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BUYING A LOTTERY TICKET TO HELP THE POOR

ALTRUISM, CIVIC DUTY, AND SELF-INTEREST IN THE DECISION TO VOTE

Richard Jankowski

ABSTRACT

A core problem of rational-actor models for politics is the seeming irrationality of voting, namely, that it is irrational for voters to vote and to be informed about politics. A simple cost–benefit analysis indicates that the probability of one's vote being decisive is so small that the costs of voting exceed the benefits. Some authors propose that civic duty or expressive voting explain why individuals vote. However, these explanations are not completely satisfactory. Five facts characterize American voting behavior: (1) the costs of voting, e.g. registration, etc. affect the probability of voting; (2) turnout varies substantially according to the type of election. In the United States, turnout for presidential elections is about 50%; for off-year elections it is about 35%; and for state and local elections it is about 25%; (3) more educated voters have a higher probability of voting; (4) individuals have a tendency to abstain from voting for races appearing lower on the ballot (the roll-off phenomenon); and (5) voters often vote strategically when their most preferred candidate has no chance of winning. Neither civic duty nor expressive voting can explain all five of these facts of voting. I argue that any successful analysis of voting must not only explain the positive turnout in elections, but also these five facts of voting. I expand the basic voting calculus model by incorporating both a pure altruistic motive and a more extensive incomplete-information component. The incorporation into the standard rational-actor model of voting of a low-grade sense of altruism is essential. The resulting analysis allows me to explain the five facts of American voting behavior.

KEY WORDS • altruism • civic duty • rationality • self-interest • voting

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1. Introduction

A rational-actor (or any other) analysis of politics must start with the decision to participate in the political process. However, it is commonly believed under a rational choice theory going back to Downs (1957) that it is irrational for a citizen to vote and to acquire political information. Nevertheless, many rational-choice analyses of elections, parties, and interest groups start with the assumption that citizens vote, as empirically is the case. Green and Shapiro (1994) go so far as to argue that this conundrum is a fatal flaw in rational-choice analysis. This paper attempts to resolve this apparent anomaly.

A standard remedy to the problem of participation and information is to posit a sense of civic duty on the part of the citizen (Riker and Ordeshook 1968). This remedy is inadequate for a number of reasons. First, we need a more extensive elaboration of what is meant by duty. The current debate over altruism indicates that duty and altruism are complex phenomena, with different implications depending upon the definition used. Second, the problem with the standard remedy is that it cannot explain the five empirical facts of voting behavior: (1) in the United States we observe that approximately 50% of eligible voters vote during presidential election years, approximately 30–35% vote in off-year elections, and 20–25% vote during state and local elections (Teixeira 1987); (2) we observe that the better educated and informed citizens have a higher propensity to vote. Wolfinger and Rosenstone (1980) argue that formal education is the most important variable in explaining differences in turnout in the United States; (3) voter turnout is affected by changes in the costs of voting (Teixiera 1992: especially ch. 4). For example, before 1960, Maine and Minnesota had the lowest turnout rates in the United States. A series of reforms reduced the costs of voting in both states. As a result, Maine and Minnesota are usually ranked one and two in terms of turnout; (4) even when voters cast their ballot they frequently do not vote for all the races. This is known as the roll-off (ballot incompletion) phenomenon (Vanderleeuw and Utter 1993); and (5) voters frequently vote strategically. When their most-preferred candidate has little chance of winning, they vote for their second-most-preferred candidate (Cain 1978; Abramson et al. 1992). The inclusion of civic duty cannot explain all these phenomena. Any 'successful' analysis of voting must explain *all* of these phenomena.

Here, I offer an alternative interpretation for the decision to vote, and also the decision to become informed about politics. First, I show that pure altruism, rather than civic duty or expressive voting, is a necessary starting point in our understanding of the voting decision. This incorporation of altruistic behavior has substantial implications for all rational-actor models of human behavior. Second, I show that in addition to altruistic behavior, the contingent nature of our choices is an essential feature of the political process, as opposed to most market decisions. This contingent nature of political choices goes beyond the fact that voting is a group process. Public policies are the product of actions of House representatives, senators and the president. Voters must also make a probabilistic assessment of which offices have a greater or lesser ability to influence policies. Third, I show that my modified version of rational choice theory can explain the empirical facts of voter turnout as specified earlier.

2. The Standard Calculus of Voting

To show that it is irrational to vote and become informed about politics is fairly straightforward based upon expected utility analysis.[1] (A game-theoretic analysis results in different conclusions, as I will presently discuss.) Assume that there are two candidates for office is defined as the difference in personal benefit that a voter receives if candidate CA is elected as opposed to CB. The citizen can either vote in the election or abstain.[2] There is some positive cost ($C > 0$) associated with the act of voting. Hence, the expected utility of the two actions is compared, and voting is preferred when equation (1) holds:

$$u(vote\ C_A) > u(abstain). \tag{1}$$

Thus, one votes when:

$$[p(C_A\ wins|vote\ C_A) - p(C_A\ wins)]B_1 > C.$$

A voter can influence the outcome of an election in two ways. First, her vote can overcome a tie between the candidates and produce a winner. Second, her vote can create a tie when the opposing candidate has a plurality of one vote. Hence, a random tie-breaking procedure gives the voter's preferred candidate a 50/50 chance of winning. If we define p_1 as the increased probability of CA winning,

given that citizen i votes for the candidate as opposed to abstaining, the expected utility of voting for citizen i is:

$$EU_i = \frac{p_1 B_1}{2} - C. \tag{2}$$

And the citizen votes only when:

$$\frac{p_1 B_1}{2} > C.$$

Given that p_1 is vanishingly small, it is irrational for citizens to vote even if B_1 is unrealistically large, e.g. one million dollars, and the costs of voting are just \$4.00. (It is assumed that the physical costs of voting are relatively small. The exact figure is arbitrary and is just meant to illustrate the cost–benefit analysis.) The probability that a vote will be decisive is a function of two factors: the closeness of the election, and the number of voters. In a very close election with 100,000,000 voters, the probability that one's vote will be decisive is about 0.00008. But if the election is not very close the probability that one's vote will be decisive becomes infinitesimally small (Owen and Grofman 1984). If we adopt $p = 1/1{,}000{,}000$, the expected utility of voting is 50 cents. Thus, the irrationality of voting is robust with regard to realistic and unrealistic values of B_1.

In terms of formal analysis, the benefits from voting can include any benefit; the only restriction is that preferences must be transitive. However, Downs, who initiated this discussion of rational voting behavior, states (1957: 27), 'whenever we speak of rational behavior, we always mean rational behavior directed primarily towards selfish ends'. Hence, benefits from voting mean the selfish or personal benefits from having one's preferred candidate elected.

Downs further states (1957: 37): 'Thus our model leaves room for altruism in spite of its basic reliance upon the self-interest axiom.' I agree with Downs that altruism can be incorporated into the self-interested analysis, but this must be done with care, as indicated below. Downs never explicitly brings altruistic behavior into his analysis, and his analysis follows the self-interest axiom. I take it that all subsequent discussants of this issue are following Downs in interpreting the benefits as the personal or selfish ends, unless they explicitly state that they are modifying the self-interest axiom.

The standard remedy for this irrationality of voting is to impute a sense of civic duty to voters. Hence, the expected utility of voting

becomes:

$$EU_i = \frac{p_1 B_1}{2} - C + D. \quad (3)$$

Thus, anyone who has $D >$ C votes, and anyone who has $D < C$ does not vote. A positive turnout can result if we allow civic duty; without civic duty, we predict a zero turnout.

By contrast, a game-theoretic analysis of voting results in a prediction of a positive turnout rate. It cannot be the case for everyone that it is irrational to vote. If no one else were voting, it would be rational for an individual citizen to vote because their single vote is decisive, and their benefit exceeds the costs in the example given. This analysis assumes complete information, i.e. everyone knows everyone else's costs, preferences, and decisions as to whether to vote or abstain. Elections, however, are characterized by incomplete information. Ledyard (1984) and Palfry and Rosenthal (1985) start with this basic insight and derive Bayes-Nash equilibria with positive rates of turnout. Neither approach can explain the five empirical facts of voter turnout noted herein. For example, the Palfrey and Rosenthal (1985) analysis predicts that as the number of voters increases the turnout declines and approaches zero. But state and local elections, which have a smaller electoral base, have lower turnout rates than national elections. Ultimately, Palfry and Rosenthal (1985: 64) return to the basic conclusion of Riker and Ordeshook that in large elections the only individuals who vote are those who are motivated by civic duty.

3. Civic Duty and Information

Can the addition of civic duty to the standard calculus of voting explain the five empirical facts of turnout? To answer this question we must first be precise about the meaning of civic duty (D). The D term in equation (3) has had many interpretations in the literature. For some, it is a measure of our obligation to vote in order to preserve democracy (see Downs 1957). For others, it is a measure of the expressive value we obtain when we vote for the candidate we support (see Riker and Ordershook 1968; Fiorina, 1976).[3] I show later that neither version provides an explanation of all five empirical facts that any complete theory of voting should be able to explain. Moreover, these versions of civic duty do not exhaust

the varieties of non-self-interested behavior. Hence, I focus upon three analytically distinct views of giving or non-self-interested behavior. The three views are duty, altruism, and warm glow. Only by incorporating pure altruism, I show, can we develop a coherent and potentially testable theory of voting.

Duty can be thought of as either: (1) a moral obligation; or (2) the satisfaction we derive when performing our obligations. The first view of duty is best thought of as a moral or legal obligation. Since voting is not a legal obligation in the US, it must be viewed as a moral obligation. Moral obligations require actions taken by an individual which are independent, for the most part, of the effects of the actions upon the individual acting. Thus moral obligations, which I call strong duty, are independent of the costs they impose upon us. (See Hardin (1982) for this interpretation of strong civic duty.)

The second view of duty, which I call weak duty, is that the expression of our duties is limited by the costs they impose upon us. This view of duty comes close to Rawls's (1971: 117) analysis of natural duty.

Neither version of duty is related to the probability of our vote being decisive, as in equation (3). If strong duty is what explains why people vote, then who votes should be independent of all considerations, specifically costs, except whether the individual believes in this moral obligation or not. Hence, changes in voter registration laws or any other changes in the costs associated with voting should not affect voter turnout, because this should not affect our sense of moral obligation or strong duty.

On the other hand, if weak duty is what motivates individuals to vote, the costs of voting will influence turnout. The variation in turnout brought about by changes in the costs of voting, therefore, can be explained only in terms of weak duty as opposed to strong duty.

In addition, we know that voter turnout varies by election–presidential, off-year, state, and local. Can weak or strong duty explain this variation? One way of attempting to link variation in turnout by level of government is to relate civic duty to the costs of voting. Previously, I have focused upon the shoe-leather cost of voting, i.e. the costs in time and money spent to physically get to the voting booth. In addition, there is a second cost of voting, the information costs of voting. The cost of getting informed is substantially greater than the shoe-leather costs of voting. It is argued that the cost of getting informed for presidential elections

is less than off-year elections because of the greater availability of incidental or free information, i.e. mass media coverage is greater. Likewise, state or local elections are more costly in terms of information because less media attention is given to them. Hence, it is argued that the variation in turnout by level of government is due to relative information costs. But, as Downs has shown, it is irrational under a cost–benefit analysis to gather information about candidates. Therefore, the question becomes can the linking of civic duty (either strong or weak) with information costs be used to explain the variation in turnout in presidential, off-year, and local elections?

Matsusaka (1995: 94) has presented a detailed investigation of the logical implications of incorporating information costs into the cost–benefit analysis of voting. He finds, however, that incorporating information costs, even when linked to a notion of civic duty, cannot explain why anyone should vote in the first place. The reason for this inability is fairly straightforward.

Assume we have voters at some time before an election. These voters feel it is their civic duty to vote because the legitimacy of the system and its policies are predicated upon the number of people voting. Alternatively, voters can obtain an expressive benefit from voting. Now we differentiate between two types of voters: one type of voter who has some (but not enough to ensure certainty) information about the net benefits of voting for one candidate versus his opponent ($B > 0$); the other type of voter who cannot differentiate between the candidates because the candidates are virtually identical in their policy positions or equally distant from the voter's ideal point ($B = 0$). Should either or both voters increase the amount of information they possess in order to make an informed decision? No. According to a cost–benefit analysis of information costs, the costs of information will exceed the benefits ($C > pB/2$).

The demands of civic duty are met by both types of voters by simply voting. The totally uninformed voter can do so by randomly choosing between the two candidates. Since the expected net benefit from either candidate's election is zero ($B_1 = 0$), any costs incurred in getting informed would be wasted. Likewise, partially informed voters should just use the information they possess, and not endeavor to get better informed.

It might be argued that the demands of civic duty are that the voter becomes informed in addition to just voting. But such a shift makes civic duty a bottomless pit of obligation, which can then be

expanded to explain all forms of behavior by expanding its requirements. If the legitimacy of the democratic system is predicated upon the percentage of the population voting, then all civic duty requires is that we vote. If the rational-actor model underlying the analysis is to be maintained, the least injury to the basic tenet of self-interest should be undertaken. The weak version of civic duty meets this criterion.

Thus, neither version of duty (weak or strong) explains the variation in turnout between presidential, off-year, state, and local elections. Weak duty does explain the variation in turnout brought about by changing the shoe-leather costs of election. However, adding a civic duty term, even when linked to information costs, will not explain this variation in voter turnout, and thus cannot be the solution to the voter turnout question.

4. Pure Altruism and Warm Glow

I now show that the introduction of altruistic motives solves the question of why people vote and also explains the five regularities of turnout noted earlier. Andreoni (1989, 1990) has presented the most extensive analysis of how to integrate altruism into standard rational-actor models. Hence, I focus on his analysis and his distinction between pure and warm-glow altruism. I employ Andreoni's definition of altruism for the most part, except where noted. His definition is the same as most definitions found in the literature, e.g. Sugden's (1984) and Sen's sympathy (1977).

Pure altruism posits that the beneficiary's utility from their charity to another is some function of the recipient's increased happiness. Hence, the greater the happiness of the recipient, the greater the utility to the beneficiary. In contrast to pure altruism, Andreoni introduces the concept of egoistical altruism, or warm-glow altruism. In giving to others, individuals experience a 'warm glow' or personal satisfaction, hence, the term egoistical altruism. This warm glow is independent (under one interpretation) of the effects of the gift upon the recipient, i.e. its consequence. The warm glow I experience is a function of how much I give. Impure altruism is when an individual gives out of pure altruism combined with egoistical or warm-glow altruism.

The best way to see the difference between pure and warm-glow altruism is to examine its implications with regard to giving by one-

self and by others. Andreoni correctly notes that pure altruism implies perfect substitutability between the giving done by others and our own giving. A dollar increase in giving by others to a public good will reduce our own giving by a dollar. This substitution effect exists because each benefactor derives utility from the effects of the giving. If the effect is achieved by the giving of another, we reduce our own giving and still obtain utility from the giving of others.

By contrast, under the independent interpretation, warm-glow altruism assumes 'a person who cares nothing at all for the public good, but gives only for the warm glow. . . . The warm glow is an increasing function of what is given' (Andreoni 1989: 1449). Hence, the warm-glow feeling is independent of its effects upon others. For Andreoni, warm glow is a normal consumption good, and, hence, how much we demand is a function of its cost. Therefore, warm glow is similar to the notion of weak duty specified above. (An alternative interpretation of warm-glow altruism is that it is not independent of the pure altruism component of utility. I take up this case below.)

In summary, both duty and warm-glow giving (under the independence assumption) provide utility to an individual independently of the effects upon the beneficiaries. Moreover, they are independent of the p term in equation (3). On the other hand, pure altruistic giving provides utility to the giver as an increasing function of the amount of happiness it confers upon the recipient. Crucially, it is not independent of the p term. Having differentiated the three types of motives that drive giving, we must now integrate the three into our analysis of the voting decision.

Pure altruism entails deriving utility when other people's well being is increased as the result of our charity. Hence, we can write an individual's utility function as:

$$U_i = U(x + \alpha U_j(x)), \tag{4}$$

where x is individual i's consumption of private goods, and $U_j(x)$ is the total net utility of all those helped by our charity when they consume private goods. A is the weight we attach to the happiness of others, where $0 < \alpha < 1$. Clearly, there cannot be a dollar-for-dollar substitution between private consumption and the consumption of others in an individual's utility function. Otherwise, individuals would give most of their wealth to charity. The implicit weight for our own consumption is one, and α captures

the relative utility to oneself of others' consumption. Lastly, equation (4) is net utility because the costs of various programs to help others are paid for by taxes imposed on citizens. Thus, a declining marginal utility of income is assumed.

Pure altruism enters the voting calculus in that candidates espouse programs that differentially help others. For example, I might believe that candidate A's platform will provide \$1 billion for the needy, relative to candidate B. Hence, I define B_2 as the benefit to voter i from seeing others' increased happiness through the adoption of candidate A's platform relative to that of candidate B. Thus, the modified voting equation is:

$$EU_i = \frac{p_1[B_1 + B_2]}{2} - C + D + W, \tag{5}$$

where B_1 is the benefit from private consumption by the voter. W is the warm glow we obtain from Andreoni's version of altruism. W like D is obtained irrespective of whether our vote is decisive. The very act of voting confers the warm glow upon us.

Now, with pure altruism, expected benefits can exceed costs, $p(B_2)/2 > C$. B_2 can be of a sufficiently large magnitude so as to counterbalance the small probability that one's vote will be decisive. For example, if the net benefit to others from candidate A's program is \$1 billion in extra welfare expenditure, then even if $p = 1/100{,}000{,}000$, the expected benefit (\$5) will exceed the costs of voting.

Fiscal conservatives can also be viewed as altruists. If they believe a candidate's program to eliminate wasteful welfare programs will save billions of tax dollars for fellow citizens, then their interest in reducing welfare payments for everyone can also be considered as pure altruism. Moreover, not everyone is altruistic, nor has the same degree of altruism, if they are altruistic. Some individuals, like Mother Theresa, are willing to give their entire lives to help others. At the other extreme, there are Scrooges who experience unhappiness when others are happy. Most human beings fall in between Mother Theresa and Scrooge. I assume throughout that the preference for altruistic giving is normally distributed.

Finally, I address the case where warm-glow altruism is not independent of pure altruism. Specifically, this interpretation entails that I receive a warm-glow effect only if my actions actually help others. Equation (6) represents this interpretation of the relationship between warm glow and pure altruism.

$$EU_i = \frac{p_1[B_1 + B_2 + W]}{2} - C + D. \quad (6)$$

Now I receive a warm-glow feeling only if my vote is instrumental in producing the desired pure altruistic benefit A comparison of equations (5) and (6) spotlights the difference. Since my vote is not decisive all of the time, warm glow does not always result when I vote. The warm-glow effect is now also contingent on the probability that my vote is decisive. And since pure altruistic benefit is substantially greater than warm-glow benefit (W), the expected benefit from the pure altruistic component ($p - 1B_2$) is substantially greater than the expected warm-glow benefit ($p_1 W$). Thus, it is pure altruism rather than warm-glow altruism that has the dominant impact on the voting decision.

Warm-glow altruism (when it is not independent of pure altruism) reinforces the benefits of pure altruism, and hence performs the identical function as pure altruism. The only difference between the two is that the benefit from pure altruism is substantially greater than from the warm glow. Thus the non-independence interpretation of warm-glow and pure-altruistic giving is fully compatible with my emphasis upon pure altruistic motivation.[4]

We can now see that the expansion of the rational-actor model to include pure altruism can be the foundation to the solution of the problem of voting. But either version of duty and warm-glow altruism (the independent version) also solves this problem. The advantage of pure altruism is that it allows us to start addressing the issue of why turnout varies by election level and the other empirical regularities of voting. With pure altruism in the individual's utility function, we can explain why turnout in national elections is substantially greater than in state and local elections. The programs espoused by the president, or senate member or house member, have an impact upon a much larger number of people than do the actions of a governor, mayor, or state senator. Hence, the amount of altruistic benefit is greatest when voting in national elections.

The presence of just pure altruism predicts that turnout in both presidential and off-year elections should be the same, *ceteris paribus*. However, the turnout is higher in presidential election years. Thus, additional factors must be considered to explain all the variation in turnout by election level.

5. Uncertainty and Voting

The voting calculus heretofore has focused upon the probability that one's vote is decisive in an election. However, there are additional sources of uncertainty when it comes to the actual passage and implementation of legislation. The policy process is a collective one. Decisions are not made by a single individual in a democracy. Instead, policies are enacted after a vote by the Senate, the House, and the influence of the president. Hence, citizens voting for their particular senate or house member are also aware that the policies advocated by their representatives are not certain of adoption. Additionally, voters are uncertain about whether candidates will even attempt to live up to their promises. Bush's 'read my lips' is an example of this uncertainty with regard to promises. Lastly, voters have incomplete information as to the true policy positions of the candidates. These additional sources of uncertainty must be included in any analysis of the voting calculus.

First, we must differentiate among elections for the House, Senate, and presidency. The probability of one's vote being decisive is lowest in presidential elections because of the number of eligible voters. The probability of being decisive in Senate races is higher. And the highest probability of being decisive is in House races, which have the fewest voters (except for those small states where the number of representatives is one). Hence, the probabilities of your vote being decisive are: $p_{1h} > p_{1s} > p_{1p}$, where h refers to House elections; s to Senate elections; and p to presidential elections.

Next, we turn to the uncertainty related to the relative influence of different office holders. I define the probability that an elected official is decisive in the enactment of legislation or policy as p_2. House members are probably least powerful relative to senators and the president. There are 435 House members, and hence the probability that their vote will be decisive in a House vote is inversely related to the total number of members.[5] Senators have a higher probability of being decisive because there are only 100 senators.

Lastly, the president has the greatest probability of affecting policy. This power stems principally from his veto power. For example, the president's veto power makes it the equivalent of approximately 73 House members' votes.[6]

Hence, I can define the relative probability that these officials are decisive as: $p_{2p} > p_{2s} > p_{2h}$.

Lastly, voters are uncertain about which policies the representative will attempt to adopt. I call this uncertainty φ. The more certain the voter is about the policy differences between candidates, the more likely she is to vote. (Please note, φ is a measure of the certainty of one's knowledge of the candidates' policy positions. As φ increases, voters are better informed.[7]) The main factor affecting this uncertainty is the knowledge or information possessed by the voter. A knowledgeable voter is better able to differentiate between candidates, and hence their φ is higher.

The final voting equation now has the specification

$$EU_i = \frac{p_1 p_2 \phi (B_1 + B_2)}{2} - C + D + W. \tag{7}$$

From this formulation, we know that turnout will be higher in presidential election years than in off-year election years if: $(p_1 p_2 \phi)_p > (p_1 p_2 \phi)_c$, where c stands for congressional elections. This inequality is likely to hold under any reasonable analysis of the electoral process.

An alternative explanation of the turnout difference is possible without recourse to the assumption that the president has more power. In presidential election years, voters elect a president, a House representative, and periodically a Senate member. In off-year elections, they elect a House member and, with the same frequency, a Senate member. Hence, their probability of affecting legislation is highest in presidential election years because of the extra office (the presidency) that individuals vote for.

Thus, with the introduction of pure altruism, I am able to explain the variation in turnout by election level. Turnout should be highest during presidential elections, next highest in off-year elections, and lowest in state and local elections. Without the inclusion of pure altruism, weak-duty or warm-glow explanations are inadequate for this purpose.

A further extension of this analysis into who becomes informed politically is essential. The empirical evidence from voting studies has regularly shown that educated and better informed citizens are much more likely to vote. Rational-actor models which appeal only to weak duty cannot explain this phenomenon. φ, which represents the reduction of uncertainty because of knowledge of the candidates' policy positions, has the effect of explaining increased turnout by the better informed. This relationship can be explained only by the presence of pure altruism. If φ interacts only with B_1,

defined as the narrow, self-interest one receives from voting in an election, the costs of voting would still exceed the expected benefits. This results because p_1, p_2 and φ are all less than one:

$$p_1 p_2 \phi < p_1.$$

And, hence, by way of equation (2), we know:

$$\frac{p_1 p_2 \phi B_1}{2} < C.$$

Thus, the knowledge held by voters should not affect turnout if their only motivation to vote is self-interest.

Only when the φ term interacts with the B_2 term, i.e. pure altruism, do we have an explanation of why more knowledgeable voters have a higher turnout. Voting then becomes an instrumental act, not just an expressive act. When citizens are motivated by pure altruism we get:

$$\frac{p_1 p_2 \phi B_2}{2} > C.$$

As φ increases, the incentive to vote increases. Hence, the inclusion of pure altruism in the individual's utility function is a necessary condition for solving another question for the rational-actor model.[8] If φ interacted only with net, self-interest (B_1), the expected value of getting informed would be infinitesimally small.

The same principle applies to the phenomenon of roll-off voting. On the same ballot, individuals frequently vote for only some of the races listed on the ballot. These races are usually those at the top of the ballot. Voters frequently then leave blank their choices for races lower down in the ballot. Civic duty dictates that one should vote for all the races. Information, in general, is more costly for the races at the lower end of the ballot. Again, only by expanding our notion of utility to include altruistic benefit are information costs a factor in the voting decision.

One final defense of the civic-duty explanation of voting must be addressed. Some argue that it is possible to interpret civic duty so that it can explain all five empirical regularities.[9] They suggest that civic duty might be conditional on the type of election, i.e. there might be more peer pressure to vote in presidential elections. Likewise, the educated might have a higher sense of civic duty. Lastly, civic duty might apply to showing up at the polls and not actually marking the ballot for a specific candidate. Thus, under these inter-

pretations, civic duty is itself a function of education, the level of the election, and other factors. Barry's response (1978) to such open-ended definitions of civic duty is that they just make civic duty a place-holder for the determinants of civic duty. For example, if higher education induces higher levels of civic duty, then what is explaining the empirical regularities is not civic duty but the underlying factors that determine civic duty. Each empirical regularity is explained by a different factor (such as education or the level of the election) which then affects civic duty. All parsimony of explanation is lost because civic duty is determined by a wide range of other factors, which actually explain variations in turnout. My analysis of voting does not suffer from this lack of parsimony because altruism is not determined by the political factors it is being used to explain.

Lastly, it is now straightforward to show that a positive turnout is a Nash equilibrium, and, moreover, it does not succumb to the inconsistency problem addressed by Ledyard (1984) and Palfry and Rosenthal (1985). Assume some voters are motivated by pure altruism. Hence, as shown in equation (5), their expected utility from voting is greater than the cost of voting even if there is a large number of voters, as reflected in 'p'. By contrast, egoistical voters will not vote because their expected utility from voting is less than the cost of voting – unless the number of voters is extremely small. Hence, neither type of individual – altruistic or egoistical – has an incentive to deviate from their choice, and we have a consistent, Nash equilibrium with a positive turnout. The actual turnout will be determined primarily by: the number of altruistic voters in the population, the altruistic benefit from voting (B_2), and the probability of affecting the outcome of a particular election.

6. Expressive Voting

A number of authors (e.g. Fiorina 1976; Brennan and Lomasky 1994; and Aldrich 1997) have argued that 'expressive' voting provides a more comprehensive analysis of voter turnout than civic duty. Expressive voting is when one votes simply as a means of expressing a preference in and of itself. It is analogous to cheering at a baseball game. It is not an instrumental action, but rather a means of expressing one's solidarity with the team; expressive voting is thus an act of consumption in and of itself. However, there are a number of different ways that expressive voting is used in the

literature. The most general use is to differentiate instrumental voting from non-instrumental voting. Under this definition, civic duty is a type of expressive voting. For example, Riker and Ordeshook (1974) focus upon civic duty but they specify several different types of civic duty, one of which is expressive voting. Thus, in the most general use, expressive voting is just another form of non-instrumental voting.

A more important reason for shifting to expressive voting is to provide a more dynamic interpretation of voting, which can then explain the variations in turnout noted herein. Aldrich (1997: 385), following Fiorina (1976), respecifies that reward equation as:

$$R = pB + d' + B - c. \tag{8}$$

The second B term is the benefit from expressive voting; while d' is the old civic duty term. The advantages of including an expressive benefit according to Aldrich are: (1) that it changes the interpretation of the intrinsic value of turnout; and (2) expressive voting varies with the intensity of the instrumental part of voting (the first B term). Hence, the greater the instrumental benefit, the greater the expressive benefit also from voting. Thus, with expressive voting the variations in voting between presidential, off-year, and local elections can be explained as due to variations in the intensity of the expressive benefit.

Implicit, therefore, in the inclusion of an expressive benefit from voting is a desire to explain more than a positive turnout rate. Expressive voting allows us to explain variations in turnout among elections. But this is only one of the empirical facts of voting that must be explained. Expressive voting does not explain why the more educated vote more frequently. As it is in the case of civic duty, it might be argued that the more educated have a greater need to express themselves. Thus, by adding the notion of expressive voting we can explain more of the empirical regularities of voting.

The major limitations of non-instrumental explanations (civic duty and expressive voting) are: (1) they require additional ad hoc extensions, e.g. that the more educated are either more civic minded or more prone to expressive voting. Thus, they are not parsimonious in terms of their explanations of the facts of voting turnout; (2) none of the non-instrumental explanations can explain strategic voting. We observe individuals changing their vote when their most preferred candidate has little or no chance of winning. Hence, the probability of being decisive (the 'p' term) is driving

the shift in voting preferences. Only instrumental analysis can explain strategic voting because it involves the probability of being decisive, i.e. instrumental analysis make 'pB' an essential feature of the voting decision. Non-instrumental explanations of voting cannot explain strategic voting because the benefits (civic duty or expressive) are independent of the probability of one's voting being decisive in an election. My analysis is ultimately a return to instrumental voting with the term in equation (5). Hence, altruistic voting can explain strategic voting, and all five empirical regularities of voter turnout.

Having shown that pure altruism can explain voter turnout, it is also necessary to explain how the analysis explains non-voting, since voter turnout in US presidential elections is only about 50%. The presence of pure altruism does not mean that everyone should vote. First, not everyone is altruistic. As noted, individuals who are purely self-interested do exist. All that I assumed was that the distribution of preferences with regard to altruistic behavior is normally distributed. Second, voters must perceive a difference between candidates so that the pure altruistic benefit is positive. If voters do not perceive a policy difference, they will not vote even if they are altruists. Third, the pure altruistic policy difference must be sufficiently large because the expected benefit from one's vote is still affected by the probability that one's vote is decisive. Thus, the expected benefit might still be less than the cost of voting, even if the voter is motivated by altruism. The mere presence of altruistic motives does not mean individuals will find that the benefits exceed the costs of voting.

7. Discussion

Rational choice theorists have attempted to explain voting and non-voting with a narrow self-interested model of human behavior. The theories do not even attempt to explain the five empirical facts of voter turnout.[10] By including a small degree of altruism in my utility function, I am able to explain the five facts that have been found in the voting literature: (1) reducing costs of voting increases turnout; (2) voting turnout varies by election level; (3) the better educated or informed voters have a higher turnout; (4) there is a roll-off in voting for offices during the same election; and (5) strategic voting. If we restrict ourselves to narrow, economic self-interest in the analysis

of human behavior, we cannot explain any of these phenomena. A number of authors have invoked civic duty or expressive voting to save the rational-actor explanation of voting.[11]

Strong duty can explain none of these phenomena. Weak duty, warm glow or expressive analyses can explain variations in turnout brought about by changes in the costs of voting. If these concepts are extended by the inclusion of various determinants, e.g. education increases civic duty or the benefit derived from expressive voting, these analyses can explain the difference in turnout by election, why the educated vote more frequently and roll-off voting. But then the need to incorporate additional factors reduces the parsimony of these analyses. Lastly, even with these heroic extensions, they cannot account for strategic voting. Only the inclusion of pure altruism can explain all five phenomena. Hence, pure altruism provides the greatest explanatory power of the possible versions of extra self-interested behavior.

Other phenomena can also be explained by the inclusion of pure altruism. The cost of getting informed about elections is greater than the act of voting. Hence, retrospective voting is a means of reducing information costs to voters. The state of the economy and one's own economic well-being provide the voter with a way to evaluate incumbents (Kiewiet 1983). However, there is substantial evidence that voters adopt a 'sociotropic' criterion when voting; instead of voting on the basis of their own economic well-being, they evaluate the economic well-being of the nation as a whole. Hence, sociotropic voting entails a sense of altruism.[12] Thus, this evidence is also consistent with pure altruism as a driving force in human behavior.

Besides lacking the ability to explain the major features of voter turnout, the evidence for weak duty or warm glow explanations of turnout is weak. Rosenstone and Hansen (1993: 146–47) argue that it explains only about 4–5% of the turnout. Their measure of civic duty is the question: 'If a person does not care how an election comes out, he should not vote in it.' Disagreement with this statement indicates the presence of civic duty. I am not denying that some individuals vote because they believe it is their civic duty or they derive expressive benefits. Rather, I am arguing that pure altruism is a much more important factor in motivating individuals.

A direct test of altruistic voting is in principle possible. In preparing this paper, I reviewed both the National Election Studies and General Social Survey questionnaires, but did not find any questions

that would measure pure altruism. As noted, questions related to weak duty are available. Even Kiewiet's (1983) test of sociotropic voting does not rely upon a direct measure of pure altruism. Rather, he compares voters' evaluations of their own economic circumstances to that of the nation as a whole. He finds the assessment of national economic performance is a better predictor of one's vote. From this, he implies sociotropic voting. Hence, as presently worded, these surveys provide no direct method of testing the effects of pure altruism. But such questions could be included in the future to provide a direct test.

Indirect evidence, however, is available to support the hypotheses presented. One implication of my analysis is that turnout is determined (though not entirely) by the relative power of the office or level of government. In most political systems, the national government offices are the most powerful, as in the United States. However, this relationship does not exist in all countries. For example, in Canada and Switzerland provincial and local governments are as or more powerful, respectively, than the national government. Hence, my analysis predicts, *ceteris paribus*, that we should not see the same roll-off or a reduction in turnout by level of government as occurs in the United States. In Canada, turnout for provincial elections is regularly equal to or greater than that of federal elections (Dyck 1996). Likewise, in Switzerland, where the cantons have the most power, turnout is highest at the canton level, and lowest at the federal level (Lander 1991).[13]

Another piece of indirect evidence is that voters who perceive no difference between candidates are substantially less likely to vote than voters who perceive a difference (Brody and Page 1973). Non-instrumental theories of voting, i.e. such as those based on civic duty, or warm-glow (the independent version) altruism, always entail expected benefits (pB_1) to be approximately equal to zero. Hence, the absence of any perceived difference between candidates should be immaterial if one was voting on the basis of civic duty. This evidence is indirect because the measures of candidate issue differences are composites of many issues, some self-interested and some potentially altruistic. Therefore, we have indirect evidence for the importance of pure altruism. And, hopefully, measures in the future will allow us to directly test the analysis.

Lastly, the inclusion of altruistic behavior in the rational-actor model is argued by some (see Sen 1977) to create inconsistencies. Sen argues that moral obligations (such as strong duty) entail a

lexicographic ordering, which undermines von Neumann-Morgenstern utility theory, and hence expected utility analysis. Sen is correct with regard to strong duty. However, his objection does not hold for weak duty, warm glow and pure altruism.

For other analysts, the inclusion of altruism eliminates the possibility of empirical testing (e.g. Olson 1965). As indicated previously, empirical testing, though indirect, is possible. Hence, these objections to the inclusion of altruism are wrong.

Andreoni's and others' work indicates that some versions of altruism are not inconsistent with self-interest when included in an analysis of decision-making by individuals. Moreover, altruism does not overwhelm self-interested behavior. Even in presidential elections, approximately 50% of the potential electorate do not vote. For these individuals, altruism is not sufficient to outweigh self-interest. Hence, pure altruism is a weak force in the decision calculus of individuals. It can have a major effect in areas such as voting, precisely because the costs of voting are so low; and hence even weak altruism can impact turnout. Tullock (1983) has shown that Americans donate about 5% of their income to charity. Thus, individuals would not, because of pure altruism, voluntarily pay their income taxes. The dominant force in human behavior is still self-interest, but we cannot deny that altruism does play a limited role in human motivation.

Incorporating altruism allows us to explain the five empirical regularities of voting. But, this is not the only reason for incorporating altruism into rational-actor models. Hoffman et al. (1994) and other experimental studies of individuals playing ultimatum and dictator games find that a fairly large number of individuals exhibit altruistic behavior.[14] Hence, the proper response to Green and Shapiro (1994) is to bring more realism into the rational-choice model by admitting and explicitly modeling altruistic behavior.

NOTES

1. For a good review of the literature on rational choice and turnout, see Aldrich (1993).
2. The citizen could vote for *CB*. Because it does not affect the analysis, I exclude this possibility.
3. I provide a more extensive discussion of expressive voting in Section V below. Fiorina (1976) defines expressive benefits from voting as the intrinsic benefit from voting for one's party, as distinct from civic duty.
4. Andreoni (1989) defines mixed-altruism as when both pure and warm-glow

benefits accrue to the donor. If we interpret warm-glow altruism as non-independent, then pure altruism is a special case of mixed altruism.

5. The exact probability of being decisive is dependent upon a number of factors as indicated in Owen and Grofman (1984). But this probability is inversely related to the number of legislators.
6. The value of 73 votes for a presidential veto is obtained by how many additional votes (73) are required to overcome a veto in the House with 435 voting members.
7. This formulation of φ is necessary to make it consistent with the probability of voting (p). An increase in both results in increased turnout.
8. There are other explanations for why more knowledgeable individuals vote more frequently. However, my analysis explains all five empirical facts of voting in a parsimonious and unified model.
9. Variants of this argument have been made by a number of authors almost immediately after Downs proposed civic duty as a solution to the turnout problem. Barry (1978) is responding, as I show, to precisely these arguments. Thus, I do not wish to cite any one author for these arguments.
10. Aldrich (1993) argues that rational choice theories should explain the variation in turnout by level of government, but he does not offer such an explanation.
11. Other means of saving the rational-actor model have been proposed. For example, Ferejohn and Fiorina's (1974) analysis of voting is based on a minmax regret decision process, we do not need to appeal to civic duty. However, a number of criticisms have been made of the minmax regret analysis, e.g. Goodin and Roberts (1975) and Kunreuther et al. (1978). They argue individuals in most decisions, e.g. insurance, investment, do not use minmax regret. This inability to explain insurance purchases occurs because the probability of a loss is not included in the calculus of decision. Hence, minmax regret does not provide a general foundation for human behavior. Nor can it explain strategic voting. Riker and Ordeshook (1971) argue that the voters' perception of the closeness of the election might vary. However, the evidence for this view is weak. Uhlaner (1989) argues that individual contact, through parties and interest groups, induces people to vote. However, most local political parties whose members are in physical contact with voters emphasize local issues. Hence, turnout at local elections should exceed that at national elections.
12. Altruistic motivation is one possible interpretation of sociotropic voting. It is possible to interpret sociotropic voting entirely as a self-interested phenomenon. The general state of the economy might be a predictor of our own economic state in the future. Hence, sociotropic voting is not definitive evidence of altruistic voting.
13. Comparisons of turnout across countries to test the analysis is not feasible at present because the *ceteris paribus* condition does not hold. More than the expected altruistic benefit differs across countries. For example, section 5 of this paper shows that the probability of affecting policy outcomes is much lower in the US because of the system of checks and balances which does not exist in many other countries. Also, the costs of voting differ among countries. For example, the US has a costly registration system.
14. As indicated, the experimental studies of ultimatum and dictator games have shown an irreducible amount of altruistic behavior. An important question left unaddressed by this paper is why individuals exhibit both altruistic and self-interested preferences. I require a separate paper to give the due consideration this question requires.

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