Dissension in the Ranks?
An Experimental Test of Rationality and Spatial Voting in Local Elections

Cheryl Boudreau
Associate Professor
Department of Political Science
University of California, Davis
One Shields Avenue
Davis, CA 95616
Phone: 530-752-0966
Fax: 530-752-8666
clboudreau@ucdavis.edu

Christopher S. Elmendorf
Professor
School of Law
University of California, Davis
400 Mrak Hall Drive
Davis, CA 95616
Phone: 530-752-5756
Fax: 530-754-5311
cselmendorf@ucdavis.edu

Scott A. MacKenzie
Assistant Professor
Department of Political Science
University of California, Davis
One Shields Avenue
Davis, CA 95616
Phone: 530-752-0966
Fax: 530-752-8666
samackenzie@ucdavis.edu

Abstract

Formal theories of voter decision-making assume that preferences for political candidates are rational and, therefore, can be represented by a utility function. They also frequently assume that ideology is a major factor that informs voters' utility functions. To date, there are no studies of whether these assumptions are met in low-information local elections. We fill this gap by conducting a written exit poll during a mayoral election that asks voters to express their preferences for five leading candidates, considered pairwise. We also experimentally manipulate information shortcuts to examine their effects on voters' preferences. We find that a large majority of voters' preferences are rational even in this low-information context. We also show that ideology strongly influences voters' preferences. However, political party and ethnic group endorsements weaken rather than strengthen the influence of ideology. These results indicate that most voters' preferences satisfy the basic assumptions that formal models make and that spatial models can be usefully applied to local elections.

Rational choice theories make assumptions about voters' preferences in order to create tractable models of their decision-making. A near universal assumption is that voters' preferences are rational and, therefore, can be represented by a utility function. Beyond rationality, scholars often make additional assumptions about what factors inform voters' utility functions. For example, the most ubiquitous model of voting behavior—the spatial model— assumes that voters prefer candidates whose policy views, or ideological positions, are most similar to their own (Black 1948; Downs 1957; Enelow and Hinich 1984). Other models assume that voters do not simply prefer candidates whose ideological positions are most similar to their own, but also prefer candidates who share their partisanship (Adams 1998; Adams, Merrill, and Grofman 2005). Still others assume that voters also prefer candidates who are of a particular race or ethnicity (Glazer, Grofman, and Owen 1998), who have favorable valence traits (Ansolabehere and Snyder 2000; Groseclose 2001; Schofield 2004; Adams et al. 2011), or who have performed well in office in the past (Grofman 1985; Fiorina 1981).

Given that most voters are woefully uninformed about politics (Campbell et al. 1960; Delli Carpini and Keeter 1996), it is worth questioning whether these basic assumptions about voters' preferences and utility functions are met in real-world settings. Previous studies of voting in national and state elections largely support the assumption that voters' preferences are rational (Brady and Ansolabehere 1989; Radcliff 1993; Alvarez and Kiewiet 2009). And, recent empirical research indicates that ideology strongly influences voters' choices in presidential and congressional elections (Jessee 2009, 2010; Shor and Rogowski 2010; Stone and Simas 2010).

These basic assumptions have rarely if ever been tested in local election settings. Examining whether these assumptions are met in such settings is important because several features that are common at the local level make forming rational preferences and distinguishing

candidates' ideological positions especially difficult. Compared to national and state elections, local elections are low-information settings. Local campaigns receive less media coverage than national and state campaigns, and local elections often feature a relatively large number of serious candidates. In addition, most local elections are nonpartisan, which deprives voters of party labels that might distinguish the candidates.

The difficulties voters face in forming rational preferences and comparing candidates' ideological positions are exacerbated in local elections that use rank choice voting (RCV) rules. In contrast to the first-past-the-post system used in national and most state elections and even the primary-runoff system used extensively at the local level, RCV rules encourage a large number of candidates to run. Even if a candidate is well behind in the polls, he or she can influence the outcome by collecting second- and third-place votes. In the 2010 mayoral election in Oakland, for example, Jean Quan was ultimately elected even though her opponent, Don Perrata, received a greater number of first-place votes. In addition, RCV complicates voters' task by allowing them to rank multiple candidates in order of preference on their ballot, as opposed to forcing them to choose a single most-preferred candidate. Thus, voters in these elections not only have a greater number of candidates to compare, but they must also be able to develop a meaningful rank ordering of multiple candidates.

Our study is the first to assess whether voters' preferences are rational in a nonpartisan local election using RCV, as well as whether and when their preferences are based on ideology and other factors (e.g., partisanship, ethnicity, and evaluations of government performance) that scholars presume inform their utility functions. To this end, we conduct a written exit poll survey during an actual mayoral election that asks voters to express their preferences for five leading candidates, considered pairwise. We use this information to assess whether voters'

preferences are rational and/or related to ideology and other factors. We also experimentally manipulate information shortcuts—political party and ethnic group endorsements—to examine whether these types of information help voters to express rational preferences and/or alter the relative influence of ideological and non-ideological factors.

By eliciting voters' pairwise candidate preferences in a nonpartisan local election and by embedding experiments, we overcome three limitations of previous research. First, previous research examines the rationality of voters' preferences exclusively in partisan elections at the national and state levels (Brady and Ansolabehere 1989; Radcliff 1993; Alvarez and Kiewiet 2009). This limits our understanding of whether voters' preferences are rational in low-information contexts like local elections. Second, previous research suggests that information helps voters express rational preferences that are related to their ideology (Brady and Ansolabehere 1989), but this research is observational and does not experimentally manipulate information. This limits our understanding of how voters' preferences might change if given additional information. Third, while many experiments investigate whether information helps citizens make "better" decisions (Boudreau 2009; Kuklinski et al. 2001; Lau and Redlawsk 2001; Lupia and McCubbins 1998), they typically do not examine voter rationality or spatial voting as outcomes of interest (for an exception, see Sniderman and Stiglitz's [2012] experiments on spatial voting).

Our results indicate that two fundamental assumptions of formal models of voter decision-making are reasonably met in low-information local elections. First, a large majority of voters in the mayoral election we study have rational preferences that can be represented by a utility function. As expected, voters with low levels of knowledge about local politics and those who did not rank one of the five leading candidates first on their ballot are less likely to have

rational preferences. Second, factors that scholars presume inform voters' utility functions do influence their preferences. Most notably, voters' local ideological positions strongly influence their candidate preferences. However, political party and ethnic group endorsements do not help voters to express rational preferences. They also weaken rather than strengthen the influence of ideology and, instead, activate group-based considerations like ethnicity. Together, these results indicate that most voters' preferences satisfy the basic assumptions that formal models take for granted and that spatial models can be usefully applied to low-information local elections.

Rationality, Spatial Voting, and the Effects of Information in Local Elections

Though spatial models and other formal representations of voter decision-making depend on voters having rational preferences, little empirical work examines whether this assumption is met in real-world settings. The few studies that consider this question find that the vast majority of voters have rational preferences (Brady and Ansolabehere 1989; Radcliff 1993; Alvarez and Kiewiet 2009). For example, in their study of the 1976 presidential election, Brady and Ansolabehere (1989) find that only 6.7 percent of voters had intransitive preferences among five candidates running in the Democratic primary. (Transitivity and completeness are necessary and sufficient conditions for rationality [Mas-Colell, Whinston, and Green 1995].[1]) Voters with low levels of political knowledge exhibited greater intransitivity, and intransitivity rose to 20 percent when voters were asked to consider a sixth candidate. In their study of the 2003 California recall

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[1] Completeness assumes that voters have the ability to compare any two alternatives among a set of choices (i.e., prefer Option A to Option B, prefer Option B to Option A, or be indifferent between Option A and Option B), which most scholars consider to be unproblematic. We follow previous studies and focus on whether voters' preferences satisfy the requirements of transitivity.

election, Alvarez and Kiewiet (2009) find that only 3.3 percent of voters had intransitive preferences among the four leading candidates. Many of these voters preferred another candidate and, thus, were only intransitive among candidates for whom they did not actually vote. Together, these studies confirm that the rationality assumption holds in important real-world settings and that voters' preferences can be represented by a utility function. They also suggest, however, that the extent to which the rationality assumption holds varies among subgroups of voters and that increasing the number of candidates induces greater intransitivity.

Existing studies also provide empirical support for the assumptions scholars make about what factors inform voters' utility functions. For example, several studies show that voters do prefer candidates whose ideological positions are most similar to their own in presidential and congressional elections (Jessee 2009, 2010; Shor and Rogowski 2010). Thus, the spatial model of voting appears to characterize these elections quite well. Other studies demonstrate that voters prefer candidates who are members of their own political party (Campbell et al. 1960; Adams 1998). Still others find that race, ethnicity, valence, and evaluations of government performance influence voters' preferences in presidential and congressional elections (Fiorina 1981; Stone and Simas 2001; Piston 2010; Ansolabehere, Persily, and Stewart 2010).

However, previous research has rarely if ever tested whether these assumptions are met in local elections. Indeed, we are unable to find any published study that assesses whether voters' preferences are rational in local elections. Further, the studies that examine the rationality assumption at the national or state level are observational and, therefore, do not systematically manipulate information and examine whether it affects the extent to which this assumption holds. This lack of attention to the rationality assumption and the effects of information in local settings is surprising, given the greater obstacles that voters face in forming rational preferences in these

elections. It is also curious that scholars have not explored these questions in local elections using RCV rules, where voters are asked to provide an explicit ranking of candidates for elective offices.

To the extent that existing studies of local elections test the assumptions scholars make about the factors that inform voters' utility functions, they call into question whether the spatial model can be usefully applied to local elections. Indeed, scholars characterize these elections as non-ideological affairs and find little evidence that ideological considerations influence voters' choices (Peterson 1981; Oliver 2012). Instead, voters' utility functions appear to be informed by non-ideological considerations, such as partisanship, race, and ethnicity (Banfield and Wilson 1963; Kaufmann 2004), mobilization by machine-like organizations (Gosnell 1937; Trounstine 2008), and evaluations of local government performance (Oliver 2012). However, none of these studies actually measure candidates' and voters' local ideological positions on the same scale, as we do here.

Moreover, while many experimental studies systematically assess the effects of information on voters' opinions and decisions (e.g., Boudreau 2009; Kuklinski et al. 2001; Lupia and McCubbins 1998; Petersen, Slothuus, and Togeby 2010), none assess whether different types of information improve voters' ability to form rational preferences. Further, we are aware of only one experimental study that examines how information affects spatial voting, but it focuses on spatial voting at the national level (Sniderman and Stiglitz 2012). These studies also do not assess whether and how different types of information alter the relative influence of factors that might inform voters' utility functions.

Our study contributes to existing research on rationality, spatial voting, and local elections in three important ways. First, we assess whether voters' preferences are rational and

whether they are related to factors that scholars presume inform their utility functions in a nonpartisan local election that uses RCV. Second, we experimentally manipulate different types of information and examine their effects on rationality and spatial voting in this context. Third, we are the first to develop comparable measures of candidates' and voters' ideological positions in a local election, which enables us to test whether voters prefer candidates whose ideological positions are similar to their own in local elections. In doing so, we clarify whether and when voters' preferences can be represented by a utility function, as well as whether and when the assumptions scholars make about the factors that inform their utility functions are met.

The 2011 Mayoral Race in San Francisco

We selected the 2011 mayoral race in San Francisco as the setting for our study for several reasons. First, it provides a difficult test of whether voters can form rational preferences and identify candidates whose ideological positions are similar to their own. Like many major American cities, San Francisco is overwhelmingly Democratic in terms of party registration and voting patterns. As a result, its elections for local offices typically feature candidates who are all Democrats. In the 2011 mayoral election, for example, 15 of the 16 candidates were Democrats. Of these 16 candidates, 11 were current or former elected officials.[2] This partisan homogeneity among such a large number of qualified candidates should make it more difficult for voters to form rational preferences and distinguish the candidates' ideological positions than in national and state elections.

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[2] Nine of these candidates qualified for and accepted more than $290,000 each in public financing. A tenth (Edwin Lee) did not apply for public financing, but pro-Lee groups outspent all other candidates.

Second, San Francisco's electoral rules make the rationality of voters' preferences an especially important outcome to examine. Specifically, local elections in San Francisco use rank choice voting (RCV), which allows voters to rank up to three candidates in order of preference on their ballot. If no candidate wins more than 50% of the first-place votes, the candidate with the fewest first-place votes is eliminated. Votes cast for that candidate are then reallocated to the candidate listed in the second position on those ballots, and votes are tallied again. The candidate with the lowest total is eliminated, and so forth until a candidate crosses the threshold of 50% (of the ballots not "exhausted" by that stage of the counting). Given these rules, voters should rank three candidates to express their preferences fully and increase their likelihood of affecting the election outcome. However, if voters have intransitive preferences, then it is not clear what their rankings of the candidates on their ballot actually mean.

Third, the partisan homogeneity of candidates with very real ideological differences provides a difficult test of whether voters prefer candidates whose ideological positions are similar to their own, as the spatial model assumes. As we show below, although all of the serious candidates in this election were Democrats, they favored quite different local policies. These differences reflect an ideological divide among the city's elites between so-called "progressives" (the local left) and "moderates" (the local right).[3] In recent years, progressives (such as mayoral candidate John Avalos) have advocated providing cash grants to the homeless and opposed tax breaks for local businesses, such as Twitter. Moderates (including mayoral candidate Edwin Lee) have opposed cash grants to the homeless and advocated tax breaks for

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[3] We follow local usage and refer to candidates and voters who are left-of-center on the San Francisco political spectrum as "progressive" and those who are right-of-center as "moderate."

local businesses. These ideological differences, in the absence of partisan differences, enable us to disentangle the effects of ideology and partisanship on voters' preferences.

Finally, San Francisco features a unique convention that enables us to develop comparable measures of candidates' and voters' ideological positions in the local policy space. Specifically, political party organizations, newspapers, and interest groups in San Francisco distribute questionnaires to candidates for local offices. It is considered bad form for a candidate not to answer a group's questionnaire, even if the candidate knows he or she has no chance of winning its endorsement. Answers to questionnaires are often made public and scrutinized for inconsistencies. Thus, candidates who refuse to answer or who dissemble do so at their peril. Typically these questionnaires use open-ended questions that allow candidates to elaborate (or obfuscate) their views. In this election, we collaborated with two groups, which agreed to ask candidates the yes/no policy questions we developed to measure candidates' local ideological positions. We use these positions to assess whether ideological considerations influence voters' candidate preferences.

Study Design

To examine whether voters' preferences for the mayoral candidates are rational and related to factors that scholars presume inform their utility functions, we conducted a written exit poll on Election Day and during early voting on the two previous weekends. To this end, we recruited 117 student pollsters and assigned them to 41 teams working in randomly chosen precincts across the city. We oversampled majority-minority precincts (Chinese-American and Latino) because of historically low turnout levels among these voters. We randomly assigned morning or afternoon/evening coverage to each precinct, with each team of pollsters working a

3.25-hour shift. Teams of early voting pollsters were assigned to 3.25-hour shifts at City Hall—the only location where in-person early voting occurred.

As voters left their polling places, our pollsters asked if they would be willing to complete a short, written survey. Voters could complete the survey in English, Spanish, or Chinese, and pollsters fluent in these languages staffed the majority-minority precincts. Pollsters escorted voters who agreed to take the survey to a nearby table with chairs so that they could take the survey comfortably. In all, 1,593 voters completed our survey, which took five to ten minutes. These respondents' demographic characteristics resemble San Francisco's voting population in many respects, including age, gender, ethnicity, income, and education.

To assess whether voters' preferences meet the rationality assumption, we asked them to express their preferences for five leading candidates, considered pairwise. These candidates – John Avalos, David Chiu, Dennis Herrera, Edwin Lee, and Leland Yee – were the top five finishers in the election, accounting for more than three-quarters of voters' first-choice rankings. To obtain a complete preference ordering of these candidates, we asked voters to make ten one-on-one comparisons between these five candidates.[4] Specifically, voters were asked to indicate which candidate in each pair they would prefer to be the mayor, *regardless of whom they had actually voted for*. For example, when comparing candidates John Avalos and Edwin Lee, voters were asked, "How about John Avalos or Edwin Lee? Do you prefer Avalos over Lee or Lee over Avalos?" In this way, we follow Alvarez and Kiewiet (2009) and Brady and Ansolabehere

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[4] For practical reasons, it was not possible to elicit preferences over all 16 mayoral candidates on the ballot in our exit poll. Given these practical considerations and the high probability that many of the other candidates were unknown to all but a small number of voters, we focus on the five leading candidates.

(1989) in using voters' pairwise comparisons to measure their sincere preferences and to examine whether those preferences are rational.

In addition to analyzing whether voters' preferences are rational, we assess whether their preferences are related to factors that scholars assume inform their utility functions. These factors include ideology and non-ideological factors such as partisanship, ethnicity, and/or evaluations of government performance. To measure voters' partisanship, ethnicity, and evaluations of local government performance, we included questions about these factors on the survey. We then assess whether they affect voters' candidate preferences in the ten pairwise comparisons they were asked to make.

Measuring voters' ideological positions in the local policy space and determining whether they prefer ideologically-similar candidates is less straightforward. To do so, we take advantage of the unique convention in San Francisco politics described above, which enabled us to ask candidates and voters multiple questions about their local policy views. Specifically, we developed a set of 43 yes/no policy questions based on divided roll call votes in the San Francisco Board of Supervisors (the city's legislative body) and other issues in the news. We approached several groups about including our questions on their candidate questionnaires, and two agreed to do so. One is a local club of Democratic voters;[5] the other is the *San Francisco Public Press* (*SF Public Press*), a nonprofit news organization. Six candidates answered the local club's questionnaire; thirteen filled out the *SF Public Press* questionnaire.[6] To measure

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[5] We omit its name to preserve anonymity.

[6] Candidates were told that answers to the *SF Public Press* questionnaire would be used as the basis for questioning at a debate held three weeks before the election and publicized through an

voters' ideological positions on the same scale, we included 13 of these questions on the written

exit poll. We chose these questions based on succinctness and utility for distinguishing the

candidates' ideological positions.[7] Table 1 summarizes these questions, as well as voters' and

the ten leading candidates' answers. From these responses, we estimated candidates' and voters'

ideal points (for a similar approach, see Jessee 2009, 2010; Shor and Rogowski 2010; Bafumi

and Herron 2010). We use these ideal points to measure voters' ideological positions and to

examine whether and when they prefer candidates whose ideological positions are similar to

their own.

[Table 1 about here]

To examine whether information affects the rationality of voters' preferences and the

extent to which ideological and non-ideological factors inform their utility functions, we

experimentally manipulated endorsements across the surveys.[8] We randomly assigned voters to

either the control group or one of two treatment groups. Voters in the control group answered

the pairwise comparison questions without any additional information about the candidates.

Voters in our treatment groups received actual endorsements that candidates got in this election.[9]

online "issues guide." The guide went live one day before Election Day and was visited by 414

viewers by Election Day. We suspect that it was read by few if any of our respondents.

[7] Each voter received 11 questions, but we randomized four of the longer questions, for 13 total.

[8] Although experiments in exit polls are rare in political science, scholars have recently used

them to great effect (Druckman and Bolsen 2011; Katz et al. 2011).

[9] This enhances external validity and avoids deception. A potential concern is "pretreatment"

from the real-world campaign (Gaines, Kuklinski, and Quirk 2007). If anything, this should

make it more difficult to observe treatment effects. Further, by manipulating information in an

Voters assigned to the "party endorsement" treatment group were told which candidate(s) in each pair the Democratic and/or Republican parties endorsed. For example, when comparing John Avalos and Edwin Lee, voters were asked, "How about John Avalos or Edwin Lee? (Avalos is endorsed by the Democratic Party; Lee is supported by the Republican Party.) Do you prefer Avalos over Lee or Lee over Avalos?" This manipulation enables us to test whether endorsements from political parties help voters to express rational preferences among the five leading candidates. It also enables us to assess whether partisan endorsements alter the relative influence of ideological and non-ideological factors on voters' candidate preferences.

Voters assigned to the "ethnic endorsement" treatment group were told which candidate(s) were endorsed by two ethnic interest groups. Specifically, these voters were told which candidate(s) in each pair the Chinese American Citizens Alliance and/or the Latino Democratic Club endorsed. Thus, when comparing John Avalos and Edwin Lee, these voters were asked, "How about John Avalos or Edwin Lee? (Avalos is endorsed by the San Francisco Latino Democratic Club; Lee is endorsed by the Chinese American Citizens Alliance.) Do you prefer Avalos over Lee or Lee over Avalos?" We provided these endorsements because Chinese-Americans and Latinos comprise the two largest non-white ethnic groups in San Francisco, and because we wanted to assess the effects of identity-based considerations on voters' preferences.[10]

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exit poll, we likely understate its effects because we assess its effects *after* voters may have acquired other information.

[10] One consequence of providing real endorsements is that both candidates in some pairs receive endorsements, while only one candidate is endorsed in other pairs. We combine candidate pairs where either both candidates or only one candidate receives an endorsement within treatment

Hypotheses

We now make predictions about the extent to which voters will form rational preferences and what factors will inform their utility functions. First, we expect that the share of voters with intransitive (i.e., irrational) preferences will exceed what scholars have found in national and state elections. We expect greater intransitivity because of the relative lack of media coverage of local campaigns, the greater number of serious candidates in this election, and the absence of party labels that meaningfully distinguish the candidates. Following Brady and Ansolabehere (1989) and Alvarez and Kiewiet (2009), we also expect that voters with low levels of knowledge about local politics and voters who prefer a candidate other than the five that we asked about (i.e., who did not rank any of these five candidates first on their ballot) will have higher rates of intransitivity.

We expect that political party and ethnic group endorsements will have positive effects on voters' ability to form rational preferences. In particular, we predict that they will reduce intransitivity rates. In low-information local elections like the one we examine here, many candidates are often no more than names on a page for voters (Kam and Zechmeister 2013). However, political party and ethnic group endorsements may help voters to identify candidates whose policy views, partisanship, or ethnicity are similar to their own and develop transitive preference orderings over them. Indeed, while voters may not be able to express a transitive preference ordering among the five leading candidates in the control group, they likely have a preference between the Democratic and Republican parties and between Latino and Chinese-

groups because analyzing them separately produced similar results. In one pair in the party endorsement treatment group, no candidate received an endorsement. This pair is omitted from our analysis of the effects of information on voters' candidate preferences.

American groups. These preferences for political parties and ethnic groups should provide a decision rule that helps voters express transitive preferences for the candidates.[11]

We also make predictions about the extent to which voters' candidate preferences will be related to their ideological positions and other factors that scholars presume inform their utility functions. Previous research on local elections suggests that we should observe little, if any, effect of ideology on voters' preferences. Indeed, scholars find little evidence that ideology influences voters' preferences in these settings and, instead, emphasize the effects of non-ideological considerations, such as ethnicity, partisanship, and local government performance (Kaufmann 2004; Oliver 2012). If these scholars are correct, then we should observe strong effects of partisanship, ethnicity, and/or evaluations of local government performance on voters' preferences and weak or nonexistent effects of ideology.

With respect to whether and how information will alter the relative influence of ideological and non-ideological factors, we test the competing predictions that existing theories make about the effects of party and ethnic cues. On the one hand, many scholars view partisanship and ethnicity as affective, identity-based relationships between voters and their political party or ethnic group (Campbell et al. 1960; Hutchings and Valentino 2004). If this is the case, political party and ethnic group endorsements should induce a group-based response, increasing co-partisan and co-ethnic voters' support for endorsed candidates, relative to co-partisan and co-ethnic voters in the control group. Importantly, if these endorsements elicit a group-based response, we should observe this favorable response irrespective of co-partisan and co-ethnic voters' local ideological positions.

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[11] Indeed, it is possible that voters who see candidates as just names on the page will choose randomly or express indifference. Both behaviors are more likely to result in intransitivity.

On the other hand, recent research suggests that political parties and ethnic groups also send ideological signals (Sniderman and Stiglitz 2012; Sigelman et al. 1995; McDermott 1998; Abrajano, Nagler, and Alvarez 2005). Because the Democratic Party typically supports liberal policies/candidates and the Republican Party typically supports conservative policies/candidates, the parties have well-known ideological reputations that can help voters determine which candidate is to the left/right of the other (Sniderman and Stiglitz 2012). Similarly, many voters hold stereotypes about the ideological leanings of different ethnic groups, with Latinos perceived as more liberal than Chinese-Americans (Karl and Ryan 2013). If voters use political party and ethnic group endorsements as ideological signals, then voters who receive the endorsements should be more likely to prefer ideologically-similar candidates, relative to the control group. We should, therefore, observe a stronger effect of ideology on voters' candidate preferences in these treatment groups than in the control group.[12]

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[12] Importantly, our predictions about these endorsements' effects on voters' candidate preferences hinge on the assumption that they provide ideologically "correct" information for each candidate pair (e.g., the Democratic Party and the Latino Democratic Club endorse the more progressive, i.e., liberal, candidate). Most endorsements in this election (and hence in our treatment groups) sent such correct signals. One consequence of providing actual endorsements is that there are a few candidate pairs where the endorsements sent incorrect signals about the candidates' relative ideological locations. Because we are interested in whether information enhances the effect of ideology on voters' preferences and because these pairs with incorrect ideological signals provide insufficient variation for statistical analysis, we do not make predictions about or analyze them here.

Data Analysis

To assess whether voters' preferences are rational, we examine whether their pairwise choices among the five leading candidates satisfy the following three relations:

1. Preference for Candidate A over Candidate B and for Candidate B over Candidate C implies preference for Candidate A over Candidate C.

2. Indifference between Candidates A and B and between Candidates B and C implies indifference between Candidates A and C.

3. Preference for Candidate A over Candidate B and indifference between Candidates B and C implies preference for Candidate A over Candidate C.

Following Alvarez and Kiewiet (2009) and others, we consider voters to have transitive preferences if their pairwise choices satisfy these three relations.[13] We consider voters to have intransitive preferences if their pairwise choices do not satisfy one or more of these relations.

For voters whose preferences are transitive, we also assess how strongly ordered their preferences are by counting the number of candidate pairs on which they express indifference. We consider voters to be indifferent between two candidates if they did not choose one over the other (Brady and Ansolabehere 1989; Alvarez and Kiewiet 2009).[14] Voters who express a preference for one candidate over the other in all ten pairwise comparisons are not indifferent between any candidates. Thus, their ten pairwise comparisons yield a complete rank ordering of

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[13] Specifically, preferences are considered to be rational if they are complete and transitive. Only rational preferences can be represented by a utility function.

[14] We omit respondents who did not answer at least five of the ten pairwise choices and those who answered at least five, but answered no questions in subsequent sections of the exit poll. We treat these respondents as refusing to participate in this portion of our exit poll.

the five candidates from most to least preferred. Voters who are indifferent between two candidates, but have strict preferences in the nine other pairwise comparisons will express a single indifference. Voters who do not express a preference for any of the candidates are indifferent on all ten pairwise comparisons. Such voters' preferences satisfy the requirements of rationality, but are very weakly ordered.

We also assess whether voters' preferences are related to factors that scholars presume inform their utility functions. Specifically, we examine whether their ideology, partisanship, ethnicity, and evaluations of local government performance influence their preferences for the candidates in each pair. Our dependent variable in this analysis is a dummy variable that is coded as one for voters who prefer the more moderate candidate in each pair and zero otherwise.[15] Thus, the unit of analysis is voter-pair observations.

To determine which candidate is more moderate in each pair and to measure voters' local ideological positions, we estimate ideal points for candidates and voters based on their answers to the policy questions we developed. To do so, we use the Bayesian item-response model developed by Clinton, Jackman and Rivers (2004). To enhance the precision of our ideal point estimates, we combine voters' and candidates' responses to the 13 policy questions in Table 1 with candidates' responses to 52 other yes/no policy questions found in publicly available candidate questionnaires during the 2011 mayoral race.[16] In bridging candidates' and voters'

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[15] We use clustered standard errors because the errors in our models are independent across voters, but not necessarily within voters across the candidate pairs.

[16] Since all positions were taken during the campaign, we avoid the assumption common in studies that use bridging that the ideological positions of elites do not change over time (Shor and McCarty 2011).

responses, we make it more likely that the ideological dimensions described by our ideal point estimates accurately reflect the salient ideological divisions in local politics.[17] In each candidate pair, we consider the candidate with the ideal point furthest to the right to be the more moderate candidate.

The main independent variables in this analysis are five variables that reflect voters' ideology, partisanship, ethnicity, and evaluations of local government performance. The variable *Ideology* reflects each voter's ideal point in the local policy space. Large negative values of *Ideology* indicate voters whose local policy views are more progressive (liberal), while large positive values indicate voters whose local policy views are more moderate (conservative). The variable *Democrat* is a dummy variable coded as one for voters who are registered Democrats and zero otherwise. The dummy variables *Chinese* and *Latino* are coded as one for voters who identify themselves as Chinese-Americans and Latinos, respectively. The variable *Local*

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[17] We used the IDEAL program (Clinton, Jackman, and Rivers 2004) to analyze candidate and voter responses to 65 policy questions (the 43 questions that we wrote and 22 from other candidate questionnaires). We estimated a one-dimensional model with uninformative priors for all model parameters with 200,000 iterations after discarding the first 10,000 and thinning by 100. Ideal point estimates were then post-processed, fixing Leland Yee at -1 and Edwin Lee at 1 in the issue space. The first dimension correctly classifies approximately 73.7 percent of candidate and voter responses. Adding a second dimension results in only mild improvement (78.2 percent correctly classified). These numbers are comparable to what scholars have found at the national level (Jessee 2009). As the first dimension explains most of the variance, we use candidates' and voters' ideal points along the first dimension in our models.

Evaluation measures each voter's rating of the performance of San Francisco's government. This variable ranges from one ("poor") to four ("excellent").

To examine whether and when these factors affect voters' candidate preferences, we interact each of these five variables with dummy variables that reflect whether voters are in the control or treatment groups. The interactions between these five variables and the dummy variable *Control* reflect the effects of these factors on voters who did not receive any additional information about the candidates. The interactions between these five variables and the dummy variables *Party Endorsement* and *Ethnic Endorsement* reflect the effects of these factors on voters who received political party or ethnic group endorsements, respectively. We omit a constant term from this analysis because the control group is included as an independent variable.

Given the coding of these variables, if voters in the control group prefer candidates who are closer to them ideologically, the coefficient for the interaction between *Control* and *Ideology* should be positive and significant.[18] Comparing this coefficient to the coefficients for the interactions between *Party Endorsement* and *Ideology* and *Ethnic Endorsement* and *Ideology* enables us to examine whether political party and ethnic group endorsements enhance or reduce voters' propensity to prefer candidates who share their policy views. Similarly, comparing the coefficients for the other interaction terms (e.g., those for partisanship, ethnicity, and evaluations of local government performance) across treatment and control groups enables us to examine whether political party and ethnic group endorsements enhance the relationship between these

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[18] Because we include *Control* as an independent variable (and omit a constant term), we interact *Ideology* with *Control* (and omit a main effect for *Ideology*). Thus, the coefficient for the interaction of *Control* and *Ideology* measures the baseline effect of ideology in our analyses.

factors and voters' candidate preferences. For example, political party endorsements might strengthen the relationship between voters' partisanship and candidate preferences, relative to the control group. If this is the case, the coefficient for the interaction between *Party Endorsement* and *Democrat* should be larger than the coefficient for the interaction between *Control* and *Democrat*. It is also possible that ethnic group endorsements will enhance the relationship between voters' ethnicity and candidate preferences, which we can assess by comparing the coefficient for the interaction between *Control* and *Chinese* (or *Control* and *Latino*) to the coefficient for the interaction between *Ethnic Endorsement* and *Chinese* (or *Ethnic Endorsement* and *Latino*).

Results

Our results indicate that a large majority of voters have rational preferences over the five leading candidates in this election. However, a considerably larger percentage of voters have intransitive preferences than in the national and state elections that previous research examines. As expected, voters with low levels of knowledge about local politics and those who prefer a candidate who was not among the five that we asked about are more likely to have intransitive preferences. We also find that voters' candidate preferences are related to factors that scholars presume inform their utility functions. Most notably, voters' local ideological positions have a strong influence on their candidate preferences. Indeed, this influence is stronger than the effects of partisanship, ethnicity, and evaluations of local government performance. However, political party and ethnic group endorsements do not help voters to express rational preferences. They also weaken rather than strengthen the influence of ideology and, instead, activate group-based considerations like ethnicity. That said, the endorsements help voters who prefer a candidate

other than the five that we asked about (i.e., who did not rank any of these candidates first on their ballot) to express preferences that are more similar to other subgroups of voters.

The (In)Transitivity of Voter Preferences

The results in Table 2 show that a large majority (73.82 percent) of voters in the control group have rational preferences among the five leading candidates. However, the remaining 26.18 percent of voters have intransitive preferences. This is a substantially larger percentage than the 3.3 percent of voters with intransitive preferences among the four leading candidates in the 2003 California recall election (Alvarez and Kiewiet 2009). It is also larger than the 6.7 percent of voters with intransitive preferences among five candidates in the 1976 Democratic presidential primary (Brady and Ansolabehere 1989). Among voters in the control group, 37.45 percent have a clear rank ordering of the five candidates; that is, they are not indifferent between candidates in any of the ten pairwise comparisons. Of the remaining voters, most express a preference between candidates on seven or more candidate pairs. Specifically, 18.54 percent are indifferent on only one of the ten candidate pairs, 1.09 percent are indifferent on two candidate pairs, and 9.45 percent are indifferent on three candidate pairs. Only 1.45 percent of voters are indifferent between all five candidates.

[Table 2 about here]

As expected, voters with low levels of knowledge about local politics are more likely to have intransitive preferences than voters with high levels of local political knowledge. As Table 2 shows, 32.3 percent of low-knowledge voters have intransitive preferences in the control group, which is significantly greater than the 20.68 percent of high-knowledge voters with intransitive preferences ($p < 0.05$). High-knowledge voters are also more likely to have a clear

rank ordering of all five candidates than low-knowledge voters. Indeed, 48.27 percent of high-knowledge voters have a clear rank ordering of the candidates, while only 25.38 percent of low-knowledge voters have such a rank ordering ($p < 0.05$).

Table 2 also shows that voters who did and did not rank one of the five leading candidates first on their ballot have similar levels of transitivity in the control group. However, there is a large difference in the extent to which these two groups of voters have a clear rank ordering of all five candidates. Among voters who ranked one of the five leading candidates first on their ballot, 25.46 percent have intransitive preferences. Among voters who did not rank one of the five leading candidates first on their ballot, a slightly higher, but not significantly different, percentage of voters have intransitive preferences (28.81 percent). However, while 39.81 percent of voters who ranked one of the five leading candidates first on their ballot have a clear rank ordering of all five candidates, only 28.81 percent of voters who did not rank one of these candidates first on their ballot have a clear rank ordering ($p < 0.05$). Thus, like low- and high-knowledge voters, there are appreciable differences in these two groups of voters' preferences.

Importantly, the difference between these two groups of voters becomes larger when political party and ethnic group endorsements are provided. While neither type of endorsement significantly changes the extent to which voters in the aggregate have intransitive preferences, both types of endorsements increase intransitivity among voters who did not rank any of the five leading candidates first on their ballot. As Table 2 shows, 47.61 percent of voters who did not rank any of the five candidates first on their ballot have intransitive preferences in the party endorsement treatment group. Similarly, 44.11 percent of these voters have intransitive preferences in the ethnic endorsement treatment group. Both of these percentages are significantly larger than the percentage of these voters who have intransitive preferences in the

control group (28.81 percent; p < 0.05). In contrast, the endorsements do not significantly

increase intransitivity among voters who ranked one of the five leading candidates first on their

ballots. One explanation for these results is that voters who prefer other candidates may treat the

endorsements as mere quality signals, as opposed to signals that suggest a rank ordering of the

candidates. Given that both candidates receive endorsements in some candidate pairs, while only

one candidate receives an endorsement in other pairs, treating these endorsements as quality

signals (and flipping a coin when both candidates in a pair receive an endorsement) can lead

voters astray.

The Effects of Ideology and Non-Ideological Factors

Having confirmed that most voters have rational preferences, we now examine whether

the factors that scholars presume inform their utility functions actually influence their

preferences in this election. The results in Table 3 provide strong evidence that voters' ideology

influences their candidate preferences in the control group. Indeed, this factor has the largest

influence on control group voters' candidate preferences. As shown in Figure 1, there is a

significant, positive relationship between voters' ideal points and the probability that they prefer

the more moderate (conservative) candidate in each pair. Shifting from an ideal point of -0.93 to

one of 1.92 (a shift from a progressive to a moderate ideal point) increases the probability of

preferring the more moderate candidate by 0.42 (p < 0.05). The strength of this effect is

remarkable, given the difficulty of this low-information setting. It also challenges the prevailing

view of voting in local elections as being dominated by non-ideological considerations.

The effects of voters' partisanship and evaluations of local government performance are

also significant in the control group. As Figure 1 shows, the probability that a Democratic voter

prefers the more moderate candidate is 0.13 smaller than the probability that a non-Democratic voter does ($p < 0.05$). The size of this effect, however, pales in comparison to that of ideology. The same is true of voters' evaluations of local government performance. Given that the incumbent, Edwin Lee, and his two predecessors were well-known moderates, we expected voters with more positive evaluations of local government performance to prefer more moderate candidates. This is the case, but the effect is small compared to ideology. Shifting from a "fair" to "good" evaluation of local government performance increases the probability of preferring the more moderate candidate by 0.11 ($p < 0.05$). These relationships are also impressive given the difficulty of this low-information setting.

[Table 3 and Figure 1 about here]

Given the greater intransitivity rates we observed among low-knowledge voters and voters who did not rank any of the five leading candidates first, we also examine whether these voters' preferences are related to ideological and non-ideological factors in the control group. As shown in Table 3, low- and high-knowledge voters look very similar to each other and to voters in the aggregate. That is, ideology has a similarly strong effect on both low- and high-knowledge voters' candidate preferences. These voters' partisanship and evaluations of local government performance also exert significant, but substantively smaller, effects on their preferences, much as we observe among voters in the aggregate.

In contrast, voters who did not rank any of the five leading candidates first have preferences that are less strongly related to ideology and other factors that scholars assume are important. Specifically, the effect of ideology on these voters' candidate preferences is weaker than it is for voters in the aggregate or in the other subgroups. As Figure 2 shows, shifting from an ideal point of -0.93 to one of 1.92 (a shift from a progressive to a moderate ideal point)

increases these voters' probability of preferring the more moderate candidate by 0.33 ($p < 0.05$). This is a substantively smaller effect of ideology than we observed among voters in the aggregate (0.42). Further, partisanship and evaluations of local government performance do not affect these voters' candidate preferences. The only other factor that significantly influences these voters' preferences is ethnicity. That is, Chinese-American voters are significantly more likely to prefer the more moderate candidate in each pair (the probability increases by 0.25). In contrast, voters who ranked one of the five leading candidates first look very much like voters in the aggregate, as the strongest influence on their candidate preferences is ideology, with significant but smaller effects for partisanship and evaluations of local government performance.

[Figure 2 about here]

How Endorsements Alter the Influence of Ideology and Non-Ideological Factors

We find that political party and ethnic group endorsements alter the relative influence of ideology, partisanship, ethnicity, and evaluations of local government performance. Specifically, the endorsements weaken the effects of ideology and evaluations of local government performance, while strengthening the effects of ethnicity. As Figure 1 shows, shifting from an ideal point of -0.93 to one of 1.92 (a shift from a progressive to a moderate ideal point) increases the probability of preferring the more moderate candidate by 0.31 in the party endorsement treatment group ($p < 0.05$). The same ideal point shift in the ethnic endorsement treatment group increases the probability of preferring the more moderate candidate by 0.28 ($p < 0.05$). While still significant effects of ideology, both are significantly smaller than the effect of ideology in the control group ($p < 0.05$). We observe a similar weakening of the effect of evaluations of local government performance in the party endorsement treatment group. While shifting from a

"fair" to "good" local government evaluation significantly increases the probability of preferring the more moderate candidate in the control group, this same shift does not significantly affect voters' candidate preferences in the party endorsement treatment group. These results indicate that while political party and ethnic group endorsements influence voters' preferences, voters do not appear to use these endorsements as ideological signals for identifying candidates who share their policy views.

In addition to weakening the effects of ideology and evaluations of local government performance, political party and ethnic group endorsements strengthen the influence of ethnicity on voters' candidate preferences.[19] Whereas ethnicity does not have a significant influence on voters' preferences in the control group, the ethnic group endorsements appear to activate group-based considerations. As shown in Figure 2, the probability that Latino voters support the more moderate candidate is 0.21 less than the probability that white voters support the more moderate candidate in the ethnic endorsement treatment group (p < 0.05). The probability that Chinese-American voters support the more moderate candidate is 0.35 more than the probability that white voters support the more moderate candidate in the ethnic endorsement group (p < 0.05). Interestingly, political party endorsements activate similar ethnic group-based considerations.[20]

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[19] The other group-based consideration (partisanship) has a similar influence on voters' preferences in the party and ethnic endorsement treatment groups as it does in the control group. That is, Democratic voters in all three groups are significantly less likely to prefer the more moderate candidate in each pair.

[20] The effect is probably due to the nature of the political parties' endorsements. The Democratic Party endorsed two Latino candidates, while the Republican Party endorsed a Chinese-American candidate.

As for the effects of endorsements on voters who did not rank any of the five leading candidates first, the political party endorsements structure these voters' preferences in a way that makes them more closely resemble voters in the aggregate. As Figure 2 shows, ideology continues to have a significant effect on these voters' preferences in the party endorsement treatment group. Voters with more moderate ideal points are more likely to prefer more moderate candidates, just as we observed among these voters in the control group. The political party endorsements also increase the effects of local government evaluations on these voters' preferences. Specifically, shifting from a "fair" to "good" evaluation of local government performance increases the probability of preferring the more moderate candidate by 0.11 in the party endorsement treatment group ($p < 0.05$). This is similar to the effect of local government evaluations that we observed among voters in the aggregate in the control group. The political party endorsements also appear to activate ethnic group-based considerations among these voters who are Latino or Chinese-American, just as we observed among voters in the aggregate.

Conclusion

The results of our study confirm that two fundamental assumptions of formal models of voter decision-making are reasonably met in local elections using RCV. First, a large majority of San Francisco voters have rational preferences over the five leading candidates in the 2011 mayoral election. While the share of voters with rational preferences is lower than what scholars have observed in national and state elections, the extent of rationality we observe is impressive given the relative lack of media coverage of local campaigns and the large number of candidates voters were asked to compare. Like other scholars, we observe lower levels of rationality among voters with low levels of knowledge about local politics and who preferred a candidate other

than the five leading candidates. Providing voters with political party or ethnic group endorsements does not appear to increase the extent to which these voters form rational preferences.

Second, voters' ideological positions in local politics and their candidate preferences are strongly related, as spatial models predict. Indeed, the effects of ideology among voters in our control group are equal to or greater than the effects of partisanship, ethnicity, and evaluations of local government performance. While this finding is at odds with much previous research on voter decision-making in local elections, we believe our measures of candidates' and voters' ideological positions provide a better test of the effects of ideology. Specifically, our measure is based on concrete policy questions that capture the main ideological dimension of local politics and meaningfully distinguish both candidates and voters along that same dimension.

We also find that providing voters with political party or ethnic group endorsements reduces the effects of ideology on voters' preferences. In this way, our results suggest that voters' response to these endorsements was group-based rather than ideological. Further, both types of information strengthened the relative influence of ethnicity and, in the case of the political party endorsements, weakened the effects of voters' evaluations of local government performance. These results indicate that different types of information can alter the relative influence of ideology, partisanship, ethnicity, and evaluations of local government performance on voters' preferences.

Our results have a number of relevant implications for scholars and practitioners. For scholars, our results suggest that spatial models can be usefully applied to low-information local elections. Indeed, voters' preferences appear to satisfy the basic assumptions that spatial and other formal models take for granted. However, future research might explore ways to account

for the relatively low levels of order that characterize voters' preferences in these settings. Similarly, the strong empirical relationship that we find between voters' ideological positions and their candidate preferences testifies to the powerful incentives that candidates for local offices have to carefully position themselves in the local policy space. The crowded field in such settings suggests ample opportunity for strategic candidate entry and position taking.

Our study also shows the benefits of experiments that manipulate the amount and type of information that voters receive before expressing their preferences. We provide a strong test of the effects of information by exposing voters to endorsements that political parties and ethnic groups actually attempted to disseminate on citizens who actually turned out to vote. In recent years, scholars have developed more elaborate spatial models to account for non-ideological or valence factors that influence voters' choices. Our results indicate that endorsements can activate such non-ideological factors, reducing the effects of ideology in the process. This finding perhaps explains why candidates work hard to secure these endorsements and then disseminate them to voters. At the very least, it suggests that the strategies of candidates for local offices encompass both ideological and non-ideological choice dimensions. Scholars, both formal and empirical, should continue to represent both dimensions in the future. Given that endorsements appear to have different effects on different groups of voters, they would be wise to do so in more sophisticated ways.

For practitioners, our results indicate that some critics' concerns about RCV might be overblown. Voters do form rational preferences over candidates in local elections, even where the number of candidates is large and there are no partisan differences between them. Voters' preferences can also be empirically connected to several sources of self-interest in political settings, including their ideology, partisanship, ethnicity, and evaluations of local government

performance. That the effects of voters' ideological positions weaken in the presence of certain types of information also need not be cause for alarm. While there ought to be a relationship between voters' and candidates' policy views, it is neither unexpected nor "undemocratic" for other factors to compete with policy-based considerations. Further, neither type of information that we examine completely eliminates the influence of ideology. And, the stronger effects of ethnicity and other factors compensate for the reduced influence of ideology.

Our results also offer little support for proposals to improve voter decision-making by including political party or ethnic group endorsements on the ballot or in the ballot pamphlets that local governments publish and distribute. Providing voters with political party or ethnic group endorsements is unlikely to change the extent to which voters express rational preferences in local elections. Nor is it likely that either type of information will strengthen the relationship between voters' ideological positions and their candidate preferences. To the extent that practitioners wish to increase the level of order in voters' preferences (i.e., less intransitivity and/or less indifference) or enhance their ability to identify candidates who share their policy views, providing other types of information might be necessary. Perhaps providing voters with information that better emphasizes candidates' views on local issues, such as a policy scorecard or candidate statements, would allow voters to make more informed comparisons between candidates and identify candidates who share their policy views. We explore this possibility elsewhere (Boudreau, Elmendorf, and MacKenzie 2013). Suffice it to say, what types of information, if any, will increase the extent to which voters express rational preferences and/or strengthen the link between their ideology and preferences remains an open question.

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Table 1. Policy Questions with Candidates' and Voters' Answers

| Policy Proposal | Candidates | | | | | | | | | | Respondents |
	Avalos	Yee	Chiu	Adachi	Herrera	Rees	Dufty	Lee	Alioto-Pier	Hall	Y-N-DK (%)
Charge entry fees to non-residents for use of botanical gardens	N	N	Y	N	n/a	N	N	Y	Y	N	40-48-12
Base school admissions on proximity to schools	N	N	N	Y	N	Y	N	N	Y	Y	36-58-6
Support "Care Not Cash" program	N	n/a	Y	Y	Y	Y	Y	Y	Y	N	67-12-21
Require nutritional standards when selling food with toys	Y	Y	Y	Y	Y	N	Y	N	N	N	66-28-6
Impose fee on alcohol distributors to pay for health costs	Y	Y	Y	N	N	Y	N	Y	n/a	N	50-41-9
Ban new buildings more than 40 feet tall that cast shadows	Y	Y	N	Y	N	Y	Y	N	N	n/a	54-31-15
Prohibit loitering outside nightclubs	N	N	Y	Y	N	Y	Y	Y	Y	Y	53-32-15
Rent control for all tenants, not just those who cannot afford market-level rents	Y	Y	Y	Y	Y	Y	Y	Y	N	N	53-35-12
Prohibit sitting or lying on public sidewalks between 7:00 a.m. and 11:00 p.m.	N	N	N	N	Y	Y	N	Y	Y	Y	54-40-6
Exempt Twitter from 1.5% city payroll tax for six years	N	N	Y	N	Y	N	Y	Y	Y	Y	57-32-11
Increase tax on sales and leases of properties worth over $5 million	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	76-15-9
Delay Central Subway project until MUNI shortfalls are eliminated	N	N	N	Y	Y	N	N	N	Y	Y	44-42-14
Require AT&T to undergo full environmental review before installing boxes on sidewalks	Y	Y	Y	Y	n/a	Y	N	N	N	Y	56-27-17

Table 2. Preference Orderings over Candidates in the San Francisco Mayoral Election

| Type of preference ordering	ALL VOTERS	POLITICAL KNOWLEDGE[a]		RANKED OTHER CANDIDATE FIRST[b]	
		High	Low	No	Yes
Control					
Transitive, linear	37.45	48.27	25.38	39.81	28.81
Transitive, one indifference	18.54	18.62	18.46	20.83	10.16
Transitive, two indifferences	1.09	1.37	0.76	0.46	3.38
Transitive, three indifferences	9.45	7.58	11.53	8.33	13.55
Transitive, four or more indifferences	5.81	3.44	8.46	5.09	8.47
Indifferent between all five candidates	1.45	0.00	3.07	0.00	6.77
Intransitive	26.18	20.68	32.30	25.46	28.81
N	275	145	130	216	59
Party Endorsement					
Transitive, linear	39.25	49.57	31.12	44.92	20.63
Transitive, one indifference	18.14	19.32	17.21	18.84	15.87
Transitive, two indifferences	1.11	1.68	6.62	9.66	1.58
Transitive, three indifferences	5.55	3.36	7.28	6.28	3.17
Transitive, four or more indifferences	3.33	1.68	4.63	2.41	6.34
Indifferent between all five candidates	2.22	8.40	3.31	1.44	4.76
Intransitive	30.37	23.52	35.76	25.12	47.61
N	270	119	151	207	63
Ethnic Endorsement					
Transitive, linear	36.61	45.57	27.00	38.42	30.88
Transitive, one indifference	16.54	19.72	13.13	19.90	5.88
Transitive, two indifferences	2.11	0.00	4.37	1.85	2.94
Transitive, three indifferences	4.57	2.72	6.56	6.01	0.00
Transitive, four or more indifferences	5.98	3.40	8.75	6.01	5.88
Indifferent between all five candidates	4.22	2.04	6.56	2.31	10.29
Intransitive	29.92	26.53	33.57	25.46	44.11
N	284	147	137	216	68

NOTE: Total indicates the number of observations in each category. [a] High and low knowledge determined by responses to a four-question local political knowledge battery. [b] Indicates whether respondents ranked a candidate other than the five leading candidates first on their ballot.

Table 3. Voters' Preferences for Candidates and the Effects of Endorsements

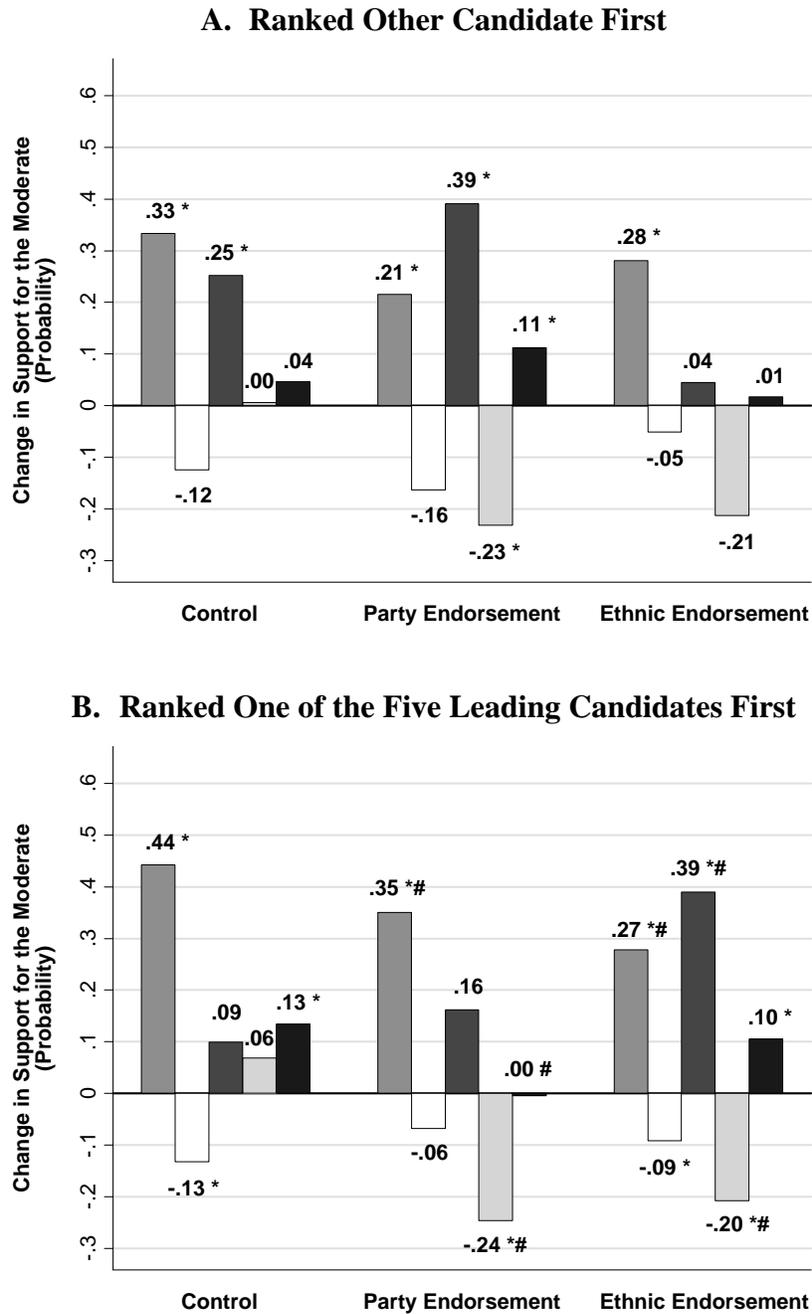|	ALL VOTERS	POLITICAL KNOWLEDGE[a]		RANKED OTHER CANDIDATE FIRST[b]	
		LOW	HIGH	YES	NO
Control	**-0.756**	**-0.540**	**-1.027**	-0.279	**-0.918**
	(0.191)	(0.293)	(0.262)	(0.331)	(0.233)
Control * Ideology	**0.416**	**0.433**	**0.412**	**0.317**	**0.439**
	(0.033)	(0.054)	(0.041)	(0.072)	(0.038)
Control * Democrat	**-0.358**	**-0.349**	**-0.426**	-0.351	**-0.335**
	(0.138)	(0.189)	(0.183)	(0.322)	(0.154)
Control * Chinese	0.297	0.454	0.090	**0.734**	0.248
	(0.234)	(0.292)	(0.330)	(0.427)	(0.256)
Control * Latino	0.137	-0.050	0.365	0.009	0.167
	(0.210)	(0.346)	(0.263)	(0.467)	(0.235)
Control * Local Evaluation	**0.295**	**0.237**	**0.399**	0.124	**0.343**
	(0.081)	(0.126)	(0.108)	(0.185)	(0.093)
Party Endorsement	**-0.545**	-0.147	**-0.872**	**-0.778**	**-0.360**
	(0.187)	(0.249)	(0.280)	(0.333)	(0.214)
Party Endorsement * Ideology	**0.313**	**0.353**	**0.298**	**0.219**	**0.344**
	(0.035)	(0.052)	(0.047)	(0.085)	(0.038)
Party Endorsement * Democrat	**-0.219**	**-0.542**	0.112	-0.428	-0.179
	(0.130)	(0.173)	(0.196)	(0.292)	(0.141)
Party Endorsement * Chinese	**0.473**	**0.526**	0.418	**1.085**	0.404
	(0.270)	(0.316)	(0.467)	(0.356)	(0.300)
Party Endorsement * Latino	**-0.813**	**-0.525**	**-1.632**	**-0.882**	**-0.780**
	(0.228)	(0.256)	(0.303)	(0.426)	(0.253)
Party Endorsement * Local Evaluation	0.095	-0.026	**0.162**	**0.292**	-0.012
	(0.072)	(0.100)	(0.098)	(0.118)	(0.086)
Ethnic Endorsement	**-0.773**	**-0.688**	**-0.836**	-0.454	**-0.859**
	(0.208)	(0.329)	(0.256)	(0.325)	(0.267)
Ethnic Endorsement * Ideology	**0.277**	**0.278**	**0.283**	**0.270**	**0.274**
	(0.032)	(0.052)	(0.039)	(0.061)	(0.037)
Ethnic Endorsement * Democrat	**-0.227**	-0.222	-0.210	-0.140	**-0.239**
	(0.119)	(0.180)	(0.157)	(0.263)	(0.137)
Ethnic Endorsement * Chinese	**0.949**	**1.115**	**0.794**	0.082	**1.071**
	(0.192)	(0.257)	(0.295)	(0.521)	(0.200)
Ethnic Endorsement * Latino	**-0.711**	**-0.616**	**-0.819**	-0.718	**-0.682**
	(0.288)	(0.349)	(0.476)	(0.478)	(0.323)
Ethnic Endorsement * Local Evaluation	**0.225**	0.144	**0.270**	0.047	**0.268**
	(0.086)	(0.123)	(0.112)	(0.163)	(0.105)
Log-likelihood	-2471.68	-1109.09	-1337.28	-553.10	-1901.06
Clusters	742	359	383	162	580
N	4425	2037	2388	916	3509

NOTE: Numbers are probit coefficients with clustered standard errors in parentheses. The dependent variable is coded as one for voters who prefer the more moderate candidate in a pair and zero otherwise. Boldface coefficients are significant at the .05 level (one-tailed). [a] High and low knowledge determined by responses to a four-question local political knowledge battery. [b] Indicates whether respondents ranked a candidate other than the five leading candidates first on their ballot.

Figure 1. The Effects of Information on Voters' Preferences
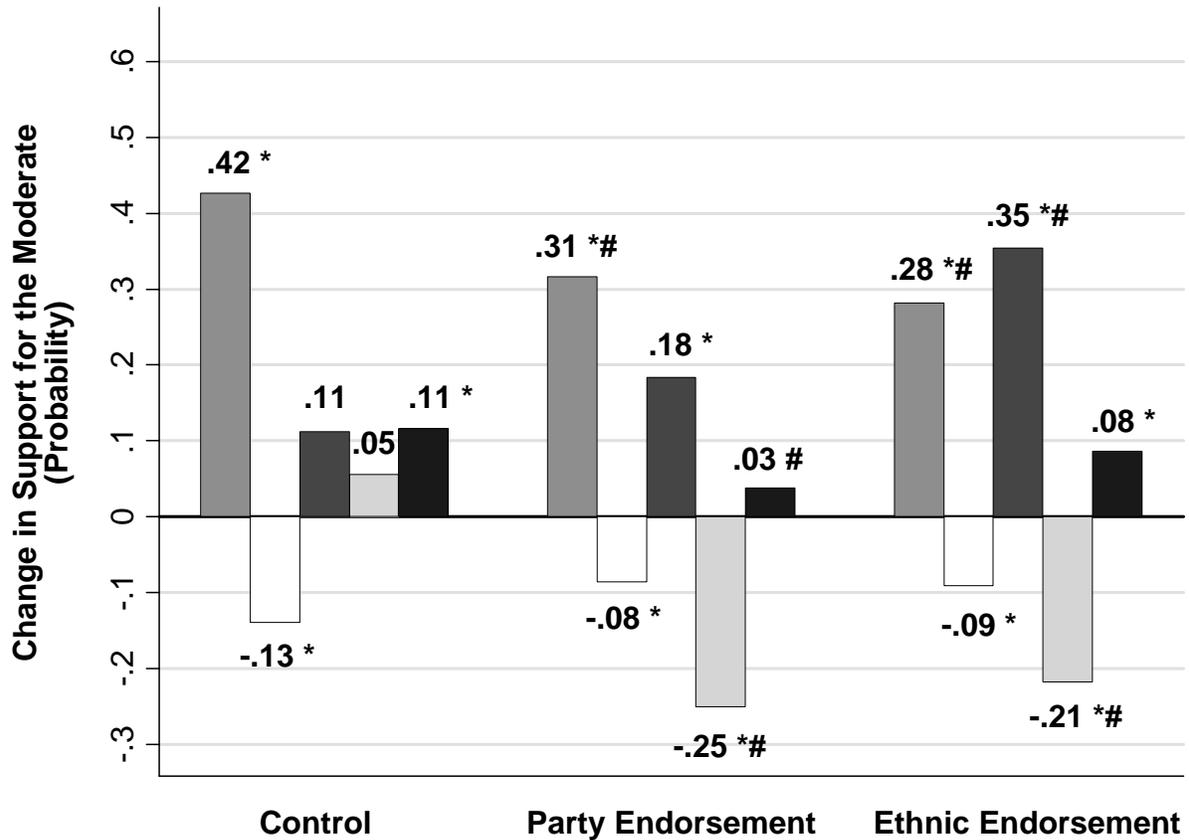
NOTE: Bars indicate predicted changes (i.e., first differences) in support for the more moderate candidate as ideology, partisanship, ethnicity and local evaluations change. Grey = Ideology (change from -.93 to 1.92); White = Democrat (Democrat vs. non-Democrat); Dark Grey = Chinese (Chinese vs. White); Light Grey = Latino (Latino vs. White); Black = Local Evaluation (change from "fair" to "good"). * indicates first difference is significant at the .05 level (one-tailed); # indicates difference with control group is significant at the .05 level (one-tailed).

Figure 2. The Effects of Information on Voters' Preferences, by First Choice for Mayor

A. Ranked Other Candidate First

B. Ranked One of the Five Leading Candidates First

NOTE: Bars indicate predicted changes (i.e., first differences) in support for the more moderate candidate as ideology, partisanship, ethnicity and local evaluations change. Grey = Ideology (change from -.93 to 1.92); White = Democrat (Democrat vs. non-Democrat); Dark Grey = Chinese (Chinese vs. White); Light Grey = Latino (Latino vs. White); Black = Local Evaluation (change from "fair" to "good"). * indicates first difference is significant at the .05 level (one-tailed); # indicates difference with control group is significant at the .05 level (one-tailed).