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Whose Votes Count?

Undervotes, Overvotes, and Ranking in San Francisco's Instant-Runoff Elections

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We examine the first 3 years of San Francisco's instant-runoff voting (IRV) elections to determine whether some voters adapt more easily than others to the more complex ballot and decision task. We draw on studies of uncounted votes to develop hypotheses about tendencies to undervote, overvote, and rank candidates in IRV elections. Individual ballot records and precinct-level census data are used to estimate the relative influences of demographic and election-specific factors. A natural experiment tests whether or not prior experience with IRV makes a difference. The change to IRV appears to have increased the rate of overvotes and decreased tendencies to undervote. Both behaviors are explained by demographics and aspects of the electoral environment. Meanwhile, tendencies to rank candidates were shaped less by demographics and more by contextual factors and prior exposure to IRV. The findings extend the literature on uncounted votes, inform issues of equality in elections, and provide practical insights on this type of electoral reform.

Keywords: *election reform; instant runoff; IRV; undervote; overvote; uncounted votes; residual vote*

The drama in Florida during the fall of 2000 marked a shift in the practice and the study of U.S. elections. What followed was a groundswell of public concern, academic scrutiny, and legislation addressing the fairness of voting systems. This lent momentum to reform efforts, one of which promotes instant-runoff voting (IRV) as a replacement to plurality or

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two-round systems (TRS).[1] In 2004, San Francisco became the first of several U.S. cities to adopt IRV since Ann Arbor's brief foray in the 1970s.[2]

Although IRV permits voters to express a fuller set of preferences and avoids second-round runoff elections, it also complicates the ballot and the voters' decision task. Demands placed on voters can function as barriers to participation, especially among historically disenfranchised populations (Wolfinger & Rosenstone, 1980), and reforms intended to address those discrepancies sometimes have the opposite effect (Berinsky, 2005). Therefore, we examine voters' behavior during the first 3 years of IRV elections in San Francisco to assess the capacity to adapt to reforms of this nature. Our concern is that some voters more than others may encounter difficulty navigating the more complex system and that this could compromise the equality of voice among citizens.

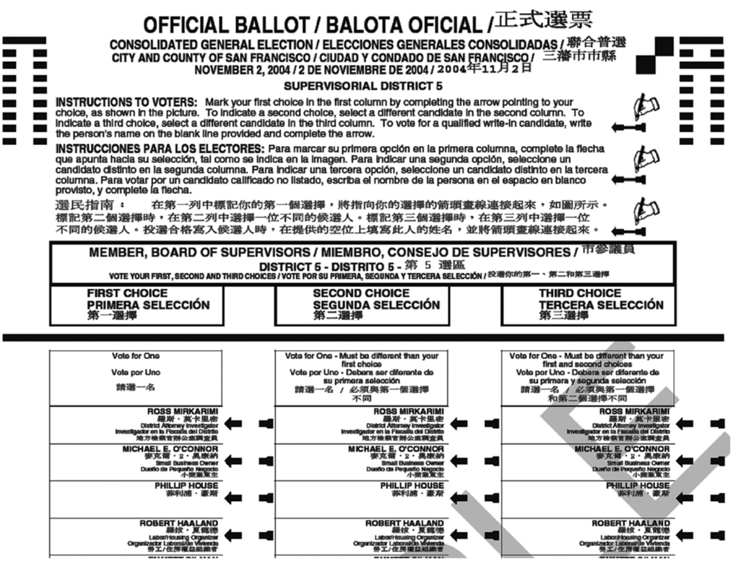
We take up that inquiry in two parts. First, we ask, whose votes count? These analyses closely follow the literature on uncounted votes and examine the types of voters who tend to undervote or overvote in IRV elections. Second, we explore how voters rank candidates, identifying those who are more likely to take full advantage of that option. Here, the question becomes, whose votes count more? We use individual ballot records and precinct-level census data to estimate various influences with multivariate models. We consider those findings alongside comparable results from studies of plurality and TRS elections to assess the impact of the IRV reform. In addition, we provide evidence from a natural experiment that offers insight into how prior experience with the IRV ballot affects voters' behavior.

Although IRV remains a relatively rare bird among the many species of election systems across the country, this case merits examination for two reasons. First, it extends the literature on undervotes and overvotes by analyzing the use of a more complex ballot in local elections. Second, because the number of jurisdictions adopting or considering IRV is on the rise,[3] this early example can inform both the decision to move to IRV and options for implementation. After a brief description of San Francisco's IRV system, we turn to the literature on uncounted votes to develop hypotheses about whose votes count in IRV elections.

San Francisco's Instant-Runoff System

San Francisco's IRV tally begins with a count of all first-place votes. If a candidate has a majority, then a winner is declared; if not, then the lowest vote getter is eliminated from the race. Ballots for that candidate are allocated

Figure 1
**Sample IRV Ballot From the 2004 Election:
District 5 Board of Supervisors**



Note: The ballot image is cropped for legibility; the full District 5 ballot (FairVote, n.d.) listed 22 candidates in each column.

to those voters' next choice, and the tally is taken again. This process repeats until a majority winner emerges. Three characteristics of San Francisco's system are noteworthy. First, the ballot format limits voters to ranking, at most, three candidates.[4] Second, ranking is optional; ballots containing fewer than three ranked choices are not disqualified. Third, some mistakes on the ballot are allowed.[5] However, if a ballot contains more than one vote in any single column, it is considered an overvote and is voided.

San Francisco uses single-sided IRV ballot papers that are optically scanned at the precincts. The IRV ballot is one of several ballots the voter receives and the only one containing three columns (see Figure 1). Each column lists all of the candidates running for an office, and voters indicate their preferences by drawing a line to complete an arrow. First-choice candidates are marked in Column 1, second and third choices in Columns 2 and

3, respectively. When first scanned, any ballot that does not correctly rank three candidates is rejected. The voter may then resubmit it, changed or unchanged, or obtain a fresh ballot and start again. The optical-scan system was also used in the former TRS elections and has been shown to produce moderate (Bullock & Hood, 2002; Knack & Kropf, 2003; Sinclair & Alvarez, 2004) to relatively low rates of uncounted votes (Ansolabehere & Stewart, 2005; Kimball, Owens, & Keeney, 2004).

Literature Review and Hypotheses

We operationalize overvotes and undervotes to provide the best possible match to studies of plurality or TRS elections. Undervotes are IRV ballots that were left blank for a given contest. Overvotes are IRV ballots that have more than one mark in a single column, invalidating the ballot. Although a couple of studies distinguish undervotes from overvotes, as ours does, most of the work connected to this inquiry examines them in a combined group of uncounted votes (also called the residual vote, unrecorded votes, or voided ballots).[6] Therefore, we turn to that broader literature to identify the main theoretical bases and then apply them to our research question. Aside from the voting machinery that in our case remains constant, three general explanations have been offered for the incidence of uncounted votes: voter fatigue, confusion, and information costs.

Three General Explanations for Uncounted Votes

Voters who become fatigued as they complete their ballots may reach a point where they either intentionally opt out or accidentally skip a portion of the ballot (Bullock & Dunn, 1996; Walker, 1966). According to this theory, IRV elections should yield more undervoted ballots than TRS elections because it takes more effort to rank candidates across columns than pick a single candidate from a list.

Voter confusion also leads to uncounted votes. The most commonly studied source of that confusion is the ballot format. For instance, it has long been known that candidates listed first enjoy an undeserved advantage (Hecock & Bain, 1956; Krosnick, Miller, & Tichy, 2004). Analyses of other aspects of ballot design find that simpler layouts are associated with lower rates of uncounted votes (Bullock & Hood, 2002; Darcy & Schneider, 1989; Kimball & Kropf, 2005; Walker, 1966). With the introduction of IRV, the ballot format became more complex, splitting a single column into three.

The transition from TRS to IRV, then, might produce confusion and increase the rates of both undervotes and overvotes.

In addition, some voters skip items on the ballot not because they are fatigued or confused but because they lack the necessary information to cast an educated vote (Wattenberg, McAllister, & Salvanto, 2000). The role of information costs in explaining voters' decisions to turn out (Arbour & Hayes, 2005; Feddersen & Pesendorfer, 1996; Ghirardato & Katz, 2002) should apply to their decisions to vote on items once at the polling place. IRV increases the informational demands on voters who, instead of simply finding one person to endorse, now compare several candidates to determine their relative desirability. As a result, we should expect a higher incidence of undervoting in IRV than in comparable plurality or TRS elections.

These three influences function to varying degrees depending on the nature of the individual voter and the electoral environment in which she or he operates. In what follows, we look more specifically at these expected effects across a set of demographic factors and two that specify the electoral context. In addition, because the reform was phased in over time (see details below), we weigh the impact of voters' prior exposure to IRV. We examine undervotes and overvotes to extend the previous work to behavior in a more complicated system. We focus on ranking three candidates to further assess the equality of voice, recognizing that those who fully rank their ballots convey more preferences than do others.[7]

Race, Ethnicity, and Uncounted Votes

Perhaps the most consistent finding in the literature on uncounted ballots, most of which are undervotes, is that they are more prevalent among non-White voters, particularly African Americans (Bullock & Hood, 2002; Darcy & Schneider, 1989; Kimball et al., 2004; Kimball & Kropf, 2005). However, that gap has been shown to be a function of the type of voting equipment (Tomz & Van Houweling, 2003) and the political and racial dynamics in elections (Herron & Sekhon, 2005; Vanderleeuw & Liu, 2002; Vanderleeuw & Sowers, 2007; Vanderleeuw & Utter, 1993). In systems that use voting machinery such as San Francisco's, Black voters' ballots for president are as likely to be counted as others' and Latinos' are *more* likely (Knack & Kropf, 2003). And the most comparable study of a local election indicates that Black, Latino, and Asian voters appear to undervote at *lower* rates than others (Sinclair & Alvarez, 2004). We expect, then, that the number of undervotes in a San Francisco TRS election should be either unrelated or negatively related to proportions of African Americans, Latinos, and Asian Americans. With no reason to suppose that one's race or ethnicity would affect voters' capacity to adapt to the reform, we hypothesize the same under IRV.

As for overvotes, the evidence is more limited and mixed. One study reports overvotes in a punch-card election to be more prevalent among Black, Latino, and Asian voters (Sinclair & Alvarez, 2004), but another finds no connection between Black voters and overvotes after controlling for voting technologies (Kimball & Kropf, 2005). We expect that in plurality or TRS elections in San Francisco, African American voters will be no more likely than others to overvote, and we maintain that hypothesis under IRV. We approach the question of Latino or Asian voters overvoting as exploratory. Meanwhile, the guidance we gain from the literature in regard to Black, Latino, and Asian voters' tendencies to rank candidates comes from studies of reforms to cumulative voting in the 1980s and 1990s. When it was introduced to address the historical exclusion of African Americans and Latinos from local office, voters understood the more complex system and used the cumulative option strategically (Cole, Taebel, & Engstrom, 1990; Engstrom & Barrilleaux, 1991; Engstrom, Kirksey, & Still, 1997). Although the motivations in those scenarios differ from ours, we tentatively expect that Black and Latino voters will be as likely as others to rank candidates, and we posit the same for Asian American voters.

The Influence of Other Demographic Factors

Two studies that compare the sexes find that women are more likely than men to file uncounted ballots (Stiefbold, 1965) and that the difference holds for both undervotes and overvotes (Sinclair & Alvarez, 2004). With generally lower levels of political knowledge (Delli Carpini & Keeter, 2000), women should be more likely than men to intentionally undervote in plurality or TRS elections. Given its added informational demands, IRV might amplify that effect. Women should also be less likely than men to rank three candidates for similar reasons. However, lacking a theoretical base and empirical results from elections using similar voting machinery, we hypothesize no difference in overvotes based on one's sex.

Voters in several other demographic groups have been identified as disproportionately likely to cast uncounted ballots. These include the elderly (Darcy & Schneider, 1989; Kimball & Kropf, 2005; Stiefbold, 1965), the less educated (Bullock & Hood, 2002; Walker 1966), poorer voters (Darcy & Schneider, 1989; Kimball et al., 2004; Knack & Kropf, 2003), and voters with language barriers (Sinclair & Alvarez, 2004). These influences follow from the theoretical expectations about ballot confusion and information costs discussed above. Voters who are poorer, are less educated, or face a language barrier should find it harder to obtain the additional information necessary to complete an IRV ballot and might tend to undervote more frequently. We see no reason why seniors would be more likely to undervote and explore that question without clear expectations.

Overvotes, however, should be more common among elderly voters if their vision or hearing is compromised. This could make reading instructions, marking the ballot, and getting help from poll workers more difficult. We also hypothesize that lower levels of education and income and limited English-language skills will increase the likelihood of overvotes, based on difficulty understanding the written and oral IRV ballot instructions and less discretionary time to research the voting process. Meanwhile, driven again by the informational requirements, we suggest that voters with little education, lower incomes, and potential language challenges may be less likely to fully rank their IRV ballots.

Influences in the Electoral Environment

Although a full study of campaign effects is beyond the scope of this inquiry, we consider two contextual factors that we expect to affect behavior. The first is campaign spending. This should generally increase the quantity and thus decrease the cost of information about the candidates. We hypothesize that as spending increases, the rate of undervotes will drop and the rate of ranking three candidates might rise. Meanwhile, we see no theoretical connection between campaign spending and overvotes and do not pursue that question here.

Second, we expect that the number of candidates on the ballot will matter. Some undervotes result from voters finding no candidates acceptable. The fewer candidates running, the more likely that is to happen. Conversely, ranking might be more common on ballots that present longer lists of candidates, increasing the chance of finding three worthy of a vote. Overvotes should also be more common as the list of candidates grows; keeping track of columns and rows will be easier on a ballot containing fewer names. Longer lists of candidates, then, should lead to fewer undervotes, more overvotes, and more fully ranked ballots.

Finally, we expect that prior experience with IRV should affect voters' behavior. People who have used IRV before should be less likely than others to undervote because they will be more familiar with IRV generally, more prepared when coming to vote, and more acquainted with the ballot's format. For the same reasons, prior exposure to the IRV ballot should reduce the likelihood of an overvote and increase the tendency to rank three candidates.

Data and Method

To test the above hypotheses, we employ four types of data: archival election results, individual IRV ballot records, census data, and accounts of campaign spending. The election results were obtained from the Web pages of the San Francisco Department of Elections. The individual ballot records are supplied in electronic files by the same department for IRV contests only and include all ballots—early, polling place, and mail-in ballots. Each record represents one voter and contains three bits of information that indicate the ballot mark in each of the three IRV columns. Those were used to construct the three dependent variables: undervotes, overvotes, and rankings. We first offer a descriptive report and then aggregate those data to the precinct level to estimate multivariate models.

We do that with our next data set—census figures compiled at the precinct level (DeLeon & Latterman, 2004).[8] San Francisco currently has 580 precincts, and 553 are included in the analyses below.[9] Although we are interested in individual voters' experiences and behavior, it is important to recognize that inferences drawn from these estimates are limited to precincts and voting patterns among them. Our final data set, the campaign expenditures, was constructed from figures obtained through the San Francisco Ethics Commission's campaign finance database.

We specify negative binomial regression models to estimate the various influences. This is an appropriate estimator for these types of dependent variables, counts of events that are overdispersed with unusually high number of observations near or at zero (Kimball & Kropf, 2005; Sinclair & Alvarez, 2004). Because the resulting coefficients lack an intuitive interpretation, we also report the expected influence of each explanatory variable. For the interval-level variables, we report the expected change in the dependent variable (in percentages), given a one standard deviation increase in the independent variable. For the one binary independent variable, we report its estimated full impact. Long and Freese's (2001) postestimation routines in Stata were used to compute the expected impact of one explanatory variable while holding the others at their mean values.

In addition, we gain some empirical leverage through a natural experiment because of the gradual implementation of the IRV reform. The 11 members of the Board of Supervisors (BOS) are elected to staggered 4-year terms in a single-member district system, where about half run in one even-numbered year and the other half 2 years later. In 2004, when IRV was introduced, the only local offices elected were 7 of the 11 BOS seats.[10] Therefore, in November 2005, when the first citywide offices were elected with IRV, voters who lived in Districts 4, 6, 8, and 10 encountered the IRV ballot for the first time, whereas voters in the other seven districts (who had also turned out in 2004) saw it for the second time. We compare those two groups, controlling for other factors, to test the impact of prior exposure to IRV.

Our three dependent variables are dichotomous (coded 1 if the event occurred and 0 if not) and indicate undervotes, overvotes, and ballots on which three candidates were ranked. The independent variables include the set of demographic influence, the two aspects of the electoral context, and a variable for the natural experiment. Most of the demographic variables are percentages of residents in a particular precinct: the eldest (70 years or older), the least educated (less than high school), female, African American, Latino, Asian American, and those born outside the United States (to indicate potential difficulties based on language). We use median income and divide it by 10,000 so that the estimates fit more neatly with the other results. These demographic measures vary greatly across precincts.[11] The two contextual variables measure the number of candidates on the ballot (2004 $M = 9.9$, $SD = 6.3$; 2006 $M = 5.0$, $SD = 2.3$) and the mean amount of campaign expenditures per candidate in a race, divided by 10,000 to ease the presentation (2004 $M = \$64,747$, $SD = \$28,520$; 2006 $M = \$66,422$, $SD = \$29,504$). The natural experiment is specified in the 2005 data with a variable that is coded 1 if the precinct used IRV in 2004 and 0 if the precinct was using the IRV ballot for the first time.

Finally, because the dependent variables are counts, it is necessary to control for the relative size of the precincts. To do so, we compute a variable following Sinclair and Alvarez (2004, p. 20) that is the ratio of the number of ballots cast in a precinct to the number of ballots cast in the entire election (multiplied by 10,000, again for ease of presentation).

Results

Table 1 summarizes the results of the 17 contests conducted in San Francisco under IRV between 2004 and 2006. We analyze the 14 that involved races with at least one challenger. Of those, 7 required multiple counts to produce a winner. We see considerable variation across these elections. Note the size of the candidate pools (from 2 to 22 candidates) and the closeness of the

Table 1
San Francisco Elections Using Instant-Runoff Voting (IRV)

Year	Office	Jurisdiction	Number of Candidates on Ballot	Round 1 % of Eligible Ballots, Leader	Number of Rounds Required	Final % of Continuing Ballots, Winner
2004						
	BOS[a]	District 1	7	41.1	5	54.0
	BOS	District 2	5	61.3	1	61.3
	BOS	District 3	4	62.6	1	62.6
	BOS	District 5	22	28.4	17	50.6
	BOS	District 7	13	33.2	11	56.9
	BOS	District 9	6	50.7	1	50.7
	BOS	District 11	8	32.2	6	58.3
2005						
	Assessor–recorder	Citywide	4	47.4	2	58.1
	Treasurer	Citywide	4	61.4	1	61.4
	City attorney	Citywide	1	98.1	1	98.1
2006						
	BOS	District 2	2	80.1	1	80.1
	BOS	District 4	6	26.2	4	52.5
	BOS	District 6	8	48.8	5	50.8
	BOS	District 8	3	66.2	1	66.2
	BOS	District 10	7	56.2	1	56.2
	Assessor–recorder	Citywide	1	98.6	1	98.6
	Public defender	Citywide	1	98.9	1	98.9

Note: BOS = Board of Supervisors, 11 seats in a single-member district system.

race indicated in the "Round 1 %" column, which reports the leading candidate's portion of the top-ranked votes in the first tally (from 26% to 80%).

Table 2 reports the undervotes, overvotes, and rankings in the 14 IRV races that involved more than one candidate. For simplicity, we aggregate the individual district results from the 2004 and 2006 BOS elections. Row 1 displays undervoting rates that varied considerably, from about 8% in the 2004 BOS elections to 21% in the 2005 treasurer's race. Overvotes, shown in row 2, were more common in the BOS elections (0.8% and 0.9%) than in the citywide 2005 elections (0.5% and 0.6%). Although the incidence of overvoting may appear low in an absolute sense, it is surprisingly high when considered with other evidence. In the only comparable study that examines local elections Sinclair and Alvarez (2004) report overvote rates of 0.96% for assessor

Table 2
Undervotes, Overvotes, and Ranking in San Francisco's Instant-Runoff Voting (IRV) Elections

	Board of Supervisors (BOS) 2004, 7 Contests[a], N = 223,837 (%)	Assessor 2005, Citywide, N = 225,370 (%)	Treasurer 2005, Citywide, N = 225,370 (%)	Board of Supervisors 2006, 5 Contests[a], N = 119,906 (%)
Undervotes	8.3	11.3	21.4	12.2
Overvotes	0.9	0.6	0.5	0.8
Uncounted	9.2	11.9	21.9	13.0
Ranked three	61.6	45.2	36.3	38.1[b]
Ranked two	10.8	13.4	10.1	16.3[b]
Bullet voted	18.4	29.5	31.7	34.6[b]

a. See Table 1 for a list of the separate BOS contests.
b. The column total does not equal 100 because we omit one 2006 contest that involved only two candidates when reporting the percentage who ranked three or two or who bullet voted.

in Los Angeles County and 0.20% for district attorney (with 0.64% for U.S. Senate and 0.55% for president). That election used punch-card machinery that should produce overvote rates substantially higher than San Francisco's. Their similarity suggests that something elevated the rate of overvotes in San Francisco. We suspect that, as hypothesized, the more complex IRV ballot led to more errors that resulted in overvotes.

Overvotes and undervotes are recorded only in IRV elections. Therefore, comparisons between IRV and other contests in San Francisco must be based on the total number of uncounted votes (undervotes plus overvotes), reported in row 3. First, consider differences across a range of election years. Under IRV, the proportions of uncounted votes, in order of magnitude, were 9%, 12%, 13%, and 22% (BOS 2004, assessor 2005, BOS 2006, and treasurer 2005, respectively). In the most recent November elections under the TRS system, the comparable figures were 15%, 16%, 18%, and 22% (treasurer 2001, BOS 2000, BOS 2002, assessor 2002, respectively).[12] Uncounted votes were somewhat more common, then, under TRS than IRV, especially in the BOS contests (IRV: 9% and 13% vs. TRS: 16% and 18%).

Next, we can look within the IRV election years at other local items. The proportions of uncounted votes on local ballot measures averaged 10%, 11%, and 15% (2005, 9 measures; 2006, 11 measures; and 2004, 14 measures), respectively. This overall range fits fairly well with the IRV contests and suggests that uncounted votes may be no more common on the IRV ballot papers than on other local portions of the ballot. From these two comparisons—across election systems on like contests and within elections across ballot items—it appears that IRV might produce fewer uncounted votes than the former TRS system and no more uncounted votes than other local ballot items. And because the lion's share of uncounted votes (90% or more) are undervotes, this implies that IRV leads to fewer undervotes. We hasten to emphasize the suggestive nature of these comparisons in the rates of overvotes and undervotes, given the limited number of observations.

Turning to the ranking figures, the proportion of voters who ranked three candidates was about 62% in the inaugural IRV election and 38% two years later. This pronounced decline is accompanied by a corresponding rise in bullet voting, with about 18% choosing just one candidate in 2004 and nearly twice that proportion (35%) voting for only one in 2006.[13] The large shift in ranking behavior over a relatively short period is remarkable. However, we note that the most recent bullet-voting rates are within the observed range for elections run elsewhere, in which ranking candidates is optional (Jansen, 2004; Reilly & Maley, 2000).

Next, we report the findings from multivariate analyses of how different types of voters experienced the IRV ballot. Tables 3, 4, and 5 display the estimated influences on undervotes, overvotes, and ranking, respectively. Within each table, the first column of figures reports the results for the seven BOS races of 2004, combined; the second and third columns report the 2005 citywide elections for assessor and treasurer, respectively; and the final column reports the 2006 combined BOS contests.

The results in Table 3 reveal that undervoting was consistently less prevalent in precincts with larger populations of Blacks (especially in 2006), Latinos (notably in 2004), and Asians. Higher undervote rates occurred in areas where relatively more women reside. To interpret the expected "percentage change" figures, consider Latino voters in the 2005 assessor's race, where a relatively moderate effect is estimated at –9%. This means that, when compared to a precinct in which 13% of the residents were Latino (the mean), one with 26% Latino residents (the mean plus one standard deviation) should have about 9% fewer blank ballots.[14] If the former had an undervote rate of 11.3% (the average in 2005), then we would expect that to drop to 10.3% in the latter.

No clear relationship was found between undervotes and the elderly, those with low levels of education, and foreign-born voters. Meanwhile, undervoting was considerably less common in wealthier areas of town in two of the four tests. The electoral environment affected undervote rates in at least two ways. Generally, the longer the list of candidates on the BOS ballot, the less likely voters were to undervote. Undervoting was also inversely related to

Table 3
Explaining Undervotes in Instant-Runoff Voting (IRV) Contests

Explanatory Variable	2004 Board of Supervisors (7 Contests) Coeff. (*SE*)	% Change	2005 Assessor (Citywide) Coeff. (*SE*)	% Change	2005 Treasurer (Citywide) Coeff. (*SE*)	% Change	2006 Board of Supervisors (5 Contests) Coeff. (*SE*)	% Change
% Black	–0.70**	–6	–1.01**	–12	–0.35**	–4	–1.92**	–26
	(0.22)		(0.14)		(0.10)		(0.28)	
% Latino	–2.89**	–35	–0.73**	–9	–0.41**	–5	–0.48	–5
	(0.36)		(0.14)		(0.09)		(0.28)	
% Asian	–1.01**	–17	–0.92**	–16	–0.59**	–10	–0.92**	–16
	(0.25)		(0.12)		(0.08)		(0.25)	
% female	2.79**	10	1.36**	8	0.79**	5	2.40**	18
	(0.72)		(0.33)		(0.22)		(0.43)	
% elderly (70+)	–0.76	–4	–0.61**	–4	–0.31*	–2	0.88*	5
	(0.48)		(0.19)		(0.14)		(0.39)	
% less than high school	–0.32	–4	–0.28	–4	–0.12	–2	0.06	1
	(0.33)		(0.26)		(0.17)		(0.49)	
Median income ($10K)	–0.08**	–18	–0.05**	–11	–0.01*	–3	0.02	4
	(0.01)		(0.01)		(0.005)		(0.01)	
% foreign born	0.07	1	0.10	2	0.17	3	0.26	4
	(0.35)		(0.18)		(0.13)		(0.37)	

(continued)

Table 3 (continued)

Explanatory Variable	2004 Board of Supervisors (7 Contests) Coeff. (*SE*)	% Change	2005 Assessor (Citywide) Coeff. (*SE*)	% Change	2005 Treasurer (Citywide) Coeff. (*SE*)	% Change	2006 Board of Supervisors (5 Contests) Coeff. (*SE*)	% Change
Number of candidates	–0.04** (0.01)	–22	—	—	—	—	–0.06** (0.02)	–13
Campaign spending	–0.10** (0.02)	–26	—	—	—	—	–0.05** (0.01)	–15
Used IRV before	—	—	0.03 (0.02)	3	0.02 (0.02)	2	—	—
Relative precinct size	0.05** (0.01)	15	0.05** (0.003)	21	0.05** (0.002)	24	0.02** (0.01)	11
Constant	4.04** (0.50)		3.07** (0.13)		3.40** (0.08)		0.06** (0.01)	
α	.09** (.01)		.03** (.004)		.01** (.002)		3.23 (.28)	
Model χ^2	504.4**		617.8**		1110.9**		505.6**	
N	348		553		553		263	

Note: Coefficients are negative binomial regression estimates (robust standard errors). The dependent variable is the number of blank IRV ballots submitted. The unit of analysis is precinct. Percentage change is the expected change in number of blank ballots, given a one standard deviation increase in the independent variable. For "used IRV before," it is the expected change, comparing precincts that had not previously used IRV to those that had.

$^*p < .05$. $^{**}p < .01$.

campaign spending. These contextual variables functioned in sensible ways and as hypothesized, with the strongest influences observed in 2004.

Overall, these results match our expectations and fit with the findings from studies of similar plurality and TRS elections. The null results are also noteworthy, especially the negligible or inconsistent effects of older age, lower education, and nativity on undervoting. This implies that language, verbal skills, and facility did not function as barriers to casting an IRV vote. The natural experiment also returned a null result: Voters who saw the ballot for the first time were just as likely to complete it as those who had a bit more familiarity.

Table 4 displays the estimated influences on overvotes. Counter to our expectations, a consistent and relatively strong relationship occurred between precincts with more African American residents and the rate at which overvotes were cast. Strong ties were also found between the number of foreign-born residents and overvotes. In two of the four tests, voters in precincts with relatively more Latino and elderly residents cast more overvotes. Meanwhile, no clear pattern of influences emerges among the other demographic variables. It is again noteworthy that levels of education and income were generally unrelated to the propensity to make this type of error on the ballot. We also see no support for the hypothesis that those who had used IRV before would be less likely to overvote than those who had not.

Longer slates of candidates do, however, tend to produce more overvotes. For example, in 2004 a change from a ballot that lists 10 candidates to one with 16 is associated with a 34% increase in the amount of spoiled ballots. In this case, the average undervote rate of 0.9% would be expected to rise to 1.2%.

Finally, we turn to the question of who used the full potential of the IRV ballot by ranking three candidates. The first thing to note in Table 5 is the overall weakness of the demographic influences compared to those reported in Tables 3 and 4. However, the tendency to rank three candidates was consistently more common in precincts where more Asian Americans reside. In 2006, comparing a precinct with 29% Asian American residents to one with 48%, we would expect the proportion of fully ranked ballots to increase from around 38% to 44%.[15]

Counter to expectations, in two of the four instances, more fully ranked ballots were filed in precincts with more foreign-born residents. Meanwhile, for the first time we see an influence of education, with fewer fully ranked ballots filed in precincts with higher proportions of residents with little education. Note, however, the relatively small estimated effects.

(text continues on p. 549)

Table 4
Explaining Overvotes on Instant-Runoff Voting (IRV) Ballots

Explanatory Variable	2004 Board of Supervisors (7 Contests)		2005 Assessor (Citywide)		2005 Treasurer (Citywide)		2006 Board of Supervisors (5 Contests)	
	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change
% Black	2.65**	27	1.09**	15	1.70**	25	1.80**	32
	(0.34)		(0.38)		(0.34)		(0.46)	
% Latino	1.79**	31	–0.35	–5	0.95*	14	0.09	1
	(0.39)		(0.41)		(0.40)		(0.56)	
% Asian	0.72	14	–0.82*	–14	0.72	14	0.91	19
	(0.39)		(0.39)		(0.42)		(0.51)	
% female	3.13**	12	0.39	2	–0.71	–4	–0.28	–2
	(0.99)		(0.87)		(0.81)		(0.94)	
% elderly (70+)	1.16	7	1.30*	8	2.70**	18	0.47	3
	(0.64)		(0.54)		(0.52)		(0.70)	
% less than high school	–0.96	–12	0.18	2	0.24	3	–0.09	–1
	(0.51)		(0.57)		(0.52)		(0.70)	
Median income ($10K)	0.005	1	0.004	–1	0.001	0	0.01	2
	(0.02)		(0.02)		(0.02)		(0.03)	
% foreign born	1.28*	22	1.95**	36	0.40	6	1.73**	31
	(0.51)		(0.54)		(0.51)		(0.58)	

(continued)

Table 4 (continued)

	2004 Board of Supervisors (7 Contests)		2005 Assessor (Citywide)		2005 Treasurer (Citywide)		2006 Board of Supervisors (5 Contests)	
Explanatory Variable	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change
Number of candidates	0.05** (0.01)	34	—	—	—	—	0.18** (0.04)	52
Used IRV before	—	—	0.01 (0.08)	2	0.04 (0.07)	5	—	—
Relative precinct size	0.09** (0.01)	28	0.03** (0.01)	15	0.03** (0.01)	13	0.06** (0.01)	34
Constant	–2.93** (0.53)		–0.60 (0.40)		–0.53 (0.38)		–1.83** (0.55)	
α	.13** (.02)		.11** (.03)		.02 (.03)		.05* (.03)	
Model χ^2	258.3**		82.1**		124.5**		327.5**	
N	348		553		553		263	

Note: Coefficients are negative binomial regression estimates (robust standard errors). The dependent variable is the number of IRV ballots with an overvote (see text for details). The unit of analysis is precinct. Percentage change is the expected change in the number of IRV ballots with an overvote, given a one standard deviation increase in the independent variable. For "used IRV before," it is the expected change, comparing precincts that had not previously used IRV to those that had.
$*p < .05$. $**p < .01$.

Table 5
Explaining Tendencies to Rank Three Candidates in Instant-Runoff Voting (IRV) Contests

	2004 Board of Supervisors (7 Contests)		2005 Assessor (Citywide)		2005 Treasurer (Citywide)		2006 Board of Supervisors (4 Contests)[a]	
Explanatory Variable	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change
% Black	0.19*	2	–0.29**	–4	0.05	1	0.60**	11
	(0.08)		(0.05)		(0.06)		(0.17)	
% Latino	0.68**	11	0.01	0	0.10	1	–0.04	0
	(0.07)		(0.06)		(0.06)		(0.16)	
% Asian	0.45**	8	0.10*	2	0.49**	10	0.74**	16
	(0.05)		(0.05)		(0.06)		(0.15)	
% female	–0.67**	–2	–0.24	–1	–0.39**	–2	0.40	3
	(0.16)		(0.13)		(0.14)		(0.26)	
% elderly (70 +)	–0.03	0	–0.51**	–3	–0.02	0	–0.74**	–4
	(0.10)		(0.11)		(0.11)		(0.23)	
% less than high school	–0.28**	–4	–0.31**	–4	–0.35**	–4	–0.23	–3
	(0.08)		(0.09)		(0.09)		(0.26)	
Median income ($10K)	0.002	0	–0.03**	–6	–0.01**	–3	0.03**	6
	(0.003)		(0.003)		(0.003)		(0.01)	
% foreign born	0.04	1	0.04	1	0.27**	4	0.49*	8
	(0.07)		(0.08)		(0.09)		(0.20)	
Number of candidates	0.03**	17	—	—	—	—	0.12**	26
	(0.002)						(0.01)	

(continued)

Table 5 (continued)

Explanatory Variable	2004 Board of Supervisors (7 Contests)		2005 Assessor (Citywide)		2005 Treasurer (Citywide)		2006 Board of Supervisors (4 Contests)[a]	
	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change	Coeff. (*SE*)	% Change
Campaign spending	0.02**	7	—	—	—	—	0.05**	14
	(0.004)						(0.01)	
Used IRV before	—	—	0.07**	7	0.09**	9	—	—
			(0.01)		(0.01)			
Relative precinct size	0.07**	21	0.06**	28	0.06**	26	0.07**	44
	(0.002)		(0.002)		(0.002)		(0.005)	
Constant	4.50**		4.41**		3.98**		2.18**	
	(0.11)		(0.06)		(0.07)		(0.19)	
α	.004		.004		.01		.02	
	(.001)		(.001)		(.001)		(.003)	
Model χ^2	1600.1**		1464.0**		1481.1**		1369.8**	
N	348		553		553		205	

Note: Coefficients are negative binomial regression estimates (robust standard errors). The dependent variable is the number of ballots on which three candidates were ranked. The unit of analysis is precinct. Percentage change is the expected change in the number of ballots ranking three, given a one standard deviation increase in the independent variable. For "used IRV before," it is the expected change, comparing precincts that had not previously used IRV to those that had.

a. One Board of Supervisors contest that involved only two candidates was excluded.

$*p < .05$. $**p < .01$.

Again, the contextual factors operated as expected. Voters were more likely to use the ballot to its fullest in contests where more candidates ran, and that influence was relatively strong. They were also more likely to rank three candidates in precincts where more campaign money was spent. Last, the evidence here shows that familiarity with the IRV ballot does matter in regard to ranking candidates. The number of ballots on which three candidates were ranked was 7% to 9% higher in precincts where voters used it for the second time compared to those using it for the first time.

Discussion

We posed the question, "Whose votes count?" out of concern that the IRV reform might advantage some voters over others. In regard to overvotes, that concern appears valid. But the overall findings are mixed, with tendencies to undervote and rank candidates carrying more positive implications. To be clear, the data allow more rigorous tests of voting behavior in IRV elections than a comparison between IRV and plurality or TRS systems. Because those comparisons rely on precious few observations, the inferences they yield must be considered suggestive. When coupled with the more robust findings from the regression estimates and the natural experiment, however, we obtain some instructive insights in this first close analysis of IRV in the United States.

First, consider an important type of uncounted vote—overvotes. These are ballots that voters, in all likelihood, have marked in good faith and expect to count toward their desired outcome. Although they make up a fraction of all uncounted votes, they represent a significant failure of the voting system, the voter, or both. Although San Francisco's precinct-level optical scanners with error-correction indicators should produce relatively low rates of overvoting (Kimball & Kropf, 2005), the rates under IRV were as high as those in punch-card elections for similar offices (Sinclair & Alvarez, 2004). Note that the number of overvotes would be even higher if San Francisco's definition of spoiled ballots were less forgiving (see Note 5). It appears that voters had trouble navigating the more complex IRV ballot. This is supported by the fact that the number of candidates listed on the ballot was the strongest determinant of overvotes.

In addition, the null result from the natural experiment suggests that confusion with the IRV ballot might persist over time. We expected that practice with IRV would lead to fewer errors, but it did not. Although one might suspect that our measure of exposure was inadequate—that is, that one prior use of IRV might be insufficient for learning to occur—voters' ranking behavior *did* change significantly after just one exposure. This implies that voters might continue to overvote at similarly high rates in future IRV elections. If additional research were to confirm this, it would identify an important shortcoming of the IRV reform, important because the proportion of African American and foreign-born residents in precincts was consistently and strongly related to the count of overvotes. And although those differences might not be a unique function of IRV, if IRV increases overvoting, then the reform serves to exacerbate those discrepancies. Given the import in equality of voice among voters, these findings deserve more study.

Although overvotes were more common, it appears that the IRV system produced relatively fewer undervotes when compared to previous San Francisco TRS elections. Such reductions are desirable and serve to equalize the expression of preferences across types of voters. We hypothesized that more, not fewer, undervotes would result from the added informational demands of IRV. This surprising overall result suggests that information costs did not present a significant barrier to voting under IRV. The more specific tests within the IRV elections also show that concerns about voters' language and verbal skills or the novelty of IRV working as a barrier to the vote were unwarranted. However, because the two contextual factors—campaign spending and the number of candidates running—were relatively strong predictors of undervotes, the availability of information about candidates *does* appear to affect behavior. We can only speculate at this juncture that other unspecified aspects of IRV counterbalance the additional information costs and see this as another topic worthy of further research.

We asked a second question, "Whose votes count more?" to address the possibility that some voters more than others would exercise their option to rank candidates. Because voters submitting fully ranked ballots provide more input than others, it matters whether or not those tendencies are distributed evenly across types of voters, especially those considered more at risk (e.g., the less educated and poorer). It is good news for democrats that the demographic influences on ranking were mostly absent and relatively small. The theory of information costs best explains tendencies to fully rank the IRV ballot, with more campaign spending and longer lists of candidates among the leading influences. As mentioned above, prior exposure to IRV also increased the likelihood of ranking three candidates, suggesting that experience and familiarity matters.

In sum, our findings suggest that voters adapted fairly well to IRV and that various types of voters experienced it in largely similar ways. The differences we observed in the types of voters who undervote match what occurs under plurality and TRS systems, and ranking behavior was unrelated to most demographic measures. To be sure, the tendency for some voters to overvote more than others presents a problem. Further outreach to those communities could reduce these discrepancies in future elections, as could more rigorous training of precinct workers to help voters better understand how to correct ballot errors. We also see value in San Francisco's policy that forgives certain types of mistakes when marking the ballots. Clearly, this led to fewer spoiled ballots.

Local electoral reforms like San Francisco's move to IRV provide a useful lens through which to examine voting behavior. Although often perceived as rare, such experimentation is "alive and well at the sub-national level" in the United States (Bowler & Donovan, 2006, p. 2). This case helps us understand how voters adapt to more complex systems and sheds light on the influences in local elections, an arguably understudied venue. Although we have focused on voters' behavior as they marked their ballots, we note that a comprehensive assessment of IRV will balance our findings with other aspects of those elections, including turnout, representation, the nature of campaigns, the cost of election administration, and the perceived legitimacy of the system.

Notes

1. It is better known in comparative studies of election systems as the alternative vote.

2. The charter of the City and County of San Francisco (2008; which are consolidated) was amended to adopt IRV with Proposition A in March 2002. Originally called instant-runoff voting (IRV) and later dubbed ranked-choice voting, it is used to elect local officials, all of whom were previously elected in a two-round system.

3. Currently, five cities in the United States use IRV for local offices (Burlington, VT; Cary, NC; Hendersonville, NC; Tacoma Park, MD; and San Francisco), and three states use it in their overseas absentee balloting (Arkansas, Louisiana, and South Carolina). Other jurisdictions that have enacted IRV provisions but have yet to conduct IRV elections include Aspen, CO; Minneapolis, MN; Oakland, CA; Pierce County, WA; Berkeley, CA; and Ferndale, MI.

4. The city may limit the number of candidates voters rank based on the capacities of voting machinery, providing at least three can be ranked (City/County Charter Section 13.102[b]).

5. Two types of errors are allowed: If Column 1 contains no mark and Column 2 contains a valid mark, then the ballot is "advanced" and the mark in Column 2 is considered the voter's first preference. Also, if a voter chooses the same candidate in both Columns 1 and 2, then the mark in Column 1 is counted and Column 2 is ignored.

6. Rolloff is also widely studied. In theory, it is an undervote occurring when an item on the ballot is left blank. In practice, the measure usually includes both undervotes and overvotes.

7. In this system, voters gain no tactical advantage by ranking fewer than three candidates. Multiple votes for a single candidate are ignored (see Note 5). However, we note that some

voters who find only one or two candidates acceptable will express their full set of sincere preferences by bullet voting (choosing only one) or ranking two.

8. Using 2000 census data to analyze elections occurring as late as 2006 could present problems if the population had significantly changed in the interim. A comparison of San Francisco data from the 2000 census and the 2006 American Community Survey shows that on measures very similar to what we use in our analyses, in the aggregate the changes are small, with the exception of an expected rise in income (2000 values minus 2006 values): Black –0.8%, Latino 0.0%, Asian +0.9%, Female –0.2%, 65 or older +0.2%, high school or less –3.7%, median income +$10,276, foreign born –0.5%.

9. We excluded 27 precincts, including 17 that are mail-in precincts with unusually low vote totals, 3 that the Department of Elections combines with other precincts in their reports, and 7 that are missing cases in the DeLeon and Latterman census data set.

10. The District 2 seat was elected in 2004, outside the usual sequence, because of a special election.

11. The descriptive statistics of the precinct-level variables ($N = 553$) we use are as follows:

	M	*SD*	Min.	Max.		*M*	*SD*	Min.	Max.
Black (%)	8.0	12.9	0.1	75.1	70 or older (%)	10.0	6.0	0.3	57.8
Latino (%)	13.1	13.4	1.0	76.6	< high school (%)	17.1	12.8	0.2	72.7
Asian (%)	29.2	18.6	4.5	92.3	Median income ($)	62,171	23,140	9,994	174,456
Female (%)	49.0	5.6	29.0	64.3	Foreign (%)	33.6	15.7	5.3	79.2

12. We cannot extend the comparison to earlier years because the Board of Supervisors elections employed an at-large system from 1980 to 1998.

13. Note that we omit data from the 2006 District 2 race when reporting rates of ranking candidates because only two people ran.

14. See Note 11 for precinct statistics.

15. This is based on an expected percentage change of 16%, the overall rate of fully ranked ballots at 38% (Table 2), and a mean of 29% Asian residents (*SD* = 19%, as reported in Note 11).

References

Ansolabehere, S., & Stewart, C. (2005). Residual votes attributable to technology. *Journal of Politics, 67,* 365-389.

Arbour, B. K., & Hayes, D. (2005). Voter turnout in the California recall: Where did the increase come from? *American Politics Research, 33,* 187-215.

Berinsky, A. J. (2005). The perverse consequences of electoral reform in the United States. *American Politics Research, 33,* 471-491.

Bowler, S., & Donovan, T. (2006, July). *Election reform in the US and problems of measuring institutional change*. Paper presented at the Montreal Conference on Electoral Reform, Montreal, Quebec, Canada. Retrieved July 27, 2007, from http://www.crcee.umontreal.ca/pdf/Bowler.pdf

Bullock, C. S., & Dunn, R. E. (1996). Election roll-off; A test of three explanations. *Urban Affairs, 32,* 71-86.

Bullock, C. S., & Hood, M. V. (2002). One person—no vote; one vote; two votes: Voting methods, ballot types, and undervote frequency in the 2000 presidential election. *Social Science Quarterly, 83,* 981-993.

City and County of San Francisco. (2008). *City and County of San Francisco 1996 Charter*. Retrieved July, 28, 2007, from http://www.municode.com/Resources/gateway.asp?pid=14130&sid=5

Cole, R. L., Taebel, D. A., & Engstrom R. L. (1990). Cumulative voting in a municipal election: A note on voter reactions and electoral consequences. *Western Political Quarterly, 43,* 191-199.

Darcy, R., & Schneider, A. (1989). Confusing ballots, roll-off, and the Black vote. *Western Political Quarterly, 42,* 347-364.

DeLeon, R., & Latterman, D. (2004). *Updating the new Progressive Voting Index (PVI), with tables, map, and precinct scores*. Retrieved June 18, 2007, from http://www.sfusualsuspects.com/DeLeon%20Files/DeLeon%20Latterman%20New%20PVI%20Report%20April%202004.pdf

Delli Carpini, M. X., & Keeter, S. (2000). Gender and political knowledge. In S. Tolleson-Rinehart & J. J. Josephson (Eds.), *Gender and American politics* (pp. 21-52). Armonk, NY: M. E. Sharpe.

Engstrom, R. L., & Barrilleaux, C. J. (1991). Native Americans and cumulative voting: The Sisseton-Wahpeton Sioux. *Social Science Quarterly, 72,* 388-393.

Engstrom, R. L., Kirksey, J. F., & Still, E. (1997). One person, seven votes: The cumulative voting experience in Chilton County, Alabama. In A. Peacock (Ed.), *Affirmative action and representation:* Shaw v. Reno *and the future of voting rights* (pp. 285-316). Durham, NC: Carolina Academic Press.

FairVote. Sample ballot from 2004 San Francisco Board of Supervisors District 5 election. Retrieved January 17, 2008, from http://www.fairvote.org/media/irv/2004rcvballot.pdf

Feddersen, T., & Pesendorfer, W. (1996). The swing voter's curse. *American Economic Review, 86,* 408-424.

Ghirardato, P., & Katz, J. (2002). *Indecision theory: Quality of information and voting behavior* (California Institute of Technology social science working paper). Retrieved December 27, 2007, from http://web.econ.unito.it/gma/paolo/voting-iv.pdf

Hecock, D. S., & Bain, H. M., Jr. (1956). *The arrangement of names on the ballot and its effect on the voter's choice.* Detroit, MI: Wayne University Press.

Herron, M. C., & Sekhon, J. S. (2005). Black candidates and Black voters: Assessing the impact of candidate race on uncounted vote rates. *Journal of Politics, 67,* 154-177.

Jansen, H. J. (2004). The political consequences of the alternative vote: Lessons from western Canada. *Canadian Journal of Political Science, 37,* 647-669.

Kimball, D. C., & Kropf, M. (2005). Ballot design and unrecorded votes on paper ballots. *Public Opinion Quarterly, 69,* 508-529.

Kimball, D. C., Owens, C. T., & Keeney, K. M. (2004). Unrecorded votes and political representation. In R. P. Watson (Ed.), *Counting votes: Lessons from the 2000 presidential election in Florida* (pp. 135-152). Gainesville: University Press of Florida.

Knack, S., & Kropf, M. (2003). Voided ballots in the 1996 presidential election: A county-level analysis. *Journal of Politics, 65,* 881-897.

Krosnick, J. A., Miller, J. M., & Tichy, M. P. (2004). An unrecognized need for ballot reform: Effects of candidate name order. In A. N. Crigler, M. R. Just, & E. J. McCaffery (Eds.), *Rethinking the vote: The politics and prospects of American election reform* (pp. 51-74). New York: Oxford University Press.

Long, J. S., & Freese, J. (2001). *Regression models for categorical dependent variables using Stata.* Thousand Oaks, CA: Sage.
Reilly, B., & Maley, M. (2000). The single transferable vote and the alternative vote compared. In S. Bowler & B. Grofman (Eds.), *Elections in Australia, Ireland, Malta under the single transferable vote* (pp. 37-58). Ann Arbor: University of Michigan Press.
Sinclair, D. E., & Alvarez, R. M. (2004). Who overvotes, who undervotes, using punchcards? Evidence from Los Angeles County. *Political Research Quarterly, 57,* 15-25.
Stiefbold, R. P. (1965). The significance of void ballots in West German elections. *American Political Science Review, 59,* 391-407.
Tomz, M., & Van Houweling, R. P. (2003). How does voting equipment affect the racial gap in voided ballots? *American Journal of Political Science, 47,* 46-60.
U.S. Bureau of the Census. (2000). *Decennial census of population and housing, Summary Files 1, 2, and 3*. Retrieved January 10, 2008, from http://factfinder.census.gov/home/saff/main.html?_lang=en
U.S. Bureau of the Census. (2006). *2006 American Community Survey*. Retrieved January 10, 2008, from http://factfinder.census.gov/home/saff/main.html?_lang=en
Vanderleeuw, J. M., & Liu, B. (2002). Political empowerment, mobilization, and Black voter roll-off. *Urban Affairs Review, 37,* 380-396.
Vanderleeuw, J. M., & Sowers, T. T. (2007). Race, roll-off, and racial transition: The influence of political change on racial group voter roll-off in urban elections. *Social Science Quarterly, 88,* 937-952.
Vanderleeuw, J. M., & Utter, G. (1993). Voter roll-off and the electoral context: A test of two theses. *Social Science Quarterly, 74,* 664-673.
Walker, J. (1966). Ballot forms and voter fatigue: An analysis of the office block and party column ballots. *Midwest Journal of Political Science, 10,* 448-464.
Wattenberg, M. P., McAllister, I., & Salvanto, A. (2000). How voting is like taking an SAT test: An analysis of American voter rolloff. *American Politics Research, 28,* 234-250.
Wolfinger, R., & Rosenstone, S. (1980). *Who votes?* New Haven, CT: Yale University Press.

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