

The Voluntary Provision of Public Goods: Public Interest Groups and the Collective Action
Problem—A Test

Richard Jankowski
Political Science Department
SUNY at Fredonia
richard.jankowski@fredonia.edu

ABSTRACT

Mancur Olson in “The Logic of Collective Action” presents an analysis of the freerider problem faced by groups that provide a public good. His analysis is explicitly limited to the collective action problem in economic interest groups, such as unions and business associations. Olson specifically notes that his analysis does not apply to philanthropic organizations. In recent years, Walker (1991) and others have documented a substantial growth in what are called public interest groups, such as Greenpeace, Amnesty International and Common Cause. These public interest groups are examples of Olson’s philanthropic groups because their goal is helping others or society in general, rather than solely benefitting the members of the group.

We propose an explanation of how public interest groups solve their collective action problem by modifying Olson’s analysis. First, we modify the underlying rational, self-interested axiom by incorporating weak altruistic motives to individuals. Second, we analyze the game as one of incomplete information.

We incorporate these two features into a formal model of voluntary contributions to the provision of a public good. We show that a Bayes-Nash equilibrium exists which provides for positive contributions to the public good. Our solution is different from that of Ainsworth and Sened (1993) who analyze the collective action problem of interest groups by modeling it as a signaling game with an entrepreneur. Their model is based upon Palfrey and Rosenthal’s (1984, 1988) analysis of the voluntary provision of a discrete, public good. However, Ainsworth and Sened’s analysis applies only where there are no competing interest groups (a rarity in the political process). Our analysis explicitly models the provision of a public good when there are competing interest groups.

In the second half of the analysis, we test the theoretical model. We use the 2004 GSS analysis of altruism as the instrument for our tests. We find strong support for the hypothesis. Membership in economic groups is not correlated with altruism, i.e., selective benefits are sufficient. But, membership in groups advocating social or political causes is correlated with altruistic motivation. In addition, contributing of money to social and political causes is correlated with altruistic behavior.

Mancur Olson in “The Logic of Collective Action” presents an analysis of the freerider problem faced by groups that provide a public good. His analysis is explicitly limited to the collective action problem in economic interest groups, such as unions and business associations. Olson specifically notes (1965: 159-60) that his analysis has limited applicability to non-economic interest groups and does not at all apply to philanthropic organizations. In recent years, Walker (1991) and others have documented a substantial growth in what are called public interest groups, such as Greenpeace, Amnesty International and Common Cause. These groups are examples of Olson’s non-economic groups because their goals are political goals or helping others or society in general, rather than solely benefitting the members of the group.

We present a solution to the collective action problem of public interest groups which depends upon the voluntary provision of a public good. Our analysis differs from Palfrey and Rosenthal (1984, 1988) and Ainsworth and Sened (1993), who also argue that voluntary contributions can solve the collective action problem in the provision of a discrete, public good. Both of these analyses, however, are predicated upon an uncontested provision of a public good. Ainsworth and Sened (1993: 860) specifically note that their analysis of interest group formation does not extend to situations where there are competing interest groups. The preponderance of politics is about the allocation of scarce resources, and hence, entails conflicts over policy by competing groups. Thus, Palfrey and Rosenthal’s and Ainsworth and Sened’s analyses do not apply to the vast majority of political interest groups. In addition, our analysis posits that altruism is a necessary motivation for contributors to public interest groups.

Additionally, Olson (1965) argues that as groups become larger, they find it more difficult to overcome the freerider problem. Runge (1984) and Cornes and Sandler (1996) posit that public interest groups follow an “inverse size principle.” We show that in most situations they are governed by the same size principle that Olson proposed.

Any formal analysis requires some empirical testing, because it is relatively easy to develop a model which predicts facts already established. Hence, we test the analysis by using the 2004 General Social Survey which surveys the US population for membership in various economic and non-economic groups, and different forms of political behavior. We find empirical support for the hypotheses developed in the first part of the paper.

I. The Collective Action Problem in Economic and Non-Economic Organizations

Olson’s classic analysis “The Logic of Collective Action” linked the freerider problem with the provision of a public good by economic organizations. He showed that the beneficiaries of an organization providing a public good had an incentive for not contributing to the organization but rather freeriding on the provision of the public good because it is non-exclusionary.

Missing from Olson’s analysis is a complete theory of the formation of groups. Olson (1965) explicitly limits his analysis to economic groups. Economic groups like trade associations, professional associations and unions, still comprise 80% of all interest groups in the United States (Schlozman and Tierney, 1986). The number of public interest groups have been growing since the 1960s. They entail a broad range of groups: environmental (e.g., Greenpeace), philanthropic (e.g., the Salvation Army) and public interest (e.g., NOW). For the purposes of this analysis, we will

differentiate between philanthropic and public interest groups. We will analyze public interest groups, but not philanthropic groups.

The primary goal of economic interest groups is the betterment of their members. By contrast, the essential characteristic of public interest groups is that they pursue goals which are not restricted to the benefit of their members. For example, members of anti-abortion or anti-capital punishment groups are not trying to benefit themselves. Members of a group opposed to capital punishment are not on death row. They are not pursuing their narrow, self interest. But these are ideal-types, and there can be overlap in the motivation of individuals. Olson, because of his axiom of narrow, self-interest, did not offer an analysis of other-regarding groups.

Thus, we adopt a slightly modified version of Shaiko's (1999:19) definition of public interest groups as "complex, institutionalized nonprofit organizations that seek to represent collective interests to policymakers, the representation of which will not selectively benefit the leadership or membership of the organization." We find in reviewing the literature that Walker (1991) uses the term citizens' groups; Schlozman and Tierney (1986) use the term externality groups; while Berry (1977), Nownes and Neeley (1996) and Shaiko (1999) use the term public interest groups. We prefer the term public interest group because we follow Nownes and Neeley in excluding philanthropic groups, simply because most philanthropic groups do not obtain government funding. Those philanthropic groups which operate through the use of public funds, however, fit within our analysis.

Several explanations of how public interest organizations solve the collective action problem have been proposed. First, Olson's selective benefits might explain why individuals contribute to public interest groups. However, Walker (1991) presents survey data that selective benefits are secondary considerations to contributors to public interest groups. Walker argues that his study

indicates that citizens' groups solve the freerider problem by means of sponsorship, i.e., a fat cat contributor (an individual or government agency) subsidizes the group. However, Bosso (1995), Nownes and Neeley (1996) and Shaiko (1999) present evidence that sponsorship is a secondary factor in most public interest groups' finances. Rather, voluntary contributions are the groups' primary source of revenue.

A third set of explanations for the successful formation of citizens' organizations is based upon the altruistic motives of their members. For example, Moe argues (1980) that people join and contribute to these organizations only to achieve the goal or purpose of the organization; they do not join for any material self interest or selective benefit. Hence, he differentiates between joining a group out of economic self interest and joining for purposive benefits. However, he offers no analysis of how purposive benefits lead to overcoming the freerider problem. The observation that people do not receive any material benefits, but act out of altruistic motives is at best a step in the direction of providing an alternative explanation.

Chong (1991), and Oliver and Marwell (1989) have pursued this line of analysis. However, their explanations are incomplete, and do not fit the empirical facts of public interest group formation. They argue that when altruistic motives are added to the benefits from contributions that the collective action problem changes from that of a prisoner's dilemma to that of an assurance game. Once the critical level is reached in the assurance game, the optimal strategy for players is to contribute. Hence, we would expect to observe 100% of potential members contributing (Chong, 1991: 112). However, none of the public interest groups witness 100% membership. The highest membership among public interest groups seems to be around one percent of the potential members.

The fourth explanation by Ainsworth and Sened (1993) holds that the collective action

problem can be overcome by voluntary provision, without recourse to altruism. Their analysis (following Palfrey and Rosenthal (1984, 1988) is predicated upon an uncontested provision of a discrete (lumpy) public good. Thus, there is a pivotal contributor. In addition, as in the case of the League of Women Voters which provides voter education, the benefit is uncontested. Hence, Ainsworth and Sened's analysis applies. Their analysis does not extend to the more common case of where there is competition between interest groups, as between pro-choice and anti-abortion groups. Our analysis is of this more common political situation.

Before turning to our analysis of how voluntary contribution in a competitive framework solves the collective action problem of public interest groups, we first review the histories of successful citizens' organizations to help motivate our analysis.

II. The Organization of Public interest Groups

The best way to motivate our theoretical analysis is to review the history of the formation of several prominent public service organizations. We chose to focus on two groups, Public Citizen founded by Ralph Nader and Common Cause founded by John Gardner, because they exhibit features which are found in all citizen's organizations.

Nader, after he wrote "Unsafe at Any Speed," sued GM because of the tactics the company used in attacking him and his views. Nader won his lawsuit against GM and used \$270,000 of the money from the lawsuit to place ads in papers around the country soliciting money to form and operate a consumer advocacy group. Only 62,000 people contributed out of a population of approximately 150,000,000 adults. Yet the average contribution of \$15 raised \$1,000,000. These

limited voluntary contributions were sufficient to launch his organization.

Likewise, John Gardner, a Republican lawyer, formed Common Cause in 1968. He placed ads in the New York Times and got 70,000 contributors, and thus was able to raise more than \$1,000,000 (Rothenberg, 1992: p.9).

In these two examples, the essential role of the entrepreneur is seen. Nader and Gardner both functioned as entrepreneurs in the formation of these public interest groups. They provided the seed money (the start-up costs), their organizational skills, and the risk-taking required to get the associations formed.

Entrepreneurs are essential in providing the initial impetus toward organization, but how do the groups attract and maintain members; how do they overcome the freerider problem? Voluntary contributions from the “members” are the life blood of these organizations.¹ These groups do not provide selective benefits (e.g., low-cost insurance, journals, etc.) to induce people to join. Most people get very little back from the organization beyond a newsletter indicating the group’s activities (Shaiko, 1999). These newsletters are a way to maintain a flow of contributions through annual solicitations. What motivates individuals to voluntarily contribute to a public interest group? Is it self interest or altruism? We argue that altruism drives individual contribution, and the reason for this claim will become apparent only after we complete the formal analysis.

From our review of the literature, we find two general facts of public interest group formation. First, voluntary contributions are the primary source of ongoing funding, Bosso (1995),

¹ The character of the contributors’ relations with the organization differs in the Nader groups from Common Cause. In the case of Common Cause, the contributors have little say in the organization’s policies, leadership, etc., except for the act of writing a check to the organization. The Nader groups, by contrast, regularly send out questionnaires to their members to solicit their opinions on policy direction and issues.

Nownes and Neeley (1996) and Shaiko (1999)). However, whether the voluntary contributions are driven by self interest or altruism is still open to question. The second fact is that only a very small percentage of potential members actually contribute. For example, NOW has a paying membership of approximately 200,000.² The potential membership base³, if we just limit it to females, is over one-hundred million adult females. Thus, the number of contributors is less than one per cent. Likewise, the NAACP membership is about 200,000, while it has a potential membership of over twenty million adults. We do not know a single public interest group that has a paying membership that exceeds one percent of its potential base.

In general, formal theory should be driven by empirical facts of the phenomenon to be explained. In the course of our presentation, we will show that our theoretical analysis is consistent with these empirical facts.

III. A Bayesian Solution to a Game of Incomplete Information

Our analysis of public interest groups differs from Palfrey and Rosenthal (1984, 1988) and Ainsworth and Sened (1993) in three fundamental respects. First, we argue that the motivation for contributing to the group is competitive in the sense that public interest groups invariably promote a policy which spawns a competing group. For example, both pro-choice and anti-abortion groups

² NOW is very secretive about its paying membership. Estimates of membership range from 150,000 to 300,000.

³ The potential membership base for public interest groups is ultimately defined by subjective demand for the benefits provided by the group. Hence, the figure cited for potential membership is always an upper bound.

have been formed in the fight over abortion policy. The formation of each must be analyzed in terms of the dynamics of the competition between the two. Heretofore, the analysis of group formation has focused on the inducements that a group uses to get members to contribute some fixed amount of resources. The formation of the group is not an end in itself. Second, we argue that altruistic benefits are required, in addition to self-interested benefits.

Third, we turn to an incomplete information analysis of the decision to contribute or to freeride. Specifically, we employ a Bayesian analysis of the decision to contribute or not contribute to public interest groups. With millions of potential members, no individual can have complete information about the choices of others.⁴ Hence, we will reinterpret the contribution game as one of incomplete information. Specifically, we assume that potential contributors do not know the number of other potential contributors to each group. We assume a Poisson distribution to reflect their beliefs as to the population size of the two competing groups.

A. Contributions as Competition between Groups

As noted above, there are three distinct types of groups: economic, public interest and philanthropic. We undertake herein an analysis of the collective action problem in public interest groups. An analysis of the collective action problem for philanthropic groups is yet to be

⁴ Ainsworth and Sened (1993) posit an entrepreneur who coordinates the contributions so that a mixed-strategy equilibrium is not necessary. But, their analysis does not allow competition between groups.

formulated.⁵

All previous analyses of interest group formation implicitly assumed some threshold level of contribution necessary to found a group. Our analysis therefore is fundamentally different because it posits that the necessary funding level is a function of the competition between groups. The more a competing group raises and contributes to policymakers, the more the opposition needs to raise to successfully have its policies implemented. Thus, the amount of money that a group needs to raise is endogenous to the analysis.

Crucially for our analysis the public goods sought are not a positive good for everyone. These public goods regularly produce negative externalities for some groups. As in Sen's Liberal Paradox and a reading of *Lady Chatterly's Lover*, some groups of individuals experience a negative externality in the exercise of rights by others. Thus, opponents of abortion experience a negative externality when individuals exercise their right to chose abortion.

Public interest groups have as their essential characteristic the provision of a pure, public good, but in doing so they regularly produce negative externalities for other groups. Thus, two opposing sets of interest groups are regularly found among public interest groups. If there were no opposition to some proposed legislation because everyone favored it, there would be little need for establishing an interest group to fight for the enactment of the legislation. Even clean government, as promoted by Common Cause, finds substantial opposition in the case of campaign finance reform.

Hence, the benefits provided by public interest groups are group specific, they are simultaneously goods and bads for different groups of individuals.

⁵ Vickrey (1975), Rose-Ackerman (1987) and Andreoni (1990) have presented analyses of purely philanthropic organizations, but not of their collective action problem.

Thus, the formation of public interest groups is embedded in a contest between two groups, for example, “pro” and “anti” environment. Thus, with two groups, $T = 1, 2$. (The formal analysis that follows parallels Palfrey and Rosenthal’s (1985) and Myerson’s (1998) exposition of the decision to vote which is limited to two candidates and two teams of supporters for the respective candidates.) We restrict our analysis to two groups, specifically, a pro and con side of an issue, an example being, gun control legislation. More groups are feasible, but for tractability we restrict the analysis to two groups. For our model, individuals make monetary contributions to their respective groups. The money collected by the two interest groups is then used to influence legislators in their choice of legislation. (See Baron (1994) for an analysis of money in campaigns, and Bennedsen (1998) for the role of money in buying votes.) We assume that contributions are primarily used to bribe policymakers, and/or to pay for information used in lobbying.

Individuals can directly contribute to candidates. Therefore, why do they need to contribute through interest groups? One of the major advantages of interest groups is that their leaders are much better informed than the members about the politics, policymakers’ preferences and policy options. Hence, the leadership is better able to strategically spend money contributions on legislators that are likely to increase the probability of passing the legislation favored by the group. Individual contributors might be knowledgeable about the preferences of their own representatives, but those representatives might not be the most influential with regard to a piece of legislation that the group favors. Hence, money contributions to the local representative would not be totally wasted. However, the group’s leaders are much better able to dispense the monies strategically over a set of preferred policymakers.

Our focus on the policy benefits from the formation of a group contrasts with the standard

analysis of group formation. For example, Olson's (1965) selective benefit analysis emphasizes private benefits from groups that promote membership. Likewise, the coercive and sponsorship solutions focus upon exogenous factors to solve the collective action problem. Hence, the principal-agent problem is a common concern in the literature because members join groups for reasons other than those related to the policy objectives of the group. In the case of public interest groups, the goals of the organization are the primary factor affecting contributions. Hence, the analysis emphasizes the ability of groups to achieve their desired policies rather than the formation of the group as a goal in itself.

The most important aspect of this reconceptualization of the group contribution process is that the game is no longer strictly a prisoner's dilemma, and thus, no longer always a freerider problem. The dominant strategy in all cases is no longer to freeride. If one's group does not contribute, the payoff to each member is -1 because if the opposition contributes even a little, they obtain their preferred policy outcome. By contrast, in the pure freerider problem it is always the dominant strategy to not contribute because the worst that can happen is getting a payoff of zero when no one else contributes.

The collective action problem becomes one of whether to contribute or not; but the choice is contingent upon the decision of others. In particular, the choice depends upon whether one's contribution is pivotal. (Thus, the analysis exactly parallels that of the decision to vote.) We now present a formal analysis of the collective action problem facing public interest groups.

B. What Do We Mean by Altruistic Giving?

Our second modification of the basic Olsonian analysis is the introduction of altruistic considerations in the decisions of individuals. A number of authors, including Moe (1980), Chong (1991), Oliver and Marwell (1989) and others have argued that altruistic giving is sufficient to solve the freerider problem for public interest organizations. But, Palfrey and Rosenthal (1984, 1988) and Ainsworth and Sened (1993) do not require altruistic motives for their voluntary solutions to the collective action problem. We argue that altruistic motivation is necessary to solve their collective action problem. But, the reasons for this claim will be clear when we finish the formal analysis. Instead, we start with an analysis of what is meant by altruism.

Sen (1977) notes that there are two alternative views of altruism. The one view is that altruism is based upon ethical norms; the other view is that it stems from a feeling of sympathy we experience when observing the state of others. Chong (1991) and Oliver and Maxwell (1988) use an ethics-based altruism to solve the collective action problems. Becker (1976), and Stark (1995) analyze human behavior using a sympathy-based notion of altruism. We follow Becker and Stark in adopting a sympathy-based version of altruism in our analysis.

First, what do we mean by altruism as sympathy? Altruism-as-sympathy entails that the beneficiary's utility is some function of the recipient's increased happiness. Hence, the greater the happiness of the recipient, the greater the happiness/utility of the donor. Hence, the utility functions of individuals can be written as:

$$U_i = U(x + \alpha U_j(x)) \quad (1)$$

where x is individual i 's consumption of private goods, and $U_j(x)$ is the total utility of all those

helped by our charity when they consume private goods.⁶ Alpha is the weight we attach to the happiness of others, where $0 < \alpha < 1$. Clearly, there cannot be a util for util 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 one's own consumption is 1, and α captures the relative utility to oneself from others' consumption. Lastly, equation #1 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.

Another characteristic of sympathetic altruism is that it is a pure, public good (Sudgen, 1982 and 1984). All sympathetic altruists experience happiness from the well-being of others. Hence, it is immaterial who provides an increase in well-being.

There is substantial evidence that humans do exhibit altruistic behavior and goals. Individuals routinely donate blood to the Red Cross, even though a commercial market in blood exists. Tullock (1983) has shown that Americans donate about 5% of their income to charity. This 5% figure is probably an exaggerated estimate of actual altruistic giving because a tax credit is provided for charitable giving. Thus individuals would not, simply because of 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. The problem is how to incorporate altruistic goals and still maintain the basic self-interested nature of humans. We propose a limited view of the extent and scope of altruism

Hence, we assume that human goals are not exclusively self-interested, but rather, include

⁶ There are several forms of interdependent utility functions. For the purposes of this paper, this representation is the most direct. See Sobel (2005) for a good review of alternative specifications.

a weak altruism, to the extent, people are willing to give some low amount (5%) of their income to help others or help society in general. Moreover, this altruistic impulse is not uniformly distributed in the human population. Some individuals are Scrooges, whose altruistic impulse is zero, and others are like Mother Theresa, whose altruistic impulse is to sacrifice most of their lives to help others. The majority of us fall in between. Hence, we will characterize the distribution of altruistic preferences in the population as normally distributed with a mean of 5% of income.

In both the cases of Common Cause and Nader's groups, the average contribution was about \$15 per person.⁷ This figure conforms to the weak altruism argued above. Individuals only contribute a small portion of their income to civic or charitable associations. In addition, the number of contributors out of the potential number of members is very small. As indicated, Ralph Nader's group to help consumers received 62,000 contributions out of a potential 150,000,000 donors, which is about .04%.

Sen (1977) argues that moral obligation is a second source of altruistic behavior. Chong notes (1991: 93) that a moral obligation on the part of the contributors precludes freeriding. Thus, Chong's analysis follows Sen (1977) in positing the centrality of moral obligations over sympathetic altruism.

Shifting to moral obligation as the rationale for contributing to citizens' organizations does produce a logically consistent analysis. However, this shift has two drawbacks. First, the introduction of moral obligations does serious damage to the rational, self-interested analysis of human behavior. Moral obligations, as argued by Sen (1977), do supercede self-interest in any of

⁷ Both of these examples are from the 1960s. Hence, in real terms an equivalent donation today would be in the \$50-70 range.

a number of different realms of behavior. He thus argues that moral obligation analyses and rational, self-interested models of human behavior are inherently contradictory.

Instead of abandoning the rational, self-interest analysis of human behavior, we have used the notion of weak altruism, which does the least amount of injury to the self-interested axiom, and which is consistent with the observed behavior of individuals.

The second and primary drawback of making the shift to moral obligations is that it places an unlimited burden on giving. In principle, moral obligation can entail substantial costs to the individual. However, we observe that individuals follow a 5% rule for altruistic giving. We can reasonably expect individuals to contribute \$50 to an environmental organization, but they will not voluntarily (out of moral obligation) pay their taxes. Hence, we assume a weak altruism, not absolute altruism, as driving human behavior

Hence, for both theoretical and empirical reasons, we reject the shift to moral obligation as a way of overcoming the freerider problem and explaining human behavior more generally.

C. A Formal Game-Theoretic Analysis of Contributing

The decision to contribute to most public interest groups entails a cost-benefit analysis, which is also contingent upon the choices of others. Thus, the net expected value EV from contributing is the expected benefit (the probability that one's contribution is decisive p times the benefit B_1 minus the costs of the contribution C). The classic equation for the voting decision is:

$$EV = pB_1 - C \quad (2)$$

We assume that the contribution C one gives to the organization is the same for all

individuals. This assumption simplifies the analysis and is based on the observation that any one individual's contribution is very small relative to the total amount raised. Individual contributions to public interest groups, like Greenpeace or Common Cause, range from \$10 to \$100. But this variation is minuscule relative to the total income of the groups.

Each potential member of the group receives a private benefit from the activities of the group B_1 . Whether one contributes to a group is conditional upon one's contribution being decisive. One can obtain the benefit without contributing as long as others contribute, and one's contribution can be meaningless if the opposition wins out in the policy process. The costs of this form of political participation are even higher than the costs entailed in the physical costs of voting. Thus, given the large number of potential contributors, the probability that one's contribution will be decisive is very small and it is irrational to contribute to a public interest group.

Having shifted the basic analysis of the public interest group's formation to a contest between two groups, we now turn to incorporating the altruistic component. Following Becker (1976) and Stark (1995) and others we assume sympathetic altruism as in equation #1.

In order to simplify the formal analysis, we normalize the private and public benefits from contribution to equal one, i.e., $B_1 + B_2 = 1$. This simplification is justified as the good B_1 supplied by public interest groups' lobbying efforts is a non-rival public good, and hence, everyone obtains the same benefit from the public good. Likewise, the altruistic benefit B_2 is also a non-rival public good. In the case of individuals negatively impacted by others' rights, the benefits of contributing are likewise positive and equal to one, because the benefit to them is preventing the negative impact.

The choice of whether to contribute to the organization or not now depends upon the probability that one's contribution will be decisive in getting the policy objectives of the group

enacted as in equation #3.

$$EV = p(B_1 + B_2) - C \quad (3)$$

Instead of being the classic collective action or freerider problem, the contribution question is now that of the rationality of contributing to an activity when the probability of one's action being decisive is very small.

As in the case of voting, because of the small probability that one's contribution will be decisive, it would appear that contributing to an organization is irrational because:

$$p(B_1 + B_2) < C \quad (4)$$

However, if everyone adopts the non-contribution strategy, then it is rational to contribute because your contribution will be decisive. (We are making the assumption that if only one person contributes, that one person will be decisive in the lobbying game.) Hence, not contributing is not a dominant strategy. Thus, the collective action problem is no longer the prisoner's dilemma. The question becomes, what is an equilibrium strategy for potential contributors? The answer, in part, depends upon the probability that one's contribution is decisive in obtaining the goal of the group.

Each individual can take one of three actions in the contribution game: contribute to Group 1; contribute to Group 2; or not contribute. In addition to the two groups, we have N_1 potential members of T_1 , and N_2 potential members of T_2 , and $N_1 + N_2 = N$. The payoffs are normalized to +1, in the case when one's policy is adopted, and to zero, when one's opponents' policy is adopted. For example, when T_1 's total contributions exceed that of T_2 , the per capita payoffs are $1-c$ for those who contributed to the group. Those who freeride obtain a payoff of +1. There is a symmetric table for the members of Group 2's payoffs. Thus, the payoffs are bounded on the interval $[1, 0]$.

D. Population Uncertainty

We now turn to the proposition that players do not have complete information as to the actions of hundreds of millions of other potential contributors. Their choice of actions are based upon a lack of information as to how many other potential contributors there are to the two respective groups. Hence, we shift the analysis from one of complete to incomplete information and thus, following Harsanyi, we adopt a Bayesian analysis of the collective action problem entailed in contributing to public interest groups.

To simplify the analysis, we follow Myerson (1998) in making population uncertainty the sole source of incomplete information.⁸ We can transform the game of incomplete information into one of imperfect information by positing that nature creates different types of individuals, i.e., those in favor of a particular policy and those opposed (e.g., individuals who are anti-abortion and those who are pro-choice). Thus, there is a set of types T , with $t = 1, 2, \dots$. The total number of potential contributors is known; but the number of individuals of each of the types is unknown. All that is known is that the distribution of each type is Poisson, with a different mean for each type. Thus, we

⁸ The reasons for the incomplete information can be because players: 1) don't know the physical outcome function of the game; 2) don't know other players' utility functions; and 3) don't know their own or some other players' strategy spaces. Any private information possessed by one or some of the actors, but not common information to all players, creates the problem of incomplete information. Hence, we must be careful in specifying what is (are) the source(s) of incomplete information. In the case of contributing to a public interest group, there are several possible reasons for incomplete information. Players might have different degrees of pure altruism or warm-glow benefit, have different contribution levels, or the total number of players in each group can all be unknown to each of the players.

The presence of several different sources of incomplete information should not affect the subsequent analysis of the contribution game but does substantially complicate the mathematics. Thus, this possibility is not pursued at this time.

can define Q as the probability distribution of the set of types of group members. It specifies the number of contributors of each type t in the game. For a Poisson random variable with mean λ , the random variable equals any nonnegative integer k with probability:

$$p(k|\lambda) = e^{-\lambda} \lambda^k / k!$$

Furthermore, we assume that each of the two type is independently and identically distributed. It is clear that the set of types T is non-empty, and we can quite sensibly assume that it is finite.

The independent assumption also means that the aggregation property of Poisson distributions holds. Thus, the sum of independent random variables, here for each type, is also a Poisson random variable. This property will be very useful in establishing equilibrium and other characteristics. In addition, the Poisson distribution is for non-negative integers, which is most appropriate for the choice of contributing or not.

To show that an equilibrium to the contribution game must exist, we must specify the action set available to the players, the utility functions of the players, and then link them to the population uncertainty. First, we define an action set A for members of the groups. We assume further that this action set is the same for all groups. Moreover, this set is finite and has at least two elements; to contribute and to not contribute.

Second, the utility payoff for each player is a function of three elements: the player's type t ; the player's action a ; and the number of other players choosing the various options x . Thus the utility function $U(t,a,x)$ is defined and we have a game with population in (Q, T, A, U) . Thus, we can prove the following theorem.

Theorem 1: any game with population uncertainty (Q, T, A, U) as defined above, and where

T and A are finite (as above) and U is bounded, must have at least one equilibrium.

Myerson (1998: 385) provides the proof for this theorem. The existence of a fixed point or equilibrium to this game requires (following Kakutani's theorem): one, that the strategy set a for every player is convex, closed and bounded; and two, that each player's utility function is both continuous in a , and concave in the i th player's strategy a_i , holding the other players' strategies a_{-i} as fixed. Since both of these conditions hold, at least one fixed-point exists. Note that one of the strategies may be a mixed Bayesian strategy.

E. Characterizing the Equilibrium

Showing that an equilibrium exists is only a first step in the analysis of the contribution game. We want to characterize this equilibrium(a). To do this, we return to the cost-benefit analysis of contributing as represented by equation #4. We show that the equilibrium, besides existing, has three characteristics: it is symmetric, it is a mixed-strategy equilibrium, and it is unique. A game is symmetric if all players of the same type adopt the same strategy. Asymmetric games are feasible, but they encounter serious problems in large n games. For example, Palfrey and Rosenthal's (1985) allow for asymmetric, pure-strategy equilibria in a voting game. Hence, different voters of the same type will either vote or abstain as a pure strategy. They start with an electorate of 1,000,000 rightists and 2,000,000 leftists. One equilibrium entails all rightist voting, and the leftists being divided into two subgroups of equal size. One subgroup of leftists votes, and one subgroup abstains. Each individual member of the group must know if they are to vote or abstain, and the number of voters in each group. Clearly, such an equilibrium requires extensive coordination which is unrealistic in

an election with a voting base in the millions. Myerson (1998) shows that with population uncertainty, only the low-turnout equilibrium holds, and it requires symmetric strategies.

In addition, the equilibrium from the population uncertainty game is a mixed-strategy equilibrium. The only pure strategies available to all members of either group are to contribute or to abstain. Clearly, not contributing is not an equilibrium. Likewise, everyone contributing is not an equilibrium when there is population uncertainty, i.e., when members of each group do not know the exact number of individuals contributing. Only a mixed-strategy equilibrium is feasible.

Lastly, the equilibrium of this game is unique. The proof of uniqueness is fairly straightforward. Myerson (1998: 391, 2000) provides the proof for uniqueness in large Poisson games.

F. A Computational Analysis

Having argued that the equilibrium is symmetric, mixed and unique, we turn to the question of whether it is consistent with the two empirical noted above: voluntary contributions, and low number of contributors. We will answer this question by computational analysis.

First, the analysis of contributing to groups must be integrated into a policy process. We assume that the public interest groups use money to bribe a policymaker to adopt the policy favorable to that group.

Assume that there is a single policymaker whom the interest groups need to bribe to make a decision favorable to themselves. (We can relax this assumption by “buying” a majority of the policymakers.) The group that provides the most money is given the policy they prefer. In case of

a tie, the policymaker flips a coin to determine which policy is enacted.

A pro-group member is pivotal in two cases. In one case, without the pro-member's contribution, there is a tie in the contributions levels, which the con-policy group wins in a coin toss. In the second case, without the pro-policy group's contribution, the con-policy groups wins, although the pro policy would have won in a coin toss. The population uncertainty assumption entails that we do not know the number of contributors, but rather, that the pro and con contributors are independent Poisson random variables⁹. Hence, each potential pro-group contributor's pivot probability is given by:

$$\sum_{k=0}^{\infty} \left(\frac{e^{-100000000\rho} (100000000\rho)^k}{k!} \right) \left(\frac{e^{-100000000\lambda} (100000000\lambda)^k}{k!} \right) \left(1 + \frac{100000000\lambda}{(k+1)} \right) (1/2) \quad (5)$$

A comparable pivot probability is given for con-group members:

$$\sum_{k=0}^{\infty} \left(\frac{e^{-100000000\rho} (100000000\rho)^k}{k!} \right) \left(\frac{e^{-100000000\lambda} (100000000\lambda)^k}{k!} \right) \left(1 + \frac{100000000\rho}{(k+1)} \right) (1/2) \quad (6)$$

The pro-policy group members contribute with probability λ and the con-policy group members contribute with probability ρ . In a mixed-strategy equilibrium these probabilities are the randomization probabilities adopted by the members of the two groups that produce a Bayes-Nash equilibrium. These randomization strategies result in the individuals of each group being exactly

⁹ We are directly applying the Poisson distribution, though it could be used as an approximation to the binomial distribution. See Myerson (1998: 389).

indifferent between contributing and not contributing. There are no pure-strategy equilibria when we have population uncertainty.

Next, we define the benefit from contribution solely in terms of self interest as in equation #1. Equation #1, then, is rewritten as the pivot probability equal to the cost-benefit ratio:

$$p = C / B_1 \quad (7)$$

This pivot probability is then set equal to .05 to represent a realistic measure of costs relative to private benefit. Since the average contribution to a public interest group is about \$50, this means that the expected private benefit is \$1000. We take this ratio from Palfrey and Rosenthal (1984, 1988) and Myerson (1998) who argue this is the typical ratio of costs to private benefits from voting. This might be on the high end of expected, private benefit, but we would rather err on the side of overestimation.

To determine the equilibrium contribution levels by members of the two groups (λ and ρ) we solve for them simultaneously and set both pivot probabilities equal to .05. To solve for the Poisson pivot probabilities, we use an approximation developed by Myerson (2000).¹⁰ This approximation is given by:

$$\sum_{k=0}^{\infty} \left(\frac{e^{-\alpha} \alpha^k}{k!} \right) \left(\frac{e^{-\beta} \beta^k}{k!} \right) \left(1 + \frac{\beta}{(k+1)} \right) (1/2) \approx \frac{e^{-(\alpha+\beta-2\sqrt{\alpha\beta})}}{4\sqrt{\pi\sqrt{\alpha\beta}}} \left(\frac{\sqrt{\alpha}+\sqrt{\beta}}{\sqrt{\alpha}} \right) \quad (8)$$

Since this approximation is very good for expected turnouts of greater than ten, we use this approximation for later computations.

¹⁰ The standard approximation of a Poisson by a Normal distribution cannot be used when the ratio of probabilities goes to zero, and $n \rightarrow \infty$.

The α and β parameters are the means of the Poisson distributions for the two groups; they are equal to $N_1 \lambda$ and $N_2 \rho$ respectively. We solve equation #8 for the equilibrium randomization strategies of the group members. If $N_1 \lambda = N_2 \rho$, then the approximation for the pivot probability reduces to:

$$\frac{1}{2\sqrt{\pi N_1 \lambda}}$$

Setting this equal to $C/B = 0.05$, we obtain:

$$\frac{1}{2\sqrt{\pi N_1 \lambda}} = .05$$

Thus, $N_1 \lambda = 31.83$. Hence, if there are one hundred million members in each group, approximately 32 individuals from each group will contribute in equilibrium. Therefore, the predicted numbers are not even remotely close to the observed contributors to public interest groups.

Hence, we shifted to the pure altruistic formulation as found in equation #3. To obtain contribution levels of approximately one percent by the members of the two groups, we calculated that we need a ratio of costs-to-benefits of approximately .0003. This means a contribution of fifty dollars must produce a benefit of \$166,650 for the average member. However, this requirement to produce the observed level of contributions can only be supported by altruistic benefits because it is unrealistic to expect that members of these groups can expect to receive individual benefits of this magnitude.

It is extremely unlikely that an individual contributing to a public interest group might expect

a private benefit of \$166,650. Since individuals regularly contribute on an annual basis, this benefit must be the annual expected private benefit from contributing to the public good. The expected private benefit must therefore, exceed by approximately a factor of four, the average annual income of a family in the United States. It is improbable that the average contributor to an environmental group, to NOW or to Common Cause, for example, expects a private benefit of \$166,650. Individuals may have this private valuation, but we suspect that these are very rare. For these reasons, we argue that weak altruistic considerations must be included in the utility function of individuals.

Ultimately, whether and to what extent individuals include altruistic considerations is an empirical question, which we cannot resolve here. But, even in the unlikely case that individuals place an unrealistically high valuation on private benefits from public goods, the analysis of voluntary contribution presented herein requires minimum modification. The altruistic benefit term B_2 would be eliminated; but the rest of the analysis goes through.

More generally, the intuition behind this analysis is that as the individual benefits increases from contributing to the public interest group, the equilibrium probability for contributing increases. This probability is the randomization strategy between contributing and not contributing to the group. Thus, even though the probability of being pivotal declines, the probability of contributing increases as the benefit ($B_1 + B_2$) increases, holding C constant.

Figure 1 plots the equilibrium probability of contributing L from .005 to .05, the size of the groups N ranging from ten million to a hundred million members, and the cost-benefit ratio (the vertical axis) from .000 to .010. The product of the group size N and the probability of contributing gives us the total number of contributors from each group. As can be seen, as the benefits increase,

the cost-benefit ratio decreases, and the probability of contributing increases.

The analysis presented up-to-now assumes that the two groups have the same number of potential members. We now turn to the case where the two groups are different membership sizes, i.e., $N_1 \neq N_2$. Changing the size of the two groups does not affect the equilibrium number of contributors. The intuition behind this is fairly straight forward to see. Since members of both groups use mixed-strategies in determining whether to contribute, they randomize, so that the other group's members are indifferent between contributing and not contributing. Hence, both groups are indifferent in equilibrium only when the expected number of contributors from either group is the same. For this to occur, the smaller group must assign a higher probability of contributing than the larger group to offset the larger group's size.

This adjustment is evident from equation # 8. The means (α and β) of the Poisson distributions for the two groups are equal to $N_1 \lambda$ and $N_2 \rho$ respectively. The means must be equal in equilibrium. Hence, if one group is larger than the other, the randomization strategy of the members of the groups (α and β respectively) must adjust to compensate for the group size. Thus, if group one is larger, then group two must randomize with a higher probability of contributing to the group. Thus, group size differences do not affect the conclusions derived from the case of groups of equal size.

Thus with realistic expectations as to private benefits, weak altruism is needed to explain the number of voluntary contributors to public interest groups. If private benefits are twenty times that of costs, we would only observe about thirty-two contributors per one hundred million of potential contributors. Moreover, the amount of altruism required is not extensive. We are not claiming individuals are not primarily self interested. However, it is a fact that we do contribute a portion of

our income (about 5% by some estimates) to charitable causes. A fifty dollar contribution to NOW, Greenpeace or the NRA is a form of weak altruism, for most individuals. Hence, weak altruism can explain the observed level of contributions to public interest groups. We would not, however, expect individuals to pay their taxes voluntarily, out of altruistic motives.

This analysis is also consistent with the observed low number of contributors (about 1%) of the potential pool of members to public interest groups. Higher numbers of contributors would require much higher levels of expected benefits.

IV. An Inverse Size Principle?

Olson (1965) noted that in the case of economic interest groups, the larger the group the less likely the group would be able to overcome the freerider problem. This argument is known as the size principle. In the case of non-economic groups, Runge (1983) and Cornes and Sandler (1996) argue that an inverse size principle holds (i.e., the larger the potential group, the greater the probability of overcoming the collective action problem). Runge suggests an inverse size principle, while Cornes and Sandler present a more formal analysis. Hence, we focus upon the Cornes and Sandler (1996: pp.161ff.) analysis. We show, using the framework already developed, that an inverse size principle does not hold in the case of most public interest groups.

Their alternative size principle stems from the non-rival character of the good provided by public interest groups. Olson's version of the size principle is based on the rival nature of the public good provided by economic interest groups. In the case of a non-rival good, the cost of providing the benefit is fixed at some constant. Further, they assume that the number of beneficiaries is fixed.

Hence, as the potential beneficiaries of the group increase in number, with the costs equal to a constant, the likelihood of reaching the threshold contribution level increases.

Cornes and Sandler's analysis, therefore, does not view the public interest group to be in competition with an opposing group. They assume a single group providing a benefit. When there is competition between groups over policy decisions, there are no fixed costs for providing the benefits for the members of the group. The amount required to be spent is a function of what the opposition is spending. It is this feature of competition between public interest groups that underlies our analysis. It is therefore fairly easy to show that Olson's original size principle holds even in the case of public interest groups.

A formal proof of Olson's size principle also follows from our analysis; start with the case that the two groups are of equal size ($N_1 = N_2$) and thus the two contribution probabilities are the same, i.e., α equals β ; we set equation # 8 equal to C/B (the pivot probability), i.e., we set the pivot probability equal to a constant. The modified equation becomes:

$$g = (N, \lambda) = (1/2) \left(\frac{e^{-N\lambda - N\lambda + 2\sqrt{N^2\lambda^2}}}{\sqrt{\pi\sqrt{N^2\lambda^2}}} \right) \quad (9)$$

This equation in turn reduces to:

$$C/B = \frac{1}{2\sqrt{\pi N\lambda}} \quad (10)$$

Since C/B is a constant, it is clear that there is an inverse relationship between the number of potential members and the probability of contributing to the organization.

When the two groups differ in size, the same relationship holds. Because the contribution probabilities are a Bayes-Nash equilibrium, the two groups randomize so that each member is indifferent between contributing and not contributing. Thus, as the size of the groups diverge from identity, the contributing probabilities adjust so that $N_1\lambda = N_2\rho$. (See Myerson (1998) or Palfrey and Rosenthal (1985) for this condition.)

Thus, both size principles hold. Olson's original size principle holds in the case of competitive public interest groups. This conclusion follows from analyzing the motive for contributing as a competition between two groups as opposed to one group attempting to reach some threshold of contribution as assumed by Runge (1984) and Cornes and Sandler (1996). The Cornes and Sandler version holds when there is no competition over the merits of the public good.

V. Empirical Tests

A number of researchers have been testing the role of altruism in various settings. For example, Putnam (1998) notes that there has been a decline in altruism, starting in the early 1960s, that coincides with the decline in civic engagement and voting turnout. Feldman and Steenberger (2001), Fong (2001) and Russell, Bjorner and Clark (2003) analyze support for welfare programs by differentiating between self-interested and altruistic motivations.

To my knowledge, there have been no empirical tests linking group membership, and or contribution, with altruism. The 2004 General Social Survey (GSS) has a battery of questions related to various group memberships, and other forms of political participation, including contributions to social and/or political causes. In addition, there are a number of questions which

tap the altruism of respondents.¹¹

To test whether membership in various organizations is related to the altruistic views of the respondents, we regress the altruistic responses with the membership of individuals. The dependent variable is membership in the group. The responses are either yes or no. The independent variable is a measure of the altruistic attitude of the individual. The specific measure used is the response to the following question: As far as you are concerned personally on a scale of 1 to 7, where 1 is not at all important and 7 is very important, how important is it--To help people in America who are worse off than yourself.

In the test of whether membership in political organizations are related to altruism, an additional modification is necessary. The benefits (B), as specified in equation #3, are the net benefits from political participation. If it is perceived that parties do not offer real choices in elections to citizens, the net benefit is equal to zero. Thus, irrespective of the altruistic intent of individuals, the rational, instrumental choice is to not participate in politics. However, an individual obtaining expressive benefits would participate irrespective of the net benefit. To test these hypotheses, an interactive variable is created, the product of extent of altruism and the perception of whether parties really offer a choice to citizens (ALTRUISM*PARTYD).

In addition, a number of controls are used. Rosenstone and Hansen (1993) argue that group participation is also contingent upon the age, education and income of individuals. Each of these control variables are hypothesized to have a positive impact upon group membership. (See the

¹¹ The 2004 GSS had as one of its goals the measurement of altruism among US citizens. It contains fifteen questions that aim at measuring empathy, altruistic behavior and other regarding attitudes. Unfortunately for this study, the individuals asked the altruism questions were in a different subgroup from individuals asked about membership and political participation. Thus, I was not able to use this set of responses in the analysis.

appendix for the specific wording of the various measures, and descriptive statistics for each variable.)

Table 1 presents the findings from the test of the membership hypothesis. Please note that the coding for membership is: Yes = 1, No = 2. Thus, the expected sign if altruism is correlated with membership is negative, in both the simple and interactive versions. Likewise, the expected signs of the control variables are negative, because of the coding of the dependent variable. The statistical test herein for membership is a logistic regression relating whether one is a member of a group (a dichotomous dummy variable) and the degree to which the individuals espouse altruistic sentiments.

As expected, membership in economic groups (Unions, Farm and Professional Associations) is not correlated with the altruistic individuals. This is the expected relationship if the reason for joining these groups are the selective benefits, as argued by Olson. Fraternal association membership is likewise not correlated with altruism.¹² By contrast, membership in service and religious groups is correlated with altruism. Because these are philanthropic groups, there is an expected relation to altruism. Thus, the pattern in economic versus philanthropic groups conforms to expectations.

Lastly, membership in political organizations is, as hypothesized, correlated with the interactive version of altruism and perceived choice provided by political parties (ALTRUISM*PARTYD). This finding is consistent with the proposition that the reason people join political organizations is that they are motivated by altruism. They are not primarily motivated by

¹² Additionally, membership in hobby, sports, ethnic and Greek groups is not correlated with altruism. I omitted the statistical results just for the sake of space. These data are available from the author on request.

promoting their self-interest. This interpretation is reinforced when I test for a linkage between altruism and other forms of political participation.

Table 2 presents the findings when I test for a linkage between altruism and a variety of political behavior. The dependent variable is the response to the question: Here are some forms of political and social action that people can take. Please indicate, for each one, whether you (1) have done any of these things in the past year, (2) have done it in the more distant past, (3) have not done it but might do it, (4) or have not done it and would never, under any circumstances, do it--Donated money or raised funds for a social or political activity. As before, the expected sign is negative because the dependent variable's measure of contribution is coded so that increasing contribution is decreasing in its ordinal ranking.

Signing a petition and contacting a city official are not correlated with the altruism of the respondent. Most times when citizens contact city officials it is for facilitation services, which are personal benefits for themselves (Fiorina, 1977). For example, citizens regularly contact city officials to get pot holes fixed in front of their house, signs changed, etc. Hence, a public good, for the most part, is not being provided. Signing a petition entails almost zero cost, and hence, does not require altruism either.

By contrast, donating money to a social or political cause, or joining a demonstration, entails an appreciable cost to the individual. Given the low probability that one's meager contribution will be decisive, self interest cannot explain contributing money to a group in order to affect public policy. Thus, both of these activities are not motivated by self interest, but require altruism on the part of the individual. And the statistical test confirms the hypothesis that both forms of activity are motivated by altruism.

The major difference between the findings on membership in groups versus contributing money or joining a demonstration is that the latter do not require an interactive version of altruism. One possible reason for this is that contributing money to a social or political activity entails support of activities other than traditional electoral politics. One engages in electoral politics, either through voting or working in parties, because one believes that the parties offer real choices to voters. Hence, testing the link between electoral politics and altruism requires an interactive measure (Jankowski, forthcoming; Fowler, 2005). But, money contributed to a social or political activity is directed at non-electoral behavior. For example, public interest groups are very extensively involved in lobbying Congress (Berry, 1999). The money raised by the public interest groups is used for promoting their policies via lobbying elected representatives from both parties. Hence, a belief that parties offer a real choice is not necessary when it comes to lobbying and other non-electoral forms of political behavior.

Thus, altruism is found to be linked to both membership in political organizations and to contributions to social and political causes. As such, this is evidence for the hypothesis that voluntary contributions to public interest groups is the solution to their collective action problem. Additional evidence that contributions are the main income of public interest groups is found in Nownes and Neeley (1997), Bosso (1995). and Shaiko (1999).

The proposition that altruism is a prime motivating consideration in politics, and for contributors to both conservative and liberal public-interest groups, requires that liberals and conservatives be comparably altruistic. Otherwise, if there were only “bleeding heart liberals”, altruism would help explain only the contributions to liberal public interest groups.

Table 3 presents the evidence from a statistical test for correlation between altruism and

ideological identification of individuals. Unfortunately, the measure of altruism used above was not asked of the same subgroup of respondents as the question asking for ideological identification. But, the fifteen questions regarding empathy, altruistic behavior, and other-regarding preferences was asked of this subgroup.

The measure of altruism is the question: how well does the following statement describe your thoughts and feelings: 1 = does not describe very well to 5 = describes very well; I often have tender, concerned feelings for people less fortunate than me. Sixty-four percent of extreme conservatives indicate that this statement describes their thoughts; while only fifty-four percent of extreme liberals concur. The gamma statistic and its probability indicate that there is no basic difference between liberals and conservatives if we consider the full distribution. Table 3 is representative of the fifteen measures of altruism and their relation to ideological identification. One measure, the response to the question: did you contribute to a charity?, indicates that conservatives are more altruistic in this behavior than liberals. This could be a Type 1 error when the probability used is equal to .05 and there are fifteen different measures of altruism.

Thus, the successful overcoming of the collective action problem by both conservative and liberal public interest groups can be explained by the desire of contributors to help the nation or others in general, rather than pursuing their own self interest.

This conclusion contradicts Berry's (1999) analysis of the origins of public interest groups. He argues that the gradual development of post-materialist preferences explain the explosive growth of public interest groups starting in the 1960s. However, I find that altruistic values are a good predictor of social and political contributions and membership.

My findings reinforce the findings of those that examined just the relation between

environmental groups and post-materialist preferences. Davis (2000) and Stern et al. (1999) find that support for environmental issues is unrelated to post-materialist views. Instead, they find a strong correlation between support for environmental issues with altruism.

If voluntary contributions solve the collective action problem of public interest groups, because contributors are trying to help society in general, then Berry's (1999) explanation for their explosive growth starting in the 1960s requires rethinking. Putnam (1997) finds that altruism actually starts declining in the U.S. starting in the 1960s. Thus, an alternative explanation for the growth of public interest groups is needed.

VI. Discussion

Olson's analysis of the collective action problem is incomplete because he only considered economic groups, and he specifically excludes philanthropic and public interest groups from his analysis. I have shown that an analysis of how the collective action problem is solved in the case of public interest groups requires some changes in Olson's analysis. First, I keep the self-interested axiom with a modification allowing for a weak altruism. Hence, the basic self-interested character of man is preserved. Second, public interest groups' contributors give money because their goal is the attainment of the group's policy goals, which for the most part are to help society in general. Their goal is not solely the creation of an interest group. Third, there is invariably an opposing group who is injured by the policy pursued by the first group. This situation gives rise to competition between groups in contributing to candidates for political office. Thus, the collective action problem is no longer the prisoner's dilemma. Rather, it is a coordination problem between the members of

the two groups, and thus, parallels the voting decision problem. Fourth, the decision to contribute must be seen as a problem of incomplete information because of the great uncertainty as to who will contribute amongst millions of potential contributors.

My analysis differs fundamentally from those found in the literature. Ainsworth and Sened (1993) also argue that voluntary contributions is the solution to the collective action problem of public interest groups. However, their analysis is limited to the uncontested formation of a single interest group, and thus, the public good is discrete/lumpy, i.e., it is the formation of the group. The goals of the group are immaterial to the incentive to form the group. Our analysis is of the more common situation where interest groups compete amongst themselves in the pursuit of public policy.

Formal analysis should attempt to conform to the observed facts of the phenomenon it is attempting to explain. There are two regular facts of public interest groups. One regular fact is that their primary source of revenue is voluntary contributions from members. There are limited or no private (selective) benefits provided by the groups to their members. Hence, altruistic motivation is a necessary component of any formal analysis. The other regular fact is that no more than one percent of any public interest group's potential membership base ever contributes to the organization. Our formal analysis herein supports both of these empirical facts in its explanation of the organization of public interest groups.¹³

At the outset of this paper, I identified three types of groups: economic, public interest and philanthropic. Our analysis of public interest groups compliments Olson's analysis of economic interest groups. An analysis of philanthropic groups is still required.

¹³ The formal analysis herein can generate contribution rates of greater than one percent. It only requires that the altruistic benefit be greater.

Lastly, I present empirical evidence that altruism motivates individuals to become members of non-economic groups, and to contribute money to social and political causes. Thus, the evidence is consistent with the theoretical analysis presented herein. Clearly, more extensive empirical analysis is needed. Alternative measures of altruism would be useful, as I were limited to surveys created by others for their purposes.¹⁴

Three additional caveats are in order. First, our integration of the collective action problem of public interest groups and the political process assumes that the money collected is used to bribe a policymaker and/or lobby a policymaker. Clearly, a competitive, electoral process is also possible. I are presently working on such a modification of the analysis. It entails a non-symmetric game, and hence, it is much more computationally complex than the analysis herein. Second, the categories of groups developed are ideal typical. This means that in practice we find groups which overlap categories. The NRA, for example, functions as a public interest group and a narrow, special interest group. Hence, it obtains some of its revenues from those motivated by altruistic considerations (i.e., maintaining freedom of gun ownership), and from some contributors (who may disagree with its policy goals) who are interested purely in the specific benefits provided by the organization.

Third, competition between groups over public policy can be between public interest and economic interest groups that use selective benefits to induce individuals to join. For example, environmental groups are regularly in conflict with businesses over pollution controls. Both contribute to candidates and/or lobby to get their respective policies enacted. Large businesses are either privileged or they solve the collective action problem through other means. Groups of small

¹⁴ This problem could be addressed if the GSS would ask in the future its battery of altruism questions to the same group who are asked the membership and political behavior questions.

businesses, because of their greater number, have a more difficult time solving the collective action problem. On the whole, they seem to rely also upon voluntary contributions. I have yet to formally analyze competition between business and public interest groups.¹⁵ The three caveats are in fact an outline to our future research on the interaction of interest groups and their attempts to achieve policy outcomes.

¹⁵ The Ainsworth and Sened (1993) analysis likewise does not address this case, because they eschew the competitive case in toto.

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Table 1

Altruism and Membership in Organizations

Dependent Variable:

Membership in Various Groups (1 = yes, 2 = no).
Logistic Regression Analysis.

	Reg Coef	Standard Error	Prob>F
Membership in:			
1. Fraternal Association			
Constant	9.91	1.57***	0.000
Age	-0.04	0.007***	0.000
Education	-0.12	0.04***	0.003
Family Income	-0.28	0.12***	0.006
Altruism	-0.06	0.10	0.938
2. Service Organization			
Constant	7.86	1.09***	0.000
Age	-0.02	0.006***	0.003
Education	-0.16	0.04***	0.000
Family Income	-0.09	0.06*	0.046
Altruism	-0.32	0.10***	0.001
3. Union			
Constant	5.44	1.08***	0.000
Age	-0.004	0.006	0.244
Education	-0.02	0.04	0.258
Family Income	-0.18	0.07**	0.004
Altruism	-0.07	0.09	0.206
4. Farm Group or Association			
Constant	4.21	1.50**	0.003
Age	-0.01	0.010	0.136
Education	-0.01	0.06	0.466
Family Income	-0.03	0.07	0.361
Altruism	-0.07	0.14	0.933
5. Professional Association			
Constant	9.99	1.03***	0.000
Age	0.01	0.00	0.051
Education	-0.52	0.04***	0.003
Family Income	-0.08	0.05*	0.025

Altruism	-0.03	0.08	0.378
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6. Church Organization

Constant	3.45	0.61***	0.000
Age	-0.01	0.004**	0.001
Education	-0.11	0.02***	0.003
Family Income	-0.05	0.03*	0.031
Altruism	-0.16	0.06**	0.003

7. Political Organization

Constant	7.53	1.22***	0.000
Age	-0.01	0.009	0.189
Education	-0.18	0.05***	0.000
Family Income	-0.18	0.08***	0.000
Altruism*PartyD	-0.03	0.02*	0.027

*** Significant at .000 level
 ** Significant at .001 level
 * Significant at .050 level

Table 2: Altruism and Political Behavior

Anova Test	Reg Coef	Standard Error	T-Stat
Dependent Variable			
1. Contribute to Social or Political Cause			
Age	0.01	0.002*	3.556
Education	-0.07	0.01***	-10.629
Family Income	-0.02	0.01	-1.406
Altruism	-0.08	0.03**	-3.186
2. Join a Demonstration			
Age	0.01	0.001*	3.556
Education	-0.07	0.01***	-8.267
Family Income	-0.01	0.01	-1.113
Altruism	-0.05	0.02**	-2.673
3. Contact City Government Official			
Age	-0.01	0.002***	-6.693
Education	-0.12	0.01***	-9.010
Family Income	-0.06	0.01***	-5.204
Altruism	-0.03	0.02	-1.181

*** Significant at .000 level

** Significant at .001 level

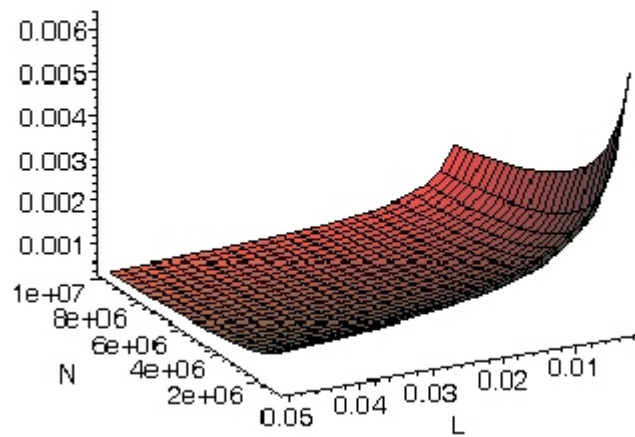
* Significant at .050 level

Table 3: Altruism and Political Ideology

POL. VIEW	by		EMPATHY1			
	NT VRY WEL		2	3	4	DES WELL
EXT. LIB.	1		1	4	15	25
	2.2%		2.2%	8.7%	32.6%	54.3%
LIBERAL	5		2	15	40	58
	4.2%		1.7%	12.5%	33.3%	48.3%
LEAN LIB.	4		13	20	48	68
	2.6%		8.5%	13.1%	31.4%	44.4%
MODERATE	18		18	86	137	235
	3.6%		3.6%	17.4%	27.7%	47.6%
LEAN CON.	5		11	35	85	77
	2.3%		5.1%	16.4%	39.7%	36.0%
CONSERV.	9		9	31	72	100
	4.0%		4.0%	13.9%	32.3%	44.8%
EXT. CON.	0		3	7	10	36
	0.0%		5.4%	12.5%	17.9%	64.3%
Missing	2	2	3	11	10	
TOTAL	42		57	198	407	599
	3.2%		4.4%	15.2%	31.2%	45.9%

Gamma = -0.011 Prob. = 0.726

Figure 1: Probability of Being Decisive Contributor as a Function of Group Size and Cost-Benefit Ratio



Appendix: Measures Used in Statistical Analysis.

Altruism -- There are different opinions as to what it takes to be a good citizen. As far as you are concerned personally on a scale of 1 to 7, where 1 is not at all important and 7 is very important, how important is it--To help people in America who are worse off than yourself.

Mean: 6.029 Std.Dev.: 1.201 N: 1465

Category	Freq.	%	Cum.%	Z-Score
1) NOT AT ALL	12	0.8	0.8	-4.188
2)	8	0.5	1.4	-3.355
3)	27	1.8	3.2	-2.522
4)	112	7.6	10.9	-1.690
5)	277	18.9	29.8	-0.857
6)	312	21.3	51.1	-0.024
7) VERY	717	48.9	100.0	0.808

Contribute Funds-- Here are some forms of political and social action that people can take. Please indicate, for each one, (1) whether you have done any of these things in the past year, (2) have done it in the more distant past, (3) have not done it but might do it, (4) or have not done it and would never, under any circumstances, do it--Donated money or raised funds for a social or political activity. (POLFUNDS)

Mean: 2.391 Std.Dev.: 1.120 N: 1466
 Median: 2.000 Variance: 1.254 Missing: 1346

Category	Freq.	%	Cum.%	Z-Score
1) YES,RCNT	451	30.8	30.8	-1.242
2) YES,PAST	284	19.4	50.1	-0.349
3) NO,WOULD	438	29.9	80.0	0.544
4) NO,NEVER	293	20.0	100.0	1.437

MEMBER SERVICE -- MEMBER? Service clubs (MEMSERV)

Mean: 1.904 Std.Dev.: 0.294 N: 1462
 Median: 2.000 Variance: 0.087 Missing: 1350

Category	Freq.	%	Cum.%	Z-Score
1) YES	140	9.6	9.6	-3.072
2) NO	1322	90.4	100.0	0.325

FAMILY INCOME -- In which of these groups did your total family income, from all sources, fall last year before taxes, that is? (INCOME)

Mean: 10.886 Std.Dev.: 2.408 N: 2482
 Median: 12.000 Variance: 5.799 Missing: 330

Category	Freq.	%	Cum.%	Z-Score
1) UNDER 1 K	46	1.9	1.9	-4.105
2) 1K-2999	30	1.2	3.1	-3.690
3) 3K-3999	21	0.8	3.9	-3.275
4) 4K-4999	19	0.8	4.7	-2.859
5) 5K-5999	25	1.0	5.7	-2.444
6) 6K-6999	38	1.5	7.2	-2.029
7) 7K-7999	24	1.0	8.2	-1.614
8) 8K-9999	36	1.5	9.6	-1.198
9) 10K-14999	160	6.4	16.1	-0.783
10) 15K-19999	153	6.2	22.2	-0.368
11) 20K-24999	166	6.7	28.9	0.048
12) 25K & UP	1764	71.1	100.0	0.463

PARTY DIFFERENCE -- Political parties do not give voters real policy choices. (CHOICES)

Mean: 2.741 Std.Dev.: 0.981 N: 1440
 Median: 3.000 Variance: 0.962 Missing: 1372

Category	Freq.	%	Cum.%	Z-Score
1) STR AGREE	127	8.8	8.8	-1.775
2) AGREE	525	36.5	45.3	-0.755
3) NEITHER	403	28.0	73.3	0.264
4) DISAGREE	364	25.3	98.5	1.284
5) STR DISAG	21	1.5	100.0	2.30

SELFLESS --I feel a selfless caring for others. (SELFLESS)

Mean: 2.895 Std.Dev.: 1.385 N: 1324
 Median: 3.000 Variance: 1.917 Missing: 1488

Category	Freq.	%	Cum.%	Z-Score
1) MANY/DAILY	191	14.4	14.4	-1.369
2) EVERY DAY	392	29.6	44.0	-0.646
3) MOST DAYS	353	26.7	70.7	0.076
4) SOME DAYS	229	17.3	88.0	0.798
5) ONCE AWHLE	101	7.6	95.6	1.520
6) NEVER	43	3.2	98.9	2.242
8) DONT KNOW	15	1.1	100.0	3.687

EMPATHY1 --

HOW WELL DOES THE FOLLOWING STATEMENT DESCRIBE YOUR THOUGHTS AND FEELINGS; 1 = DOES NOT DESCRIBE VERY WELL TO 5 = DESCRIBES VERY WELL. I often have tender, concerned feelings for people less fortunate than me. (EMPATHY1)

Mean: 4.133 Std.Dev.: 1.059 N: 1336
 Median: 4.000 Variance: 1.122 Missing: 1476

Category	Freq.	%	Cum.%	Z-Score
1) NT VRY WEL	44	3.3	3.3	-2.958
2)	59	4.4	7.7	-2.014
3)	201	15.0	22.8	-1.070
4)	418	31.3	54.0	-0.126
5) DESC WELL	609	45.6	99.6	0.818
8) DONT KNOW	5	0.4	100.0	3.650