Patience and Turnout *

James H. Fowler†
University of California, Davis

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Abstract

A number of scholars have demonstrated that voter turnout is influenced by the *costs* of processing information and going to the polls, and the policy *benefits* associated with the outcome of the election. However, no one has yet noted that the costs of voting are paid *on and before* Election Day while policy benefits may not materialize until several days, months, or even years *later*. Since the costs of voting must be borne before the benefits are realized, people who are more patient should be more willing to vote. I use a "choice game" from experimental economics to estimate individual discount factors which are used to measure patience. I then show that patience significantly increases voter turnout. Moreover, patience is significantly related to two other correlates of turnout, church attendance and political interest. The results suggest that variation in patience may explain why those who follow politics and those who attend church are more likely to vote.

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† Department of Political Science, University of California, Davis, One Shields Avenue, Davis, CA 95616. (530) 752-1649. E-mail: jhfowler@ucdavis.edu

For decades, social scientists have sought to explain why people vote (Campbell et al. 1960; Rosenstone and Hansen 1993; Verba, Schlozman, and Brady 1995; Wolfinger and Rosenstone 1980). Several empirical studies suggest that voter turnout is influenced by the costs of processing information and going to the polls, and the policy benefits associated with the outcome of the election (Franklin and Grier 1997; Hansen, Palfrey, and Rosenthal 1987; Highton 1997; Jackson 2000; Kaempfer and Lowenberg 1993; Knack 1997; Knack 2001; Nagler 1991). However, none of these studies consider the fact that the costs of voting are paid *on and before* Election Day while policy benefits may not materialize until several days, months, or even years *later*. If people must bear the cost of participation long before they see its effects, then *patience* should also affect individual turnout decisions. Patient individuals who place greater value on the future benefits of participation should be more likely to vote, while impatient individuals who place greater value on the up-front costs of participation should be less likely to vote.

In this article I test the relationship between patience and voter turnout in the laboratory by using a technique from experimental economics. Subjects are asked a number of standard questions regarding their socioeconomic status, political beliefs, and turnout behavior. They then play a "choice game" (Coller and Williams 1999; Harrison, Lau, and Williams 2002; Harrison et al. 2004) in which they are asked to make a series of choices between a prize that will be awarded in 30 days and a larger prize that will be awarded in 60 days. The choices they make reveal the degree to which subjects are willing to wait for future benefits and can be used to estimate how much they discount future payoffs. In other words, this procedure yields a measure of the *patience* of each individual.

Regression analysis of the turnout behavior of the subjects in the experiment suggests that more patient individuals are significantly more likely to vote. Moreover, patience is found to be positively related to two other widely-studied correlates of turnout, political interest and church attendance. The results suggest that we may need to reevaluate theories that have been advanced to explain the relationship between political interest, church attendance, and voter turnout.

Patience and the Costs and Benefits of Voting

A wide range of empirical studies of voting have shown that turnout is influenced by the *costs* associated with making a decision and going to the polls and the *benefits* associated with the outcome of the election (Aldrich 1993). For example, Verba, et al. (1995) argue that socioeconomic status variables like education affect turnout because they influence the cost of obtaining and processing political information. Restrictive registration laws that increase the cost of voting also discourage turnout (Franklin and Grier 1997; Highton 1997; Knack 1997; Knack 2001; Nagler 1991), while liberal absentee ballot laws and all-mail elections encourage it (Karp and Banducci 2000; Oliver 1996; Southwell and Burchett 2000). Even rainfall on election day has been shown to depress turnout among some voters (Knack 1994). Although less well documented, benefits related to the election outcome also have an effect on turnout. For example, people are more likely to vote in "high stakes" elections that have larger policy effects (Hansen, Palfrey, and Rosenthal 1987; Jackson 2000; Wolfinger and Rosenstone 1980) and when they think there is a larger difference in the policies offered by the competing parties (Kaempfer and Lowenberg 1993).[1]

An important oversight in this literature is that the costs of voting are paid on or before Election Day, but any benefits related to the outcome are not obtained until *after* the election. In fact, it may take several years for an election result to yield the policy outcomes that motivate citizens to go to the polls. Given that present costs are being compared to future benefits, subjective time preferences may have an impact on the decision to vote. Patient citizens might value future policy benefits more and be more likely to vote. Impatient citizens might focus more on the costs of voting and be less likely to vote. Thus variation in patience may be an important factor in explaining individual turnout decisions.

[1] The expressive benefits of voting and benefits related to fulfilling a social obligation may also play a role in the turnout decision, but controlling for these factors does not eliminate the influence of benefits related to the election outcome (Blais, Young, and Lapp 2000).

Patience and the Discount Factor

To test the effect of patience on turnout, we need a measure for how much people are willing to wait for future benefits. One way experimental economists have tackled this problem is by presenting subjects with a series of choices between two payoffs, a smaller amount paid now and a larger amount paid later. Each choice yields information about how much a subject *discounts* future payoffs, which allows us to estimate the subject's *discount factor* (δ). For example, if a subject chooses \$90 now instead of \$100 later, we know that she values the earlier payment more than the later payment. This implies a subjective inequality for her discount factor: \$90 > δ \$100 or $\delta < 0.9$ for the period between the present and future payoff. If the same subject also chooses \$100 later instead of \$80 now for the same time period, then we know that \$80 < δ \$100 and the discount factor must lie in the interval $0.8 < \delta < 0.9$. A series of choices with different values for the same time period allows us to identify the interval in which the discount factor falls for each subject. Those who more frequently choose the future payoff will have higher discount factors. Thus, there should be a positive relationship between the discount factor and patience.

One potential wrinkle in the procedure for measuring patience is that discount factors may be hyperbolic, meaning that people tend to value the present much more strongly than other periods (Laibson 1997). As a result, recent efforts by economists to elicit discount factors usually avoid choices with immediate payments and instead give subjects two future choices (Coller and Williams 1999; Harrison, Lau, and Williams 2002). This work suggests that beyond the immediate present the discount factor is approximately constant—people make consistent choices when they are faced with similar future time intervals. For example, subjects make the same choices between a smaller payment in 30 days and a larger payment in 60 days as they do when they must choose between a smaller payment in 90 days and a larger payment in 120 days.

Research Design and Subject Profile

In May 2004, about 350 subjects were recruited from two introductory undergraduate political science courses to participate in a study administered by computer. Subjects were offered credit towards their course grade for their participation in the study, and 249 (about 70%) of them chose to participate. Of these, 235 were eligible to vote in the March 2004 California primary election. Each subject answered several standard socioeconomic and political attitude questions (exact question wording can be found in the appendix).

Subjects ranged in age from 18 to 27 years, were evenly divided between women and men, and about 53% were minorities. They were asked whether or not they voted in the March 2004 California primary, which included nominations for national and local offices and four widely publicized ballot measures related to the California budget crisis. Typical for a younger population, about 21% of those eligible say they voted, compared to 31% in the population as a whole. The average subject leaned left and Democratic, placing herself at 3.57 on the seven point liberal conservative scale and 3.27 on the seven point party identification scale. About 39% said they were very interested in the election campaign, but only 34% agreed that voting in elections is a duty. Finally, there was a wide range of religious observance, with the average subject attending services about once a month.

At the end of the survey, each subject was informed that he or she was eligible to win a prize and then asked to make a series of choices between a $100 prize in 30 days or a larger prize in 60 days (see the appendix for a full description). Following Harrison, Lau, and Williams (2002) both a dollar amount and an effective annual interest rate were displayed in order to help subjects think about their choices. At the conclusion of the survey a lottery was used to choose a single prize winner and another lottery to decide which set of alternatives determined the payoff. It should be noted that just like previous experiments using this method (Coller and Williams 1999; Harrison, Lau, and Williams 2002), the expected value of the prize to each subject in this experiment is quite low (approximately $\$100/N \approx \$0.40$ to each subject). However, Camerer and Hogarth (1999) show that stake size has only a small effect on average behavior in experiments like these and the biggest effect of stakes on

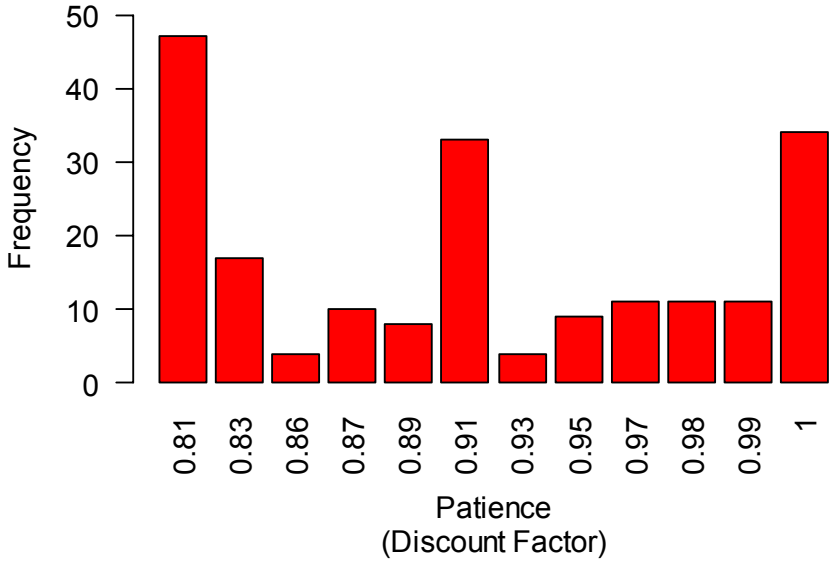
behavior is changing from zero to positive stakes. Coller and Williams (1999) specifically show that discount factors elicited with a single prize are significantly different than discount factors implied by hypothetical choices, suggesting that even a small prize incentive causes subjects to take their decisions seriously.

If subjects are consistent and make no mistakes, they should always choose the earlier payoff, always choose the later payoff, or switch from the earlier payoff to the later payoff at exactly one point during their series of choices. The point at which they switch indicates the interval of the implied discount factor. For example, a subject may choose the earlier $100 prize when the later prize is less than or equal to $104.25 and then switch to the later prize for all values greater than or equal to $106.44. If so, then the implied discount factor is estimated to fall somewhere between $\$100/\$106.44 \approx 0.94$ and $\$100/\$104.25 \approx 0.96$. About 82% of the subjects in the experiment made consistent decisions across all twenty choices, while 15% made only one 'mistake'. Inconsistent choices are dropped from the data as in Harrison, Lau, and Williams (2002) and Coller and Williams (1999), but none of the analysis changes significantly when the first observed choice of the larger prize, the last observed choice of the smaller prize, or multiple imputation is used to estimate the remaining discount factors.

Figure 1 shows the distribution of monthly discount factors implied by subject responses in this experiment.[2] For subjects who always choose the earlier or later prize, discount factors are set to the value implied by maximum and minimum values, respectively. All other values are set to the midpoints of the estimated intervals. Notice that there are modes at the endpoints, suggesting that several subjects were either willing to wait for *all* future prizes (the patient), or not willing to wait for any of them (the impatient). There is another mode in the center where subjects chose the future prize once its value rose

[2] Although these experimental discount factors may be high relative to those implied by *annual* market rates of interest, they fall within the wide range of discount factors estimated by other scholars in the literature (see Frederick, Loewenstein, and O'Donoghue 2002 for a comprehensive review) and should still be useful for resolving whether or not people who prefer the earlier prize behave differently than people who prefer the later prize.

Figure 1. Distribution of Patience in the Discount Factor Experiment



above $110. This is consistent with evidence from Harrison et al. (2004) showing that subjects sometimes focus on dollar values instead of rates of return and thus may be influenced by "focal points" in the dollar amount. The rest of the discount factor estimates span the distribution, ensuring a wide range of variation for evaluating the influence of patience on turnout.

Patience and Turnout

To test the hypothesis that patient subjects are more likely to vote, I regress individual turnout on the discount factor measured in the experiment. Table 1 shows results from several logit models. Model 1 with no controls indicates that the relationship between patience and turnout is positive and significant. People who are more willing to wait for a larger prize in the choice game are more likely to vote, supporting the connection between patience and turnout.

A number of factors are added to Model 2 which are widely thought to affect turnout. Verba, et al. (1995) argue that individuals with higher socioeconomic status (SES) are more likely to vote because their costs are lower, so I include variables like age, gender, race, and marital status. SES variables for parents (income and education) are also added because they have been shown to be important for the development of turnout behavior among young people (Plutzer 2002). Verba, et al. (1995) suggest the

Table 1. Effect of Patience and Other Variables on Voter Turnout

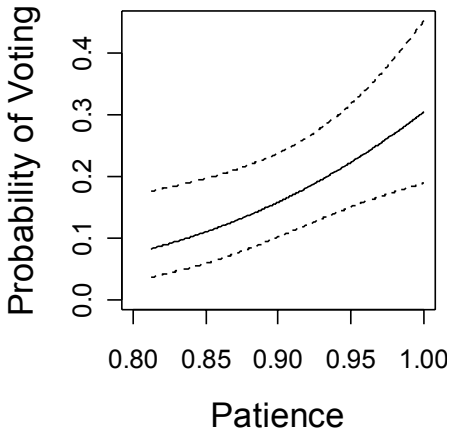
	Dependent Variable: Did Subject Vote?								
	Model 1			Model 2			Model 3		
	Coef. (S.E.)	95% Conf. Interval		Coef. (S.E.)	95% Conf. Interval		Coef. (S.E.)	95% Conf. Interval	
Patience	4.91	0.02	10.01	8.21	1.58	15.38	8.48	2.53	14.93
	(2.54)			(3.49)			(3.14)		
Age				0.27	-0.01	0.55	0.25	-0.01	0.52
				(0.14)			(0.13)		
Female				-0.87	-1.92	0.13	-0.82	-1.76	0.07
				(0.52)			(0.46)		
Race				0.14	-3.06	2.53			
				(1.32)					
Married				0.38	-5.66	6.14			
				(4.17)					
Parents' Income				0.27	-0.01	0.58	0.26	0.04	0.50
				(0.15)			(0.11)		
Parents' Education				-0.10	-0.46	0.25			
				(0.18)					
Strength of Party ID				0.18	-0.37	0.74			
				(0.28)					
Political Interest				0.32	-0.55	1.23			
				(0.45)					
Reads the News				0.32	0.09	0.56	0.38	0.17	0.60
				(0.12)			(0.11)		
Watches the News				0.19	-0.03	0.41	0.20	0.02	0.40
				(0.11)			(0.10)		
Political Information				0.18	-0.15	0.52			
				(0.17)					
External Efficacy				0.17	-0.40	0.75			
				(0.29)					
Internal Efficacy				0.00	-0.37	0.36			
				(0.18)					
Civic Duty				-0.08	-0.41	0.24			
				(0.17)					
Church Attendance				-0.04	-0.40	0.31			
				(0.18)					
Constant	-5.71	-10.45	-1.24	-18.84	-29.23	-9.62	-17.16	-26.27	-8.99
	(2.34)			(4.97)			(4.38)		
AIC	198.83			173.35			156.91		
N	186			170			170		

Note: Model estimated using GLM with logit link function. Standard errors in parentheses, 95% confidence intervals are from profile likelihood. Model 3 specified using stepwise model selection by exact AIC on Model 2.

inclusion of several other variables in turnout models. Interest in politics, the frequency of news reading or viewing, and the ability to answer basic questions about the government indicate political engagement, which tends to correlate with turnout. Moreover, if people feel that they can understand political issues (internal efficacy) and their government responds to them (external efficacy), then they are more likely to go to the polls. Church attendance has also been found to be significantly related to turnout in a number of studies (e.g. Timpone 1998). In particular, Verba, et al. (1995) argue that church attendance is important because people acquire civic skills in religious organizations (writing letters, public speaking, and so on) that may make it easier for them to participate in politics. Finally, I include a variable for civic duty (Riker and Ordeshook 1968) to control for the possibility that the feeling that voting is an obligation causes subjects to turnout. Details on coding and question wording for all these controls can be found in the appendix.

Even with the addition of numerous controls, Model 2 shows that patience continues to significantly affect turnout. Compare this with the fact that many variables related to conventional explanations of turnout such as strength of party identification and political interest are not significant in the model. This may be due to loss of efficiency resulting from so many covariates, so I use stepwise AIC model selection to eliminate variables and generate Model 3. This model suggests that the only variables that significantly affect turnout are patience, parents' income, and news readership and viewership. To make the results for patience concrete, Figure 2 shows the predicted effect of patience on the probability of voting while holding all other values at their means. The least patient subjects vote at a rate of about 8% compared to 30% for the most patient subjects. These results suggest that subjective time preferences have an important effect on the decision to vote.

Figure 2. Effect of Patience on Turnout



Note: Predicted turnout probabilities and 95% confidence intervals calculated from Model 3 in Table 1 by varying patience and holding all other values at their means.

Patience and the Determinants of Turnout

How does patience directly relate to other variables thought to affect turnout? Table 2 presents sufficient statistics and correlations with patience for each of the control variables used above. Notice that patience is significantly correlated with both political interest and church attendance. These correlations have two important implications for the literature on turnout.

First, the relationship between political interest and turnout may be epiphenomenal. Although a number of studies show a positive relationship between political interest and turnout (e.g. Timpone 1998; Verba, Schlozman, and Brady 1995), none of these includes a control for patience. The data here indicate that patience is associated with *both* political interest and turnout, but when patience and political interest are included in a model of turnout only patience is significant. This suggests that the relationship between political interest and turnout is being driven by the effect of patience on both. In other words, political interest may not cause turnout—instead it might be a proxy for patience.

Table 2. Study Variables and Their Correlations with Patience

Variable	Sufficient Statistics				Correlation with Patience	p-value
	Mean	S.D.	Min.	Max.		
Political Interest	2.32	0.60	1	3	0.20	0.00
Church Attendance	2.31	1.34	1	5	0.20	0.00
Civic Duty	2.67	1.32	1	5	-0.12	0.08
Strength of Party ID	2.99	0.84	1	4	0.08	0.25
Female	0.49	0.50	0	1	0.08	0.25
Internal Efficacy	2.58	1.29	1	5	0.07	0.32
Parents' Education	4.23	1.59	1	7	-0.06	0.37
Political Information	4.76	1.60	1	8	0.03	0.71
Reads the News	3.29	2.24	0	7	0.02	0.73
Parents' Income	5.73	2.19	1	8	-0.01	0.86
Married	0.01	0.09	0	1	-0.01	0.87
Age	19.77	1.62	18	27	-0.01	0.88
Race	0.02	0.15	0	1	0.01	0.90
External Efficacy	2.37	0.83	0	4	0.00	0.93
Watches the News	2.89	2.21	0	7	0.00	0.99

Second, the relationship between church attendance and turnout may also be epiphenomenal. A number of studies show that church attendance significantly increases the likelihood of turnout (e.g. Timpone 1998; Verba, Schlozman, and Brady 1995). Other studies suggest a link between patience and church attendance. For example, Iannaccone (1998) shows that those who believe in an afterlife are more likely to attend church, while Becker and Mulligan (1997, p.741) argue that religious people have higher discount factors because they believe in an afterlife and thus have longer time horizons. The data in this study indicate that patience is associated with *both* church attendance and turnout, but when patience and church attendance are included in a model of turnout only patience is significant. This suggests that the relationship between church attendance and turnout may be driven by the effect of patience on both. We should thus reevaluate theories that religious affiliation increases turnout because of the organizational effect it has on attendees (e.g. Verba, Schlozman, and Brady 1995). It may be the case that the relationship between church attendance and turnout is purely coincidental to the fact that religious groups tend to attract more patient individuals.

Conclusion

A number of scholars have demonstrated that individual decisions to vote depend on the costs of processing information and going to the polls, and the benefits associated with the outcome of the election. This article draws attention to the fact that the costs of turnout are borne on Election Day and before while benefits related to the outcome of the election are not reaped until much later. This suggests that patience plays an important role in the turnout decision. Patient citizens who are willing to wait for future benefits should be more likely to vote because they place a greater value on the impact of the election on future policy changes. Impatient citizens should be less likely to vote because they are more influenced by the immediate burdens of decision-making and physical participation.

Evidence from the laboratory supports this hypothesis. Subjects were given a series of choices between an earlier, smaller prize and a later, larger prize. Those who consistently chose the later prize were significantly more likely to vote than those who consistently chose the earlier prize. The statistical relationship between patience and turnout remains even when we control for numerous other factors thought to affect the decision to vote. Patience is also found to correlate with political interest and church attendance, which suggests that variation in patience may be able to explain their relationship with turnout.

Finally, one might argue that these results are of limited value because they are based on the behavior of college students who are not representative of the population as a whole. However, the first few years of adulthood are probably the most critical for the formation of habitual political behavior (Highton and Wolfinger 2001; Plutzer 2002). Even if future work suggests that patience cannot explain the habits of older adults, it might still help to explain how these habits are formed.

Appendix: Variable Description and Question Wording

The discount factor is based on behavior in the choice game. The game was described to subjects as follows: "Two prizes will be awarded in class at the conclusion of this study. If you are chosen to receive the second prize[3], your answers to the following series of questions will determine the amount of the award and the date of payment. You will be asked to choose the payment option that you would prefer in each of 20 different payoff alternatives. Note that each of the 20 payoff alternatives will pay $100 in 30 days (option A) or $100 + $x in 60 days (option B), where x differs under each payoff alternative. For each payoff alternative you will select the payment option (A or B) that you would prefer if you are chosen to receive the prize. When the study is completed, a random drawing will be held in class to choose which one of the 20 payoff alternatives will determine the prize and another random drawing will be held to determine the one person who will receive the second prize. When and how much the winner will be paid will be based on the payment option he or she chooses under the payoff alternative selected.

"In the table of alternatives there is a column labeled "Annual Interest Rate." This is the interest rate required on the initial balance of $100 (option A) that would yield the amount in option B, after accounting for the fact that interest is compounded daily on the initial balance. For comparison, most banks are currently paying 1% to 2% interest on savings accounts or certificates of deposits. Most credit card companies are charging college students 12% to 16% interest to borrow money. Thus, you have an opportunity to earn money at much higher rates of interest in this study. Below is the table of the payment options for the 20 different alternatives. For payoff alternative 1, would you prefer option A ($100 in 30 days) or option B ($100.17 in 60 days)?" Subjects were asked to make choices over twenty sets of alternatives. Table 1 shows each set of alternatives as they were displayed to the subjects.

[3] There was another prize related to a dictator game experiment that came earlier in the omnibus survey. Responses in the other experiment are not correlated with those made in the choice game.

Table A. Choices Available to Subjects

Payoff Alternative	Payment Option A (pays amount below in 30 days)	Payment Option B (pays amount below in 60 days)	Annual Interest Rate	Payment Option Preferred (choose A or B)
1	$100.00	$100.17	2.0%	A B
2	$100.00	$100.25	3.0%	A B
3	$100.00	$100.33	4.0%	A B
4	$100.00	$100.42	5.0%	A B
5	$100.00	$100.63	7.5%	A B
6	$100.00	$100.84	10.0%	A B
7	$100.00	$101.05	12.5%	A B
8	$100.00	$101.26	15.0%	A B
9	$100.00	$101.47	17.5%	A B
10	$100.00	$101.68	20.0%	A B
11	$100.00	$102.10	25.0%	A B
12	$100.00	$102.96	35.0%	A B
13	$100.00	$104.25	50.0%	A B
14	$100.00	$106.44	75.0%	A B
15	$100.00	$108.68	100.0%	A B
16	$100.00	$110.96	125.0%	A B
17	$100.00	$113.29	150.0%	A B
18	$100.00	$115.66	175.0%	A B
19	$100.00	$118.08	200.0%	A B
20	$100.00	$123.07	250.0%	A B

Political information is the number of correct answers to the following 8 multiple choice and open answer questions. "Which party currently has the most members in the House of Representatives in Washington?" (Republican / Democrat) "Which party currently has the most members in the Senate in Washington?" (Republican / Democrat) "Who has the final responsibility to decide if a law is constitutional or not?" (President / Congress / Supreme Court) "Whose responsibility is it to nominate judges to the Federal Courts?" (President / Congress / Supreme Court) "What is the job held by William Rehnquist?" "What is the job held by Tony Blair?" "What is the job held by John Ashcroft?" "What is the job held by Bill Frist?"

Reads the News and Watches the News were based on answers to these two questions: "During the past week, about how many days did you read a daily newspaper (other than the CALIFORNIA

AGGIE) or consult an online news source?" and "During the past week, about how many days did you watch a national network news program on television?"

Parents' Income is the answer to: "Please choose the category that describes the total amount of INCOME earned in 2003 by your PARENTS or GUARDIANS. Consider all forms of income, including salaries, tips, interest and dividend payments, scholarship support, student loans, parental support, social security, alimony, and child support, and others." (1 = $15,000 or under, 2 = $15,001 - $25,000, 3 = $25,001 - $35,000, 4 = $35,001 - $50,000, 5 = $50,001 - $65,000, 6 = $65,001 - $80,000, 7 = $80,001 - $100,000, 8 = over $100,000) Parents' Education is the average for both parents on "What was the highest level of education that your father [mother] (or male [female] guardian) completed?" 1 = Less than high school, 2 = High school diploma, 3 = Vocational School, 4 = Attended College, 5 = Bachelor's, 6 = Graduate School.

For external efficacy I follow Craig, Niemi and Silver (1990) and Niemi, Craig, and Mattei (1991) by creating an index that sums responses from four questions: "People like me don't have any say about what the government does", "I don't think public officials care much what people like me think", "How much do you feel that having elections makes the government pay attention to what the people think?", and "Over the years, how much attention do you feel the government pays to what the people think when it decides what to do?". The first two questions are coded 0 = agree, 0.5 = neither, and 1 = disagree in 1976-1984. For 1988 they are 0 = agree strongly, 0.25 = agree somewhat, 0.5 = neither, 0.75 = disagree somewhat, and 1 = disagree strongly. The third and fourth questions are coded 1 = a good deal, 0.5 = some, and 0 = not much.

For the remaining variables I follow the coding procedure in Timpone (1998) and the question wording used in the NES. Age is in number of years. Married is 1 for married and 0 for all others. Church attendance is an index of religious attendance, 1 = never/no religious preference, 2 = a few times a year, 3 = once or twice a month, 4 = almost every week, and 5 = every week. Internal efficacy is a binary response (0 = true, 1 = false) to the question "Sometimes politics and government seem so complicated that a person like me can't really understand what's going on." Strength of party

identification is coded 1 = independents and apoliticals, 2 = independents leaning towards a party, 3 = weak partisans, and 4 = strong partisans. Civic duty is coded 1 = agree strongly, 2 = agree somewhat, 3 = neither, 4 = disagree somewhat, and 5 = disagree strongly for "If a person doesn't care how an election comes out he shouldn't vote in it." Female is 1 for female, 0 for male. Race is 1 for black, 0 for others. Interest in Politics is the answer to the question "Some people don't pay much attention to political campaigns. How interested are you in the 2004 presidential election campaign?" (1 = not much interested, 2 = somewhat interested, 3 = very much interested)

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