NBER WORKING PAPERS SERIES

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Working Paper No. 3789

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
July 1991

This paper is part of NBER's research program in Labor Studies. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

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ABSTRACT

Economic theories of discrimination are usually based on tastes. The huge body of empirical studies, however, considers the discriminatory outcomes that are the reduced-form results of interactions between tastes and opportunity sets. None examines tastes for discrimination directly, or considers people's willingness to trade off other characteristics to indulge their tastes. We study these trade-offs using a set of data on votes for officers in a professional association. The evidence shows that female voters are much more likely to vote for female than for male candidates, and that other affinities between them and a candidate have little effect on their choices. Male voters are slightly more likely to vote for female candidates, but their choices are easily altered by other affinities to a candidate.

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I. Introduction

The widely accepted definition of discrimination derived from Becker (1957) is that it exists when two equally qualified individuals are treated differently solely on the basis of characteristics that are irrelevant in the particular context, such as gender, race, ethnicity, religion or disability. Early work was generally concerned with questions of race, while the focus of much recent work, and of this paper, is on gender discrimination. For the most part, however, the issues are the same.

The explanation for discrimination proposed by Becker is that people have discriminatory tastes. Newer theories, such as those based on statistical discrimination (Aigner and Cain, 1977) or on language differences (Lang, 1986), also to some extent depend on the costs of overcoming tastes for discrimination. Despite the central role of tastes in the theory, the voluminous empirical research in this area has provided little direct evidence on the effect of tastes. Instead, a great deal of research has been done by economists studying outcomes such as earnings and occupational distributions to determine whether and how much discrimination exists in the labor market. The methods used have become increasingly sophisticated and the data increasingly refined, but the basic approach has remained the same.[1] No attempt has been made to measure discrimination directly; rather, it is identified as, for instance, that part of the differential in earnings that is not explained by productivity differences.

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[1]See, for example, Blau and Ferber (1986, Chapter 8) and Cain (1986) for recent surveys of this literature.

A few studies have tried to identify tastes for discrimination by assuming that discriminatory outcomes result from the behavior of one set of agents from among the possible groups of co-workers, employers and consumers. For example, in a rapidly growing literature on discrimination in professional sports (surveyed by Kahn, 1991) racial or ethnic differences in earnings are assumed to stem from consumer discrimination. The assumption is especially convincing when applied outside the labor market, for example, to racial differences in the prices of memorabilia (Nardinelli and Simon, 1990). Even there, however, tastes are inferred from market prices of traded goods, not examined directly.

The difficulty with this literature is that the empirical research is inherently incapable of identifying tastes, let alone inferring how agents' tastes interact with their characteristics to determine outcomes. A direct examination of tastes --- not reduced-form inferences from market results, and not responses to hypothetical questions --- is necessary to shed empirical light on tastes for discrimination and their interaction with prices. In this study we present such evidence, based on an examination of voting patterns by sex and how they are affected by "prices" of alternative choices. As always, prices must be relative. Here the prices faced by the individual voter are measures of a candidate's absolute quality and attractiveness to the voter relative to that of the other candidate in the election.

The next section examines related research by noneconomists on the determinants of voting and other decisions involving choosing between men and women. Section III presents a formal theory of voting that generates empirically testable propositions about voters' choices and allows us to infer how tastes interact with "prices;" Section IV discusses the novel set of data used in this study; Section V presents the main empirical results; finally, Section VI shows measures of sex discrimination by sex and discusses alternative explanations of the results.

II. Evidence from Previous Research

Prior research has addressed a number of distinct aspects of sex discrimination that are relevant for examining tastes. Among the questions asked have been: 1) Are equally qualified men and women equally likely to be considered for the same job? 2) Do comparable men and women running for the same office have an equal chance to get elected? 3) Is work of equal quality equally valued whether it is produced by men or women, and do men and women with the same credentials get equal recognition? 4) Are women inclined to view and treat women more favorably than do men?

Fidell (1970), Kryger and Shukiar (1978) and Riach and Rich (1988) address the issue of jobs. All relied on mailing identical or comparable information to potential employers with randomly chosen male and female names assigned to the purported applicants. The results generally suggest that women are at least as likely as men to be considered for jobs, except in traditionally male occupations. Women applicants were perceived to have more initiative as well as responsibility. More of them were invited for interviews, but they were considered for lower-level positions.

Far more work has been done on attitudes toward women and men running for political office and on their chances of being elected. Groeneman (1983) says that male candidates are generally thought to have an advantage. There may, however, be cases where women benefit from a "sympathy vote" or an "underdog effect." Groeneman's own findings and earlier work are consistent with this hypothesis. Over the last two decades relatively few studies (Perkins and Fowlkes, 1980, and Ambrosius and Welch, 1981) have shown any consistent preference for men. Numerous others, including most recently Karpilow (1984) and Zipp and Plutzer (1985), showed no particular preference in either direction. Although many of these studies should be viewed skeptically because they are based on unrepresentative samples and in some instances rely on opinion surveys rather than actual elections, taken together they demonstrate that the situation is much too complex for easy generalizations.

On the third question also, the very sparse evidence is inconclusive. Several early studies, discussed in Ferber and Teiman (1980), showed that the same works of literature or art were not rated as highly when they were thought to have been produced by women rather than men, as did their own study of acceptances of papers by economics journals. Blank (1990), on the other hand, finds no significant difference by sex in an experiment on blind refereeing in one economics journal.

Little evidence has been found of a special affinity beween voters and candidates of the same sex in investigations concerned with political elections. Similarly, Schoen (1988) found no differences in voting patterns of men and women by sex of the candidate in elections for offices of a professional association. Other research, however, showed that men tend to rate very competent men more highly than objectively comparable women, while the opposite is true of women (Deaux and Taynor, 1973). Scholars are more likely to cite authors of the same sex (Ferber, 1988). Thus the evidence is once again mixed.

This review clearly shows that further work is needed if we are to make progress toward resolving these issues. A study of actual voting patterns where each voter's choice is known and where a number of objective characteristics of voters and candidates are available would advance existing research in political science and sociology and would be entirely novel in the economics literature. It should shed substantial additional light on the fourth question and also provide the first opportunity to examine the extent to which preferences for discrimination can be overcome by other differences in the candidates' attractiveness.[2]

III. A Model of Voting by Sex

Let C refer to a vector of characteristics of a candidate, and let i index votes (voters). W denotes the eventual winner of an election, and L denotes the eventual loser. M_i is a vector of binary variables indicating whether the voter's characteristic matches that of the candidate for a

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[2]Election to office in a professional association is not really comparable to obtaining a job, to election to political office, or to direct evaluation of a person's work. The findings of this study are not entirely irrelevant to these other areas, however, to the extent that they provide some evidence about sex differences in tastes for discrimination.

particular element in the vector C. Then the potential utility obtained by a voter who chooses the winning candidate in an election is:

(1) $U_i(W) = U(C_W, M_{iW}) + \delta_{iW}$,

where δ_{iW} is an i.i.d. disturbance term. U is increasing in both of its arguments. Similarly, the potential utility from voting for the losing candidate is:

(2) $U_i(L) = U(C_L, M_{iL}) + \delta_{iL}$,

and we assume the δ_{ik} are uncorrelated.[3] The errors are specific to each vote and allow us to assume that the other part of U_i is deterministic.

The notion that voters derive utility from their choices based on the objective characteristics of the candidate chosen is not new. It is analogous to the formal modeling of workers' votes for union certification (Farber and Saks, 1980). What is new, and the basis for our testable hypotheses, is that voters derive additional satisfaction when their own characteristics match those of a candidate. Whether this hypothesis is correct is a purely empirical proposition and is the focus of our empirical analysis.

The likelihood of voting for a candidate is based on comparing the utility obtained from each choice. Under this assumption, VFW_i, the probability that the i'th voter chooses the winning candidate, is:

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[3]The model compares utilities between voting for the winner or the loser, as opposed to voting for the male or female candidate, as an expository convenience because we use data from one election in which both candidates were men. Using a dichotomy by gender would not change our conclusions.

$$\Pr\{VFW_i = 1\} = \Pr\{U_i(W) > U_i(L)\} \ ,$$

or

$$\text{(3)} \qquad \Pr\{VFW_i = 1\} = \Pr\{U(C_W \ , \ M_{iW}) - U(C_L \ , \ M_{iL}) > \delta_{iL} - \delta_{iW}\}.$$

The likelihood of choosing a candidate rises with the candidate's objective quality and with matches of the candidate's to the voter's characteristics.

Parameterize the utility functions as follows. Let $U(\cdot \ , \cdot)$ be:

$$\text{(4)} \qquad U(C_k, \ M_{ik}) = \alpha C_k + \beta M_{ik}^2 + \gamma S_{ik}^2 \ , \ k = W, \ L \ ,$$

where S denotes whether the candidate and voter are of the same sex, and α, β and $\gamma > 0$. Note that we assume here that the typical voter gets the same satisfaction, given his or her characteristics and those of the candidate, from voting for the winner as from voting for the loser. There are no bandwagon effects. Note too that we have broken out the variable S, which is the centerpiece of the empirical work, from the other variables indicating matches between the candidate's and voter's characteristics.

We can then rewrite the probability (3) as:

$$\text{(3')} \qquad \Pr\{VFW_i = 1\} = \Pr\{\alpha[C_W - C_L] + \beta[M_{iW}^2 - M_{iL}^2] + \gamma[S_{iW}^2 - S_{iL}^2] > \epsilon_i\} \ ,$$

where $\epsilon_i = \delta_{iL} - \delta_{iW}$.

The probability of voting for the winner rises the better are his or her objective characteristics relative to those of the loser, the closer is the match of the voter's characteristics to the winner's compared to the loser's characteristics, and when the voter and the winner, but not the loser, are of the same sex. The model in (3') can be estimated directly from information on individual voters' electoral choices and on the characteristics of voters and candidates.

IV. Data and Descriptive Statistics

To test this model of voting we obtained the actual votes cast for the positions of vice-president in a small professional organization. Each year two vice-presidents are chosen by the membership in separate two-person contests. Our data file is based on these elections in two years, so that we have data on four elections. Because the organization requires voters to sign the envelopes containing their ballots (as a means of preventing duplicate voting), we can identify each voter. This project was begun after the second year's elections, so that the voters' decisions were in no way biased by any possible Hawthorne effect.

Along with the ballots each voter received a brief vita for each candidate from the association's office, including all the information underlying the variables we use here plus a short list of the candidates' publications. Thus the voters had some knowledge of the candidates' qualifications for what are widely viewed as purely honorific positions. We obtained 372 complete observations on voters' choices out of a total of 386 votes cast in the four elections.[4]

One of the elections in Year I and both elections in Year II pitted a male against a female candidate. An initial view of differences in voters'

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[4]Twelve of the fourteen votes were excluded because we could not obtain some of the required information, mostly the Ph.D. year or Ph.D. school. The other two were disqualified because they were spouses (husbands) of candidates. Their affinity to one candidate suggested that their inclusion in the estimates would violate the usual assumptions of randomness. Including them would strengthen our main conclusions.

choices by sex is given by the contingency table in Table 1.[5] Taking these three elections together, voting differed significantly by sex, with women much more likely to vote for the female candidates than were male voters. Nonetheless, male voters too were more likely to vote for female candidates, which is why in this predominantly male association the female candidates won two of the three male-female elections. If $S^2_{iW} - S^2_{iL}$ were orthogonal to the other variables in (3'), the information in this Table would be the same as we would obtain from estimates of γ.

The inclusion of only four elections in the study means that we could include at most three independent measures of $C_W - C_L$ in the estimates of (3'). Each election offers one independent observation on voters' responses to these differences. Rather than representing $C_W - C_L$ by a set of three variables from among the possible measures of candidates' characteristics, we estimate (3') using dummy variables for three of the four elections.

That there are only three degrees of freedom (four elections) precludes analyzing a number of potentially interesting effects that might be important in describing voting behavior. For example, one might wish to examine whether the sex of the presidential candidate affected voters' choices between male and female vice-presidential candidates. Similarly, the sex of the candidates for one vice-presidential position might affect votes in the other contest. None of these considerations is likely to alter any

[5]The results in this contingency table parallel the entire set of results presented in Schoen (1988) for a different association. Schoen did not have access to the actual choices of individual voters.

Table 1. Voting by Sex, Combined Male-Female Elections

		Candidate: M	Candidate: F
Voter	M	114	130
	F	13	37

$\chi^2(1) = 7.26^*$

*Significant at the 5 percent level of confidence.

inferences about sex differences in the importance of affinities between voters and candidates. Each would require a very large sample of elections, including some in which candidates of both sexes were striving for each office. The difficulty of obtaining even this small data set and the paucity of female candidates for many positions in professional associations imply that this ideal data set is not likely to be available in the near future.

Though we cannot learn much about the effects of $C_W - C_L$ by examining (3'), we can examine the characteristics of the winning and losing candidates along a variety of dimensions. The candidates are compared along dimensions of: Years since receipt of the Ph.D.; quality of the graduate school attended; citations by other authors during the four years preceding the elections; number of textbooks written; level of school, as classifed by the American Association of University Professors; and the number of times the candidate had been on the Association's program in the four years before the election.

Table 2 reports these comparisons for all four elections and for the three male-female races separately. There is no single dimension along which the winning candidate dominates consistently. Having more citations and being more senior characterize the winner in all three male-female elections, but neither describes the winner in the male-male election. Along the other dimensions the candidate with what one would assume is the more desirable characteristic is no more likely to win the election.

Are the voters representative of the Association's membership? Do male and female voters differ? On the first question the only evidence is

Table 2. Descriptive Statistics, Candidates[a]

	All Elections	Male-Female
Elections		
Number of Elections with Winner:		
Male	2	1
More Senior	3	3
Higher-Quality Grad School	1	1
Lower-Quality Grad School	2	1
More Citations	3	3
More Textbooks Written	1	1
Fewer Textbooks Written	1	1
Higher-Level School	1	1
Lower-Level School	1	1
On Program More	2	2
Total Number of Elections:	4	3

[a]The quality of the Ph.D. institution is measured by the school's ranking in Davis and Papanek (1984). Citations are based on counts from the Social Science Citation Index. The level of school is based on listings in Academe, March-April 1990.

supporting: Females cast 17.5 percent of the votes; during a three-year period that contained Years I and II, they accounted for 15.6 percent of the membership. The difference is insignificant. Table 3 presents a comparison of the characteristics of male and female voters along several criteria. Women are only insignificantly less likely to hold a Ph.D. than are male voters, and there is no significant difference by sex in the number of years since receipt of the degree among those with a Ph.D. There are no pronounced differences by sex in the level of school with which the voters are affiliated.

The only significant difference between male and female voters is in their identification by sub-field within economics, as reported by them in the American Economic Review, December 1989.[6] Ignoring sub-fields 300, 800 and 900 there is no difference in the distribution of members by sex; but women in the sample are much less likely than men to be in sub-field 300 (money and public finance) and much more likely to be in sub-fields 800 and 900 (labor, demography and health and welfare). The difference between these distributions is large, but it is only slightly greater than the difference

[6]We classified those members who failed to list a field as being in the general category, 000. Voters not included in the AER list were classified according to the topic of their most recent paper on the Association's program or, failing that, according to the topics of recent published papers.

Table 3. Descriptive Statistics, Voters

	Male Voter	Female Voter
Percent with Ph.D.	92.2	84.6
Year of Ph.D., given hold degree		
Mean	1973.95	1974.93
Standard deviation	(11.56)	(9.84)
Percent Employed in:		
High-level, Ph.D.-granting University	14.0	18.5
Other Ph.D.-granting University	24.4	20.0
Comprehensive Institution	35.5	40.0
General Baccalaureate College	17.9	15.4
Other, Including Nonacademic	8.2	6.1
Percent in Sub-field:		
000	22.5	24.6
100	4.2	9.2
200	4.6	0
300	22.8	3.1
400	9.1	7.7
500	2.0	0
600	13.0	13.8
700	1.3	0
800	17.3	30.8
900	3.2	10.8
N =	307	65

in the distributions of men and women across sub-fields in the entire profession.[7]

With only four elections the estimation of (3') rests on the "affinity" variables representing $[M^2_{iW} - M^2_{iL}]$, the differences in the voter's matches with the characteristics of the winner and loser. We compared the voter to each candidate along eight dimensions. Seven of these are zero-one measures, so that we scored a variable as equalling 1 if a match occurred between a voter and a candidate, and 0 otherwise. These variables are: AEA sub-field; AAUP level of school; whether the candidate received his or her Ph.D. from the voter's school; whether the voter received the Ph.D. from the school where the candidate is employed; whether the voter and the candidate have their Ph.D.s from the same school; whether they are employed at the same institution, and whether they are employed in the same state. The other variable used was the year the Ph.D. was received. For this measure M^2_{ik} is the squared difference between the date of the voter's and the candidate's Ph.D.[8]

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[7]The <u>AER Directory</u> for December 1989 shows that 13.8 percent of all members list themselves in sub-fields 800 or 900. In the October 1987 <u>Roster</u> of the Committee on the Status of Women in the Economics Profession 25.1 percent of the women who are listed place themselves in fields 800 or 900. Conversely, 14.9 percent of AEA members classify themselves in sub-field 300; but only 11.9 percent of the women on the CSWEP Roster classify themselves in that area.

[8]For the 34 votes by people with no Ph.D. we set this variable equal to zero. In estimating (3'), which is based on differences in the voter's match with the two candidates, this assumption implies that the voter matches equally well with both candidates along this dimension. An attempt to account for this potential problem by adding a dummy variable for those without a Ph.D. to the vector of M_{ik} had only minute impacts on the estimates

Statistics describing the matches are shown in Table 4. Not surprisingly, matches along any one dimension are infrequent. Given their rarity, the sizes of the samples ensure that there are no significant differences by sex in the extent of matching with the winner or the loser along any one characteristic. Moreover, for each of the seven qualitative measures the fraction of matches differs little by sex. This means that equation (3') can be estimated without worrying that some of these affinity variables apply only to voters of one sex.

V. Estimates of the Voting Model

The empirical model is based directly on (3'). It is a probit in which the probability of voting for the winning candidate is "explained" by the dummy variables for the three elections; by the differences between the voter's matches with the winning and losing candidates along the eight dimensions discussed in Section IV; and, to examine sex preferences in voting, by the variable $S^2_{iW} - S^2_{iL}$. To illustrate the construction of the measures of $M^2_{iW} - M^2_{iL}$, consider the school level. If the voter matched neither candidate's school level, the difference is zero, as it is if the voter matched both candidates' school level; it is +1 if the winner, but not the loser, was matched, and -1 if the opposite occurred.

Estimates of the probits, excluding the coefficients on the three dummy variables, are contained in Table 5. Table 6 presents χ^2-statistics

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of β and γ. Similarly, reestimating (3') deleting these 34 observations produced only tiny changes in the parameter estimates and their standard errors.

Table 4. Descriptive Statistics, Candidate-Voter Affinities (Means)

VARIABLE	Male Voter	Female Voter
Same Field as Winner	0.092	0.031
Same Field as Loser	0.147	0.108
Same Level School as Winner	0.199	0.154
Same Level School as Loser	0.251	0.277
Winner's Ph.D. from Voter's School	0.029	0.015
Loser's Ph.D. from Voter's School	0.013	0.015
Voter's Ph.D. from Winner's School	0.016	0.031
Voter's Ph.D. from Loser's School	0.010	0.015
Voter and Winner Same Ph.D. School	0.036	0.046
Voter and Loser Same Ph.D. School	0.036	0.031
Same Employer as Winner	0.020	0
Same Employer as Loser	0.016	0.078
Same State as Winner	0.101	0.092
Same State as Loser	0.078	0.169
Difference in Ph.D. Year from Winner	1.31	2.35
Difference in Ph.D. Year from Loser	1.29	2.45

testing various hypotheses about adding successive sets of independent variables to the probits. Each triad of numbers in Table 5 contains the estimated probit coefficient, its standard error, and the effect on the probability of voting for the winner of changing the voter's match from the loser to the winner.[9] The constant and the estimated coefficients of the three election dummies are not listed.

Consider the simple probit in which only a match by sex is included (column (1) of Table 5). As its standard error, and the first χ^2 in Table 6 both show, matching a candidate's sex significantly affects the voter's propensity to choose the candidate. That is just a formalization of the results implicit in Table 1. The central test of the validity of the voting model is whether the addition of the vector of variables representing the differences $M^2_{iW} - M^2_{iL}$ adds to the ability of the probits to describe voters' behavior.

The estimates in column (2) of Table 5 test the voting model by adding the eight measures of differences in affinities. They show that for six of the eight affinity measures the coefficient has the expected positive sign and is larger than its standard error.[10] A test of adding these eight

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[9]This calculation involves setting all other variables equal to their mean values and computing the differences in the values of the probits when the particular variable increases from -1 to +1 (except for the continuous difference in Ph.D.-year squared).

[10]To maintain comparability among the variables, the coefficient on the difference in the match on Ph.D. year is the negative of the estimate, since the difference $M^2_{iW} - M^2_{iL}$ increases as the winner's Ph.D. year becomes more distant from that of the voter.

Table 5. Parameter Estimates, Standard Errors and Partial Effects of Changing Affinities[a]

	EQUATION					
	All	All	Men	Women	All	
VARIABLE					Main Effect	Interaction with Female
$S^2_{iW} - S^2_{iL}$	0.570	0.615			-0.431	2.131
	(0.210)	(0.220)			(0.580)	(1.040)
	0.407	0.436			-0.327	0.894
$M^2_{iW} - M^2_{iL}$:						
School Level		0.034	0.175	-0.326	0.119	-0.507
		(0.150)	(0.170)	(0.390)	(0.170)	(0.420)
		0.026	0.132	-0.255	0.090	-0.303
Field		0.252	0.323	-0.477	0.372	-0.854
		(0.150)	(0.150)	(0.480)	(0.160)	(0.490)
		0.191	0.240	-0.367	0.274	-0.370
Voter's School with Ph.D. School of Candidate		-0.519	-0.217		-0.452	
		(0.660)	(0.660)		(0.670)	
		-0.382	-0.163		-0.336	
Voter's Ph.D. School with School of Candidate		0.813		-0.280	1.225	
		(0.450)		(0.930)	(0.520)	
		0.567		-0.160	0.763	
Voter's Ph.D. School with Ph.D. School of Candidate		0.644	0.691	0.280	0.680	0.377
		(0.320)	(0.350)	(0.837)	(0.350)	(0.880)
		0.468	0.490	0.220	0.484	0.238
Ph.D. Year Squared (x -1000)		0.797	0.702	1.069	0.868	-0.070
		(0.620)	(0.660)	(2.115)	(0.670)	(2.040)
		0.554	0.501	0.536	0.599	0.528
Employer		1.700		1.867	2.334	
		(0.600)		(1.070)	(0.910)	
		0.898		0.931	0.975	
State Employed		0.359	0.625	-0.130	0.436	-1.047
		(0.200)	(0.210)	(0.610)	(0.220)	(0.590)
		0.271	0.451	-0.102	0.326	-0.458
FEMALE					-1.190	
					(0.450)	
Log-likelihood	-243.86	-226.21	-193.29	-33.79	-219.03	
No. of Observations	372	372	307	65	372	

[a]The probits also include a constant and three election dummy variables. The partial effect is the impact of changing the match from the loser to the winner, except for Ph.D. year, where it is 1000 times changing the squared difference one year closer to the winner, and one year away from the loser.

variables, the second χ^2-statistic in Table 6, shows that the vector of coefficients is highly significant ($\chi^2_{.99}(8) = 20.09$). Only school level and whether the candidate received the Ph.D. from the voter's school do not, and only the latter has the incorrect sign (but with a t-statistic below one). Though it does not explain a large fraction of the variance in voting, the affinity model does describe a significant fraction.

Before discussing the results in detail, we consider whether we are using all the information in the sample. There are 372 votes, but these were cast by only 162 members. Twenty-six people cast four votes, 6 cast three votes and 120 cast two votes. Equation (3') is estimated as if all votes were independent; it takes no advantage of the presence of multiple votes by the same member. This might produce inefficient parameter estimates if prediction errors are small in absolute value for some voters, but large for others, a form of heteroskedasticity in the context of estimating probits. One test of this possibility is to examine whether incorrect predictions of voters' choices occur randomly, or whether an unusually large number of some voters' choices are predicted incorrectly, while others' choices are predicted well. Such a test shows very clearly that there are no significant unexplained individual effects in the prediction errors in these data.[11]

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[11]We performed a two-way analysis of variance of the "residuals" of the probit equation shown in the last two columns of Table 5. These are calculated as $VFWIN_i - N(\beta X_i)$, where the βs are the parameter estimates from the probits, X_i is the vector of independent variables, and N is the cumulative normal. This analysis is equivalent to testing the significance of voter-specific dummy variables in the probits. Using all 162 voters, the estimated $F(161, 210) = 1.06$ is not significantly different from zero even at the 90-percent level. If we delete those people for whom only one vote is

Table 6. Likelihood Ratio Tests of Alternative Specifications

Alternative Hypothesis:	χ^2	Degrees of freedom
Add Sex Match	7.62	1
Add Affinity Variables		
All:	35.30	8
Male Equation:	20.75	6
Female Equation:	5.87	7
Add Interactions	13.01	6

Using the estimates in column (2), consider the partial effects of switching from matching the loser to matching the winner. In interpreting the size of these effects it is important to remember the evidence from Table 4 that any match is a rare occurrence. Thus switching involves a comparison of the outcomes of two relatively infrequent events. It is therefore not surprising that such switches generate immense changes in the probability of voting for the winner. For example, a voter is almost certain to choose a candidate employed at the same institution; having one's Ph.D. degree from the same school as a candidate also makes one very likely to choose that candidate, as does having one's degree from the institution where a candidate is currently employed. Interestingly, if a candidate's degree is from one's own institution, we are (insignificantly) less likely to vote for him or her. We apparently admire our professors, but disdain our (former) graduate students.[12]

Having demonstrated that the average voter prefers a candidate of the same sex, we now examine whether this preference differs between men and women, and whether the ease of overcoming it differs by sex. This can be done by estimating the probits separately for men and women, as in columns (3) and (4). Alternatively, we can add interaction terms between a dummy variable for women and the affinity differences (including differences in the

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included, we find $F(151, 210) = 1.09$, also not significantly different from zero.

[12]This illustrates one of the corollaries of the Groucho Marx theory of clubs.

match with the candidates' sex). This is done in columns (5) and (6), with column (5) showing the main effect, interpretable as the effect for men, and column (6) showing the interactions with the dummy for women. The partial effects shown in column (5) are calculated for men, those in column (6) for women.[13] The two forms of this test will yield the same implications; we present both for clarity.

The χ^2-statistics in Table 6 summarize the results clearly. Adding the vector of six affinity differences to the probit for male voters adds significantly to our ability to explain their voting behavior: $\chi^2(6)$ = 16.81. Among women a test of the significance of the vector of affinity differences in column (4) yields $\chi^2(7)$ = 5.87, not significantly different from zero ($\chi^2_{.90}(7)$ = 12.02). Thus a male voter's choice between candidates is swayed by whether or not he matches a candidate along one or more of the eight matching criteria we have used. A female voter is essentially unmoved by matches along these criteria.

Additional evidence that men and women react differently to the affinity measures is provided by the estimates in columns (5) and (6). Other than the interaction on the difference in matching the candidate's sex, all five of the interactions are negative. This repeats the inference from the separate probits in columns (3) and (4). The estimates of the interactive

[13]A main-effect variable for women is also included. Because some of the affinity differences are identically zero for one sex or the other, not all interaction terms can be included in the estimates in column (6), and not all affinity differences can be included in the separate probits in (3) and (4).

model also demonstrate that the sex differences in the responses to the affinity measures are significant: As the final line of Table 6 shows, the set of interactions adds significantly to the probit ($\chi^2(6) = 13.01$, compared to a criterion of $\chi^2_{.95}(6) = 12.59$).

The interactive model also demonstrates the other crucial difference between men and women voters. The main effect on the difference in the match with the candidate's sex shows that men are (insignificantly) less likely to vote for a male candidate. Women, on the other hand, are significantly more likely to vote for a female candidate, other things, including the differences along other affinity dimensions, being the same. Indeed, holding other factors constant (for example, if there is no match along any dimension with either candidate), a woman is nearly certain to vote for a female candidate if the other candidate is a male.

These inferences are completely insensitive to the inclusion of a variety of additional variables. For example, allowing for different effects of $S^2_{iW} - S^2_{iL}$ among men of Asian or African origin had no impact, and the interaction term itself was insignificant. Matching a dummy variable indicating whether the voter was widely cited (more than 10 citations per annum) with the more-cited candidate (thus expanding the vector of differences $M^2_{iW} - M^2_{iL}$) was similarly insignificant and changed none of the other coefficients by more than one percent.

The robustness of the results to alternative specifications allows us to conclude that men prefer to vote for the opposite sex (though not significantly), but that their preference is greatly affected by a change in an affinity match other than gender. Women strongly prefer to vote for women; and that preference is quite insensitive to changes in other affinities. **This difference is truly striking**, and is especially convincing given the ability of the voting model to describe behavior.

VI. Explaining Sex Discrimination in Voting

We can view the results of Table 5 as reflecting sex differences in tastes for sex discrimination. These results appear to suggest that the women in this study strongly discriminate in favor of women, and men too have a (weak) taste for discrimination in favor of women. While no monetary equivalent can be assigned to the strength of these tastes, we can measure the change in the affinity variables necessary to overcome a voter's taste for discrimination and induce her or him to vote for a member of the opposite sex. These changes can thus be viewed as the relative prices of discrimination.

To infer these prices we compare the impact of switching an affinity from the losing to the winning candidate to the effect of switching the match with the sex of the candidates. Table 7 just takes the partial effects from columns (2), (5) and (6) of Table 5 and calculates the ratio (in percentage terms) of the effect for the affinity change in question to the effect for the sex match. Thus, for example, the figure 43.81 shows that switching from matching the loser's field to matching the winner's offsets nearly half the voter's desire to choose the loser if the loser and the voter are of the same sex.

Table 7. Percentage of "Taste for Sex Discrimination" Offset by Switching from Matching Loser to Matching Winner, Based on Table 5

	EQUATION		
VARIABLE	All Voters	Men	Women
School Level	5.96	-27.52	-33.89
Field	43.81	-83.79	-41.39
Voter's School with Ph.D. School of Candidate	-87.61	102.65	
Voter's Ph.D. School with School of Candidate	130.05	-233.33	
Voter's Ph.D. School with Ph.D. School of Candidate	107.34	-148.01	26.62
Ph.D. Year Squared (x 1000)	127.06	-183.18	59.06
Employer	205.96	-298.17	
State Employed	62.16	-99.69	-51.23

Consider the results in the first column of Table 7, based on the probit in column (2) of Table 5 that pools voters of both sexes. Matching along most affinity dimensions is sufficient to overcome the average voter's taste for a candidate of the same sex. The picture is very different when we disaggregate by sex and base the inferences on the interactive model in columns (5) and (6) of Table 5. Since men had a slight preference for voting for women, other things equal, the estimated prices for them are negative in all cases except the interaction of the voter's school with the Ph.D. school of the candidate. Switching an affinity from the losing male to the winning female candidate compounds the male voter's predilection to vote for the female candidate. Among women the effects of switching the affinity matches are mixed, and even if positive they are insufficient to offset women voters' very strong preference for female candidates. This result is another reflection of the inference from Table 5 that women voters will choose female candidates with very little regard to affinity matches with a male candidate.

Taking a standard economic approach to these results, one way of interpreting them is to infer that these women have a strong taste for discrimination in favor of their own sex that is not easily overcome by changes in the cost of discriminating. Of course, unobserved heterogeneity between the sexes along other dimensions may be causing the difference in voting behavior at the means. Unless these unobserved differences are correlated with the affinity measures, though, they cannot explain away our results on the relative importance of these measures by sex. The men in our sample, on the other hand, do not discriminate, or may even have negative tastes for discrimination; and their decisions are easily altered by changes in the cost of discriminating.

A simple objection to this interpretation is that identifying "discrimination" as a response to matching the sex of a candidate and calling the other matches "affinities" is arbitrary. One might just as easily argue that voters in our sample discriminate in favor of candidates in their own field, or who taught at their Ph.D. institution. This objection is reasonable; but if one accepts it, one still needs to explain why an affinity on the characteristic "same gender" has no, or even a negative impact on men's voting, but a very strong positive effect on women's voting, and why other affinities affect men's but not women's choices. This semantic reversal does not vitiate the results; it merely recasts the question, but still leaves it unresolved.

If correct and generalizable, our inferences suggest that, as women's representation in high-prestige white-collar occupations such as college teaching increases, their economic outcomes will improve rapidly relative to those of men. Can we, however, generalize from these surprising results? Or is there something specific to the case under study? Schoen (1988) examined (without individual identification) the votes for male and female candidates for offices in another academic association where women constituted a far larger minority (37.8 percent) of the membership. Members were somewhat more likely to vote for candidates of their own sex; but in none of the elections were the differences between men and women statistically significant.

The two sets of results are consistent with the hypothesis that members of a small minority group tend to identify strongly with each other, while large minorities, who are less likely to see themselves to be at a particular disadvantage, behave differently. This speculation is supported by Kanter (1977), who concluded that a small number of "tokens" behave differently from a more substantial minority. It is the same kind of behavior exhibited by members of a small immigrant group crowding into an enclave economy where they can rely on others in their group (Borjas, 1990, Chapter 10).

There are several possibilities why the men in our sample had a slight negative taste for discrimination and why this outcome might differ if women were more widely represented in the group (or, more broadly, in the occupation). Men may tend to be unduly impressed by reasonably competent women in nontraditional professions (Ferber et al., 1979). Also, the members of a small minority are more readily noticed than those in a larger minority group. This may give them an advantage in elections where most voters are not likely to know all the candidates.

There is some evidence for this. In this association in which under one-sixth of the members are women, women constituted five of the twenty candidates for the ten vice-president positions during a recent five-year period. Two of the five people elected to the uncontested office of president during this period were women. During the preceeding twenty years there were nine women among the forty vice-presidents elected, and two were elected president. One might argue that officers other than president in such professional associations have no real power, and that reverse discrimination by men is a very low-cost way of expiating perceived guilt. The women candidates for these positions may thus receive a sort of sympathy vote.

The main point is that gender identification may be the relevant objective affinity measure for women where and when they are a small minority. One can interpret our findings that way, or one can infer that women (academics, or perhaps women generally) have stronger tastes for sex discrimination than do men. Our data and estimates do not allow us to distinguish between these alternatives.

VII. Conclusions

In this study we have proposed and tested a formal model of voting based on candidates' quality and the affinity of the voters to the candidates. We estimated the model over data covering nearly 400 votes in elections in a professional association where we were able to identify the voters by name, and thus by gender and other characteristics. In this mostly male organization women voted disproportionately for female candidates, and their votes are virtually unswayed by other affinities with a candidate. Men were slightly more likely to vote for female candidates as well, but their votes were strongly affected by their other affinities with the candidates.

Had we merely looked at outcomes, we would have seen that women won two of the three male-female elections despite a very heavily male electorate. We would have inferred that at the margin the electorate has a negative taste for discrimination against women. That would have been analogous (though with the reverse result) to using information produced by standard earnings regressions to infer the presence of racial or sex discrimination. Like those studies, the link would have been between the outcomes and the mix of the underlying population (of fellow workers, employers or consumers). What we have done here instead is modeled and derived explicit information on the tastes of the population and how they generate discriminatory outcomes. By doing so we have been able to infer how tastes for discrimination can be overcome by changes in the relevant market characteristics of groups that are the focus of those tastes.

By placing the analysis of this novel set of data in the context of the theory of discrimination we have been able to expand beyond the standard studies in this voluminous literature. Is this advance limited to the specific case of voting and to the narrow example of a small professional association of economists, or can it be applied much more broadly? Clearly, one cannot usually obtain data on the explicit expression of agents' tastes that will allow direct inferences of how tastes interact with prices to generate outcomes. What is surprising, though, is how little effort has been devoted to trying to model tastes and thus draw structural inferences about discrimination. By concentrating on outcomes the empirical literature has only estimated reduced forms --- usually describing wages and employment. With the growth of attempts to infer the structure of tastes and their effects on outcomes in other areas, for example, trade-union bargaining, and compensating wage differentials, there is no reason why similar efforts could not be fruitfully applied to the study of discrimination.[14] What we have learned here should demonstrate the gains that could flow from such an application.

[14] Dertouzos and Pencavel (1981) is one of the first to try to infer the tastes of union members. Rosen (1986) presents a comprehensive survey of work on compensating wage differentials, a subject that necessarily includes a discussion of tastes.

ACKNOWLEDGEMENTS

Associate professor of economics, Illinois State University; professor of economics, University of Illinois--Urbana-Champaign; professor of economics, Michigan State University and research associate, National Bureau of Economic Research. Helpful comments were received from colleagues at each of our universities, and from seminar participants at Curtin, Flinders and LaTrobe Universities. The authors thank Kin-yu Lee for his diligent research assistance, and the Executive Committee of the Association that approved our use of the data. A LOTUS file containing the underlying data (purged of any identifying characteristics) is available upon request from the authors.

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