quan's victory possible.

[11] An incumbent has yet to lose a reelection attempt in either San Francisco or Oakland ("San Francisco should repeal ranked-choice voting")

Berkeley is not a viable choice for analysis here because it has yet to elect a mayor using ranked choice voting. Examining the race for Oakland mayor as opposed to Oakland city council or San Francisco supervisor minimizes the expected cognitive challenges for the voter and therefore provides the most positive possible environment for evaluating the electoral system. The mayor's race is the most important municipal election, which should limit the extent to which cognitive limitations bind because of lack of import of the race for the voter. Voters might abstain from down-ticket races because of fatigue or limited name recognition of the candidates, but the mayor's race receives most of the publicity and therefore affords voters the greatest chance to critically evaluate the candidates. The mayor's race further limits cognitive challenges due to a lack of funding. Less visible contests do not attract the level of fundraising of mayoral elections, and therefore do not have the same advertising, which provides information about the candidates to the voters. The same is true of the energy of the campaign, which will be highest for the mayoral election. Finally, elections departments in Oakland, San Francisco, and elsewhere have timed educational efforts around RCV to mayoral elections, which should further increase the level of voter knowledge of RCV.

### b. The data

Analysis in this thesis utilizes two types of information – demographic and electoral – to test the impact of RCV implementation on different groups in the Oakland electorate. Demographic information used here includes data on race, education, income, and language. Electoral information provides an accounting of how many people voted from each precinct and, in the case of RCV, how they used their ballots.

All demographic data presented here comes initially from the Census. The 2010 Census provides the most specific information on demographics by ethnicity on the block level. Education, income, and language use a smaller sample and are collected at the larger unit of the

block group to protect the anonymity of respondents. Because the Census has yet to release the 2010 information in these areas, this analysis uses data from the 2000 Census Summary File 3 as gathered by the Minnesota Population Center.[12]

There are two types of electoral information used here: statements of vote and RCV ballot image data. Turnout information used to analyze the threshold decision to vote comes in the form of statements of vote from the University of California Berkeley Statewide Database, which aggregates these statements from all California counties. The statement of vote contains the number of registered individuals and voters in each precinct. The ballot image data, used to examine whether ethnicity, language, income, or education affect whether voters use all three options, comes from each city's elections department as a text file with a string of digits on each line that encode one of the three rankings for each voter. Each voter, then, has three lines in the ballot image file. By using the codebook, it is possible to aggregate the choices and identify the rankings of the three candidates selected by each voter. This aggregation allows for the examination of usage of rankings including undervotes and duplicate voting pursued in Chapter 4 on ballot usage.

Following typical practice, block-level ethnicity variables were joined to precinct-level electoral variables by reducing each block to a point at the spatial center of the precinct,

[12] This may introduce error because of changes over time. People may have moved in the intervening 10 years. Nevertheless, the alternative of using 2005-2009 aggregated American Communities Survey responses solves one problem while introducing an even larger issue. The ACS aggregated responses are newer, so less error is introduced because of the time between the survey and the election. However, the ACS sample is much smaller than the one used in the Census survey, so the Census will only release data at the Census tract level, which is much larger than the block group (American FactFinder 2012). Differentiation of groups of voters is at the core of this thesis, so the analysis here uses block group data from the 2000 Census. Other recent analysis of RCV has attempted to impute race and other demographic characteristics from the names of voters on official voter registration records (Cook and Latterman 2012). This has the benefit of limiting the examined population to registered voters, but introduces error due to inaccurate imputation.

depicting each precinct as a polygon, and summing the values of each variable across the blocks within each precinct (Donald 2005; Dyck and Gimpel 2005; see Figure 2-2 for a visual depiction of this spatial join and Appendix A for a discussion of this method's threats to validity).[13]

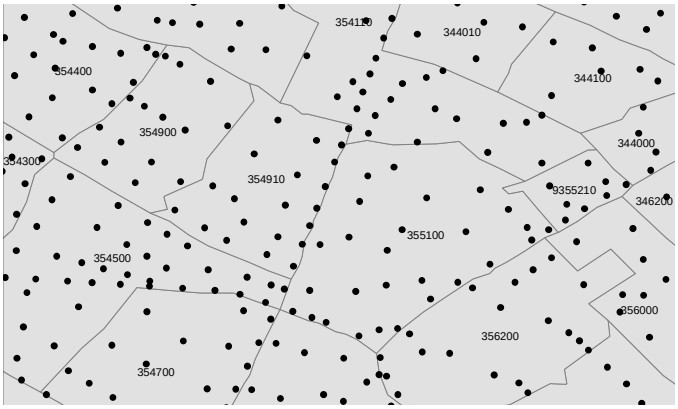


Figure 2-2 – Blocks are converted to points and data aggregated by precinct ("California Election Precinct Data Files"; American FactFinder)

# III. Two approaches to RCV's effect on turnout in Oakland offer contrasting conclusions

## a. Introduction

Electoral systems alter the threshold decision to participate in an election. They change the incentives to participate, confidence in voting decisions. Understanding how this change affects the aggregate voice of the electorate is important. The system may increase or decrease turnout, changing the size of the slice of the public that forms the electorate. Even more importantly, a change in voting system can change the balance of voices in the election by

[13] The wider demographic information provided at the block-group level presents a further challenge as the size of block groups is approximately the same as that of precincts but with non-matching borderlines. This means that unlike the spatial joining of blocks to precincts in which the center point of several blocks almost invariably fell within each precinct, precincts often did not contain the center point of a block group. To resolve this issue, the values of these variables for each precinct take the value of the block group with a center point nearest to the center point of the precinct. For most of the precincts, the center point of the nearest block group lies within the borders of the precinct, but this method allows precincts for which this is not the case to remain in the analysis.

disproportionately encouraging or discouraging participation from one group in relation to others. Within this framework, there are fundamentally two divergent accounts of turnout with ranked choice voting in Oakland based on different assumptions. Looking at Oakland alone highlights low turnout among minorities both before and after the implementation RCV. The strength of this method is that it only relies on the features of Oakland but falls short because it relies on constancy within Oakland during the enactment of RCV. Using this method, overall turnout increased only slightly and a strongly negative relationship between the percent minority population in a precinct and turnout appeared both before and after the change in electoral systems and for individual ethnic groups for Latinos and Asians. The second account of RCV's effects is a difference in differences model that attempts to isolate the effects of RCV by using a similar city that did not implement RCV. The strength of this method is that it allows for changes within Oakland apart from RCV as long as they also appear in the comparison city, but it too faces challenges based on degree of match between Oakland and Long Beach. This model indicates that RCV may have reduced the turnout gap between high Asian and African American precincts and lower minority precincts in Oakland.

### b. Oakland mayoral elections without RCV in 2006 and with RCV in 2010 show low and decreasing turnout among higher minority precincts

Turnout data from the 2006 and 2010 Oakland elections indicates that while overall turnout increased during the implementation of RCV, minority turnout decreased, suggesting that RCV had a negative effect on minority turnout. This within-city analysis avoids assumptions of comparability between different cities, but relies on the assumption that the sole force acting on turnout in Oakland between 2006 and 2010 was the introduction of RCV.

Overall, turnout in Oakland increased slightly from 2006 to 2010. In 2006, 60.23 percent of registered individuals voted (2006 Alameda Statement of Vote). In 2010, 61.22 percent voted,

for an increase of about one percent (2010 Alameda Statement of Vote). This turnout varied across the population of Oakland.

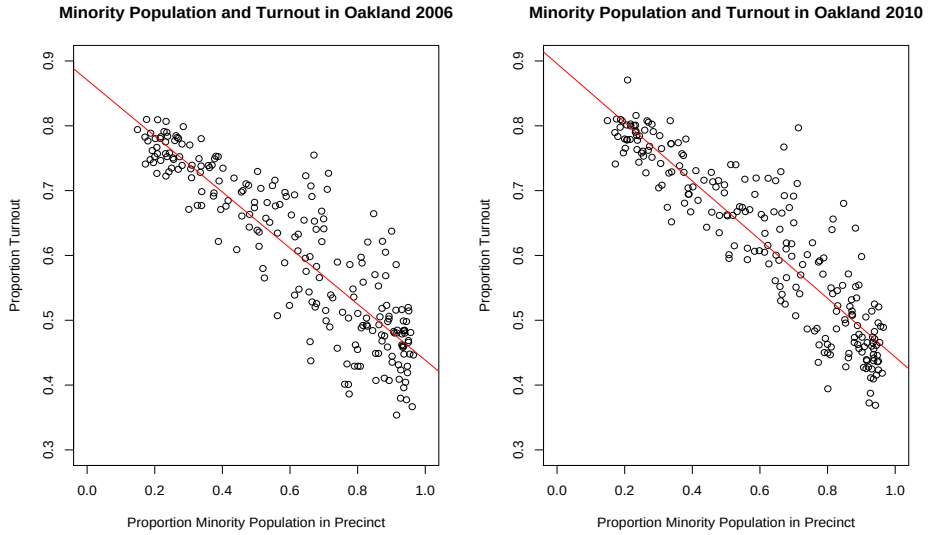


Figure 3-1 ("California Election Precinct Data Files"; American FactFinder)

The strong negative relationship between the percent minority population in a precinct and decreased turnout is striking both in 2006, before the implementation of RCV, and in 2010, in RCV's first usage in a mayoral election.[14] In both years, precincts with 20 percent minority population had 80 percent turnout while those with 80 percent minority population averaged about 50 percent turnout. This difference is particularly striking given that measuring turnout as

[14] Aggregating the proportion population of different ethnic groups in the precinct, while not necessarily consistent with likely predictors of turnout, serves two purposes here and in the next chapter. In situations such as this in which the effect of larger proportions of each ethnic group has the same direction of effect as the aggregated proportion, it makes the chart more readable. To the extent that there are no anticipated mechanisms specific to a single ethnic group, no hypothesis needs to be tested using one ethnic group alone. The later multiple regression disaggregates the ethnic groups to look at the effects of proportion population of each individual group. This and later charts address the question of whether RCV reduces the electoral voice afforded to minority communities. Constitutional redistricting challenges have consistently considered the proportion minority population in a precinct as a relevant figure of concern and so this same proportion would feature in any constitutional analysis of RCV (Voting Rights Act, Section 2).

a percentage of registered individuals who voted maximizes minority turnout by excluding the registration barrier often cited as the cause of low minority turnout (Rosenstone and Wolfinger 1978). In light of the downward slanting line in both years, the differences between the years seem slight in light of the similarities.

Nonetheless, examining the effects of ranked choice voting requires delving into those small differences. Figure 3-2 shows that there is a small but nonetheless statistically significant relationship between percent minority population and turnout change in a precinct.

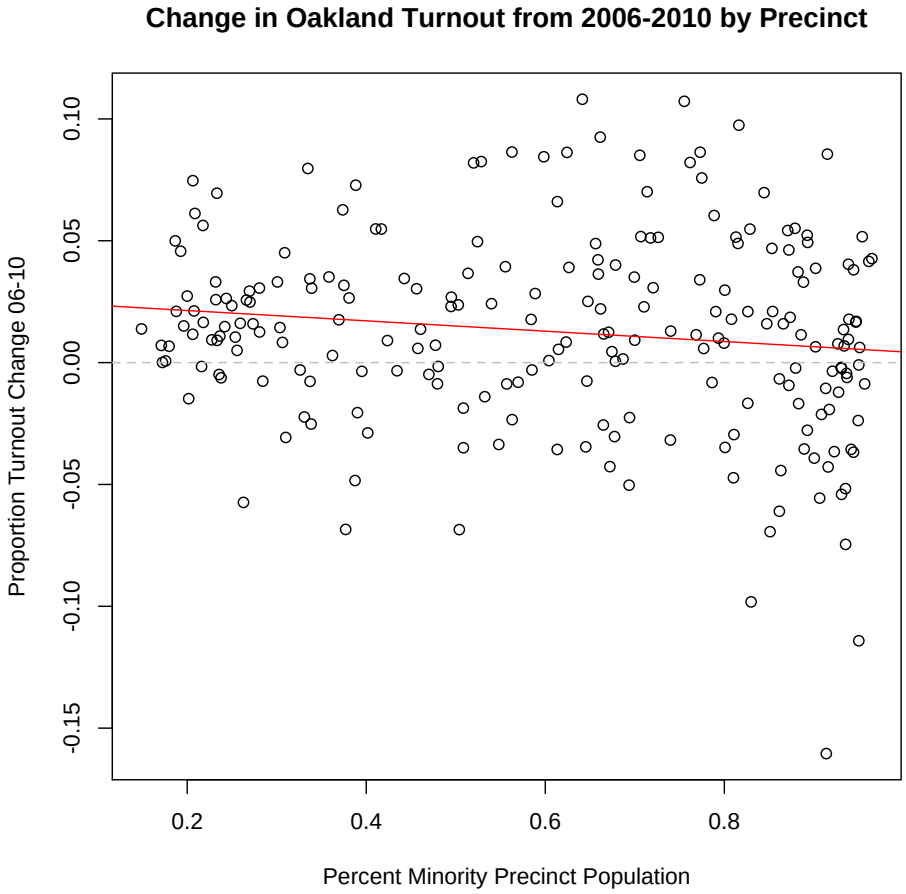


Figure 3-2 (UC Berkeley 2010 SOV; American FactFinder)

Looking at turnout change as opposed to raw turnouts in each election adds valuable information to the analysis. Rather than relating to a raw turnout, the coefficients on predictor

variables refer to changes in the *change* in turnout from 2006 to 2010. The coefficients, then, refer not to a percent change in turnout but a change in the proportion of the population of a precinct who turn out.

The magnitude of changes in precinct turnout from 2006 to 2010 is large given that the two elections occurred at the same place in the elections cycle. The absolute value of the turnout change reveals that turnout increased or decreased in precincts by an average of three points. From the perspective of differences in turnout between presidential-year and non-presidential-year elections, this magnitude of change appears small. Turnout typically varies widely based on the elections cycle, so changes of 30 points or more are common. Nevertheless, the two elections here are four years apart, so elections cycle effects are not expected. Viewed in light of studies of get-out-the-vote techniques, the change here appears large. The most successful and directed door-to-door mobilization techniques only increased turnout by between seven and fourteen percentage points (Green and Gerber 2008, 169). An average change of three points seems large in the absence of such focused efforts. In one precinct, turnout declined from 58 percent in 2006 to 42 percent in 2010. This precinct also has a large, mixed minority population. It has a 36 percent Latino, 36 percent Asian, and 19 percent African American population.

This one precinct is only the most visible case of a more general negative relationship between the turnout change from 2006 to 2010 and the percent of the precinct population identifying as Asian, Latino, and African American. The model predicts that moving from zero-percent minority precinct-population to 100 percent minority population will decrease the 2010 turnout by two points relative to 2006.[15] While many precincts with high minority populations

[15] This linear relationship has a p-value of 0.04.

had increased turnout in 2010, the negative relationship suggests that the introduction of RCV negatively affected turnout in higher minority precincts.

Latino and Asian precinct population were significant predictors of changes in precinct turnout from the 2006 to 2010 mayoral elections in Oakland. In the within-city framework, the introduction of RCV diminished turnout in higher Latino and Asian precincts as compared to lower Latino and Asian precincts.

| **Response variable: Change in Turnout from 2006 to 2010 Coefficients:** | | |
|---|---|---|
| | Estimate | Pr(>\|t\|) |
| (Intercept) | 0.076 | 0.002 ** |
| Percent Latino Pop. | -0.055 | 0.042 * |
| Percent Asian Pop. | -0.088 | 0.002 ** |
| Percent African American Pop. | -0.006 | 0.796 |
| Percent Speaking Spanish Only | -0.120 | 0.087 |
| Percent Speaking Asian Language Only | 0.041 | 0.618 |
| Median Income in Thousands | 0.000 | 0.230 |
| Percent Asians with Some College | -0.005 | 0.608 |
| Percent African Americans with Some College | -0.025 | 0.212 |
| Percent White with Some College | -0.034 | 0.054 |
| --- | | |
| Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 | | |

Table 3-3 – Multiple regression for change in turnout from 2006 to 2010 (UC Berkeley 2010 SOV; American FactFinder; Minnesota Population Center)

The predictor variables considered in this multiple regression fall into four categories: ethnicity, education, income, and language. The first three predictors are the percent of the population in the precinct identified in the 2010 Census as Latino, Asian, or African American.

The education, income, and language predictors of turnout are included to pinpoint causes underlying decreased minority turnout. The theory of turnout discussed in Chapter Two indicates that low education, low income, and lack of English knowledge should explain variation in turnout. “Percent Spanish Speaking Only” is the percent of the population in the precinct who told the 2000 Census that they primarily spoke Spanish and spoke English either “not well” or “not at all,” and the “Percent Speaking Asian Language Only” refers to those who

primarily spoke an Asian language and reported speaking English "not well" or "not at all." "Median Income in Thousands" considers the role that economic circumstances might play in turnout change. The remaining predictor variables fall into the category of education. The Census provides seven answer choices in its question about education ranging from "less than 9th grade" to "graduate or professional degree." The cutoff here is at "some college" because of the requirement that children in the United States complete high school. Since some college or greater educational attainment represents greater than the national requirement, it would be illustrative to discover that having that level of education made one more likely to vote in RCV as compared to an individual without that level of educational attainment. Educational predictor variables are broken down by ethnicity in order to isolate the effects that educational levels by each ethnic community have on turnout change with the implementation of RCV.

In some ways, Table 3-3 offers a hopeful vision of the implementation of ranked choice voting. The switch in voting systems was not accompanied by strong reductions in turnout for poor, less educated, or African American minority communities since education, income, and language factors have no statistically significant effect on the change in turnout. The two statistically significant predictor variables are percent Latino and percent Asian population in the precinct. Increased percentage Latino and Asian population in a precinct was related to lower turnout change. Going from zero to 50 percent Asian population in a precinct reduced the turnout change by about 2.8 percent and doing the same for Latino population reduced the turnout proportion by 4.4 points from 2006 to 2010. Examining the reasons for this relationship is challenging because none of the income, language, and education factors are statistically significant. Since there is nothing to suggest that, absent these covariates, Asians or Latinos are

less likely to vote or less able to deal with the complexity of the RCV ballot, the explanation for the relationship is unclear.

The only message is that turnout in these ethnic communities declined somewhat *during* the switch to RCV. Any other force increasing or decreasing turnout during this same period becomes a confounding variable. This model assumes that the only force that would increase or decrease turnout for one group and not another from 2006 to 2010 was the introduction of RCV. Building a case for the causal effects of RCV requires a comparison city that allows for the isolation of the electoral system type variable.

### c. Long Beach as a comparison city that did not implement RCV

An ideal natural experiment of the turnout effects of ranked choice voting would involve two otherwise identical cities, one of which decided absent any other differences to implement ranked choice voting. Any change in turnout, therefore, would be attributable to RCV's implementation as opposed to one of myriad reasons for turnout to increase or decrease over a given timespan.

In forming a difference in differences model, however, the cities need not be identical and will not be in practice. Instead, authors place the focus on comparing changes over the period of observation and thereby isolating the effects of the treatment condition. Card (1990), in his analysis of the impact of the Mariel Boatlift on wages in Miami, Florida, offers a method for selecting comparison cities in a difference in differences model. He matches Miami with Atlanta, Los Angeles, Houston, and Tampa-St. Petersburg based on demographic similarity and similar economic growth patterns to Miami during the period under study. The only differing force on the labor markets between Miami and these comparison cities in the observation period, according to the model, is the presence of Mariel immigrants in Miami.

Card and Krueger (1994) present a parallel to the methods used below in the precinct analysis of ranked choice voting in their examination of the unemployment effects of an increase in the minimum wage in New Jersey. While the specific mechanisms postulated by the authors are not relevant to a study of electoral systems, the difference in differences model they employ for the fast food restaurants mirrors that employed here.

Following these authors' lead, five criteria factor into the matching of Oakland with Long Beach for the analysis of ranked choice voting turnout changes: same state, initiative system, political party distribution, population size, and race and ethnic makeup. The first two: same state and initiative system are threshold issues. Comparable cities must be within the same state to keep state laws and the state political environment constant. Oakland and Long Beach share a secretary of state in charge of administering elections. Moreover, state laws on elections vary widely across the country, necessitating the choice of two California cities (Blank 1973; Burden and Greene 2000). Similarly, both Oakland and Long Beach have an initiative system for adopting changes to electoral systems. Although a city council might choose to adopt ranked choice voting, that process differs from initiative-backed systems. If the city council selects RCV, the voters do not directly choose the elections system and a majority of voters may oppose the change. If the voters approve RCV, there is explicit support from the slice of voters who voted for the change (Briffault 2006). While this majority support may make up only a small part of the citizenry, majority vote requires at least a minimum threshold of support. Voters who choose to adopt a new electoral system should understand the strengths and weaknesses of that system and so should be more likely to vote than those who have a new system imposed upon them. This criterion means that only home-rule cities that give initiative power to voters are eligible for comparison.

The remaining three criteria address the importance of a match between the constituencies in comparable cities, since these variables may affect turnout. These are all questions of degree rather than presence or absence. Perhaps most important among them is the total population size. Cities of different sizes have fundamentally different political outlooks and different relationships to elections operations. In a small city or town, voters are more likely to know the candidates personally and the system is more contained (Welch and Bledsoe 1986). Moreover, smaller cities tend to have fewer candidates, which also will affect turnout and ballot usage (Webber 2011). Long Beach and Oakland are the seventh and eighth largest cities in California respectively. Long Beach has 462,257 and Oakland has 390,724 people according to the 2010 Census ("Oakland (city), Californa" and "Long Beach (city), California" Census QuickFacts).

Since this thesis analyzes voter behavior, the ideology of voters in comparison should closely match. Political party distribution, measured as the percent of voters registered as Democrats serves as a proxy for the cities' mix of ideological viewpoints. The movement for ranked choice voting is closely aligned nationally and particularly in California with liberal causes.[16] Moreover, turnout is closely aligned with viewpoint in any particular election.[17] Both Oakland and Long Beach are strongly Democratic. Oakland has 78 percent while Long Beach has 69 percent registered Democrats (Sperling's 2012). While the city of Bakersfield, California,

[16] The endorsers listed on the FairVote website are dominated by liberal-leaning officeholders and organizations including Howard Dean, Dennis Kucinich, Bernie Sanders, Peter Welch, Mark Ritchie, Arianna Huffington, the California, Colorado, and Maine Democratic Parties, and League of Women Voters organizations in Arizona, California, Florida, Massachusetts, Minnesota, North Carolina, South Carolina, Vermont, and Washington.

[17] In any election, national and state level political forces affect turnout. The campaigns by the parties matter, especially in presidential election years when there is a significant nationwide get-out-the-vote effort by the political parties. Moreover, Democrats have fairly consistently had lower turnout rates than Republicans.

has a population slightly closer to that of Oakland than does Long Beach, the cities differ widely in ideological orientation. Bakersfield has 40 percent registered Democrats and 58 percent Republicans (Sperling's 2012).

The final criterion is race and ethnic makeup. This is important since demographics are a target of the analysis and therefore need to be held as close to constant as possible in doing the comparison. Race and ethnic makeup is the percent population identifying as White, African American, Asian, and Latino in the 2010 Census. Oakland residents were 25.9 percent White persons not of Hispanic origin, 28.0 percent Black, 16.8 percent Asian, and 25.4 percent Hispanic or Latino ("Oakland (city), California" Census QuickFacts). Long Beach residents identified themselves as 29.4 percent White, 13.5 percent Black, 12.9 percent Asian, and 40.8 percent Hispanic or Latino ("Long Beach (city), California" Census QuickFacts).

### d. Comparing Turnout in Oakland and Long Beach shows increased voice for minorities

Looking at raw turnout changes from 2006 to 2010 in Oakland and Long Beach shows that the overall trend in turnout for precincts differs between the cities (see Figure 3-4). Data from the statements of vote in Oakland show that most precincts increased turnout slightly. Both the median and mean turnout change was an increase of 1.3 points ("California Election Precinct Data Files"). The middle two quartiles range from a turnout decrease of 0.8 points to an increase of 3.6 points. Long Beach turnout increased much more dramatically. The mean and median turnout change was an increase of 18 percentage points and the middle two quartiles range from an increase of 13 points to an increase of 23 points.

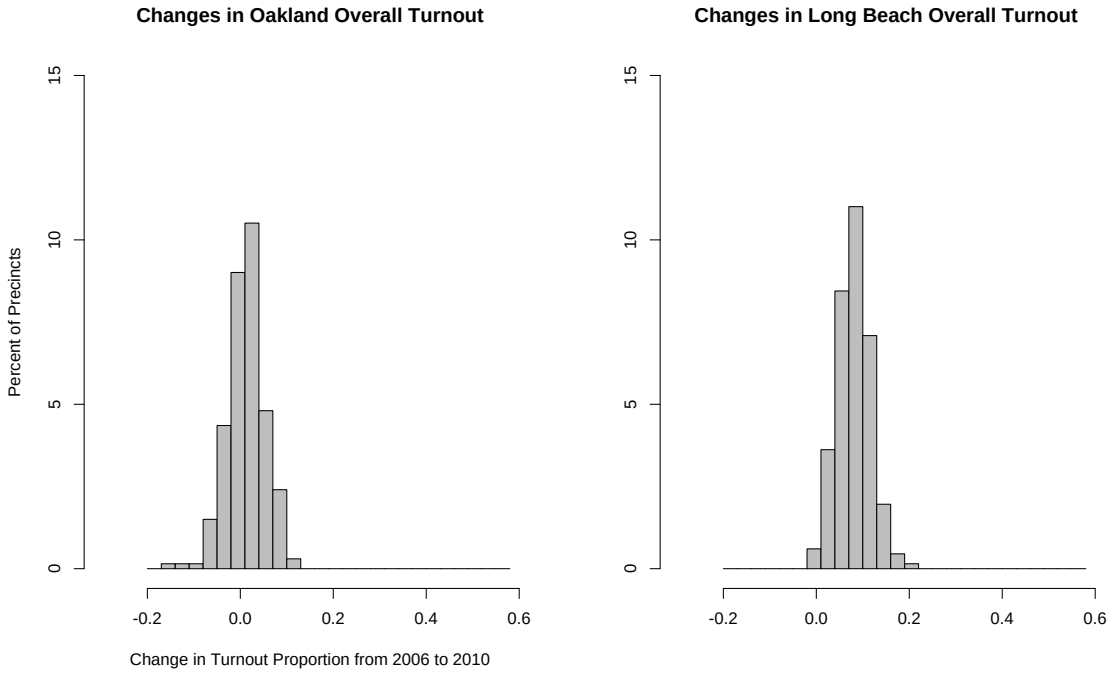


Figure 3-4 (“California Election Precinct Data Files”)

To the extent that the comparative turnout change between the cities is attributable to the implementation of ranked choice voting in Oakland, the new electoral system seems to have seriously stifled the large turnout increases witnessed in Long Beach. The vast majority of Long Beach precincts saw turnout increases while most precincts in Oakland clustered around small turnout changes. The average Long Beach precinct had a turnout of 34 percent in 2006 and 52 percent in 2010. By contrast, average 2006 precinct turnout in Oakland was 60 percent and increased only slightly to 62 percent by 2010. Turnout in Oakland was higher, therefore, in both years than it was in either year in Long Beach.

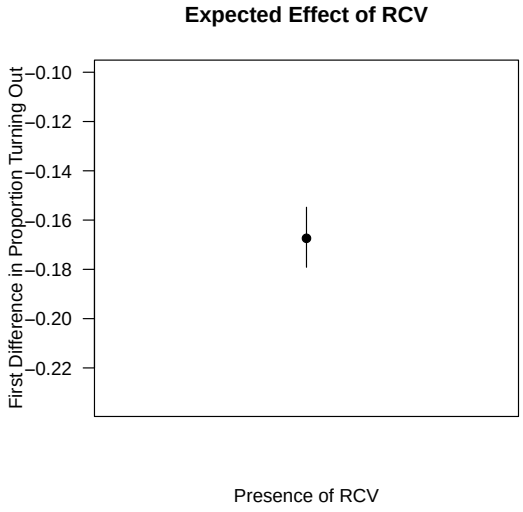


Figure 3-5

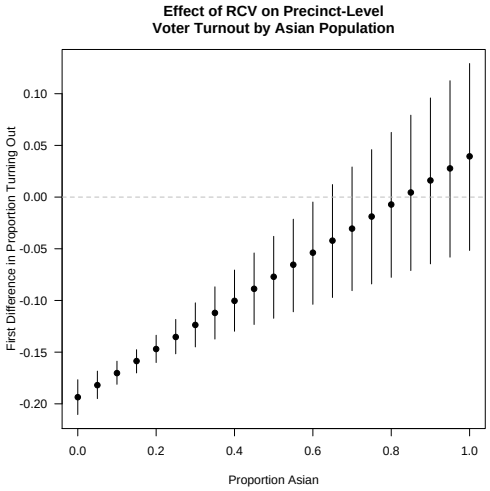


Figure 3-6

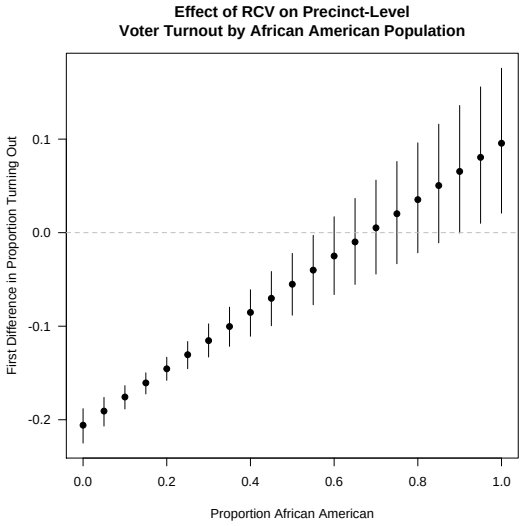


Figure 3-7

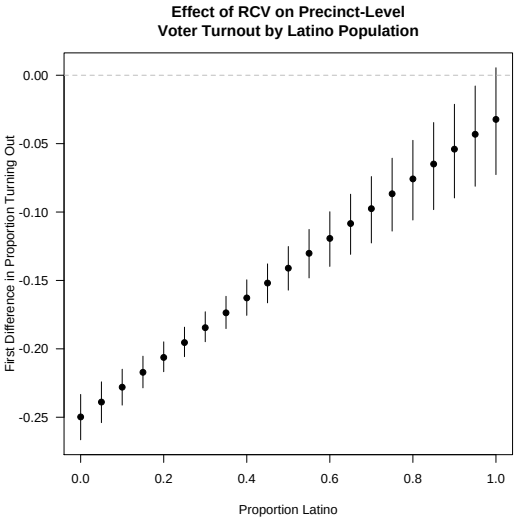


Figure 3-8

(Nall; Imai 2007a; Imai 2007b; Imai 2008; "California Election Precinct Data Files"; American FactFinder).

RCV reduced precinct turnout by 16.7 percent (Figure 3-5). This plot models the turnout difference as an equation $\text{Turnout Difference} = \beta(\text{RCV}) + \text{error}$. The β here is -0.167. The mean turnout increased by 1.3 percent in Oakland and by 18 percent in Long Beach. The

difference of these two means closely mirrors the estimate here. This result is consistent with the earlier discussion of cognitive challenges and voter confusion in the switch to RCV.

Figures 3-6, 3-7, and 3-8 examine the expected difference in the proportion of registered individuals turning out to vote with and without ranked choice voting for the percent Asian, African American, and Latino population in the precinct. In its simplest form, the relationship between the turnout difference and precinct percent Latino with or without RCV, for example, can be depicted as an equation

$$\text{Turnout Difference} = \beta(\%\text{Latino}) + \beta(\text{RCV}) + \beta(\text{Interaction of \%Latino and RCV}) + \text{error}.$$

This analysis uses least squares regression analysis to simulate the effects of ranked choice voting as proportion minority population increases in a precinct. The least squares model provides regression coefficients for ranked choice. As expected, RCV and each of the percent minority measures have a negative relationship with the turnout difference from 2006 to 2010. The interaction term, however, has a positive coefficient. A picture of the expected effects of RCV comes from plotting the simulated differences in expected values of the turnout difference between an RCV and non-RCV election.

Taken together, this comparative analysis of Oakland and Long Beach suggests that RCV is helpful to minority turnout. Each plot is upward sloping, indicating that the larger the population each ethnic group examined here, the better off the RCV precinct does in turnout as compared to an otherwise identical non-RCV precinct. The 95 percent error bars as well as the initial linear regression show that the relationship is highly significant in all three cases. Looking individually at each plot, the situation becomes somewhat more complex. Especially for the plot of proportion Latino population in the precinct, large parts of the plots lie below the zero-line on the y-axis. Below that zero-line, voters in RCV precincts have lower turnout than the similarly

situated non-RCV precinct. At no level of proportion Latino population in a precinct, for example, does the expected turnout change in an RCV precinct meet or exceed that of a non-RCV precinct, even though the gap closes with higher proportion precinct Latino population. The situation is better for the plots of proportion Asian and African American population, but up to 80 percent Asian population in a precinct, the turnout difference is still higher in a non-RCV precinct than in the matched RCV precinct.

**e. Furthering these findings**

While the difference in differences model allowed by the comparison of cities is useful for isolating the effects of a single change – in this case, the introduction of ranked choice voting – acknowledging the challenges in this implementation of the model is important as well. The largest shortcoming, inevitably, is the degree to which forces other than the studied treatment may affect the two cities. A particularly dynamic minority candidate in one city could affect turnout. Jean Quan, the victor of the 2010 Oakland mayor election, may have been one such candidate. While only using California cities ensures a large degree of uniformity and Oakland and Long Beach both have initiative systems, matching the systems in this way is not sufficient if one city has a controversial initiative measure on the ballot while the other does not. Both cities considered several ballot measures in 2006 and 2010, but discerning which measures were controversial is a challenge. These outside forces can skew outcomes, creating the perception of RCV effects when none exist.

While it is beyond the scope of this thesis, a more comprehensive analysis of the role of ranked choice voting in affecting turnout would examine a wider range of cities both with and without ranked choice and a wider range of elections. More cities would provide greater confidence in the claims and limit the outside factors that here might change results. Perhaps

more important than more cities, however, is more elections. RCV systems are new in nearly every city in which they are used. If RCV continues in use in those places, the system's effects on turnout will undoubtedly change. More time will provide greater opportunities for education, which may increase turnout but will also decrease the novelty of the new system that may have attracted some otherwise disinterested individuals. If the large number of candidates in early RCV elections is a result of this novelty, then future elections may feature higher turnout to the extent that having many candidates confuses voters who then decide not to participate. It may also lower turnout if the large number of candidates attracts more voters who feel a close connection with an individual candidate. In short, future effects are uncertain but nonetheless important to consider.

### f. Conclusion

The two stories of turnout, with one focused just on Oakland and the other comparing Oakland and Long Beach, offer seemingly contradictory visions. The Oakland analysis indicates that voters in high minority precincts had diminished turnout compared to low minority precincts both before and after the implementation of RCV. Looking at the difference between turnout in 2006 and 2010, precincts with larger Asian and Latino populations experienced lowered turnout. The difference-in-differences analysis, however, suggests that RCV added to turnout in precincts with higher minority populations. As a way, perhaps, of reconciling these two accounts, they together indicate that while precincts with larger minority populations in Oakland had slightly lower turnout in 2010 than 2006, interpreting that decline is complicated and RCV may have actually aided minority turnout. If that is indeed the case, then RCV may play a role in reducing the current challenge of low minority turnout in Oakland and provide a stronger voice to minority voters.

# IV. RCV has distributional ballot usage effects

## a. Introduction

Ballot usage lies at the core of participation in a ranked choice voting system. Unlike a single vote election in which an individual either does or does not express a preference, ranked choice opens the door to different levels of participation. Voters can select up to three different candidates, and increasing the number of candidates listed tends to increase the say of the voter in the election. This chapter examines the determinants of ballot usage in the 2010 Oakland Mayoral election. The analysis begins by looking at citywide ballot usage to establish a baseline for how Oakland voters tended to engage with the RCV ballot. Ballots in higher minority precincts have fewer unique selections, with accelerating decreases in ballot usage at higher levels of minority population. A t-test confirms that high minority precincts tended to vote for fewer unique candidates and a GAM plot shows a curvilinear relationship. However, a linear model actually provides an equally good fit to the data and shows that voters in higher minority precincts tended to vote for fewer unique candidates. This aggregate trend holds particularly for high Asian and Latino precincts. These two groups express their unique vote totals different ways, however. In the single most predictive finding of this thesis, high Asian precincts had many ballots that used fewer slots and high Latino precincts had many ballots that listed the same candidate multiple times. In a particularly stark example of the consequences of voting for fewer candidates, the chapter examines the large number of ballots that do not count in the final RCV elimination round because all candidates listed have been eliminated. The candidates that a voter supports, in addition to the number of candidates supported, affect whether the ballot is exhausted.

### b. Analysis of ballot usage compared to analysis of turnout

Prior work does not consider appropriate methods for analyzing ballot usage or its determinants. Given the similarity of ballot usage in an RCV system to three opportunities for turnout, it would seem reasonable to test many of the same determinants that might limit the number of candidates that voters support.

Ballot usage is different from turnout, however, because supporting an additional candidate does not necessarily change how the ballot proceeds through the runoff rounds. A voter's second choice only matters if the first choice is eliminated and the voter's third choice only matters if the first and second choices are eliminated. For example, a voter putting Jean Quan or Don Perata in first place never had any other choices counted since those two candidates reached the final round. It is impossible, however, to be certain of the elimination rounds. Only in hindsight does one know if voting for three different candidates mattered. The most common set of choices at 5.20 percent of all ballots cast was a first choice vote for Don Perata and no second or third choice. Since Perata appeared in the final round against Jean Quan, the absence of other selections did not affect how these voters' ballots counted in the election. The second most common set of choices, at 5.16 percent, was a first choice vote for Perata, a second choice vote for Jean Quan, and a third choice vote for Rebecca Kaplan. Because of the logic described above, these ballots and the first group counted as a vote for Perata in each round. The third most common set of choices, at 3.49 percent was a first choice for Quan, a second choice for Kaplan, and a third choice for Joe Tuman. Like the two most popular sets of choices, only the first choice on these ballots mattered. Taken together, though, later choices matter. While Perata was the most common first choice, Quan, the winner, was the most common second choice. More voters left their third choice blank than selected any single candidate.

| | 2nd choice | | | | | | |
|---|---|---|---|---|---|---|---|
| **1st choice** | | **Quan** | **Perata** | **Kaplan** | **Other** | **No selection** | **Total** |
| | **Quan** | 1.3% | 5.3% | 8.4% | 6.8% | 2.2% | 21.9% |
| | **Perata** | 11.6% | 3.1% | 6.8% | 12.4% | 5.3% | 33.9% |
| | **Kaplan** | 6.5% | 2.5% | 0.4% | 5.2% | 0.6% | 14.9% |
| | **Other** | 4.1% | 3.8% | 5.1% | 6.4% | 1.6% | 19.4% |
| | **No selection** | 0.0% | 0.0% | 0.0% | 0.0% | 0.3% | 0.1% |
| | **Total** | 23.6% | 14.8% | 20.8% | 30.8% | 10.0% | 100% |

Table 4-1 – Oakland 2010 First and Second Choice Cross-Tabulation ("Ballot Image File").

This transfer grid provides another way to approach the importance of later choices. Quan's victory over Perata came out of the almost three to one differential between transfers from Kaplan to Quan and Kaplan to Perata. Of the 10 percent of voters who put Kaplan first on their ballots, 65 percent put Quan as their second choice and 25 percent put Perata as their second choice. This difference gave Quan the support she needed to win in the final round. The ballot usage by Kaplan supporters made the difference for Quan, highlighting the importance of second and third choices. 25,271 Kaplan supporters listed either Quan or Perata after Kaplan on their ballots. Had two-thirds of the 7,383 Kaplan supporters who did not list anyone after her on their ballots instead listed Perata and one-third listed Quan, Perata would have won the mayor's race.

**c. Citywide background for ballot usage results**

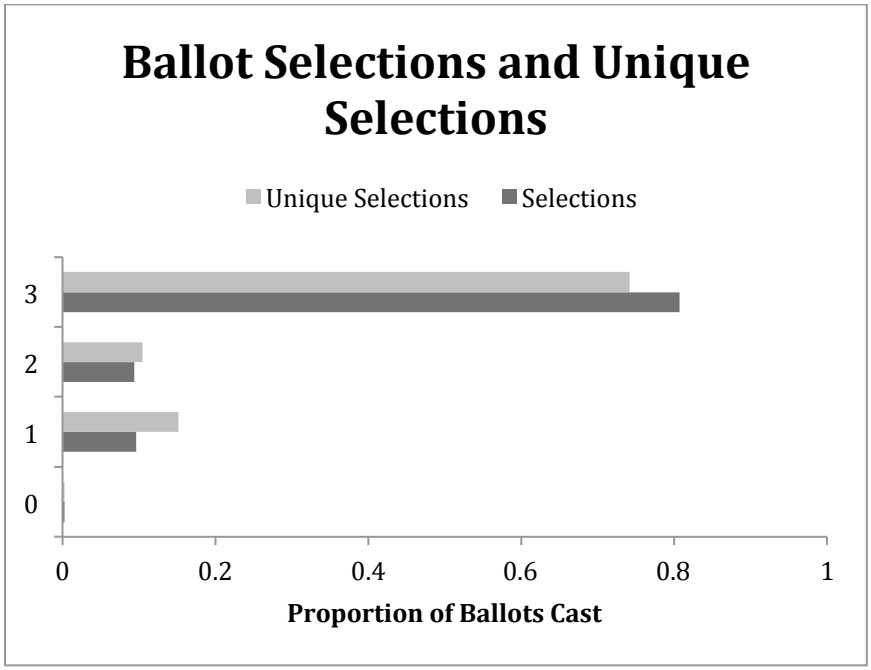


Figure 4-2 – Selections and Unique Selections ("Ballot Image File")

Figure 4-2 underlines the relationship between total number of selections and number of unique selections. The average Oakland voter selected 2.58 unique candidates and 74 percent of voters selected three different candidates (Oakland 2010 Ballot Image Data). More voters (81 percent) used all three choices on their ballots. While 26 percent of voters did not fully utilize their ballots, the Oakland 2010 mayoral election featured high ballot usage compared to other RCV races (Latterman 2010). The difference between the total number of candidates selected and number of different candidates selected comes from the average 0.12 duplicate votes on an Oakland 2010 mayoral ballot. 1.56 percent of voters supported the same candidate twice and 5.28 percent used all three choices to vote for the same candidate. Voting for the same candidate multiple times does not change the number of votes or points for that candidate and indicates confusion about the process of RCV counting.

### d. Lower ballot usage in higher minority precincts

To begin to understand how different voter groups interacted with RCV ballots in Oakland, initial analysis aggregates minority populations to capture the large number of precincts with populations of more than one minority group. Figure 4-3 plots the precinct minority population against the average number of different candidates selected by voters in the precinct. In this way, each precinct appears as a single dot. A lowess regression line fit through the points provides a smoothed average of ballot usage.

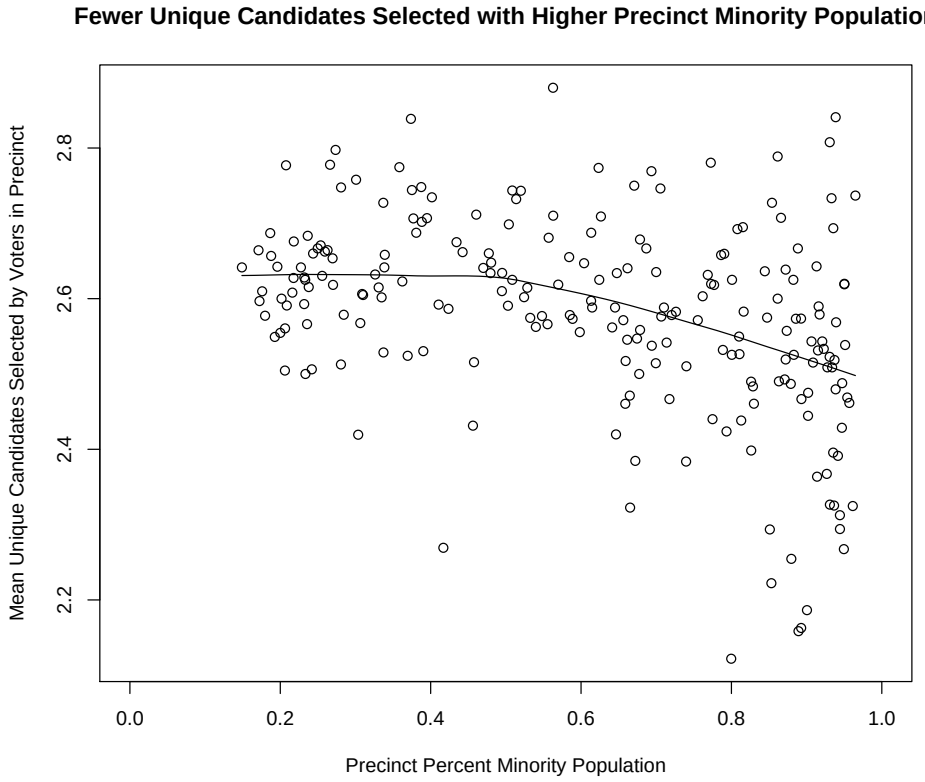


Figure 4-3 (“Ballot Image File”, American FactFinder)

Two key observations come out of Figure 4-3. First, like precinct turnout, there is a great deal of variation in precinct ballot usage. At the low end, one precinct had an average ballot usage of 2.12 different candidates. At the high end, voters in one precinct selected an average of 2.88 different candidates. The average voter in the average precinct selected 2.58 unique

candidates and the measure has a standard deviation of 0.13. Second, the scatter plot suggests and the local least squares regression line also indicates that ballot usage may have a nonlinear relationship to precinct minority population with very little decline in ballot usage through approximately 50 percent, with a steadily declining ballot usage for precincts with greater than 50 percent minority population.

A t-test (Figure 4-4) confirms on a first pass that high minority precincts tend to vote for fewer unique candidates.

| **Welch Two Sample t-test** | | |
|---|---|---|
| Data: Mean Unique Selection by Low precinct minority versus High precinct minority population | | |
| t = 7.219 | df = 176.749 | p-value = $1.490e^{-11}$ |
| alternative hypothesis: true difference in means is not equal to 0 | | |
| 95 percent confidence interval: | | |
| 0.083 | 0.145 | |
| sample estimates: | | |
| mean in low minority group | mean in high minority group | |
| 2.634 | 2.520 | |

Table 4-4 (“Ballot Image File”, American FactFinder)

Splitting the Oakland precincts in half at the median of 66 percent minority population, Table 4-4 shows that precincts in the low minority group tended to vote for more unique candidates than precincts in the high minority group. This is a course measure since it does not capture all the complexity of the continuous nature of the minority population variable, but it confirms the negative relationship between precinct minority population and unique candidates selected in Figure 4-3 without assuming a linear relationship as would be the case with a linear regression.

Nevertheless, showing a curved relationship between minority population and the number of candidates selected would add much detail to the understanding of disparate RCV ballot usage.

One way to test such a relationship is with a generalized additive model (GAM) plot, as in Figure 4-5.

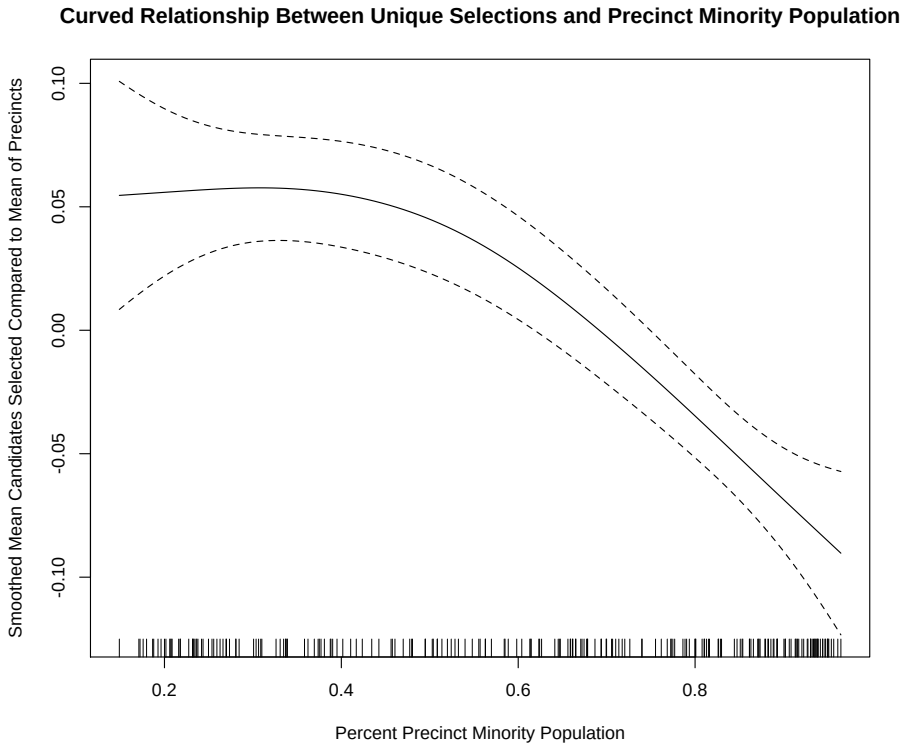


Figure 4-5 (“Ballot Image File”; American FactFinder)

The GAM plot has several strengths here. As compared to a linear model, it provides more detail about the shape of the relationship between the variables. This plot with the confidence intervals suggests the true relationship is similar to that displayed by the local least squares regression in Figure 4-3. Indeed, the number of unique selections may in fact rise from approximately 20 to 40 percent minority population in the precinct. The most important assumption of additive models, that the contribution of each covariate is additive, is not relevant in this model with only one predictor variable. Nevertheless, the shifting estimate for the smoothed relationship precludes the estimation of slope parameters to investigate. This means that, apart from observations about the above plot, there is little concrete information about the

magnitude of the relationship between the variables. Since a linear model would provide this type of information, the next step is to test whether a linear model would be inappropriate. An analysis of deviance shows that despite the seeming curve in the GAM plot, a linear model is appropriate since there is a p-value of 0.794 for the difference between the models. Table 4-6 provides a linear regression of the same two variables.

| **Linear Model** | | |
|---|---|---|
| Response Variable: Mean Unique Selections | | |
| | Estimate | Pr(>F) |
| (Intercept) | 2.698 | $< 2e^{-16}$ *** |
| Percent Minority | -0.197 | $2.045e^{-09}$ *** |
| F-statistic: 39.13 on 1 and 220 DF<br>R-sq. (adj) = 0.147<br>Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 | | |

Table 4-6 ("Ballot Image File", American FactFinder Data)

Table 4-6 quantifies the magnitude of a highly statistically significant negative linear relationship between the percent minority population in a precinct and the mean unique selections made by precinct voters. Voters in a precinct with 20 percent minority population on average selected 0.1 more candidates than those in a precinct with 70 percent minority population. Every tenth voter selected an extra candidate. While this may not seem like a large difference at first, it represents a more than four percent difference in candidates selected.

Disaggregating the precinct percentage of the different ethnic groups combined in the percent minority measure shows that percent Asian, Latino, and African American precinct population drive the linear relationship from Table 4-7.

| **Response variable = Mean Unique Candidates, Weights = Precinct Census Population** | | | | |
|---|---|---|---|---|
| Coefficients: | Model 1<br>Adj. $R^2$ = 0.29 | | Model 2<br>Adj. $R^2$ = 0.31 | |
| | Estimate | Pr(>\|t\|) | Estimate | Pr(>\|t\|) |
| (Intercept) | 2.734 | $< 2e^{-16}$ *** | 2.726 | $< 2e^{-16}$ *** |
| Percent Latino | -0.287 | $1.74e^{-11}$ *** | -0.279 | $3.14e^{-4}$ *** |
| Percent Asian | -0.438 | $5.30e^{-12}$ *** | -0.409 | $9.2e^{-07}$ *** |
| Percent African American | -0.141 | 0.006 ** | -0.168 | 0.010 * |
| Percent Spanish Speaking | | | -0.009 | 0.965 |
| Percent Asian Language | | | -0.310 | 0.180 |
| Median Income (in Thousands) | | | -0.001 | 0.071 . |
| Percent Asian with at least "Some College" | | | 0.024 | 0.401 |
| Percent African American with at least "Some College" | | | 0.071 | 0.216 |
| Percent White with at least "Some College" | | | -0.006 | 0.908 |
| ---<br>Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 | | | | |

Table 4-7 ("Ballot Image File"; American FactFinder; Minnesota Population Center)

Model 1 from Table 4-7 looks only at the three major ethnic group percentage populations as predictors of the average number of candidates selected and Model 2 adds language, income, and education variables. None of the coefficients for those additional variables are statistically significant in Model 2, meaning that controlling for the linear components of variation in the other predictor variables, language, education, and income do not explain the average number of candidates selected by voters. Soon after the 2010 election, the U.S. Justice Department filed a complaint against the Alameda Elections Department for failing to provide sufficient support to Spanish and Chinese speaking voters in the transition to RCV (*United States of America v. Alameda County*). Irrespective of the quality of foreign-language materials distributed, Table 4-7 indicates that, taking into account the other variables, foreign language had no significant effect on the number of candidates selected by voters.

In both models, however, the three ethnic group population variables have statistically significant coefficients. The percent Asian population has a strongly negative relationship with the number of different candidates selected. Going from 20 to 70 percent Asian population would be expected, according to this regression, to decrease the average number of candidates listed by voters by approximately 0.2. This is an eight percent decrease in average candidate selections. Unique candidate selections would decrease by 0.14 for the same size increase in percent Latino population and by 0.075 for the same size increase in percent African American population.

One of the driving forces in the large coefficient on the Asian precinct population variable is the effect of two high Asian precincts with low levels of unique selections. Precinct 333400 is 91 percent Asian and Precinct 337000 is 88 percent Asian. These are by far the precincts with the largest Asian percent population as the next largest Asian precinct population is 60 percent. These precincts are also distinctive for low levels of unique selections. Many voters in both precincts left their third choice blank (36 percent in Precinct 333400 and 35 percent in Precinct 337000).

Not surprisingly, both precincts show support for Jean Quan, the only Asian candidate in the mayoral race. In both precincts, Quan received 49 percent of the first choice votes. Perata received 38 percent of the first choice votes in Precinct 333400 and 28 percent in Precinct 337000.

In his interview, Quan's field director and husband, Floyd Huen, claimed that Quan supporters in high-Asian precincts would "bullet vote" for Quan, only selecting her. He argued that, in contrast to most other voters, those voters in high-Asian precincts did not understand how RCV worked. The first component of Huen's hypothesis is that voters in precincts similar to this

one are more likely to bullet vote. Second, his comment suggested that those voters in the precinct who supported Quan would be less likely than other voters in the precinct to vote for multiple candidates. The evidence strongly supports Huen's first hypothesis. In Precinct 333400, the average of 2.267 was significantly less than the citywide mean unique selections of 2.584 ($p = 0.001$). That same test in Precinct 337000 revealed a precinct mean of 2.163 ($p = 0.0002$). However, the evidence does not support Huen's second hypothesis. Quan supporters in those precincts voted for approximately the same number of candidates as other voters in that precinct. The average voter in Precinct 333400 voted for 2.267 candidates and the average Quan supporter in that precinct voted for 2.167 candidates. In Precinct 337000, the average Quan supporter voted for 2.071 candidates while the average voter in that precinct supported 2.163 candidates. While Quan supporters in both precincts voted for slightly fewer candidates, the difference is not statistically significant ($p = 0.463$ for Precinct 333400 and 0.546 for Precinct 337000).

**e. Different groups arrive at similar unique vote totals in different ways**

While voters in higher minority precincts for each ethnic group tended to support fewer candidates on their ballots, the manner in which the average unique candidates listed on a ballot decreased varied across groups. As mentioned above, there are two ways of having fewer than three unique candidates listed on an RCV ballot: not using all three slots or voting more than once for the same candidate. While these two means to reduced ballot usage have the same result in counting the ballots, they potentially reveal differences in approach to RCV across precincts.

| **Linear Model of Mean Duplicates on a Ballot**<br>**Predictor Variables: Ethnic group precinct percent population and mean unique selections** | | | |
|---|---|---|---|
| Coefficients: | | | |
| | Estimate | Std. Error | Pr(>\|t\|) |
| (Intercept) | 0.956 | 0.090 | $<2e^{-16}$ *** |
| Percent Asian | 0.050 | 0.032 | 0.127 |
| Percent Latino | 0.197 | 0.022 | $<2e^{-16}$ *** |
| Percent African American | 0.199 | 0.025 | $1.49e^{-13}$ *** |
| Mean Unique Selections | -0.355 | 0.033 | $<2e^{-16}$ *** |
| Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 | | | |
| Residual standard error: 2.343 on 217 degrees of freedom | | | |
| Multiple R-squared: 0.670, Adjusted R-squared: 0.664 | | | |

Table 4-8 ("Ballot Image File"; American FactFinder)

Table 4-8 indicates that voters in higher Latino and higher African American precincts cast more duplicate votes on ballots than those in the average precinct. The same increase as discussed above from 20 percent to 70 percent Latino precinct population is expected to increase the number of duplicates on the average ballot by 0.7 and the same increase for African Americans increases duplicates on the average ballot also by 0.7. Despite having the strongest negative relationship with mean unique selections, the percent Asian population in a precinct has no statistically significant relationship with duplicate voting. Different groups interact with the ballot in different ways. Voters in high Latino and African American precincts were more likely than voters in high Asian precincts to vote for the same candidate multiple times.

As the percent Latino population and the average number of candidates listed by the voters in the precinct both go up, the prevalence of duplicate voting decreases. The r-squared value indicates that Latino and African American group population main effects and the interaction effect of Latino population and unique selections account for nearly 70 percent of the variation in duplicate voting if the linear model holds.

### f. Exhausted ballots show that not all unique selections are made equal

Unlike with actual runoff elections, some voters may not have their ballot counted in the final selection round of an RCV election because all of their choices are eliminated before the last counting round. These votes are "exhausted" under IRV rules, meaning that they are no longer considered. It is as though voters with exhausted ballots never voted since the requirement that the winner in RCV receive a majority only counts as ballots those listing a non-eliminated candidate. In the November 2010 mayoral election in Oakland, there were a large number of exhausted ballots compared to the gap between the candidates. The number of exhausted ballots (13,838) was 6.8 times larger than the gap between the final two candidates and made up 11.5% of the ballots cast in the election.[18]

| | | **Ballot Exhausted by Final Round?** | |
|---|---|---|---|
| | | Yes | No |
| **Unique Selections** | 0 | 62 (0.28%) | 0 |
| | 1 | 806 (3.69%) | 2,505 (11.47%) |
| | 2 | 322 (1.47%) | 1,962 (8.98%) |
| | 3 | 1355 (6.20%) | 14,833 (67.90%) |

Table 4-9 ("Ballot Image File")

Table 4-9 shows that (1) more unique selections on a ballot decrease the likelihood that a ballot will be exhausted ($p < 2.2e^{-16}$) and (2) that all unique selections are not made equal in

[18] This rate of exhausted ballots is low compared to other RCV elections. The eventual winner of San Francisco Supervisor District 10 in November 2010, Malia Cohen, would not have made the runoff since she received 11.78 percent in the first round, putting her in third place. It took 20 elimination rounds for her to break 50 percent support. By the time she was elected, 43 percent of the ballots cast in the election were exhausted. A third such incidence of large numbers of exhausted ballots occurred in the 2004 District Five Supervisorial Election. By the time Ross Mirkirimi received majority support in the 19th round, 25 percent of ballots were exhausted. In other words, almost 9,000 people who voted for at least one candidate in the District Five election lost their say in the election by the time Mirkirimi won. Not counting these exhausted ballots for any candidate allowed Mirkirimi to get a majority, since he had only received votes from 37 percent of the total number of voters by the final round. Proponents of RCV contend that the method finds a majority winner. Yet, while Mirkirimi received 52 percent support with the exhausted ballots removed, he did not approach a majority with those ballots included.

terms of the likelihood of the ballot being exhausted. Voting for more candidates increases the probability of one having a say in the deciding round. 24.34 percent of those who voted for only one candidate had their ballots exhausted, compared to 14.10 percent for two candidates and 8.37 percent for three candidates. Having one's vote count in the final round matters, at least in part, because in calculating a majority vote for a candidate in the final round, only ballots with a not-eliminated candidate are counted. More than 75 percent of the voters who selected only one candidate chose either Quan or Perata and their votes counted in the final round of RCV. The other 24 percent who selected one of the eight other candidates had their ballot exhausted. While the likelihood of having a continuing ballot increased with unique selections, more than eight percent of those who selected three candidates nonetheless had their ballots exhausted before the final round. Their ballots were less effective than other ballots with three unique selections that listed Perata or Quan were. A two-round runoff system allows all voters to express a preference between the final two candidates. Under an RCV system that limits voters to three choices, voters must correctly anticipate the candidates that will make it to the final counting round (Cox 2003, 4).

In addition, some voters have all of their ranked choices considered while others do not. While the voter would certainly prefer to have only the first choice considered since it would mean that the first choice candidate won or at least made it to the final round, the unequal treatment of voters' ballot rankings by ignoring the lower ranked choices may violate the Constitutional principle of "one-person one-vote."

These concerns about RCV prompted a legal challenge in San Francisco in 2010.[19] The

[19] Challenges to RCV based on exhausted ballots are not unique to California. The Minnesota Voters Alliance sued to block implementation of RCV in Minneapolis because some voters effectively get more votes than others do. Minneapolis voters approved RCV in 2006 by a more

plaintiffs claimed that RCV violated the First and Fourteenth Amendments of the United States Constitution by limiting voters to three choices (Plaintiff's Reply Brief, 2010, 6). This differs from voting for a losing candidate in both a general and runoff election because all voters can participate in the final round irrespective of their votes in the first round.

The magnitude of exhausted ballots raises questions about fairness and public understanding of the election process since winners often reach the 50 percent cutoff in RCV without receiving a vote from more than 50 percent of people who voted. This is an as-applied problem since these issues would be resolved by allowing voters to rank all the candidates. Plaintiffs such as those in San Francisco typically try to get courts to require space for all candidates – something elections departments are unwilling to do because they say it is unfeasible.

### g. Conclusion

Analysis of unique ballot usage centers on differences in the approach to the RCV ballot for those who decide to turn out. The question of ballot usage within a single race distinguishes RCV from two-round runoff or plurality systems in which the only relevant concern in a single race is whether a voter decided to cast a vote. Since the entire change to the system is within the design of the ballot and the ballot counting process, examining differences in usage of the ballot by voters is essential. On a citywide level, Oakland voters tended to cast votes for three different candidates. Looking at differences among precincts, however, differences emerge across ethnic

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than 2-1 margin. Andy Cilek, executive director of the Minnesota Voters Alliance said, "This is the hanging chad problem-times-1,000" (Olson 2007). The group's lawyer, Erick Kaardal, cited an opinion from Attorney General Lori Swanson saying the system of ranking candidates by preference may be unconstitutional. Kaardal also referenced the 1915 state Supreme Court case, *Brown v. Smallwood* that struck down a Duluth system that ranked candidates. Vermont Governor Jim Douglas vetoed an instant-runoff voting measure because he felt it violated one person, one vote by allowing voters who's first choice for an office didn't win to have their second choices counted.

groups. The total percent minority population is negatively related to the number of candidates supported and this trend is particularly pronounced for percent Asian and Latino population though it is statistically significant for percent African American population as well. The strength of the trend for the Asian community is underlined by two high Asian precincts with lower ballot usage seemingly due to approach to ranked choice voting rather than support for any particular candidate. Apart from the number of candidates listed on the ballot, usage differs in the manner in which the voters used ranking options not taken up with unique candidates either by not listing a candidate or duplicating a candidate already supported. Higher Latino and African population precincts had a higher prevalence of duplicate voting. Finally, ballot usage matters for whether a ballot makes it to the final counting round. Indeed, appearing in the decisive round is a primary argument for the importance of voting for multiple candidates. The analysis of exhausted ballots reveals that ballots with more candidates listed are indeed more likely to remain by the decisive round. Nevertheless, the candidates supported also make a difference so that not all unique selections equally help a ballot to remain in the counting.

# V. Conclusion

Political science analysis has typically considered how a voting system might allow voters to express their preferences. The implicit assumption is that the role of a democracy is just to open the door to greater expression of the underlying preferences held by each citizen. This analytical method does not acknowledge differences between voters in knowledge, exposure to candidates, extent of preferences, or the cognitive challenges created for voters by different voting systems.

This thesis offers one method for comparing the actual performance of voting systems. In pushing for RCV implementation, supporters propose several potential benefits including

lower cost, broader support for winning candidates, and the absence of spoiler votes. Using cost as a primary measure of performance would trivialize the criteria for a democratic system by making the abolition of elections the best possible outcome. The criteria of extent of support for winning candidates and the avoidance of spoiler votes introduce preferences about types of candidates that would expose any discussion to criticism for bias.[20] Instead, this thesis considers turnout as a clear and undisputed measure of performance and describes the number of rankings used by voters, the ballot usage, as analogous to participation.

Turnout analysis suggests that Oakland faced and continues to face low turnout by minority voters, but the effects of RCV on the threshold decision to vote by voters from different communities is less clear. Turnout in higher Latino and Asian precincts declined between the 2006 mayoral election without RCV and the 2010 mayoral election with RCV. Introducing a comparison city that did not implement RCV, Long Beach, allows the isolation of the effect of RCV. This analysis indicates that RCV actually aided minority turnout. Turnout declined in higher minority precincts but by less than it did in lower minority precincts in comparison with Long Beach.

The ballot usage analysis shows that voters do not all use the three possible choices and that high Latino and Asian precincts tend to use fewer ballot options. Different ethnic groups arrive at similar average numbers of candidates listed in different ways: high Latino precincts tend to have larger numbers of ballots with the same candidate listed multiple times while ballots

[20] There would be debates about what "broad support" means for a candidate. Candidates leading in the first choice count who subsequently lose would argue, as Perata did in the wake of the 2010 election, that the candidate with the most support is the person who a plurality of citizens would prefer and who they vote for with their first choice. Quan would reply that second and third choice votes also express support. Similarly, analyzing the prevalence and effect of spoiler votes would require identifying the "spoiler candidates," which is a necessarily contentious task.

in high Asian precincts use fewer options on average. The ballot usage is analogous to turnout for multiple elections and not using all three rankings for different candidates increases the chances that the ballot is exhausted.

This thesis applies an approach to analyzing the change in voting systems to Oakland in a single pair of elections, but looking at other cities such as San Francisco and Saint Paul that have also implemented RCV would provide a much fuller picture of RCV's range of effects. The number of candidates, incumbency, and whether the election is for a mayor of city council member could all affect turnout and ballot usage with RCV.

Recognizing disparities in turnout and ballot usage, further research could examine strategies that might mitigate disparities. What role do campaigns generally play in educating voters? How can elections departments effectively reach poor and minority voters before the election so they have time to select three candidates? To what extent does the failure of voters to select three unique candidates indicate limited familiarity with the new ballot format? Would changing the ballot design or assistance in the polling place reduce disparities or is this a systematic issue with the ranked choice electoral system itself?

Responding to a lawsuit challenging ranked choice voting, the City of San Francisco responded in its brief that "nothing in San Francisco's three-candidate RCV system controls how a voter exercises her three available rankings" (City's Response 2010, 7). While technically correct, the analysis in this thesis suggests that the RCV voting system affects whether individuals cast a ballot and how they use their ballots if they do vote.

## Appendix A – Addressing Threats to Validity

This analysis, like any other, faces several threats to validity. These include ecological fallacy from precinct level analysis, heteroscedasticity based on the varying sizes of precincts, and a disconnect between actions and motivations. Each approach to a topic like this has both strengths and weaknesses. The analysis here attempts to reduce the impact of each of these challenges.

Since researchers cannot match ballots to individuals, the precinct is the smallest possible unit of analysis of a relationship between sociodemographic factors and ranked choice voting. Nevertheless, using precinct demographic information results in ecological bias if used to make inferences to individuals (Magaloni 1994, 309; King 1997; Freedman 1999; Ess and Sudweeks 2002, 90). In analyzing electoral behaviors like turnout and ballot usage, the ideal study would be able to connect each ballot to an individual with particular characteristics. Since ballots are only attributable to precincts, rather than individuals, one cannot precisely pinpoint the characteristics causing variation in electoral behaviors. However, some ecological fallacy is inherent to any ballot data analysis since the secret ballot is a key component of the democratic system. This thesis attempts to mitigate the impacts of ecological fallacy by also discussing specific case study precincts that are more homogenous, potentially lowering the bounds placed on group averages.

Further research could utilize exit polls as a way of removing ecological fallacy because such polls could tie a voter's ethnicity directly to the reported vote cast. This method removes one source of bias, however, while introducing another. Given the social pressure to vote and the encouragement by elections departments to use all three rankings, respondents might over-report their ballot usage. Using the official precinct-level turnout data and ballot images provides the

complete set of all ballots, eliminating sampling error and any over-reporting bias.

A second challenge to validity is the heteroscedasticity in the least squares regression analysis. Least squares regression assumes that the variance of the error term is constant. Heteroscedasticity does not bias least squares parameter estimates, but it can affect the unbiased estimate that the model provides (Williams, 3). This analysis attempts to mitigate the effects of heteroscedasticity by using weighted least squares with the weighting based on the precinct population (Williams, 11). The magnitude of the error terms should be negatively related to the number of people in the precinct since precincts with a large number of Census residents will have a more accurate

*Unweighted* *Weighted*

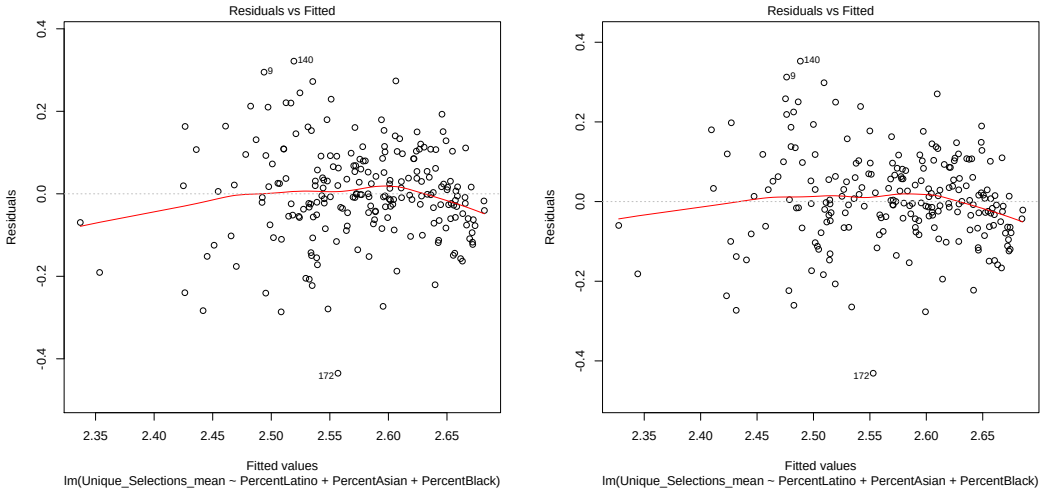



Figure A-1 (“Ballot Image File”; American FactFinder)

Perhaps the greatest threat to validity is that this work can only speculate about the motivations of voters as they make voting decisions. People cannot accurately explain why they make decisions or take actions (Krosnick 2012). For example, it is not possible to separate the voter who selects three candidates by process of elimination and another who selects exactly the same candidates because of a genuine passion for their candidacies. Similarly, if a voter uses

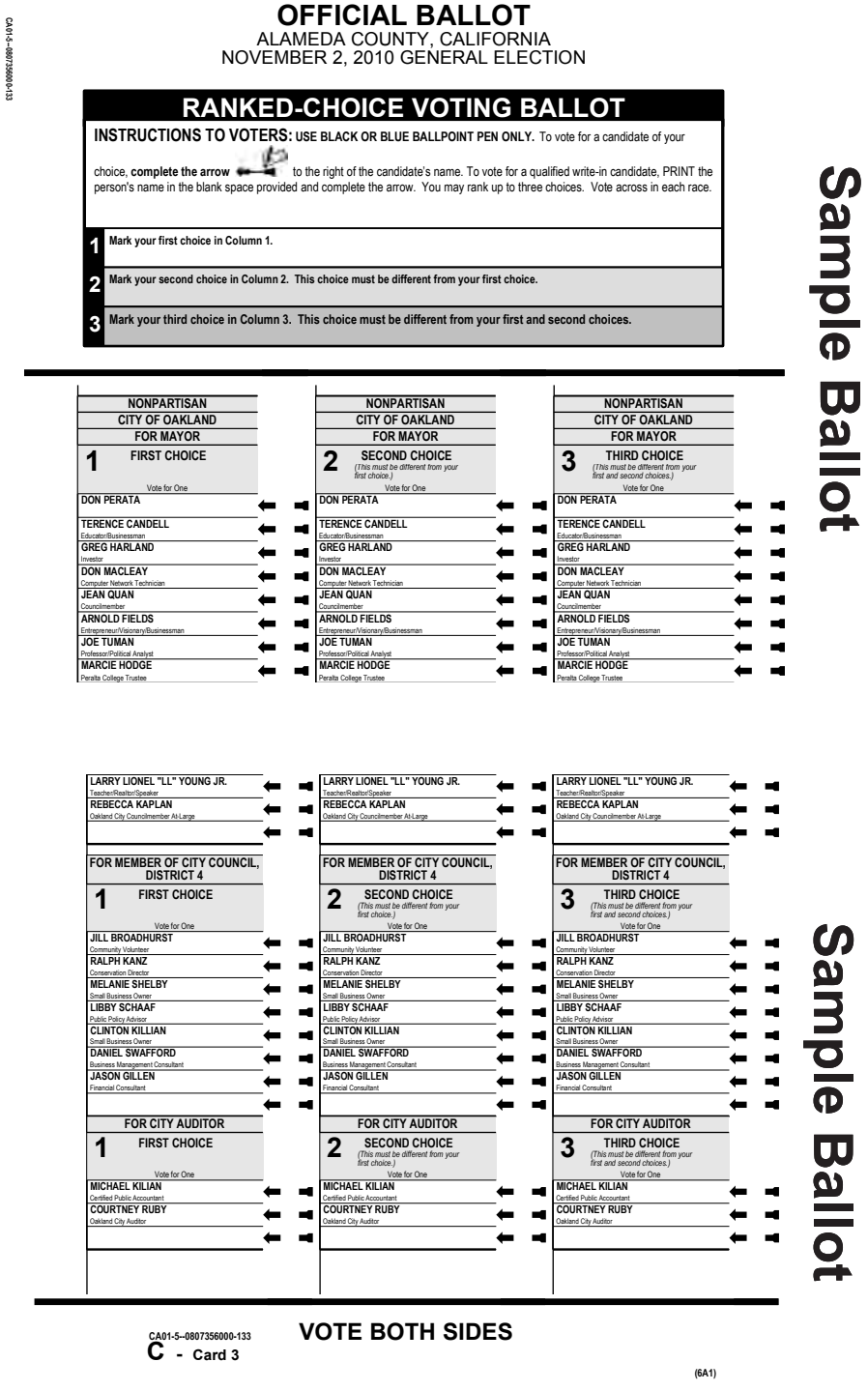
only one of the three possible rankings, he or she may not understand how RCV works or may only want to support a single candidate.

**Appendix B – Cities that had implemented RCV as of August 2011**

| City | Adopted | First used | Offices |
|---|---|---|---|
| Berkeley, CA | 2004 | 2010 | Mayor, city council, and other city offices |
| Hendersonville, NC | 2007 | 2007 | Pilot program |
| Minneapolis, MN | 2006 | 2009 | Mayor, city council, and other city offices |
| Oakland, CA | 2006 | 2010 | Mayor, city council, and other city offices |
| Portland, ME | 2010 | 2011 | Mayor |
| San Francisco, CA | 2002 | 2004 | Mayor, City Attorney, Board of Supervisors, and other city offices |
| San Leandro, CA | 2000 | 2010 | Mayor and city council |
| Takoma Park, MD | 2006 | 2007 | Mayor and city council |
| Telluride, CO | 2008 | 2011 | Mayor |
| Burlington, VT | | 2006, Repealed 2010 | n/a |
| Cary, NC | 2004 | 2004, Repealed in 2009 | n/a |

State and local governments using instant runoff voting as of August 2011 ("Where Instant Runoff is Used")

# Appendix C – 2010 Oakland Mayor RCV Ballot ("Composite Ballot 2010-11-02")



CA01-5--0807356000-133

## OFFICIAL BALLOT

ALAMEDA COUNTY, CALIFORNIA
NOVEMBER 2, 2010 GENERAL ELECTION

### RANKED-CHOICE VOTING BALLOT

**INSTRUCTIONS TO VOTERS: USE BLACK OR BLUE BALLPOINT PEN ONLY.** To vote for a candidate of your choice, **complete the arrow** to the right of the candidate's name. To vote for a qualified write-in candidate, PRINT the person's name in the blank space provided and complete the arrow. You may rank up to three choices. Vote across in each race.

1 **Mark your first choice in Column 1.**

2 **Mark your second choice in Column 2. This choice must be different from your first choice.**

3 **Mark your third choice in Column 3. This choice must be different from your first and second choices.**

Sample Ballot

**NONPARTISAN**
**CITY OF OAKLAND**
**FOR MAYOR**

| 1 FIRST CHOICE<br>Vote for One | 2 SECOND CHOICE<br>*(This must be different from your first choice.)*<br>Vote for One | 3 THIRD CHOICE<br>*(This must be different from your first and second choices.)*<br>Vote for One |
|---|---|---|
| DON PERATA | DON PERATA | DON PERATA |
| TERENCE CANDELL<br>Educator/Businessman | TERENCE CANDELL<br>Educator/Businessman | TERENCE CANDELL<br>Educator/Businessman |
| GREG HARLAND<br>Investor | GREG HARLAND<br>Investor | GREG HARLAND<br>Investor |
| DON MACLEAY<br>Computer Network Technician | DON MACLEAY<br>Computer Network Technician | DON MACLEAY<br>Computer Network Technician |
| JEAN QUAN<br>Councilmember | JEAN QUAN<br>Councilmember | JEAN QUAN<br>Councilmember |
| ARNOLD FIELDS<br>Entrepreneur/Visionary/Businessman | ARNOLD FIELDS<br>Entrepreneur/Visionary/Businessman | ARNOLD FIELDS<br>Entrepreneur/Visionary/Businessman |
| JOE TUMAN<br>Professor/Political Analyst | JOE TUMAN<br>Professor/Political Analyst | JOE TUMAN<br>Professor/Political Analyst |
| MARCIE HODGE<br>Peralta College Trustee | MARCIE HODGE<br>Peralta College Trustee | MARCIE HODGE<br>Peralta College Trustee |
| LARRY LIONEL "LL" YOUNG JR.<br>Teacher/Realtor/Speaker | LARRY LIONEL "LL" YOUNG JR.<br>Teacher/Realtor/Speaker | LARRY LIONEL "LL" YOUNG JR.<br>Teacher/Realtor/Speaker |
| REBECCA KAPLAN<br>Oakland City Councilmember At-Large | REBECCA KAPLAN<br>Oakland City Councilmember At-Large | REBECCA KAPLAN<br>Oakland City Councilmember At-Large |

**FOR MEMBER OF CITY COUNCIL, DISTRICT 4**

| 1 FIRST CHOICE<br>Vote for One | 2 SECOND CHOICE<br>*(This must be different from your first choice.)*<br>Vote for One | 3 THIRD CHOICE<br>*(This must be different from your first and second choices.)*<br>Vote for One |
|---|---|---|
| JILL BROADHURST<br>Community Volunteer | JILL BROADHURST<br>Community Volunteer | JILL BROADHURST<br>Community Volunteer |
| RALPH KANZ<br>Conservation Director | RALPH KANZ<br>Conservation Director | RALPH KANZ<br>Conservation Director |
| MELANIE SHELBY<br>Small Business Owner | MELANIE SHELBY<br>Small Business Owner | MELANIE SHELBY<br>Small Business Owner |
| LIBBY SCHAAF<br>Public Policy Advisor | LIBBY SCHAAF<br>Public Policy Advisor | LIBBY SCHAAF<br>Public Policy Advisor |
| CLINTON KILLIAN<br>Small Business Owner | CLINTON KILLIAN<br>Small Business Owner | CLINTON KILLIAN<br>Small Business Owner |
| DANIEL SWAFFORD<br>Business Management Consultant | DANIEL SWAFFORD<br>Business Management Consultant | DANIEL SWAFFORD<br>Business Management Consultant |
| JASON GILLEN<br>Financial Consultant | JASON GILLEN<br>Financial Consultant | JASON GILLEN<br>Financial Consultant |

**FOR CITY AUDITOR**

| 1 FIRST CHOICE<br>Vote for One | 2 SECOND CHOICE<br>*(This must be different from your first choice.)*<br>Vote for One | 3 THIRD CHOICE<br>*(This must be different from your first and second choices.)*<br>Vote for One |
|---|---|---|
| MICHAEL KILIAN<br>Certified Public Accountant | MICHAEL KILIAN<br>Certified Public Accountant | MICHAEL KILIAN<br>Certified Public Accountant |
| COURTNEY RUBY<br>Oakland City Auditor | COURTNEY RUBY<br>Oakland City Auditor | COURTNEY RUBY<br>Oakland City Auditor |

Sample Ballot

**VOTE BOTH SIDES**

CA01-5--0807356000-133
**C** - Card 3

(6A1)

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