# Beyond Economic Man

## ALTRUISM, EGALITARIANISM, AND DIFFERENCE MAXIMIZING

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The existence and prevalence of behavior inconsistent with economists' definition of self-interest is measured in an experimental context. Experimental situations involving choices with monetary payoffs are designed to induce preferences. The subjects' behaviors are used to measure the existence and intensity of various forms of motivation based on "interactive preference functions." Explicitly, we test for altruistic, egalitarian, and difference maximizing behaviors. Attempts to explain the nonself-interested choices by psychological and ideological constructs are not successful but statistical relationships between these choices and partisan political preferences are found.

$E$conomic man is rational and self-interested.[1] From at least the time of Adam Smith and his *Wealth of Nations,* these two fundamental behavioral assumptions have formed the twin pillars upon which modern microeconomic analysis has been built. Indeed the assumptions are so entrenched in the minds of economists that they are often implicitly assumed to be a single assumption. Of course they are not.

1. The designation "man" is generic here; it is worth noting that economics has a long history of attributing rationality to both sexes.

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Rationality refers to the individual's capacity to choose so as to maximize relative to a given set of preferences, and self-interest refers to the conjecture that the welfare of others is not an element in those preferences.[2]

Recently, both of these assumptions have run into empirical difficulties. In a brilliant set of experiments, Tversky and Kahnemann (1982, 1981, 1979) demonstrated that rationality (as traditionally defined by economists) fails to hold in a number of situations. Decisions among alternatives seem to be based not only on a fixed underlying set of preferences, but also on slight changes in the context in which the alternatives are posed.[3] Other experimental results confirm the difficulties they found (e.g., see Grether and Plott, 1979). Thus, seemingly inconsistent behavior can be demonstrated—almost at will—in a wide range of subjects. The implications of this "irrationality" for economic analysis are yet to be explored.

The self-interest assumption has also been attacked. A number of authors (Valavanis, 1958; Sen, 1977; Hochman and Rogers, 1969; Frohlich, 1974; Margolis, 1982) have attempted to demonstrate how nonself-interested behavior, envy or, usually, altruism, might be modelled so that it could be incorporated into microeconomic analysis. Although viable models were produced, they were simply that: models. They did not rest on explicit data and thus did not demonstrate the prevalence of and, hence, to economists, the plausibility of, altruistic behavior.

But recent empirical studies by Marwell and Ames (1980a, 1980b, 1979), Miller and Oppenheimer (1982), and Eavey and Miller (1982) challenge the validity of the self-interest assumption in some economic

2. A solid technical discussion of rationality can be found in Sen (1970), Chapters 1 and 1*.

3. These results cap an extensive series of experiments by psychologists and economists that is amply cited in Tversky and Kahnemann (1981).

choices. In these experimental nonmarketlike situations involving real payoffs, the majority of subjects appear to be willing to take lesser payoffs in order to take into account the welfare of others. In other words, the subjects act as if altruism or fairness is an explicit element in their preference structures.

Obviously, such results pose problems for the self-interest assumption. They indicate that one individual's preferences are a function of the welfare of others: *precisely what the economists' definition of self-interest rules out.* But these experiments do not permit one to identify much about the nature or shape of these subjects' interactive preference functions.[4]

This article reports on a set of experiments designed to test for the prevalence and nature of interdependent utility elements in individuals' preference structures.[5] Specifically, they check for three types of interactive preferences that we label: (1) altruistic, (2) egalitarian, and (3) difference maximizing.

Intuitively, altruistic preferences are those by which individuals are willing to give up something to increase the welfare of another person.[6] In these experiments, this type of behavior is operationally defined as occurring when the subject makes a choice that is personally costly but yields an increased payoff to another person. It contrasts with traditional self-maximizing behavior because subjects must accept lower payoffs to give others higher payoffs. Thus, an example of an altruistic choice would be choosing a payoff of $7 for oneself with $14 for the other person rather than opting for $8 for oneself and $7 for the other person. (See situation 1 in Figure 1 below.)

Egalitarian preferences involve a concern for the degree of equality of income, wealth, or payoff associated with the outcomes; hence, they

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4. On the other hand, in another paper based upon these same experiments, Bond (1983) defines a model of utility construction, which shows that the data from the experiment rules out many possible utility functions. He goes ahead to propose a generalized theory of utility interaction that accounts for the forms of behavior we found.

5. The experiments are an expansion and refinement of experiments by Wyner (1973) that were suggestive but not conclusive.

6. This is akin to Sen's (1977: 326ff) notion of commitment. We here develop a way of handling the substance of commitment without all of the structure that Sen suggests (1977: 335-337). He sees questions of the role of justice in individual choice as requiring orderings of preference orderings. We handle these issues by conjecturing that individual values are like other goods: one tries to achieve them when the cost of achievement is not too high. Obviously, there are testable consequences of our model, and one could argue that the experiments begin to confirm our conjecture.

**a. Situations to reveal *Altruistic* Deviance from Self Maximizing Preferences**

| 1. | | 2. | | 3. | |
|---|---|---|---|---|---|
| A | 8,7 | A | 8,7 | A | 8,7 |
| B | 7,14 | B | 5,14 | B | 3,14 |

**b. Situations to reveal *Egalitarian* Deviance from Self Maximizing Preferences**

| 4. | | 5. | | 6. | |
|---|---|---|---|---|---|
| A | 8,7 | A | 8,7 | A | 8,7 |
| B | 6,6 | B | 3,3 | B | 0,0 |

**c. Situations to reveal *Difference Maximizing* Deviance from Self Maximizing Preferences**

| 7. | | 8. | | 9. | |
|---|---|---|---|---|---|
| A | 8,7 | A | 8,7 | A | 8,7 |
| B | 7,2 | B | 6,1 | B | 5,0 |

**d. Situations to reveal a choice from among the set of Preference Types.**

| 10. | | | 11. | | |
|---|---|---|---|---|---|
| A | 7,7 | Egalitarianism | A | 8,7 | Maximizing |
| B | 7,6 | Difference Maximizing | B | 7,8 | Altruism |
| C | 7,8 | Altruism | C | 7,5 | Difference Maximizing |
| | | | D | 7,7 | Egalitarianism |

NOTE: The first number represents the payoff to the subject, while the second represents the payoff to the person paired with the subject. Thus, in situation 1, a choice of B would yield the subject 7 units and the other person 14 units.

**Figure 1: Experimental Situations for Revealing Nonself-Maximizing Preferences**

involve a form of concern for fairness. Operationally, we define this as a choice for strictly equal payoffs rather than for a higher payoff to self. (See situation 4 in Figure 1.) Again, such behavior can be contrasted with self-maximizing behavior since the subject, solely in order to achieve strict equality, would be accepting a lower payoff than he could receive.

Conceptually, difference maximizing behavior is akin to malice. It reflects a preference for outcomes that maximize the difference between what one gets and what some other person gets (with the latter getting the lesser amount, of course). In our experiment, it is inconsistent with traditional self-maximizing behavior inasmuch as the difference maximizing choice is to accept a lesser payoff to self so that another is even worse off. For example, a difference maximizing subject could prefer a $5 payoff to himself and a $0 payoff to the other over an $8 payoff to himself and a $7 payoff to the other (see choice 9 in Figure 1).

It is hypothesized that each of these three types of behavior is manifest in significant proportions of the population. Further, we

conjecture that psychological characteristics as well as sociopolitical values underlie or at least correlate with these behaviors.[7]

## EXPERIMENTAL DESIGN

A set of choice situations and a questionnaire were administered to undergraduates in both Canada and the United States in regular classrooms.[8] Each student was told that one of his choices would determine a monetary payoff for himself and one other student in the class with whom he would be paired anonymously. Following the suggestions of Epstein (1980, 1979) that single samplings of subjective variables such as preferences might be nonrepresentative of underlying preferences due to measurement error, the experiment was repeated for a total of seven times on successive class days, over a period of four weeks (with the order of the choice situations altered). The first and last instruments were administered and collected in the classroom. The intervening instruments were distributed in class, filled in by the students at their leisure, and returned at the subsequent class. The subjects were paid after their last instrument had been returned and the results tabulated. One choice situation from the fourth administration was selected randomly as the basis for the payoff. Subjects were then paid for their choice. They received an additional amount from the choice their paired subject made on their behalf. Total payoffs were on the order of $3 to $5 per subject. (Students in Canada, only, were given a five-point grade bonus in their course for participating. There, all but one student agreed to participate in the full series.)

### THE CHOICE SITUATIONS

The choices set out in the experiment were designed to identify the prevalence of behavioral goals other than maximization of the subject's

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7. The hypothesis that there might be a relationship between these sorts of choice behavior and political party preference was suggested by Wyner (1973). Specifically, in a set of experiments run in Austin, at the University of Texas, he found that Nixon supporters were significantly more likely to be difference maximizers than McGovern supporters. His experiments, however, had varous design flaws that prevented easy interpretation and replication. The current experiments are designed to determine whether his findings could be substantiated today.

8. The questionnaire and other data needed for replication of this experiment are available from the authors.

monetary gain. To accomplish this, the situations presented to the subject were totally nonstrategic. In other words, the subject, by his choice, could fully determine both a payoff to himself and to the other (anonymous) subject with whom he was paired.[9] Figure 1 represents the choice situations designed to elicit the subject's preferences for egalitarianism, difference maximizing, and altruism. Each situation confronted the subject with a set of 2, 3, or 4 options. Within each situation, each option is a box labelled A, B, C, or D, and each box contains 2 numbers. The first number represents the payoff to the subject, while the second represents the payoff to the person paired with the subject. Thus, in situation 1 in Figure 1, a choice of B would yield the subject 7 units and the other person 14 units.

Most of the choice situations involve binary choices. In Figure 1, the situations are grouped in 4 blocks: the first contains those 3 situations with alternatives permitting the subject to make altruistic choices; the next contains 3 situations involving egalitarian choices; and the third situations with difference maximizing choices. Within each block, the alternatives are ordered according to the increasing costs of choosing the nonself-maximizing strategy. (In the binary cases, the self-maximizing choice is always marked "A.") To illustrate, within the altruism block, B is the altruistic choice. In choice 1, for example, if the subject chooses A, she or he gets 8 and the other person gets 7.[10] But if the subject were to choose B, she or he would get 7 while the other person would get 14. Here choosing B rather than A "costs" the subject 1 unit. This choice situation can be contrasted with situation 2. There, choosing B over A represents a loss of 3 units to the chooser for the same gain (14) to the other. In choice 3, the cost rises to 5 units. Thus a subject would have to be increasingly altruistic to choose B in the progression through situations 1, 2, 3. A similar relationship holds for egalitarianism in choices 4, 5, 6 and for difference maximizing in choices 7, 8, 9.

The final block contains 2 situations in which there are more than 2 options each. In the first, number 10, the subject is being forced to make a choice that reveals an orientation toward 1 of the 3 forms of nonself-maximizing preferences. In the second, number 11, the subject is being

9. This form was adopted in order to extract the interactive preference question from strategic calculations. Thus, for example, tests based on the prisoner's dilemma game that were performed by Marwell and Ames (1980b, 1980a, 1979), Lave (1962), and Rapoport and Chammah (1965) do not permit the separation of these factors. Our subjects are faced with totally nonstrategic choice situations.

10. The numbers were used to calculate the actual earnings of the subjects. Thus, at the end of the seven days, payments to the subjects were made as determined by the selection of some (not previously announced pattern) of their answers over the period.

forced to reveal an orientation toward one of the 4 forms of preferences. Notice that, in situation 10, the payoff to the subject is 7 irrespective of his or her choice. Only the payoff to the other person is variable. Thus a choice of A in this situation gives the paired subject 7 (this is the same amount as the subject receives and this is thus the egalitarian response); a choice of B gives the other 6 (the difference maximizing response); and a choice of C gives the paired subject 8 (the altruistic response) as a payoff. A similar situation prevails in situation 11 except that the subject can receive 1 unit more for himself by choosing alternative A. Thus, a choice of either B, C, or D indicates that the subject is willing to pay a "price" of 1 unit for either altruism, difference maximizing, or egalitarianism.

## CANADIAN RESULTS

### ON THE STRENGTH AND PREVALENCE
### OF NONSELF-INTERESTED BEHAVIOR

In each of the seven administrations of the choice situations, subjects chose one or more of the nonmaximizing (nonself-interested) alternatives in substantial numbers. In Canada, considering only the binary choices, difference maximizing was the most prevalent form of nonself-interested behavior.[11] Some form of difference maximizing was chosen 16.1% of the time, while altruistic options were selected 12.9% and egalitarian ones 12.3% of the time.[12]

Perhaps more important than the number of raw choices, however, is the number of individuals who exhibited at least one of the nonself-maximizing behaviors in the binary choice situations as presented in Table 1. From the data in that table, it is apparent that each form of nonmaximizing behavior was exhibited by at least 19 individuals on the average. However, this number is somewhat misleading, since a few individuals exhibited more than one form of nonmaximizing behavior. The second to the last line in the table represents the number of individuals exhibiting at least one form of nonmaximizing behavior. On

11. The data reported in the bulk of this section reflect only the Canadian data. Comparisons with the United States are contained in a separate section below.
12. Choices from situations 10 and 11 are excluded from these tabulations since in one case only nonself-interested choices were possible and in the other the various elements of nonself-interested behavior are competitive. Thus only the binary choice situations are included in the table.

TABLE 1
Number of Individuals Exhibiting at Least
One Instance of Non-Self-Maximizing Behavior*

| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | Day 6 | Day 7 | Average |
|---|---|---|---|---|---|---|---|---|
| Altruism | 19 | 20 | 19 | 19 | 19 | 21 | 20 | 19.6 |
| Egalitarianism | 30 | 24 | 20 | 19 | 23 | 18 | 20 | 22.0 |
| Difference Maximizing | 31 | 21 | 20 | 18 | 15 | 15 | 16 | 19.4 |
| Total Choices | 80 | 65 | 59 | 56 | 57 | 54 | 56 | 61.0 |
| Total number of individuals without double counting | 67 | 57 | 52 | 51 | 53 | 50 | 51 | 54.4 |
| Percent without double counting | 70.5 | 60.0 | 54.7 | 53.7 | 55.8 | 52.6 | 53.7 | 57.3 |

*All entries indicate the number (or percent) exhibiting nonself-maximizing behavior. After correcting for missing data, the Canadian sample consisted of 95 individuals who participated on each of the 7 days.

the average, over the seven runs, 54 separate individuals exhibited either altruism, egalitarianism, or difference maximizing. They constituted 57.3% of the sample. Moreover, very few individuals exhibited more than one form of nonmaximizing behavior. On the average, fewer than seven individuals exhibited two or more types of nonmaximizing behavior. The type of nonmaximizing behavior that was the most exclusive was altruism. On the average, only 12.4% of the individuals who made at least one altruistic choice engaged in some other form of nonmaximizing behavior. Difference maximizing was the next most exclusive and egalitarianism the least exclusive with 23.5% and 25.3% of individuals crossing over into other types of nonmaximizing behavior, respectively.

## SCALABILITY OF NONSELF-INTERESTED BEHAVIOR

As noted above, the binary situations were chosen to form an implicit test of the strength of the various nonself-interested elements in individuals' preference structures. The expectation was that increasing the cost to the subject of altruistic behavior would decrease its frequency. Similar relationships were anticipated for egalitarianism and difference maximizing. Operationally, this means that the three binary choice situations for altruism should form a Guttman scale in which an individual's choice of altruism in the most costly situation (number 3 in Figure 1) would imply an altruistic choice in number 2, where the cost was lower, and again in number 1, where the cost was still lower. Similar

conclusions hold for egalitarianism and difference maximizing in the choices 6, 5, 4 and 9, 8, 7, respectively. These observations also imply that the frequency of nonself-interested choices should increase as one progresses through each of those three sequences in the order indicated. Table 2 sets out the frequencies of the binary choices and the scalability of altruism, egalitarianism, and difference maximizing.[13]

Under the usual convention that a scalability above .6 indicates acceptability of the scale, we can conclude that the three sets of binary choice situations offer reliable scales of altruistic, egalitarian, and difference maximizing behavior.

To facilitate the analysis, numerical scales were constructed by assigning weights to the various altruistic, egalitarian, and difference maximizing choices in the binary choice situations discussed above. (Of course, the weights were consistent with the ordinal properties we assumed.) Moreover, in order to use all relevant data, weights were assigned to the altruistic, egalitarian, and difference maximizing choices in the multiple-alternative situations, 10 and 11. Of course, since the prices for nonself-interested choices in these situations were lower (in situation 10, there was no price at all to pay), they were assigned lower weights in the scale.

## RELIABILITY OF MEASURES OF
## NONSELF-INTERESTED BEHAVIOR

Indices for each type of behavior were computed for each subject for each day. Taking into account Epstein's (1980, 1979) caveat, the indices constructed were checked for reliability. Table 3 sets out the reliability of the altruism, egalitarian, and difference maximizing indices over several samples.

As can be seen from observation, the scales are extremely reliable. The very worst correlation of 2 1-day samples is .637, a respectable number in its own right. The average 1-day reliabilities are considerably higher with altruism .850, egalitarianism .791, and difference maximizing .840. These reliabilities are significantly higher than those reported by Epstein in various experiments, but they are, in fairness to him, explicitly behavioral measures. He noted the likelihood that such measures might show higher reliability. The reliabilities rise, as would be expected from reliable measures of valid constructs, over 2-day samples

13. These results should not be interpreted as indicating the relative frequency of these elements in general. The choice situations were not normalized to any absolute scale, and, in consequence, cannot be used as an absolute index. The frequencies are relative to the particular choices presented in this experiment.

**TABLE 2**

**Item Frequency and Scalability of Nonself-Interested Choices**

| Item | Choice Number | Day 1 F | S | Day 2 F | S | Day 3 F | S | Day 4 F | S | Day 5 F | S | Day 6 F | S | Day 7 F | S | Average S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Altruistic Choices | 3 | 12 | | 7 | | 6 | | 6 | | 7 | | 7 | | 5 | | |
| | 2 | 12 | | 12 | | 13 | | 14 | | 12 | | 9 | | 11 | | |
| | 1 | 18 | .76 | 19 | .95 | 17 | .89 | 17 | .89 | 17 | .83 | 20 | .89 | 20 | 1.00 | .89 |
| Egalitarian Choices | 6 | 5 | | 2 | | 3 | | 3 | | 3 | | 1 | | 1 | | |
| | 5 | 23 | .81 | 13 | .95 | 12 | .81 | 7 | .85 | 9 | .88 | 11 | .86 | 9 | .86 | .83 |
| | 4 | 25 | | 23 | | 17 | | 17 | | 22 | | 16 | | 18 | | |
| Difference | 9 | 26 | | 15 | | 17 | | 13 | | 13 | | 13 | | 12 | | |
| Maximizing Choices | 8 | 26 | .84 | 18 | .84 | 14 | .75 | 17 | .82 | 13 | .90 | 13 | .90 | 14 | .90 | .83 |
| | 7 | 21 | | 17 | | 17 | | 14 | | 13 | | 14 | | 14 | | |

*12*

**TABLE 3**

**Reliability of Altruism, Egalitarian, and Difference Maximizing Indices***

| Index | 1-Day Sample | | | 2-Day Sample | | | 3-Day Sample | | | All Odds vs. All Evens |
|---|---|---|---|---|---|---|---|---|---|---|
| | Low | High | Average | Low | High | Average | Low | High | Average | |
| **Altruism** | | | | | | | | | | |
| Samples | .674 1R5 | .968 6R7 | | .852 1,3R4,6 | .978 1,7R4,6 | | .981 1,3,5R 2,4,6 | .969 3,5,7R 2,4,6 | | |
| Compared | | | .850 | | | .920 | | | .948 | .957 |
| **Egalitarian** | | | | | | | | | | |
| Samples | .704 1R4 | .895 6R7 | | .856 1,7R2,4 | .930 5,7R4,6 | | .924 1,3,7R 2,4,6 | .936 3,5,7R 2,4,6 | | |
| Compared | | | .791 | | | .890 | | | .928 | .944 |
| **Difference Maximizing** | | | | | | | | | | |
| Samples | .637 1R4 | .952 3R4 | | .857 1,3R4,6 | .978 3,7R4,6 | | .944 1,3,5R 2,4,6 | .973 3,5,7R 2,4,6 | | |
| Compared | | | .840 | | | .919 | | | .957 | .967 |

*Entries are either correlation coefficients or use the days' data to calculate the coefficients.

*13*

and 3-day samples. The split-half reliability of the full data set is astonishingly high. Altruism has a reliability of .957. egalitarianism .944, and difference maximizing .967.

## COMPARING CANADIAN AND U.S. RESULTS

A check on the robustness of our results can be obtained by comparing behaviors in two differing cultures. Indeed, in some important ways, this was accomplished. In the United States, experimental results showed a similar level of nonself-maximizing behavior, and the choices were found to be about as reliable and scalable as in Canada. Also, as in Canada, altruism stands out as the most "stable" nonself-interested response in the United States (note the standard deviations in Table 4). Hence, much of the thrust of the discussion above is not modified by an examination of the U.S. data. But beyond this, differences between Canadian and U.S. subjects are apparent. For example, in the United States, the subjects' choices are distributed differently across the nonself-maximizing types of behaviors. Instead of about one third of the individuals exhibiting each of the three nonself-maximizing behaviors, there were far fewer individuals who chose difference maximizing alternatives.

But problems with the data make generalizing difficult. The American statistics reflect an unstable pool of participants. Whereas in Canada there was a very steady 98% participation rate (note the low value standard deviation, to n: $s_n = 1.4$ in Table 4), in the United States, students were much less consistent in their participation over the 7 days (again, note $s_n = 11.2$). (Note that only in Canada were students given a 5 point grade bonus for participation.) In the United States, participation may well have been related to the very characteristics we were measuring. Furthermore, the distribution of nonself-maximizing responses may reflect differences other than those which exist between Canadians and Americans: The students differed along other measured dimensions. In Canada, for instance, the students were overwhelmingly business students, while in the United States, most were liberal arts students.

But these differences should not obscure the common points. In both series of experiments, nonself-maximizing behaviors were chosen often. In both, the scalability of the nonself-maximizing behaviors was impressive (see Table 5). This could indicate that we tapped common varieties of behavior with interesting properties. First, the types of behavior have an obvious moral dimension; thus, two of them (altruism and egalitarianism) are positively related to commonly espoused moral

TABLE 4
Comparing the Distribution of Nonself-Maximizing Behavioral Choices
7-Day Average[a] (and Standard Deviation)

| Behavior Type | Canada | United States |
|---|---|---|
| Altruism | 20.6% | 38.0% |
| | ( .8) | (4.6) |
| Egalitarianism | 23.2% | 27.1% |
| | (4.0) | (8.3) |
| Difference Maximizing | 20.4% | 8.6% |
| | (5.5) | (6.9) |
| Total Number of Individuals Who Chose At Least One Nonself-Maximizing Behavior | 54.4 | 20.4 |
| | (5.6) | (9.1) |
| Number of Subjects | 98.0 | 31.6 |
| | (1.4) | (11.2) |

a. The averages are of subjects choosing at least one of the designated types of behavior; hence unless otherwise designated, they include individuals who were counted twice because they chose more than one type of nonself-maximizing behavior.

precepts. The third, difference maximizing, has a negative relationship with most moral principles. The scalability of the responses indicates that the costs involved in these choices affect preferences for the realizaton of moral goals much as prices affect the demand for consumer goods. Such a view, although perhaps quite "intuitive," nevertheless flies in the face of many philosophical discussions regarding the nature of morality. Behavioral or anthropological support for Kantian and other deontological positions are denied by this data (for an analysis of the role of behavioral data in moral argument, see Edel, 1963). But the argument also has many consequences for the analysis of nonself-interested behavior. It flies in the face of the theoretical suggestions of Sen (1977) and Margolis (1982), who are among those indicating that moral concerns cannot be captured by a simple rationality or preference model. The findings of the experiments here would indicate quite the opposite. If we wish to expand the rationality (i.e. consistent and maximizing choice) models so as to cover social and moral values robustly, it would appear that a minimum manipulation of the underlying theoretical structure is required. (The importance of such minimalist changes is pointed out by Quine, 1953: 42-45).

Of course, there are dimensions of moral philosophy that are totally neglected by this line of argument. Thus, one can certainly object and ask what is the relationship between the "good" or "fair" or "just" act and that which individuals believe to be good, fair, and just? Such an "essentialist" position is quite popular in ethical philosophy and should

TABLE 5
Scalability of Nonself-Maximizing Choices

| Behavior Type | Canada | United States |
|---|---|---|
| Altruism | .89 | .98 |
| Egalitarianism | .83 | .99 |
| Difference Maximizing | .83 | .96 |

not be derided. However, we must immediately note that these nonbehavioral aspects of good, fair, and just are not directly related to the reformulations suggested by Margolis and Sen, who, like us, are primarily concerned with the behavioral questions of morality.

## STATISTICAL EXPLANATIONS
## OF THE NONSELF-MAXIMIZING CHOICES

Data other than the choices of behavioral type were collected to help us sort out the reasons for the behavioral variations that we expected to find. In particular, we had three sorts of conjectures. First, we attempted to utilize questions that, in various psychological studies, were quite successful in tapping *one's general psychological orientation toward others.* Our first conjecture was that this general orientation would prove to be a psychological "cause" of the manifest behavioral choices. For example, such characteristics as trusting in others traditionally has been conjectured to be correlated with altruism. Second, we conjectured that one's particular ideological values, especially those regarding economic distribution (after all, our data had to do with patterns of economic distribution), would be correlated with the manifest behavioral patterns. Finally, we felt that the affiliation with a political party, which reflects, among other things, a general ideological orientation, would be correlated with the revealed behaviors. All the test items were included in all seven applications of the questionnaire, and all were thus subject to Epstein's tests for construct validity. All performed well in this fashion.

In analyzing these conjectures, we performed a number of correlational tests. Behavioral choices were correlated with both single response items (averaged over the seven test periods) and with multiple response indices that we constructed to tap the underlying "psychological," "ideological," and "party affiliative" dimensions. Further, in order to investigate the relationships conjectured, we constructed various forms of indices to collapse the three types of behavior into a single dimension so as to facilitate correlational analysis.

But, almost regardless of which questions we tapped and which index construction we used, little evidence was found that supported the first

and second conjectures, either in Canada or in the United States. Indeed, only a few of the items correlated significantly with the behavioral orientations of the subjects. One of those items was the party affiliation of the respondents.

A number of questions were asked of the subjects to determine their partisan political preferences. From their responses to these questions, indices of support for each party were constructed by assigning weights to the responses of the questions and adding them. Thus, for example, the index of support for the Progressive Conservative Party (SPC) was constructed as follows:

(1) If the subject indicated that he intended to vote Conservative in an imminent election, he would be assigned a weight of 4, if not, 0.
(2) If the subject indicated that he identified himself as a Progressive Conservative, he was assigned a weight 5, if not, 0.
(3) The subject was assigned the weight (1-5) which he chose as the degree of support he had for the policies of the Provincial Conservative Party.
(4) The subject was assigned the weight (1-5) chosen as the degree of support for the Federal Conservative Party's policies.

The scores on 1, 2, 3, and 4 were added to yield the subject's index: SPC. Similar indices were computed for SNDP and SLIB (the other two major Canadian Parties: the New Democratic Party and the Liberal Party).

As with the altruism, egalitarianism, and difference maximizing indices, these indices of partisan support were checked for reliability. Table 6 gives the results of those reliability checks for both Canada and the United States. Looking at Table 6 indicates that the reliabilities are high. Even the worst one-day sample reliability is .879. And, the reliabilities continue to rise so that the split half-reliabilities for the partisan indices reach almost unbelievable levels: .994 (SPC), .992 (SNDP), .976 (SLIB), .957 (REP), and .967 (DEM).

The indices of partisan preference and the various indices of nonself-maximizing behavior were correlated with one another to determine if the relationships hypothesized did in fact hold. Table 7 reports those correlations.

The correlations presented in the table support some of the hypotheses while not bearing out others. In general, the hypotheses appeared to fare better in Canada. The hypothesized positive relationship between Conservative partisanship and difference maximizing appears to hold. There is a correlation of .182, significant at the .039 level in the posited direction, while there is a negative correlation between Conservative support and altruism of −.230, significant at the .012 level. No significant relationship with egalitarianism appears.

TABLE 6
Reliability of Indices of Political Support (United States and Canada)

| | 1-Day Sample | | | 2-Day Sample | | | 3-Day Sample | | | All Odds vs. All Evens |
|---|---|---|---|---|---|---|---|---|---|---|
| | Low | High | Average | Low | High | Average | Low | High | Average | |
| SPC | .888 2R7 | .990 6R7 | .948 | .951 2,4R3,7 | .989 3,5R4,6 | .978 | .985 1,3,5R 2,4,6 | .989 1,3,7R 2,4,6 | .987 | .991 |
| SNDP | .898 2R7 | .981 6R7 | .942 | .955 2,4R5,7 | .989 3,7R4,6 | .976 | .986 1,3,5R 2,4,6 | .990 3,5,7R 2,4,6 | .987 | .992 |
| SLIB | .879 2R7 | .982 6R7 | .922 | .937 2,4R1,7 | .985 5,7R4,6 | .960 | .967 1,3,5R 2,4,6 | .979 3,5,7R 2,4,5 | .973 | .976 |
| REP | .257 2R6 | .958 3R6 | .789 | .637 1,3R2,6 | .996 3,5R4,6 | .865 | .888 1,3,5R 2,4,6 | .965 3,5,7R 2,4,6 | .927 | .957 |
| DEM | .694 2R5 | .996 5R5 | .847 | .865 1,7R2,4 | 1.0 5,7R4,6 | .893 | .967 1,3,5R 2,4,6 | .972 3,5,7R 2,4,6 | .970 | .967 |

In a parallel fashion, some of the relationships posited for NDP support (which are diametrically opposed to those for Conservative support) also appear to hold. SNDP correlates positively with the altruism index at .206 (.023) and negatively with difference maximizing: −.168 (.052). But no significant relationships with egalitarianism holds.

The results for Liberal support are not significant, but one item of interest appears in the data. The SLIB index exhibits a pattern of correlations that is roughly halfway between that of the SNDP index and that of the SPC index. This corresponds to the commonly attributed characteristic of the Liberal party as the party of the "middle" in Canada.

Although some of the correlations were suggestive (especially in Canada), they were not, even in Canada, overly strong. In attempting to identify possible reasons for the relatively low (though significant) correlations, the sample was broken into male and female components and analyzed separately. Here we consider the U.S. and Canadian results separately.

### THE CANADIAN EXPERIMENTS, SEX DIFFERENCES, AND PARTY AFFILIATION

In Canada, the analysis of party support by itself showed no significant difference when differentiated by sex. However, the relationship between party support and the behavioral choice indices are substantially different across gender. This is shown in Table 8.

It is clear that the male subsample bears out the hypotheses in a relatively strong fashion. Support for the Conservative party among males correlates negatively with altruism, −.306 (p = .007), and positively with difference maximizing, .207 (p = .016).

By contrast, support for the NDP among males correlates positively with altruistic choice, +.389 (p = .001), and negatively with differences maximizing, −.235 (p = .031). Again there is no significant relationship with egalitarianism although the negative correlation with egalitarianism (−.196) of Conservative males comes close to significance. One unanticipated result also emerged. Support for the Liberals among males correlated positively with egalitarian choice +.330 (p = .004). Again, on the other choice indices, the Liberal scores were between the NDP and the Conservative scores.

Surprisingly, there were no significant correlations (at the .05 level) among the female subsample. Thus, although these results suggest that there is a fairly powerful relationship between choice behavior and political support as far as males are concerned, this relationship is virtually nonexistent in the case of Canadian females.

**TABLE 7**
Partisan Support Indices versus Nonself-Interested Indices

|  | Altruism | | Egalitarianism | | Difference Maximizing | |
|---|---|---|---|---|---|---|
|  | r | (p) | r | (p) | r | (p) |
| SPC | −.230 | (.012)* | −.031 | (.386) | .182 | (.039)* |
| SNDP | +.206 | (.023)* | −.063 | (.283) | −.168 | (.052) |
| SLIB | .028 | (.395) | .062 | (.276) | .027 | (.387) |
| REP | −.098 | (.236) | .052 | (.353) | .016 | (.453) |
| DEM | −.175 | (.099) | .031 | (.410) | −.143 | (.147) |

*Indicates significance at the p = .05 level.

### THE U.S. EXPERIMENTS, SEX DIFFERENCES, AND PARTY AFFILIATION

As indicated, the checks for the reliability of the party affiliation constructs were high in the United States also (see Table 6 above). In the United States, however, correlations between party and behavioral orientations, although perhaps suggestive, showed no results significant at the .05 level (see Table 7). Interestingly, controlling for sex, as was done in the Canadian sample, improves the results only marginally. Recall that, in Canada, male subjects exhibited a strong relationship between behavior mode and party, while females did not. But in the United States, the only relationship that was significant was among females (see Table 9). There Democratic orientation among females correlates positively with egalitarianism. What might be the reason? Perhaps it is the politicization of women in the United States, relative to Manitoba. Given the very sizable national political concerns of women in the United States, it is perhaps not surprising that female students have oriented their behavior around what we might conjecture (still without much support) to be a relatively stable personality trait. In any case, it is noteworthy that sex appears, if anything, to play opposite roles in the two countries.

From these results, one obvious conclusion is that our findings regarding the explanations of the behavioral choices of the subjects are far less robust than our observations of the choices themselves. After all, only the link between party affiliation and the choices appears to be given substantial support. And, even with regard to this relationship, the quality of the results, from the larger perspective, is not all that we had hoped for. For example, other variables (sex and perhaps politicization) clearly mediate these relationships. The other conjectured relationships fell quite flat.

TABLE 8
Relationship of Canadian Party Support by Behavioral Mode and Sex

|  | *Altruism* | | *Egalitarianism* | | *Difference Maximizing* | |
|--|--|--|--|--|--|--|
| *Male (n = 64)* | | | | | | |
|  | r | (p) | r | (p) | r | (p) |
| SPC | −.306 | (.007)** | −.196 | (.060) | .207 | (.016)** |
| SNDP | .389 | (.001)** | .020 | (.439) | −.235 | (.031)* |
| SLIP | −.037 | (.326) | .330 | (.004)** | −.049 | (.350) |
| *Female (n = 64)* | | | | | | |
|  | *Altruism* | | *Egalitarianism* | | *Difference Maximizing* | |
|  | r | (p) | r | (p) | r | (p) |
| SPC | −.064 | (.363) | .123 | (.255) | .014 | (.471) |
| SNDP | −.238 | (.099) | −.115 | (.269) | −.035 | (.426) |
| SLIB | .184 | (.160) | −.207 | (1.32) | .167 | (.184) |

*(**) Indicates significance at the p = .05 (.01) level.

## DISCUSSION

From our results, it is clear that nonmaximizing or nonself-interested behavior occurs consistently. The self-interest assumption as narrowly construed fails. But this is not surprising. The strong arguments for the self-interest assumption were never for its verisimilitude. Even Edgeworth, who argued that "the first principle of Economics is that every agent is actuated only by self-interest" (1881: 16; as cited by Sen, 1977: 317), also says that "man is for the most part an impure egoist" (1881: 104; again, as cited by Sen, 1977: 317). Dennis Mueller, in commenting on an earlier draft of this article, indicated his expectation that outside of market contexts, nonself-interested behavior should be expected in a society like ours. Our culture, he observed, teaches us to cooperate "altruistically" in many contexts. Therefore, this discovery is perhaps not so surprising (although it may be theoretically important to have its extent corroborated and identified). Of greater centrality, we believe, is the identification of types of common nonself-maximizing behavior. Altruism, egalitarianism, and difference maximizing all occur in significant amounts. Moreover, the results appear to be quite reliable.

But at least one objection to the generalizability of the results is sure to occur to the reader. One might argue that the sums involved are so small as to be inconsequential: At the price of a few dollars, individuals are at liberty to indulge their "whims" and be altruistic, difference

TABLE 9
Relationship of U.S. Party Support by Behavioral Mode and Sex

| | Male (n = 28) | | | | | |
| | Altruism | | Egalitarianism | | Difference Maximizing | |
| | r | (p) | r | (p) | r | (p) |
|---|---|---|---|---|---|---|
| REP | −.148 | .226 | .010 | .480 | −.022 | .456 |
| DEM | −.185 | .173 | −.143 | .235 | −.172 | .192 |

| | Female (n = 27) | | | | | |
| | Altruism | | Egalitarianism | | Difference Maximizing | |
| | r | (p) | r | (p) | r | (p) |
|---|---|---|---|---|---|---|
| REP | .001 | .497 | .212 | .145 | .264 | .092 |
| DEM | −.164 | .206 | .359 | .033 | −.269 | .088 |

maximizing, or egalitarian. If the stakes were higher, these individuals would surely forsake their indulgences and revert to good old-fashioned self-interested maximizing. When it counts, one might argue, economic theory need not take into account this variant type of behavior.

With additional money and time, it would clearly be possible to test the validity of this objection and the outer limits of the price elasticity of these elements in individuals' utility functions. Research in that direction is clearly indicated by our results. Nevertheless, the question regarding the empirical importance of the phenomena that are manifest in our results still remains.

Here we would venture a rather broad claim for the relevance of the results in the political realm. Based on the seminal work of Downs (1957), many authors have noted the very small stakes involved for the average voter in deciding how to cast his ballot (e.g., Riker and Ordeshook, 1968; Ferejohn and Fiorina, 1974; Frohlich et al., 1978). This observation follows from the fact that in voting for one of, say, two candidates, the voter has a party differential between the two candidates based on their different policies. But this differential is discounted heavily by the probability that their vote will actually make a difference in the election. This is universally acknowledged to be a very small probability in moderate to large electorates. In other words, the voter's discounted party differential is likely to be of low expected value.

If this argument is correct, *the voting situation is one which, in terms of the stakes for the voter, is likely to be analogous to the experimental situation discussed above.* If individuals do indeed indulge in altruistic, egalitarian, or difference maximizing behavior in low stakes situations,

they are likely to do so in voting situations. Thus, in electoral contexts, a substantial number of voters may be expected to take into account not only the impact of proposed policies on their own material welfare, but also the impact of these proposed policies on the fates of others. Similarly, low incentives may be associated with other political acts. To the extent that practicing politicians recognize this, they will attempt to point out the impact of policies not only on those from whom they expect support, but also on other groups. That is, they may utilize the interactive preferences prevalent in the population in appealing for their policies by emphasizing the implications of their policies for other groups.

We are not satisfied with our correlational results regarding the underlying factors that lead to nonself-maximizing behavior. More data definitely ought to be collected regarding individuals exhibiting these behavior choices. But the relationships between choices, party, and sex indicate that patterns of socialization are a likely factor. Data on ethnicity, place of origin, and socioeconomic status of parents would be useful to collect.

Nevertheless, the main thrust of our argument should be clear. First, if altruism, egalitarianism, and difference maximizing play a substantial role in individual choice, some major tenets of Welfare Economics become ambiguous. Thus, the concept of "Pareto optimality" needs clarification if (for example) a shift of material goods from one individual to another can make them both better off. Indeed, the entire thrust of Welfare Economics is called into question to the extent that the individuals attach value not only to their own consumption of material goods, but also to their relative consumption vis-à-vis relevant others.

Second, if our line of research is correct, the attainment of "morally acceptable results" is a valued good that is similar to other goods. The greater the cost of choosing to attain the desired nonself-maximizing end, the less likely the individual is to make the choice. But, more relevant to the current debates on the nature of nonself-interest, it would appear that no radical reformulation of rationality needs to be concocted in order to introduce nonself-interested behavior. This flies in the face of Sen (1977), Margolis (1982), and others (cited in Sen, 1977).

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