DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES

CALIFORNIA INSTITUTE OF TECHNOLOGY

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AN AGGREGATE NESTED LOGIT MODEL OF POLITICAL PARTICIPATION

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SOCIAL SCIENCE WORKING PAPER 998

January 1997

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Abstract

This paper builds an aggregate nested model of political participation. We use a three-event model of voting behavior that incorporates the registration, turnout, and ballot completion decisions. The definitions of registration, turnout, and ballot completion used in this paper reflect the nested nature of the model. The concept of a nested model allows us to determine the elasticity of participation in total and for specific events within the model. We find that African-Americans register more often than non-Latino whites, turnout less for general elections, and complete less of the ballot. We also find that minorities do not vote in equal proportions to non-minorities even in those instances where they have the greatest chance of influencing the outcome, such as in primaries and mid-term election.

Keywords: Panel data, single equation models, multiple equation models, discrete regression, rent-seeking, elections, legislatures, economic models

JEL: C23, C33, C25, D72

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1 Introduction

The elapsed time between the initial stirrings of an election and the election itself is many months. These months afford the candidates, proposition proponents, and other interest groups, such as those interested in increasing minority participation, opportunities to motivate and persuade voters. Of course, during this time voters can become informed and can participate in election-related events. In addition, in order to be represented in the outcome of the election, voters must have an active voter registration record, turnout for the election either at the precinct or via absentee balloting, and complete the ballot.

The voter has several opportunities to abrogate their right to vote in a particular election or contest within an election. First, a voter can fail to register upon turning eighteen, after re-locating, or after failing to vote in requisite prior elections. Second, a voter can fail to turnout at the designated precinct voting location, or fail to complete the absentee ballot in a timely manner. Third, the voter can make it to the booth, but fail to cast a valid vote in a particular contest.

Electoral participation is important to those with a vested interest in the outcome of any particular contest. The range of this interest can extend from the desire to achieve a specific outcome (e.g., the passage of a proposition) to the simple knowledge that the outcome is representative of the population. Other objectives in monitoring electoral participation include the desire to maximize participation, or to "equalize" participation across various socio-economic groups or to promote the participation of underrepresented minority groups.

The purpose of this paper is to present an integrated model of electoral participation, from registration through ballot completion. We argue that in order to properly diagnose the problems of voter participation and therefore to understand the potential solutions, it's necessary to simultaneously model the three separate stages of participation—registration, turnout, and ballot completion. The approach offered in this paper is unique in two respects. First, unlike previous studies our analysis separates the registration and turnout components of participation. We show that the underlying motivations for participating in the registration and turnout events differ. In addition, we find that the expected decision to turnout in a specific election influences the likelihood of registration. The second unique aspect of our paper is that we link ballot completion to the traditional analysis of participation. Only by considering ballot completion can we determine the full extent of participation. For example, minority groups may turnout in equal proportion to non-minority groups, but nevertheless fail to be represented in the outcome of specific contests. In addition, we will show that the turnout decision is dependent upon a voter's expectation of ballot completion. For example, voters who expect to only partially complete a ballot, for whatever reason, may be less likely to turnout to vote. This study is based upon the official reported L. A. county Statement of Vote for the four primary and four general elections from 1988 through 1994.[1] The econometric model we employ is based on the aggregate nested logit method modified to accommodate the multiple contests appearing on the ballot. A brief discussion of our approach follows.

Traditional models of political participation define participation rates as the percentage of the voting age population either registering to vote or casting a ballot (e.g., see Teixeira (1989)). Specifically, if N denotes the total population, R denotes the number of registered voters, and T denotes the turnout in a specific election, then the traditional model examines the ratios R/N or T/N. In this paper we separate the registration and turnout events by studying the registration event, R/N, and the turnout event conditional upon registration, T/R. We relate our results to traditional studies using the identity $R/N * T/R = T/N$.[2] The motivation for defining the registration and turnout statistics as we do follows from the fact that a voter must be registered before election day under current registration laws, so that the maximum number of ballots that can be cast is the number of registered voters. The number of ballots cast divided by the number of registered voters gives the proportion of eligible voters participating on election day.

As discussed above we consider ballot completion to be a component of electoral participation.[3] The ballot completion analysis identifies the relative level of representa-

[1] In our study the California Secretary of State's official Statement of Vote is merged with demographic information from the 1990 Census of Population and Housing. The election data are the statewide elections held from 1988 to 1994 and represent approximately sixteen million ballots. Since the data source is from L. A. county it also represents a racially and ethnically heterogeneous population. The size of the minority populations in L. A. county facilitates investigating their political behavior. The diversity of the minority population in L. A. county also may increase the applicability of our results to other situations. See also Teixeira (1988) for racial differences between voters and nonvoters.

[2] Although prior studies, such as Piven and Cloward (1988) and Powell (1986) purport to study registration, they in fact study turnout, T/N. By contrast, Norrander's (1991) study of voter turnout considers T/R, which is consistent with our definition.

[3] We employ the percentage of propositions voted upon as a proxy for the percentage of the ballot completed. In calculating this statistic we rely on actual electoral outcomes. This is important since Wright (1993) found that the reliability of survey data declines rapidly as respondents recall candidate selections below President. He reports that even the next highest office on a ballot suffers from a 4% to 7% drop in accuracy. See Abramson and Claggett (1991), Cain, Kiewiet, and Uhlaner (1991), and Presser and Traugott (1992) for further information regarding survey reliability.

tion of various groups, such as minority groups, in the actual electoral outcome. Simply turning out to vote does not guarantee representation in public policy. Individual voters must cast valid votes on the relevant measures and candidate races in order to be represented in the outcome.[4]

Our measure of ballot completion also provides an alternate view of "rolloff" from Burnham's study (1965), where he compares the number of votes cast for the highest office on the ballot to those contests with the fewest votes. Because the basis for our analysis is the completion rate across all propositions, the effect of a single low turnout race on our ballot completion statistic as compared with Burnham's measure is minimized.[5] In Burnham's study, one contest with an exceptionally low vote count can increase his measure of the rolloff rate for that entire election. Our definition of ballot completion includes all propositions, minimizing the chance that abstaining on any single proposition will affect our ballot completion statistic.

Our model of political participation is illustrated in Figure 1, where each successive event is depicted conditional upon the prior event. While voters must approach the electoral participation process as a series of events over time, in our econometric model we allow the expected outcome of subsequent events to influence participation in the prior event. This requires that estimation proceed from ballot completion to turnout to registration, and is a characteristic of nested logit models where estimation typically proceeds in the order opposite that taken by the individual as he or she makes the actual choices. As illustrated in Figure 1 the separation of events allows systematic differences in the behavior at each event to be uncovered.[6] For example, if a group's turnout (T/N) is below average, it may be a result of lower registration rates (R/N), or result from voter apathy or inconvenience (low T/R), or be due to some inherent bias in electoral institutions. Our model identifies whether a low turnout (T/N) is due to a low registration rate (R/N) or a low turnout rate (T/R).

In this paper we show that the use of separate statistics for registration and turnout more precisely demonstrate the underrepresentation of some voter groups. The analysis of the ballot completion event facilitates our understanding of whether certain groups are further underrepresented when the votes are counted.

[4]We do not include the actual outcomes or results of specific contests as part of our definition of participation. In this paper we only consider whether an individual votes or abstains on a contest or set of contests as the relevant measure of participation rather than the actual outcomes of specific contests. A detailed analysis of the outcomes of specific proposition contests is considered in Dubin and Kalsow (1997).

[5]California statewide propositions follow candidate races and are before county and local ballot measures. They are the largest block of contests appearing on all ballots; the number of propositions is 12, 29, 17, 28, 3, 13, 9, and 10, for the 1988 primary, 1988 general, 1990 primary, 1990 general, 1992 primary, 1992 general, 1994 primary, and 1994 general election ballots, respectively. All references to election statistics are presented in this sequence.

[6]See also Cox and Munger (1989) who analyze ballot completion in the context of their study of voting for Congress.

[Place Figure 1 Here]

The remainder of the paper is organized as follows. Section 2 presents the econometric methods used in the analysis. Section 3 discusses several hypotheses related to the model, specifically illustrating the role of race and ethnicity on electoral participation. Section 4 describes the source and content of the data. Section 5 presents the results of the aggregate nested logit analysis and derives the elasticities of the various participation probabilities with respect to underlying factors. The last section discusses the results and their implications on future public policy. A detailed presentation of the data and the construction of the exogenous explanatory factors are included in the appendices.

2 A Model of Political Participation

Three aspects of the model require definition: the econometric techniques used to estimate each event of the political participation model, the elasticity of participation, and the independent variables. Since the outcomes are frequencies with large numbers of observations per group, the minimum logit chi-square method of Berkson (1953) is an appropriate econometric technique. McFadden (1981) suggests that such information can be viewed as though it was produced by a representative consumer repeatedly making a choice. Although the decisions are discrete, what is observed is the percentage of times a particular choice is made, which is a continuous decision variable.

2.1 Political Participation

Under the assumption of random utility maximization, the representative voter's utility function can be expressed as $U_j = V_j(X_j) + \epsilon_j$, where X_j is the vector of attributes for the jth choice. Here $j = 0, 1$, where 0 indicates not participating and 1 indicates participating in each model event. The unobservable error, ϵ_j, captures unobserved effects that are specific to the alternative. A person participates in the electoral process, denoted by the indicator $Y = 1$, if the utility from doing so exceeds the utility from abstaining, denoted by $Y = 0$. That is,

$$\begin{aligned} \text{Prob}(Y=1) &= \text{Prob}[V_1(X_1) + \epsilon_1 > V_0(X_0) + \epsilon_0] & (1) \\ &= \text{Prob}[\epsilon_0 - \epsilon_1 < V_1(X_1) - V_0(X_0)]. & (2) \end{aligned}$$

McFadden (1973) shows that if the errors are independent, identically distributed and drawn from an extreme value distribution, then

$$p_1 = \text{Prob}(Y = 1|X) = e^{V_1(X_1)}/[e^{V_1(X_1)} + e^{V_0(X_0)}]. \quad (3)$$

In our data, aggregated to the census tract level, individual choices are not observed. However, for large N a reasonable approximation of $\text{Prob}(Y = 1|X)$ is $\hat{p}_1 = (1/N)\sum Y_k$ where $k = 1, \ldots, N$ indexes observations.[7]

From equation (3) it is easy to see that $\log(p_1/p_0) = V_1(X_1) - V_0(X_0)$. Under the assumption that $V_j(X_j)$ is a linear function, with $V_j(X_j) = \beta_j' X$, the log of the ratio of the probabilities is a linear function of the variables affecting the voter's choice. In the binary case with $p = p_1$ and $(1-p) = p_0$, this implies $\log(p/(1-p)) = \beta' X$, where β is a vector of coefficient differences $(\beta_1 - \beta_0)$. The regression model being estimated is thus

$$\log(\hat{p}/(1-\hat{p})) = \beta' X + u, \tag{4}$$

where $u = \log(\hat{p}/(1-\hat{p})) - \log(p/(1-p))$. The variance in this model is $1/(N\hat{p}(1-\hat{p}))$, where N is the number of participants in the tract (Maddala, 1983).[8] The minimum logit chi-square method is implemented through weighted ordinary least squares using the log odds ratio as the dependent variable, and correcting for the heteroscedasticity with the appropriate weight for each voting event. Thus, the equations are estimated using the weight $w_s = (n_s\hat{p}_s(1-\hat{p}_s))^{1/2}$, at each event. The weights compensate for the heteroscedasticity introduced by variation in the number of observations per group and differences in participation rates.

2.1.1 Registration Event

One additional component is required to model the registration event. The utility associated with casting a ballot in the future may influence a voter's current probability of registering. This choice structure is embodied in the aggregate nested logit where the probability of registering depends upon the expected maximum utility derived from turning out to vote.[9] The expected maximum utility from the decision to turnout is given by an inclusive value:

$$incv = \log(e^{V_0^{turn}} + e^{V_1^{turn}}). \tag{5}$$

The probability of registering to vote in the nested logit model is then:

$$p_1^{reg} = \frac{e^{V_1^{reg} + \theta incv}}{e^{V_1^{reg} + \theta incv} + e^{V_0^{reg}}} \tag{6}$$

where θ is the inclusive value coefficient and should lie in the unit interval for consistency with random utility maximization.[10]

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[7]The estimate for p_{reg} is the number of registered voters divided by the voting age population, R/N. The number of ballots cast divided by the number of registered voters, T/R, is the estimator for p_{turn}. Since each voter casts from zero to Q votes across a set of propositions, an estimate for p_{comp} is the total number of proposition votes cast divided by the product of the number of ballots cast, T, and the number of propositions on the ballot, Q.

[8]Refer to Dubin, Kiewiet, and Noussair (1992) for a similar implementation of the minimum logit chi-square method applied to aggregate voting data.

[9]The aggregate nested logit model was first developed and applied in Dubin, Graetz, Udell, and Wilde (1992).

[10]Refer to McFadden (1981) for a discussion.

Estimation, at this stage of the model, proceeds by first determining the expected maximum utility of turning out, or *incv*. To calculate the inclusive value, *incv*, we first estimate a binary logit model for the turnout event with the probability of "turning out", p_1^{turn}, given by:

$$p_1^{turn} = \frac{e^{V_1^{turn}}}{e^{V_1^{turn}} + e^{V_0^{turn}}} = \frac{e^{V_1^{turn}}}{1 + e^{V_1^{turn}}}. \tag{7}$$

Equation (7) represents the conditional probability of turning out to vote given that a voter registered. From equation (7), we find:

$$\frac{1}{1 - p_1^{turn}} = 1 + e^{V_1^{turn}} \tag{8}$$

so that $incv = \log(1 + e^{V_1^{turn}}) = -\log(1 - p_1^{turn})$. In the calculation of the inclusive value, we replace p_1^{turn} by the actual frequency of turning out to vote.

2.1.2 Turnout Event

Proceeding to the next event of the model, we assume that a voter's decision to turnout is potentially affected by the contests appearing on the ballot. In this case we may view the propositions as attributes of a ballot which influence the voter's decision to cast a ballot. The utility a voter receives from voting on a proposition is assumed to be:

$$U_{1qk} = V_1 + V_{1qk} + \epsilon_{1qk} \tag{9}$$

where $q = 1, \ldots, Q$ represents the propositions in a given election, $k = 1$ represents voting and $k = 0$ represents abstention on proposition q.[11] If a voter chooses not to turnout, then their utility may be represented by

$$U_0 = V_0 + \epsilon_0. \tag{10}$$

Thus, Prob[don't turnout] = Prob[$U_0 \geq \max_{q,k}(U_{1qk})$].

$$\begin{aligned} \text{Let } m_{q,k} &= \max_{q,k}(U_{1qk}) \\ &= \max_q \ \max_k (V_1 + V_{1qk} + \epsilon_{1qk}) \\ &= \max_q (V_1 + \max_k (V_{1qk} + \epsilon_{1qk})) \\ &= \max_q (V_q' + \epsilon_q) + V_1, \end{aligned} \tag{11}$$

where $V_q' + \epsilon_q = \max_k(V_{1qk} + \epsilon_{1qk})$ and $V_q' = \log(e^{V_{1q1}} + e^{V_{1q0}})$.[12] Since the ϵ_q's are also Weibull, it follows that $\max_q(V_q' + \epsilon_q) = V' + \epsilon_1$, where

$$V' = \log(\sum_q e^{V_q'}) = \log[\sum_q (e^{V_{q1}} + e^{V_{q0}})]. \tag{12}$$

[11] Note that V_1 refers to the strict utility a voter receives from casting a ballot. V_{1qk} refers to the strict utility a voter receives from turning out and voting or not voting (i.e., abstaining) on proposition q.

[12] If $(\epsilon_1, \epsilon_2, \ldots, \epsilon_J)$ are J independent Weibull-distributed random variables with parameters $(\eta_1, \mu), (\eta_2, \mu), \ldots, (\eta_J, \mu)$ then $\max(\epsilon_1, \epsilon_2, \ldots, \epsilon_J)$ is Weibull distributed with parameters $(\frac{1}{\mu} \log \sum_{j=1}^{J} e^{\mu \eta_j}, \mu)$. Refer to Anderson, de Palma, and Thisse (1992), Appendix 2.10, p. 61.

Therefore, $m_{q,k} = V_1 + V' + \epsilon_1$ and it follows that Prob[don't turnout] $=$ Prob$[V_0 + \epsilon_0 \geq V_1 + V' + \epsilon_1]$.

The conditional probability of voting "Yes" on proposition q, i.e., conditional on the decision to turnout, is given by

$$\begin{aligned} p_{1q1} &= \text{Prob}[U_{1q1} \geq U_{1q0}] \\ &= \text{Prob}[V_1 + V_{1q1} + \epsilon_{1q1} \geq V_1 + V_{1q0} + \epsilon_{1q0}] \\ &= \frac{e^{V_{1q1}}}{e^{V_{1q1}} + e^{V_{1q0}}}. \end{aligned} \tag{13}$$

Under the normalization of $V_{1q0} = 0$,

$$1 - p_{1q1} = \frac{e^{V_{1q0}}}{e^{V_{1q1}} + e^{V_{1q0}}} = \frac{1}{1 + e^{V_{1q1}}}. \tag{14}$$

Thus, $-\log(1 - p_{1q1}) = \log(1 + e^{V_{1q1}}) = \log(e^{V_{1q0}} + e^{V_{1q1}})$. Substituting these results into equation (12), we see that

$$\begin{aligned} V' &= \log \sum_q (e^{V_{1q1}} + e^{V_{1q0}}) \\ &= \log \sum_q e^{\log(e^{V_{1q1}} + e^{V_{1q0}})} \\ &= \log \sum_q e^{-\log(1 - p_{1q1})} \\ &= \log \sum_q \frac{1}{1 - p_{1q1}}. \end{aligned} \tag{15}$$

A Taylor Series expansion of $(1 - p_{1q1})^{-1}$ gives

$$\begin{aligned} \log(\sum_q \frac{1}{1 - p_{1q1}}) &\doteq \log(\sum_q (1 + p_{1q1})) \\ &= \log(\mathrm{Q} + \sum_q p_{1q1}) \\ &= \log(\frac{\mathrm{Q}}{\mathrm{Q}} + \frac{1}{\mathrm{Q}} \sum_q p_{1q1}) + \log \mathrm{Q} \\ &= \log(1 + \frac{1}{\mathrm{Q}} \sum_q p_{1q1}) + \log \mathrm{Q} \\ &\doteq \frac{1}{\mathrm{Q}} \sum_q p_{1q1} + \log \mathrm{Q}. \end{aligned} \tag{16}$$

Finally, applying the definition of p_{comp}, we see that $V' = p_{comp} + \log \mathrm{Q}$ is an estimate of the inclusive value for ballot completion employed in the turnout model. The inclusive value term in the turnout model thus depends on the expected ballot completion rate and the number of propositions present on the ballot. If either quantity is larger then the voter is more likely to turnout in our model.

2.2 Elasticity of Participation

When the effect of a specific factor on an event (i.e., registration, turnout, and ballot completion) is at issue, then an event elasticity should be calculated. This elasticity gives the percentage change in the probability of the event occurring per one percent change in the variable. When, on the other hand, the total effect of a change in a variable is desired, then a method for determining the combined effect based on the unconditional probability of participation is required. The elasticity of participation for a given event, with respect to a specific variable, is

$$\varepsilon(p_s, X^i) = \frac{X^i}{p_s}\frac{\partial p_s}{\partial X^i} = X^i(1-p_s)\beta_s^i. \tag{17}$$

The regression models estimate $\hat{\beta}_s^i$ for each event. Therefore, $X^i(1-\hat{p}_s)\hat{\beta}_s^i$ is the estimate of the elasticity of participation for event s relative to the ith variable in X.

To estimate the total elasticity of participation, the conditional probability of prior events must be determined. An individual's probability of completion is given by $\mathrm{f}(C) = \mathrm{f}_R(R) * \mathrm{f}_T(T|R) * \mathrm{f}_C(C|T \; and \; R)$, where C, T, and R represent the events of voting on a proposition, turnout, and registration, respectively, and f_s is the probability density function for event s. As $\log \mathrm{f}(C) = \log \mathrm{f}_R(R) + \log \mathrm{f}_T(T|R) + \log \mathrm{f}_C(C|T \; and \; R)$, the elasticity of participation is $\varepsilon(\hat{p}_{participation}, X^i) = \varepsilon(\hat{p}_{reg}, X^i) + \varepsilon(\hat{p}_{turn}, X^i) + \varepsilon(\hat{p}_{comp}, X^i)$. The elasticities of participation are discussed in Section 5.3 below.

2.3 Independent Variables

The independent variables are one of four types: election year specific variables, race and ethnicity, socioeconomic, or social connectedness (Teixeira, 1992) variables, as reported in Table 1. The election year specific variables capture the election's relative ballot attractiveness compared to the 1994 general election. Although it is desirable to measure how ballot length, election format, and election timing affect participation, the impact of such variables cannot be distinguished from the election year specific variable.[13] Therefore, including the election year specific indicator variables in the analysis precludes using other election specific variables, such as ballot length, a presidential versus mid-term variable, or a primary versus general election variable.

A few comments on the independent variables are necessary before proceeding. The omitted race and ethnic group, and therefore the comparison group, is the white, non-Latino population. The socioeconomic factors considered are age and income, average education, homeownership, and residential mobility. In addition, the model considers employment in each of five occupational groups; the comparison group is technical, sales, and administrative support occupations. The social connectedness factors include the

[13]Variables such as ballot length are collinear with the election specific variable since a linear combination of the election specific variables can be constructed that equals the ballot length variable.

presence of a spouse or children and the linguistic isolation of the household.[14] Refer to Appendix B for additional information on the construction of these variables.[15]

[Place Table 1 Here]

3 Hypotheses

In this section we develop a set of specific hypotheses for the effect of race and ethnicity, and linguistic isolation explanatory factors as they affect the three stages of political participation. Although it is possible to construct a set of testable hypotheses for the socio-economic and social connectedness factors, for the sake of brevity, we control for their differences in our estimation without specifically highlighting their differential impacts in our discussion. The hypotheses for race and ethnicity, and linguistic isolation are outlined below and summarized in Table 2.

Prior studies can be used as a starting point for the hypotheses on race and ethnicity. However, because a combination of the registration and turnout events appear under the term turnout in prior studies, the previous results must be separated into hypotheses for distinct registration and turnout events. The addition of a third step in the electoral model, the ballot completion event, requires new hypotheses to be formulated. We base these on the levels of involvement in local government as proxies for a group's feeling of empowerment. The effects of linguistic isolation have not been widely reported in prior studies. Therefore, our hypotheses for these variables are based on news media and other electoral information available in L. A. county.

3.1 Race and Ethnicity

L. A. county is highly unusual in terms of its racial and ethnic diversity, with 41% of the population white, 37% Latino-American, 11% African-American, 10% Asian-American,

[14]The linguistic isolation variable is the percentage of households where no one over the age of 14 speaks only English and no one over 14 who speaks a language other than English speaks English "very well" (U.S. Department of Commerce, 1991).

[15]Previous work relies on individual level survey data that includes information on political attitudes. This study employs aggregate demographics at the tract level, omitting political attitude information. If it is believed that people vote based on these attitudes in a structural sense, then there is the potential for an omitted variable bias. Omitting the attitude data can be interpreted as yielding a reduced form or predictive model. Attitude information could also be incorporated through additional structural equations using a seemingly unrelated regression technique (e.g., see Zellner (1962)). The inclusion of attitude information in this manner may increase the efficiency of the parameter estimation.

and less than 1% American Indian and "other".[16] The variations from neighborhood to neighborhood are extreme; non-Latino whites, African-Americans, and Latino-Americans range from 0% to almost 100%, and the Asian-American population ranges from 0% to 80%.

The Asian-American population demographics in L. A. county are comparable to those for the non-Latino white population.[17] This observation raises the possibility that Asian-Americans may participate in elections in a manner similar to non-Latino whites, rather than in a manner similar to other minority groups, such as African-Americans.

Verba and Nie (1972) report that African-Americans participate in alternate forms of political activities to a greater extent than whites. Specifically, Verba and Nie report that African-Americans are more likely to engage in cooperative and campaign activities, such as church-based political rallies. Both types of activities tend to increase voter registration. Therefore, a higher than average African-American registration rate is posited.[18]

Cain, Kiewiet, and Uhlaner (1991) found lower voting rates for both Latino-Americans and Asian-Americans when considering ballots cast divided by the number of eligible voters. In our three event model this implies that either the registration or turnout rates are lower, or both are lower than those for the white population. At least two phenomenon distinguish the Latino-American population from the Asian-American population in L. A. county. First, based on the number of vote-eligible minorities, there are more Latino-Americans than Asian-Americans. Second, they are currently represented in both the L. A. City Counsel, and the L. A. County Board of Supervisors. These achievements may give the Latino-American community the experience necessary to deal with bureaucracy and increase their voter registration. If the Latino-American population receives positive results in their interactions with political institutions and elected officials, ballot issue salience may increase, which in turn may increase Latino-American turnout.

The Asian-American population may lack the tenure and experience of the Latino-American population, however, their high level of average education may reflect a high

[16]The Latino-American group is constructed from the five major races in the census, white, black, Asian, American Indian, and other. The census classifies people who consider themselves Mexican, Puerto Rican, Cuban, etc., as Hispanic beginning in 1980. The Hispanic population has been subtracted from each of the five race categories, resulting in adjusted population counts. These adjusted population counts are the basis for the race categories. See Anderson (1988) for further details regarding the census.

[17]High school dropout rates and college graduation rates are similar in both populations. The Asian-American population also lives in a comparable number of "married couple with children" households, and, like the non-Latino white population, more households own their home than rent. Asian-American unemployment is low; the rate is less than one-third of that for African-Americans. Their per capita income is higher than any other minority group. The distribution of household incomes is similar to the non-Latino white population, with a peak in the $50,000 to $65,000 category, contrasted to the Latino-American and African-American populations where the peak lies below $30,000.

[18]Leighley and Nagler (1992b) report a positive relationship between African-Americans and turnout using the 1972 to 1988 CPS data, but a relationship which changes from positive to negative in 1980 using the 1964 to 1988 NES validated studies.

level of personal responsibility. If this is true, then the lower voting rate found by Cain, Kiewiet, and Uhlaner may be explained by a lower registration rate and a higher turnout rate for those who do register.

Sensible hypothesis regarding ballot completion rates are more difficult to determine. Variations in ballot completion depend on factors such as past benefits received from the government, and expectations of future benefits. In addition to the value an individual assigns to these benefits, the discount factor employed by that individual voter determines the overall level of satisfaction and empowerment felt by the individual. Since the African-American community has been dealt several large blows in both the far and recent pasts (e.g., 1992 riots in south-central L. A.), they may put less value on current benefits, and they may discount any prior benefits. Therefore, African-Americans may have a lower level of ballot completion.

Latino-Americans are one of the fastest growing segment of the population in L. A. county. Their level of local political participation, and hence, feeling of empowerment, may increase the percentage of the ballot completed. The Asian-American population's size is one-third of the Latino-American population. Although they are represented in some local government bodies, the Asian-American population is geographically dispersed, and as such they are unable to obtain a majority in a city council district or county supervisor district. Therefore, unable to elect an Asian-American, they may feel that the ballot measures' salience is lower, and hence their expected ballot completion rate may be lower.

3.2 Linguistic Isolation

Information is frequently communicated through whatever media provides the least expensive method with the most extensive audience possible. Furthermore, if the daily circulation counts of newspapers reflect the distribution of politically relevant news items, then the number of newspapers and their circulation counts depict a shortage of news available to the Spanish and Asian language audience.[19] Language creates another barrier when dealing with official state publications. Approximately one month before an election the county registrar's office mails a ballot pamphlet to each household in the county with registered voters. Although the pamphlet, sample ballots, and actual ballots are available in six languages, the English language versions are sent to every home.[20] If an individual does not read or speak English, the mass media and government lines

[19]The L. A. Times circulation exceeds 1.1 million copies daily, compared to the largest daily papers serving other languages, such as La Opinion with a circulation of approximately 100,000 copies, and Korea Times with a circulation of 45,000 copies (The Editor & Publisher Company, 1992). Note that it is not assumed that daily newspapers are the major source of political news, just that the distribution of such newspapers reflects the audiences of other mass media.

[20]Election information and ballots are available in English, Spanish, Vietnamese, Japanese, Chinese, and Tagalog. A voter is responsible for obtaining information in another language; however, the phone numbers to request the alternate versions of the publications did not appear on the English version until 1993.

of communication are narrow, if non-existent. A negative correlation between linguistic isolation and all forms of participation is anticipated, except for some Latino-American neighborhoods which have organized registration drives.

[Place Table 2 Here]

4 Data Sources

The two primary data sources for this analysis are the Statement of Vote (SOV) from the California Secretary of State, and the Bureau of the Census' 1990 Census of Population and Housing.[21] A third data source is the Precinct Information File (PIF), available from the California Secretary of State. Its primary function is matching census demographic and housing data to SOV electoral data at the appropriate level.[22]

The L. A. county SOV contains aggregate data by sub-precinct.[23] The sub-precincts recognize boundaries for political and municipal districts, such as U.S. congressional, city council, and school districts (California Secretary of State, Election Results Rental File). This sub-precinct level data includes registration counts by party and votes by candidate race and ballot measure. In addition to voting sub-precincts, the SOV contains data for absentee precincts. However, the inability to determine the appropriate physical areas and corresponding demographic characteristics for absentee precincts results in their deletion from our current inquiry.[24] The second primary source of data for our study, the 1990 Census, is arranged hierarchically, with the census block providing the lowest level of detail. We extract the census data at the tract level (above the level of block groups and blocks). Since sub-precincts do not cross tract boundaries, an accurate match of electoral and census data is possible.[25]

The process of matching SOV and census data involves the third data source, the PIF. It associates 1990 census tracts with each sub-precinct. The redistricting process assigns each tract to a congressional district; the SOV contains that tract number. Therefore, the 1988 and 1990 SOVs contain 1980 census tract numbers; the PIF facilitates matching a recent, and therefore more accurate, census tract to each sub-precinct.[26]

[21]Refer to Appendix A for details on the data sources.

[22]See Filer, Kenny, and Morton (1993) for an example of a study matching census data to aggregate election data.

[23]California SOV data have been used in other studies. See, for example, Bowler, Donovan, and Happ (1992) and Matsusaka (1992).

[24]This point not withstanding, the SOV does provide sufficient data for the analysis of absentee voting patterns at the congressional district level. See Dubin and Kalsow (1996a, 1996b).

[25]Refer to Appendix A for additional information regarding the selection of census tracts as the appropriate level for matching data. The other option was to match electoral and census data at the sub-precinct level. However, as discussed in Appendix A, the process of assigning census blocks to Voting Tabulation Districts did not results in accurate data for L. A. county. Therefore the VTD level census data could not be accurately matched to sub-precinct level electoral data.

[26]The process of merging electoral and demographic data is not perfect. There are tracts with no

5 Results

The results of the analysis are presented in several sections. First, patterns in participation rates are presented. Then, each event is analyzed and the significance of the independent variables is discussed. Last, the elasticity of political participation for several elections is computed with respect to race and ethnicity.

5.1 Event Participation

Although Wolfinger, Rosenstone, and McIntosh (1981) report that turnout is 18% lower in mid-term elections than Presidential elections, they do not separate the registration and turnout events. The mean of registration by tract as a percentage of the voting age population is approximately 54% for primary elections, 58% for Presidential general elections, and 56% for the mid-term general election. The range of registration rates across tracts is similar for all elections, with the lower bound in single digits, and the upper bound exceeding 100%.[27]

Turnout percentages show greater variation but vary predictably. The mid-term elections have lower turnout rates than Presidential year elections, and primaries have lower turnout rates than general elections. The mean turnout percentages in the primaries are 41%, 31%, 40%, and 25% for the 1988, 1990, 1992, and 1994 elections, respectively. The mean turnout percentages for the general elections are higher, but they demonstrate the same pattern of a lower mid-term rate; they are 64%, 45%, 64%, and 47%. The ranges for turnout rates also differ by election type, with primary rates lower than general elections, and mid-term elections lower than Presidential years. Primary election turnout by census tract ranges from less than 2% to a high of 62%, 54%, 61%, and 45%. The general election turnout by tract ranges from lows of 15%, 16%, 23%, and 15% to highs of 79%, 66%, 95% and 66%.

The ballot completion event exhibits the least variation across time and tracts; the mean completion percentage by tract ranges from a low of 87% to a high of 89%. The lowest tract-level ballot completion rate for every election is between 65% and 70% and the high ranges from 95% to 100%. The level of ballot completion does not differ, on average, for Presidential versus mid-term elections, nor for primary versus general elections. This fact is interesting especially since the number of propositions ranges

population, and therefore, zero participation rates. This analysis excludes tracts with no population. The manual coding process that assigns census tract information to each sub-precinct caused one tract to be incorrectly coded on the SOV. The sub-precincts encoded with that tract were dropped from the analysis. In addition, tracts reporting over 100% registration were dropped from the analysis since the log odds ratio cannot be computed. Eliminating these tracts leads to estimates of the population means for the underlying variables that are not statistically different than those for the overall population. One tract is also dropped from the completion event because its ballot completion percentage is 100% so the log odds ratio cannot be computed. Refer to Appendix A for additional information on the tracts dropped from the analysis.

[27]Refer to Appendix A for details on tracts exceeding 100% registration.

from three to twenty-nine for the eight elections studied. If the length of the ballot is important, then the completion rates may be expected to be lower for longer ballots than for shorter ballots.[28]

5.2 Influence of Independent Variables

5.2.1 Event 1: Registration

Teixeira (1989) states that registration drives do not change the outcome of the election, but he bases that conclusion on national aggregates of voting for the President in 1988. Our results identify which groups within a racially heterogeneous population are less likely to register, and therefore are unable to vote on election day. If demographers are correct, the population in the United States will become more similar to L. A. county in racial heterogeneity during the next decade, so Teixeira's conclusions based on aggregate data and an earlier less diverse population may no longer hold. Therefore, the importance of separating the registration and turnout events in the analysis of political participation will rise over time.

The eight elections used in our analysis cover the entire range of statewide elections – Presidential and mid-term, general and primary. Since each election type has different participation rates, our first inquiry was to determine whether the coefficients were the same across the elections. If the coefficients are not statistically different, then a restricted model can be used to estimate the common coefficients with a gain in statistical precision. However, if the coefficients differ by election, then separate regressions are required for each election. Using an election-specific variable for the first seven elections, the independent variables were not found to have election-specific effects, except for homeownership, residential mobility, the presence of children, and "Other Language, Isolated".

The results for the registration event are presented in Table 3. Most variables have the predicted sign. The notable discrepancy from the effects as hypothesized is the positive (but insignificant) coefficient on the linguistically isolated Asian-Americans (hypothesized as a negative relationship).

[Place Table 3 Here]

5.2.2 Event 2: Turnout

The effects of the independent variables were found to differ by election for the turnout event. In fact, nineteen of the twenty-two demographic variables had statistically different coefficients across the eight elections. Therefore, each election is presented separately in

[28] See Dubin and Kalsow (1997) for a discussion.

Tables 4 through 7. In contrast to the findings of Wolfinger and Rosenstone (1980) and Leighley and Nagler(1992a), the coefficient for African-Americans is negative and significant in six of eight elections. As we discuss below, this result implies that African-Americans are less likely to turnout in specific elections relative to non-Latino whites.[29] This result is consistent with Abramson and Claggett's (1991) finding.

[Place Tables 4, 5, 6, and 7 Here]

5.2.3 Event 3: Ballot Completion

Half of the independent variables have coefficients that differ by election in the ballot completion event. The results are given in Tables 8 through 11. Racial and ethnic groups were found to vary in their level of ballot completion, with African-Americans showing a significant negative coefficient, and Latino-Americans the opposite.

[Place Tables 8, 9, 10, and 11 Here]

5.3 Elasticity of Participation

Using the elasticity equations presented in Section 2.2 above, we calculated elasticities of participation for each of the eight elections with respect to each of the race and ethnicity factors.[30] Generally, we found that a census tract with greater racial and ethnic diversity had lower overall political participation with specific results differing somewhat by race and ethnic group and differing, importantly, by each event (i.e., registration, turnout, and ballot completion).

One theory of voter behavior supports the notion that the least informed drop out of any given election. The elections receiving the least media attention and those that voters perceive as less important should then have a lower level of participation. A second theory of voter behavior is that those with the most to gain should participate in elections

[29] The inclusive value coefficients were generally of the expected sign and magnitude for theoretical consistency of the aggregate nested logit model. In the registration model, the inclusive value coefficients were positive and statistically different from zero and less than one in all but one election. For the turnout models, the inclusive value coefficients were positive and significant for the 1992 and 1994 elections, but were negative in the primary elections and positive in the general elections for the years 1988 and 1990. This pattern of consistency of the aggregate nested logit results for general elections as opposed to primary elections was also observed in Dubin and Kalsow (1996a).

[30] Our elasticity analysis employs a sample tract similar to an "average" tract in L. A. county. The sample tract has 11.5% African-American, 15.3% Asian-American, 34.2% Latino-American, 5.8% over 64, an average of 12 years of education, 18.2% high income households, 47.9% of households have spouses present, and children are present in 36.1%. In comparison, the means for L. A. county are 11.1% African-American, 10.2% Asian-American, 34.1% Latino-American, 13.6% over 64, 12.1 years of education, 24.5% high income, 57.3% with spouses, and children in 31.3% of households.

especially when other voters participation is lowest. In that case minority groups could potentially "out vote" the non-Latino white voters.

However, our findings based on the combined elasticities of participation show that minorities do not vote in equal proportions to non-minorities when they have the greatest chance to influence the outcome, such as in primaries and mid-term elections. Either institutional or educational biases therefore exist which disadvantage minorities in the political participation process. Unfortunately, those with the most at stake apparently do not participate in the process to the extent they might.

Our results further suggest that minorities participate differently at each stage of the political process. For example, examination of the conditional elasticities of participation show that African-Americans are more likely to register to vote than non-Latino whites, but are less likely to turn out (i.e., cast a ballot) and less likely still to complete a ballot when they do turn out. By contrast, Latino-Americans register less often, yet are found to have a higher likelihood of turning out and completing the ballot in a given election.

While the total participation levels for these two groups are lower than those for non-Latino whites, the differences in the likelihoods of participation at the different stages suggest very different strategies for increasing the overall level of minority political participation. These results have apparently been masked in previous analysis which aggregate registration and turnout events.

6 Discussion and Conclusion

We find that the results of the aggregate nested logit model of political participation are generally consistent with most prior results for turnout.[31] The results of our study can be used for two purposes. First, the results of our study can be used to increase the level of participation by decreasing the biases that exist in electoral institutions. Second, the results of our study could be used to achieve a desired electoral outcome.

One method to increase participation is to determine where it needs improvement, and then concentrate on those areas. By breaking the voting process into multiple events, the impact of changes in demographics on the events that characterize electoral behavior can be determined. Our results demonstrate that for minority groups the strategies to increase participation must be tailored to the minority group involved and to the election cycle. Our evidence suggests, for instance, that past efforts to increase African-American registration have probably been successful. If overall political participation for African-Americans is to further increase, the next effort should be made in getting African-Americans to turn out and complete their ballots.

[31] Our results can be compared to prior studies by combining registration and turnout elasticities. For instance, if our results for the registration and turnout events are combined, then they are similar to those presented in Leighly and Nagler (1992a, 1992b) and Wolfinger and Rosenstone (1980).

With respect to achieving specific electoral outcomes, e.g., the marketing of a proposition by a special interest group, the results of our study have immediate significance. Candidate and ballot issue campaign efforts rely on targeted spending of limited resources to achieve a specific outcome. Our aggregate nested logit model of political participation reveals which segments of the voting population will show up at the polling place on election day and mark a ballot. The number of supporting or opposing votes an issue receives can be altered through targeted marketing. For example, if a special interest group knows what type of voter supports their issue, they can focus their marketing on those registered voters who are most likely to support the issue, turnout and complete the ballot.

Appendix A Data Sources

The two primary data sources for this analysis are the California Secretary of State's Statement of Vote (SOV) and the Bureau of the Census's 1990 Census of Population and Housing, Summary Tape File 3A (STF3A). The SOV contains the electoral data required for the analysis, including the number of registered voters, the number of ballots cast, and the vote totals. The census data provides the demographic data that were used to construct the independent variables used in the regressions. A third source of data is the Precinct Information File (PIF), available from the California Secretary of State. Its primary function is matching census demographic and housing data to SOV electoral data at the appropriate level.

A.1 Statement of Vote

The organization of the L. A. county SOV is by sub-precinct. Sub-precincts are the combination of a three digit code representing a city or unincorporated area of the county, a four digit major precinct, and a one character alpha sub-precinct identifier. The first seven digits recognize boundaries for U.S. congressional, state senate, state assembly, board of supervisor, board of equalization, city, and city council districts. The assignment of the last character also recognizes tax assessment boundaries, school districts with trustee areas, and census tracts (California Secretary of State). This definition of precincts allows combining non-contiguous areas via sub-precincts, into one major precinct. Since all land is in a precinct, zero population sub-precincts occur in uninhabited areas, industrial parks, and commercial zones (California Secretary of State).

The SOV includes registration counts by party by sub-precinct for each election. It also contains sets of counters and vote counts for each contest within a sub-precinct, with each counter identifying a candidate in a particular race or a yes/no position on a ballot measure. The corresponding vote counts are aggregates by sub-precinct for approximately 2 million ballots. Besides voting sub-precincts, the SOV contains data for absentee precincts. Absentee sub-precinct vote totals include both "regular" absentee voters, those out-of-town or otherwise unable to vote at designated polling places, and voters residing in areas where the population is insufficient to justify establishing a polling place.[32] Although absentees represent approximately 10% of the total ballots cast, they are deleted from the analysis because of the inability to disaggregate absentee ballots into appropriate

[32]In L. A. county the number of absentee sub-precincts varies from election to election, based on the required number of ballot groups, which are unique combinations of contests and rotation sequences. Absentee sub-precinct district information is from the "first" sub-precinct in the ballot group, where sorting by city–major precinct–sub-precinct determines the first. Therefore absentee voters in L. A. county casting the same ballot, based on candidates and rotation sequences, "belong" to the same absentee sub-precinct. This means absentee ballots from voters in 6000 plus sub-precincts are summarized into approximately 300 absentee sub-precincts. There were 320, 388, 323, 369, 189, 235, 166, and 214 absentee sub-precincts in the elections studied, and 6185, 6247, 6328, 6279, 6069, 6098, 6116, and 6104 voting sub-precincts.

physical areas and subsequently match them with demographic characteristics.[33]

A.2 Bureau of the Census, STF3A

The second primary data source, the 1990 Census of Population and Housing Summary Tape File 3A, is a hierarchical database, with the census block being the most detailed unit. The census data for this analysis is extracted at the tract level, an aggregation level above block groups and two levels above blocks. Census tracts represent approximately 2500 to 8000 persons, and their original boundaries create homogeneous groups of people with respect to population and housing characteristics (U.S. Department of Commerce, 1991). The decennial census gathers basic data regarding demographics and housing information for the vast majority of the population—in 1990 95% of the population responded via the mailback procedure (U.S. Department of Commerce, 1991). The Bureau of the census also obtains detailed information through a sampling procedure where the primary sampling unit is a housing unit. Although the sampling rate varies by type and estimated population of governmental units, the sample includes approximately one of every six households (U.S. Department of Commerce, 1991). This detailed decennial census sample is the basis for the STF3A dataset.

A.3 Merging Electoral and Demographic Data

The process of matching SOV and census data involves a third data source, the Precinct Information File (PIF). It contains every district and division related to an established sub-precinct, ranging from U.S. congressional districts to school districts. The current PIF associates 1990 census tracts with each sub-precinct, while SOV tapes contain census tracts in effect at the time of the last redistricting. Over 30% of the 1990 census tracts in L. A. county result from splitting or combining 1980 tracts. The PIF facilitates matching the 1990, and therefore more accurate, census tracts to each sub-precinct.

Grofman, Handley, and Niemi (1992) recommend merging census data and electoral data based on voting precincts or census blocks. They also discuss problems that may occur during the matching process, such as precincts that split census blocks, tracts that split precincts, and precinct boundaries that change over time. In many states the census data is available at the Voting Tabulation District (VTD) level, one of the levels Grofman, Handley, and Niemi have suggested using. However, the accuracy of the data at the VTD level depends on the process within the individual state that reports the assignment of census blocks to VTDs. The first comprehensive attempt to provide census data at the VTD level began with the 1990 census. Since each state was responsible for gathering the information, verifying it, and then forwarding it to the Bureau of the Census, the

[33] Absentee ballots account for 14.0%, 10.2%, 13.8%, 8.9%, 14.0%, 13.7%, 17.5%, and 17.6% of the ballots cast in L. A. county. The numbers for the state of California are higher: 18.4%, 14.1%, 15.0%, 9.5%, 16.6%, 17.2%, 20.4%, and 22.6%.

accuracy of the information varies by state. States with stable precinct boundaries were able to determine which census blocks belong to which VTD. On the other hand, states and large cities with shifting or growing populations and precinct boundaries faced a difficult task matching VTD and tract boundaries.

In L. A. county, VTDs should correspond to sub-precincts; however, the reporting process for California did not yield data that was sufficiently accurate for our analysis. Since by definition a sub-precinct is within a tract, aggregating sub-precincts to census tracts provides accurate, matching geographical areas. On average, a tract consists of four sub-precincts, with approximately 1250 ballots cast in each tract. In addition, over 1590 of the 1652 census tracts in L. A. county are represented in our data in every election studied. Tracts with zero population are eliminated from the data. Due to inaccurate reporting of sub-precinct boundaries, the other option of applying VTD census data to the 6000 plus sub-precincts would have resulted in an inaccurate analysis.

The process of merging electoral and demographic data does result in some mismatches. The Secretary of State's office manually codes census tract and sub-tract codes for each sub-precinct.[34] The SOV contains the census tract codes in effect at the time of the election; the redistricting process assigns the census tract codes to each sub-precinct. Therefore, the 1988 and 1990 SOVs contain 1980 census tract codes.

The PIF provides the necessary bridge linking 1990 census tract codes to sub-precincts in prior elections. The 1988 and 1990 election data is first matched to the PIF, and then the PIF's 1990 census tract codes are used to match the electoral data to the 1990 census. The 1992 electoral data contains the 1990 tract codes and is matched directly to the census. However, the manual process of assigning tract information for every sub-precinct is not perfect. One tract coded by the Secretary of State is incorrect in the 1988 and 1990 data; that tract is dropped from the analysis. In addition, there are tracts in each election reporting over 100% registration. Therefore, the log odds ratio used in the minimum chi-squared analysis cannot be computed for these tracts.[35] These tracts were therefore eliminated from analysis in the registration model. The turnout event does not delete any tracts; all tract-level turnout rates fall between 0% and 100%. One tract is removed from the completion model since its completion rate is 100%, again making it impossible to compute the log odds ratio.

[34]The combination of tract and sub-tract codes identifies a unique tract. If the population in a tract increases, and it is necessary to split the tract, the Bureau of the Census appends a sub-tract code. The practice of maintaining original tract codes and suffixing with sub-tract codes provides a method for analyzing data across several decennial census.

[35]The number of tracts reporting over 100% registration is 29, 50, 17, 22, 15, 43, 33, and 49, with most between 100% and 110%. These tracts are slightly more white and African-American, have higher incomes, and are less Latino-American and have fewer laborers than the average L. A. county tract. However, a sample which eliminates these precincts does not have significantly different demographics from the population as a whole. In addition, recoding the tracts with registration exceeding 100% to a registration rate of 99.9% did not alter our regression results.

Appendix B Other Independent Variable Construction

The independent variables used to measure socioeconomic status and social connectedness in our study are listed in Table 1. A few of the socioeconomic variables, specifically age, income, and occupation, require additional explanation. In addition, our selection of social connectedness variables is related to prior studies.

The first socioeconomic variable considered is age.[36] Although average age does vary from census tract to census tract, a better statistic to represent the impact of age on participation is the age distribution. Rather than using age and age-squared variables, our analysis uses the percentage of the voting age population under 35 and over 64 as proxies for the age distribution.[37]

The next socioeconomic variable we discuss is income. Income can be stated either on a per capita or on a family basis, and in either nominal dollars or by the income distribution.[38] Nominal income is a relevant measure only if the marginal value of a dollar is assumed to be constant. A better measure of income is the percent of households with "low" and "high" incomes in a neighborhood.[39]

The last socioeconomic factor considered is occupation. There should be a high level of correlation between the number of persons employed as laborers, operators. fabricators, and in precision production occupations with union membership. The latter is thought to be related to turnout.[40]

Social connectedness is measured by variables which are a combination of demographic and housing attributes available in the census. They include the presence of a spouse and children, homeownership, and tenure in current residence.[41]

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[36]See Boyd (1981) for a discussion on America's changing age distribution and the implications for turnout.

[37]For example, see Wolfinger and Rosenstone (1980) or Leighley and Nagler (1992b).

[38]See Filer, Kenny, and Morton (1993) for a discussion regarding relative incomes and real wages. Leighley and Nagler (1992b) use income quintiles as their measure of income.

[39]In L. A. county the lowest quartile of households has incomes below $17,500 (24.26 percent of households), and the high quartile represents households with incomes above $60,000 (24.14 percent of households).

[40]See Uhlaner (1989) and Leighley and Nagler (1992a) for results on union membership and turnout.

[41]Refer to Kenny (1993) and Straits (1990) for the effect of spouses on political participation. Bennett (1991) and Squire, Wolfinger, and Glass (1987) investigate the impact of homeownership on voting turnout.

Tables

Table 1: INDEPENDENT VARIABLES

VARIABLE	DEFINITION
African-American	% of population reporting African-American.
Asian-American	% of population reporting Asian or Pacific Islander.
American Indian	% of population reporting American Indian, Aleut, or Eskimo.
Latino-American	% of population reporting Latino origin.
Other Race	% of population reporting another race.
Asian Language, Isolated	% of households where only Asian and Pacific Island languages are spoken.
Spanish, Isolated	% of households where only Spanish is spoken.
Other Language, Isolated	% of households where only other languages are spoken.
Under 35	% of voting age population under 35 years old.
Over 64	% of voting age population over 64 years old.
Average Education	Average years of education for persons 18 and over.
Lowest Income Quartile	% of households with incomes in the lowest quartile.
Highest Income Quartile	% of households with incomes in the top quartile.
Farming,Forestry,Fishing	% of employed population over 16 working in Farming, Forestry, and Fishing occupations.
Laborers	% of employed population over 16 working as operators, fabricators, and laborers.
Managers	% of employed population over 16 working in managerial and professional specialty occupations.
Precision Production	% of employed population over 16 working in precision production, craft, and repair occupations.
Service	% of employed population over 16 working in service jobs.
Homeownership	% of households residing in owner-occupied homes.
Residential Mobility	% of households who moved between 1/89 and 4/90.
Married, Spouse Present	% of households where a married couple resides.
Children Present	% of households with minor children present.

Table 2: HYPOTHESES SUMMARY

VARIABLE	REGISTRATION	TURNOUT	BALLOT COMPLETION	TOTAL EFFECT
RACE AND ETHNICITY†				
African-American	+	–	–	–
Asian-American	–	+	–	–
American Indian	?	?	?	?
Latino-American	–	+	+	+
Other Race	?	?	?	?
LINGUISTIC ISOLATION‡				
Asian Language, Isolated	–	–	–	–
Spanish, Isolated	+	–	–	–
Other Language, Isolated	–	–	–	–

† The reference category is the white population.
‡ The linguistic isolation variable is the percentage of households where no one over 14 speaks a language other than English speaks English "very well" (U. S. Department of Commerce, 1991).

Table 3: L.A. COUNTY VOTER REGISTRATION

VARIABLE	ESTIMATED COEFFICIENT		T-STAT.
Constant	-0.897	***	-3.59
Dummy 1988 Primary	0.478	***	2.90
Dummy 1988 General	1.024	***	7.16
Dummy 1990 Primary	0.216		1.52
Dummy 1990 General	0.103		0.72
Dummy 1992 Primary	-0.084		-0.52
Dummy 1992 General	0.080		0.54
Dummy 1994 Primary	0.033		0.23
African-American	0.395	***	9.87
Asian-American	-1.605	***	-15.00
American Indian	-1.261		-1.08
Latino-American	-1.461	***	-17.94
Other Race	-1.626		-1.33
Asian Language, Isolated	0.127		0.58
Spanish, Isolated	1.027	***	10.19
Other Language, Isolated	-2.999	***	-8.93
Other Language, Isolated * 88 Primary	0.825	*	1.86
Other Language, Isolated * 88 General	1.361	***	2.83
Other Language, Isolated * 90 Primary	0.858	*	1.88
Other Language, Isolated * 90 General	0.806	*	1.70
Other Language, Isolated * 92 Primary	0.941	**	2.10
Other Language, Isolated * 92 General	0.447		0.95
Other Language, Isolated * 94 Primary	0.617		1.37
Under 35	-0.721	***	-6.96
Over 64	0.139		0.98
Average Education	0.166	***	11.17
Lowest Income Quartile	0.164	**	2.22
Highest Income Quartile	0.295	***	3.48
Farming, Forestry, Fishing	-0.403		-1.17
Laborers	0.045		0.33
Managers	-0.523	***	-4.24
Precision Production	-0.303	*	-1.66
Service	-0.210		-1.46
Homeownership	0.931	***	11.20
Homeownership * 88 Primary	-0.555	***	-5.75
Homeownership * 88 General	-0.257	**	-2.45
Homeownership * 90 Primary	-0.171	*	-1.74

Note: *p=.10, **p=.05, ***p=.01

Table 3: L.A. COUNTY VOTER REGISTRATION, CONT'D

VARIABLE	ESTIMATED COEFFICIENT		T-STAT.
Homeownership * 90 General	-0.087		-0.84
Homeownership * 92 Primary	0.050		0.51
Homeownership * 92 General	0.018		0.17
Homeownership * 94 Primary	0.126		1.26
Residential Mobility	-0.733	***	-4.20
Res. Mobility * 88 Primary	-1.732	***	-7.36
Res. Mobility * 88 General	-1.235	***	-5.41
Res. Mobility * 90 Primary	-0.993	***	-4.38
Res. Mobility * 90 General	-0.597	***	-2.65
Res. Mobility * 92 Primary	-0.414	*	-1.78
Res. Mobility * 92 General	-0.084		-0.36
Res. Mobility * 94 Primary	-0.169		-0.72
Married, Spouse Present	0.249	**	2.44
Children Present	-1.416	***	-9.13
Children * 88 Primary	0.166		0.95
Children * 88 General	-0.465	***	-2.74
Children * 90 Primary	0.267		1.56
Children * 90 General	0.185		1.06
Children * 92 Primary	0.316	*	1.75
Children * 92 General	-0.171		-0.98
Children * 94 Primary	0.050		0.29
Inclusive Value	0.258	**	1.99
Inclusive Value * 88 Primary	-0.061		-0.32
Inclusive Value * 88 General	-0.559	***	-3.68
Inclusive Value * 90 Primary	-0.299		-1.44
Inclusive Value * 90 General	-0.184		-1.06
Inclusive Value * 92 Primary	-0.304		-1.57
Inclusive Value * 92 General	-0.076		-0.48
Inclusive Value * 94 Primary	-0.273		-1.16
Number of Observations	12616		
R-Squared	0.709		
Corrected R-Squared	0.708		

Note: *p=.10, **p=.05, ***p=.01

Table 4: L.A. COUNTY VOTER TURNOUT – 1988

VARIABLE	PRIMARY EST. COEFF.		PRIMARY T-STAT.	GENERAL EST. COEFF.		GENERAL T-STAT.
Constant	0.431		0.72	-1.041		-1.11
African-American	0.585	***	15.49	-0.331	***	-9.50
Asian-American	0.386	***	3.44	-4.195		-0.38
American Indian	-3.641	***	-3.26	-3.714	***	-3.37
Latino-American	0.804	***	9.53	0.408	***	5.02
Other Race	1.594		1.35	1.665		1.41
Asian Language, Isolated	-1.355	***	-6.02	-0.835	***	-3.82
Spanish, Isolated	-1.102	***	-10.34	-0.665	***	-6.52
Other Language, Isolated	-0.228	*	-1.83	0.183		1.41
Under 35	-0.523	***	-4.99	-5.539		-0.54
Over 64	0.972	***	7.75	1.418		0.11
Average Education	0.116	***	8.08	6.021	***	4.16
Lowest Income Quartile	-0.201	**	-2.50	-0.373	***	-4.96
Highest Income Quartile	-0.664	***	-8.66	-0.569	***	-7.31
Farming, Forestry, Fishing	2.241	***	6.05	-0.959	***	-2.68
Laborers	-0.166		-1.19	-1.968	***	-14.66
Managers	0.402	***	3.40	-0.416	***	-3.55
Precision Production	-0.105		-1.59	-0.623	***	-3.57
Service	7.616		0.53	-1.124	***	-8.09
Homeownership	-8.701	**	-2.00	0.100	**	2.35
Residential Mobility	-0.491	***	-6.12	-0.388	***	-5.03
Married, Spouse Present	0.467	***	4.98	0.340	***	3.58
Children Present	-0.174	*	-1.74	-3.246		-0.32
Inclusive Value	-0.627	***	-3.61	0.403	*	1.83
Number of Observations	1584			1561		
R-Squared	1.458			0.252		
Corrected R-Squared	1.278			0.250		

Note:*p=.10, **p=.05, ***p=.01

Table 5: L.A. COUNTY VOTER TURNOUT – 1990

	PRIMARY			GENERAL		
VARIABLE	EST. COEFF.		T-STAT.	EST. COEFF.		T-STAT.
Constant	-0.540		-0.72	-2.853	***	-3.63
African-American	-0.239	***	-6.22	-0.348	***	-10.64
Asian-American	0.380	***	3.02	0.177	*	1.74
American Indian	-2.310	**	-1.87	-1.853	*	-1.84
Latino-American	0.828	***	8.75	0.509	***	6.68
Other Race	0.678		0.52	-0.270		-0.25
Asian Language, Isolated	-1.601	***	-6.35	-1.249	***	-6.168
Spanish, Isolated	-1.138	***	-9.43	-0.863	***	-8.94
Other Language, Isolated	-5.044		-0.37	7.345		0.64
Under 35	-0.621	***	-5.39	-0.497	***	-5.42
Over 64	0.993	***	7.16	0.303	***	2.64
Average Education	0.143	***	9.09	9.700	***	7.43
Lowest Income Quartile	-0.244	***	-2.60	-0.388	***	-5.28
Highest Income Quartile	-0.503	***	-5.98	-0.442	***	-6.38
Farming, Forestry, Fishing	0.161		0.38	-0.159		-0.47
Laborers	-0.362	**	-2.28	-1.044	***	-8.24
Managers	2.557		0.20	-8.923		-0.84
Precision Production	0.294		1.49	-7.982		-0.49
Service	0.217		1.34	-0.172		-1.32
Homeownership	6.121		1.27	2.598		0.67
Residential Mobility	-0.421	***	-4.87	-0.702	***	-9.97
Married, Spouse Present	0.436	***	4.24	0.288	***	3.39
Children Present	-0.418	***	-3.80	-0.309	***	-3.43
Inclusive Value	-0.466	**	-2.38	0.533	***	2.89
Number of Observations	1596			1589		
R-Squared	2.993			0.256		
Corrected R-Squared	1.172			0.255		

Note:*p=.10, **p=.05, ***p=.01

Table 6: L.A. COUNTY VOTER TURNOUT – 1992

VARIABLE	PRIMARY EST. COEFF.		PRIMARY T-STAT.	GENERAL EST. COEFF.		GENERAL T-STAT.
Constant	-3.474	***	-7.62	-0.913		-1.06
African-American	0.529	***	15.14	-0.272	***	-8.56
Asian-American	0.300	**	2.57	-0.255	**	-2.46
American Indian	-2.861	**	-2.48	-3.821	***	-3.61
Latino-American	0.759	***	8.64	3.151		0.40
Other Race	2.071	*	1.71	-0.543		-0.49
Asian Language, Isolated	-1.315	***	-5.63	-0.649	***	-3.13
Spanish, Isolated	-1.030	***	-9.11	-0.201	**	-2.02
Other Language, Isolated	0.488	***	3.80	0.177		1.42
Under 35	-0.521	***	-4.87	0.104		1.05
Over 64	0.573	***	4.33	-0.348	***	-2.82
Average Education	6.474	***	4.39	5.092	***	3.71
Lowest Income Quartile	-0.467	***	-5.60	-0.682	***	-9.69
Highest Income Quartile	-0.228	***	-2.89	-0.661	***	-8.84
Farming, Forestry, Fishing	-0.281		-0.73	-0.583	*	-1.70
Laborers	-0.502	***	-3.41	-1.594	***	-12.30
Managers	2.499		0.21	-0.478	***	-4.31
Precision Production	8.386	***	4.55	-9.897		-0.59
Service	-9.291		-0.61	-0.841	***	-6.27
Homeownership	-0.123	***	-2.74	0.155	***	3.80
Residential Mobility	-0.710	***	-8.99	-0.486	***	-6.64
Married, Spouse Present	0.189	**	1.97	0.147		1.62
Children Present	-0.536	***	-5.24	-0.301	***	-3.17
Inclusive Value	1.446	***	6.98	0.540	**	2.18
Number of Observations	1592			1567		
R-Squared	0.156			0.234		
Corrected R-Squared	0.154			0.232		

Note:*p=.10, **p=.05, ***p=.01

Table 7: L.A. COUNTY VOTER TURNOUT – 1994

VARIABLE	PRIMARY EST. COEFF.		PRIMARY T-STAT.	GENERAL EST. COEFF.		GENERAL T-STAT.
Constant	-2.929	***	-4.65	-2.059	***	-2.86
African-American	-0.149	***	-3.67	-0.278	***	-8.43
Asian-American	0.380	***	2.96	-5.199		-0.50
American Indian	-0.865		-0.68	-3.025	***	-2.89
Latino-American	0.765	***	7.77	0.523	***	6.66
Other Race	1.902		1.40	1.024		0.92
Asian Language, Isolated	-1.357	***	-5.26	-1.038	***	-5.00
Spanish, Isolated	-0.882	***	-6.97	-0.378	***	-3.78
Other Language, Isolated	-0.895	***	-6.21	-0.527	***	-4.24
Under 35	-0.890	***	-7.43	-0.536	***	-5.72
Over 64	0.981	***	6.86	4.942		0.41
Average Education	0.111	***	6.76	6.623	***	4.93
Lowest Income Quartile	-0.405	***	-4.17	-0.571	***	-7.96
Highest Income Quartile	-0.679	***	-7.77	-0.689	***	-9.56
Farming, Forestry, Fishing	-0.322		-0.75	-0.363		-1.05
Laborers	-7.465		-0.45	-0.995	***	-7.68
Managers	0.468	***	3.47	-7.887		-0.72
Precision Production	0.537	***	2.62	-6.792		-0.41
Service	0.522	***	3.06	-0.645	***	-4.82
Homeownership	-2.931		-0.58	0.148	***	3.67
Residential Mobility	-0.699	***	-7.74	-0.566	***	-7.80
Married, Spouse Present	0.639	***	5.95	0.581	***	6.50
Children Present	-0.550	***	-4.83	-0.197	**	-2.10
Inclusive Value	0.248		1.25	0.556	**	2.49
Number of Observations	1574			1553		
R-Squared	0.247			0.223		
Corrected R-Squared	0.245			0.222		

Note:*p=.10, **p=.05, ***p=.01

Table 8: L.A. COUNTY BALLOT COMPLETION – 1988

VARIABLE	PRIMARY EST. COEFF.		PRIMARY T-STAT.	GENERAL EST. COEFF.		GENERAL T-STAT.
Constant	0.723	***	2.84	1.035	***	5.14
African-American	-0.886	***	-24.70	-0.430	***	-14.03
Asian-American	-0.108		-0.80	-0.268	***	-2.64
American Indian	2.586	*	1.90	1.468		1.40
Latino-American	0.312	***	3.15	0.172	**	2.23
Other Race	-0.876		-0.67	1.148		1.04
Asian Language, Isolated	-0.482	*	-1.77	-0.450	**	-2.20
Spanish, Isolated	-0.489	***	-3.97	-0.155		-1.59
Other Language, Isolated	-0.927	***	-6.14	-1.130	***	-9.69
Under 35	-0.545	***	-4.23	-0.801	***	-8.80
Over 64	-1.226	***	-8.36	-1.049	***	-9.01
Average Education	0.145	***	8.66	0.105	***	7.89
Lowest Income Quartile	-0.548	***	-6.18	-0.624	***	-9.34
Highest Income Quartile	-0.450	***	-4.90	-0.444	***	-6.21
Farming, Forestry, Fishing	0.148		0.34	0.265		0.77
Laborers	-0.854	***	-5.36	-0.230	*	-1.81
Managers	-0.541	***	-3.84	2.260		0.21
Precision Production	0.536	***	2.59	0.559	***	3.41
Service	-0.490	***	-2.97	8.056		0.62
Homeownership	0.131	**	2.56	7.129	*	1.79
Residential Mobility	0.733	***	7.72	0.605	***	8.52
Married, Spouse Present	0.693	***	6.27	0.630	***	7.19
Children Present	-0.241	**	-1.99	-0.163	*	-1.72
Number of Observations	1584			1561		
R-Squared	0.648			0.633		
Corrected R-Squared	0.648			0.632		

Note:*p=.10, **p=.05, ***p=.01

Table 9: L.A. COUNTY BALLOT COMPLETION – 1990

	PRIMARY			GENERAL		
VARIABLE	EST. COEFF.		T-STAT.	EST. COEFF.		T-STAT.
Constant	1.380	***	5.00	1.216	***	5.24
African-American	-0.692	***	-17.08	-0.713	***	-20.32
Asian-American	2.022		0.13	-0.194		-1.57
American Indian	5.715	***	3.85	2.924	**	2.35
Latino-American	0.457	***	4.17	0.133		1.42
Other Race	1.325		0.89	0.786		0.61
Asian Language, Isolated	-0.456		-1.50	-0.550	**	-2.22
Spanish, Isolated	-0.792	***	-5.79	-0.386	***	-3.30
Other Language, Isolated	-0.936	***	-5.82	-1.609	***	-11.91
Under 35	-0.441	***	-3.19	-0.636	***	-5.86
Over 64	-1.689	***	-10.75	-1.263	***	-9.51
Average Education	0.114	***	6.23	0.117	***	7.54
Lowest Income Quartile	-1.014	***	-10.02	-0.938	***	-11.26
Highest Income Quartile	-0.683	***	-6.97	-0.613	***	-7.41
Farming, Forestry, Fishing	0.613		1.25	-0.257		-0.62
Laborers	-1.056	***	-5.85	-0.343	**	-2.24
Managers	-0.177		-1.14	-0.198		-1.52
Precision Production	0.870	***	3.80	1.035	***	5.29
Service	-0.369	**	-2.00	0.116		0.74
Homeownership	0.114	**	2.02	0.118	***	2.51
Residential Mobility	0.503	***	4.89	0.603	***	7.07
Married, Spouse Present	0.648	***	5.36	0.714	***	7.01
Children Present	-0.272	**	-2.07	-0.341	***	-3.10
Number of Observations	1596			1589		
R-Squared	0.648			0.645		
Corrected R-Squared	0.648			0.645		

Note:*p=.10, **p=.05, ***p=.01

Table 10: L.A. COUNTY BALLOT COMPLETION – 1992

VARIABLE	PRIMARY EST. COEFF.		PRIMARY T-STAT.	GENERAL EST. COEFF.		GENERAL T-STAT.
Constant	1.454	***	5.81	1.361	***	6.68
African-American	-0.494	***	-13.89	-0.252	***	-8.19
Asian-American	-2.782		-0.21	-0.190	*	-1.85
American Indian	6.138	***	4.61	0.999		0.93
Latino-American	0.293	***	2.96	0.471	***	5.99
Other Race	1.934		1.46	1.589		1.45
Asian Language, Isolated	-0.404		-1.50	-0.745	***	-3.64
Spanish, Isolated	-0.772	***	-6.22	-0.666	***	-6.70
Other Language, Isolated	-0.622	***	-4.27	-1.050	***	-8.80
Under 35	-0.148		-1.19	-0.981	***	-10.93
Over 64	-1.474	***	-10.27	-0.999	***	-8.45
Average Education	7.827	***	4.74	9.900	***	7.36
Lowest Income Quartile	-0.575	***	-6.34	-0.523	***	-7.85
Highest Income Quartile	-0.446	***	-4.97	-0.713	***	-9.94
Farming, Forestry, Fishing	0.806	*	1.83	0.669	*	1.90
Laborers	-0.794	***	-4.87	-0.423	***	-3.27
Managers	0.139		1.01	-7.108		-0.64
Precision Production	1.088	***	5.26	0.509	***	3.06
Service	-4.638		-0.28	-0.208		-1.56
Homeownership	0.199	***	3.95	0.169	***	4.18
Residential Mobility	9.106		0.99	0.558	***	7.85
Married, Spouse Present	0.159		1.45	0.748	***	8.44
Children Present	-4.928		-0.42	-0.209	**	-2.20
Number of Observations	1592			1567		
R-Squared	0.631			0.584		
Corrected R-Squared	0.631			0.583		

Note:*p=.10, **p=.05, ***p=.01

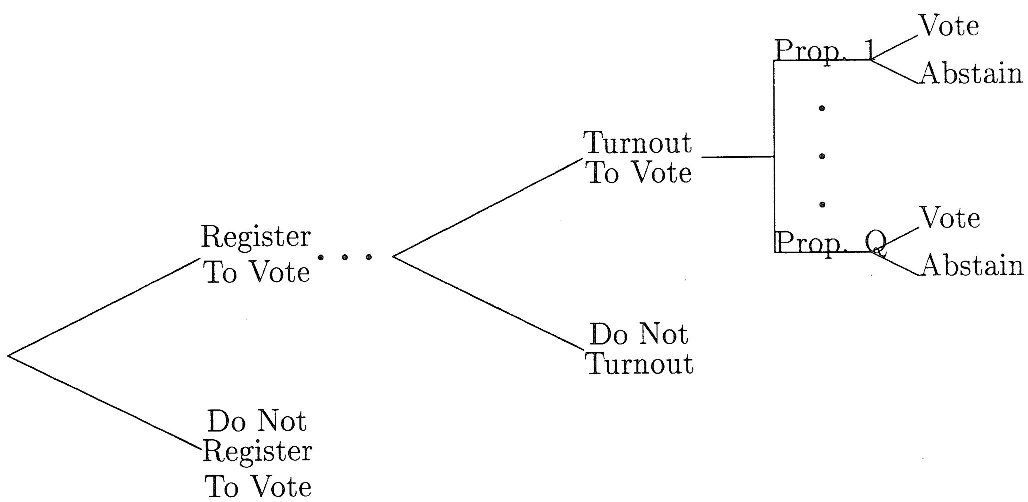
Table 11: L.A. COUNTY BALLOT COMPLETION – 1994

VARIABLE	PRIMARY EST. COEFF.		PRIMARY T-STAT.	GENERAL EST. COEFF.		GENERAL T-STAT.
Constant	0.754	***	2.78	1.204	***	5.81
African-American	-0.730	***	-18.52	-0.514	***	-16.30
Asian-American	-0.236	*	-1.70	-0.341	***	-3.20
American Indian	4.454	***	3.09	3.348	***	3.03
Latino-American	0.303	***	2.83	0.128		1.58
Other Race	1.209		0.82	1.752		1.53
Asian Language, Isolated	-0.436		-1.56	-0.371	*	-1.74
Spanish, Isolated	-0.747	***	-5.56	-0.587	***	-5.80
Other Language, Isolated	-1.343	***	-8.41	-1.760	***	-14.34
Under 35	-0.242	*	-1.79	-0.337	***	-3.42
Over 64	-1.349	***	-8.79	-0.962	***	-8.00
Average Education	0.141	***	7.93	9.074	***	6.64
Lowest Income Quartile	-0.682	***	-6.70	-0.564	***	-7.66
Highest Income Quartile	-0.519	***	-5.34	-0.466	***	-6.26
Farming, Forestry, Fishing	0.254		0.53	2.376	***	6.58
Laborers	-0.702	***	-3.94	-0.217		-1.62
Managers	-0.460	***	-3.06	-2.926		-0.26
Precision Production	0.782	***	3.45	1.051	***	6.09
Service	-0.255		-1.38	-7.551		-0.54
Homeownership	0.145	***	2.62	4.471		1.06
Residential Mobility	0.394	***	3.90	0.577	***	7.61
Married, Spouse Present	0.701	***	5.92	0.725	***	7.96
Children Present	-0.307	**	-2.39	-0.303	***	-3.13
Number of Observations	1574			1553		
R-Squared	0.655			0.630		
Corrected R-Squared	0.654			0.629		

Note:*p=.10, **p=.05, ***p=.01

Figure 1

Figure 1: A Political Participation Model



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