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DISTRIBUTIONAL EFFECTS OF COLLECTIVE GOODS: A SURVEY APPROACH

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ABSTRACT

Who gains and who loses when collective goods are provided by government? This paper explores the actual and potential usefulness of opinion polls for answering this question. Insofar as opinion polls ask about collective goods, and insofar as respondents state support or opposition defending on whether they perceive positive or negative "net benefits," answers to opinion polls can tell us something about the perceived distribution of gains and losses among people of various age, income, education, race, occupational and other groupings.

Distributional Effects of Collective Goods: A Survey Approach

1. INTRODUCTION

Collective-consumption goods, although available to all persons, do not necessarily benefit all, and certainly not equally. Some consumers may benefit substantially, whether in willingness-to-pay or in other terms; some may benefit little or not at all; and still others may derive negative benefits if technological characteristics or institutional requirements compel consumption. Such distributional effects may vary, moreover, with the level of provision of the commodity since a person who derives substantial benefits at a particular level of output may even derive negative marginal benefits at higher levels.

This paper explores the question of who gains and who loses when collective goods are provided. The presumption underlying this inquiry is that a full assessment of the desirability of governmental policy encouraging or discouraging provision of collective goods (whether directly by government or by private organizations) should reflect an awareness of distributional consequences in addition to an assessment of allocative efficiency. Economists' emphasis on allocative efficiency has tended to mask, however, the distributional consequences of governmental measures,

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despite the recognition that informational problems normally preclude the setting of Lindahl tax-prices (prices at which every consumer would pay or be paid a sum such that the tax-price would be equal to the consumer's marginal valuation of the good involved).[1]

I hope this study will contribute to understanding the distributional effects of providing particular types of collective goods at approximately their current levels. The hypothesis is that variation in consumer preferences and in incomes combine with tax-price systems that are not Lindahl equilibria to bring about variation in consumers' marginal and total valuations of collective goods. I wish to determine whether such variation is essentially random or systematic, with respect to such characteristics as income, age, and education.

Situations in which efficient resource reallocations have inequitable outcomes have long troubled economists. The considerable literature concerning the feasibility, desirability, and necessity of compensating those people who are made worse off by a resource-reallocation that is efficient has not led to a resolution of the compensation question. Nor will we resolve the issues here. The literature on the new welfare economics has made it quite clear that a strong, controversial value judgment is involved if one advocates a policy that would make some people worse off and others better off, even though that policy is efficient in the sense that by reallocating resources from lower-valued to higher-valued uses the total market value of output would increase and thus make it possible, potentially, for everyone to be better off. The distinction between the possibility of everyone gaining, and the actuality in which some people, inevitably, are made worse off, is critical.

We turn now to the problem of how to identify those who gain and lose from the provision of various collective goods. The rest of this section is concerned with the formulation of a basic behavioral model. Section 2 uses this model, along with the concept of public opinion polling, to establish a methodology for identifying redistributional effects of collective activity. Applications of this approach are presented in Section 3 and the results are analyzed.

Before describing the approach, two important distinctions need to be drawn. One is between benefits as perceived by individuals, and as seen by some "objective," fully-informed observer. An individual may have a demand for a commodity that would be either larger or smaller if the individual were better informed regarding the characteristics of the commodity and their contribution to his or her utility. Although I do not deny that people have such "mistaken" demands as a result of incomplete information, I attempt, nonetheless, to focus on actual demands in the markets for both collective goods and private-type goods; thus I assume implicitly either that serious mistakes are uncommon or that, in any event, the economy "should" be responsive to demands as they exist rather than as they might exist if people were more fully informed or more effective judges of their own self-interest. I attempt to gauge effective demands for collective-type activities as those demands and the associated benefits are perceived by individuals.

A second distinction is between (1) an individual's <u>demand</u> for a collective good--"demand" in the sense of both willingness and ability to pay (what we variously term "demand," "effective demand," or "economic demand"); and (2) an individual's <u>wants</u>, which, given his or her income,

may not be reflected in effective demand. A person may want some commodity, and might be willing, if only his or her income were greater, to pay a substantial sum for it; thus, it might be said that the individual has a great "desire" or want for the commodity. But we use the term demand to refer only to those desires or wants that are manifested in an effective demand. In the empirical work presented in Section 3, I offer some data that are interpretable as proxies for effective demand.

One useful way of attacking the question of how various collective-type goods do, or might, affect different segments of the population is to determine which individuals judge that they would benefit from those (increments of) activities; which judge that they would, on balance, neither benefit nor lose; and which, if any, judge that they would lose --that is, be made worse off. The assumption that consumer knowledge is sufficient, however, to make meaningful their judgments about benefits is worthy of further consideration. The greater the degree of "collectiveness" of a good--the more persons into whose utility functions it enters with a nonzero weight, and the greater these weights--the more substantial are the likely market interaction (general-equilibrium) effects. These overall effects may be minor for, say, an increment of a local collective good such as fire protection, but could be substantial for a national activity such as environmental protection (say, antipollution) legislation, depending, of course, on the magnitude of the change.

Thus, even if a consumer is perfectly informed about the direct effect on him or her of a unit of some private or collective good, there is reason to question whether he/she would be equally well informed about the indirect effects that operate through the general equilibrium adjustment process.

The indirect effects require a more sophisticated understanding, and as a result we might expect that consumers are less fully informed about the consequences, benefits and disbenefits, of collective goods than of private goods. Similarly it is plausible, if not likely, that a consumer is better informed about the benefits to him or her of most private goods because of the more direct connection between his/her actions (purchases) and his/her payments. This gives more of an incentive to seek information.

Still, there is wide variance in this information dimension within the collective- and private-good categories. Medical care and legal representation, for example, are private-type goods about which consumers are rather badly informed as to the benefits they receive. These services are complex and the typical consumer knows little about how to gauge quality; a person may have recovered from an illness or won his legal fight, but he or she generally does not know whether it was because of, or in spite of, the medical or legal services he/she received. The "full-information" assumption is a poor one for such private-good markets, as it is for such collective goods as basic research and national defense. At the same time, there are some collective goods about which consumers are likely to be reasonably well informed--e.g., parks and highways--as they are about such frequently-purchased private goods as table salt and tea. On the whole it does not seem foolish to assume that, in general, the degree of consumer understanding of the consequences for him or her of an increment of a collective good is not greatly dissimilar to the understanding of the consequences of an increment of many goods he or she purchases in private markets. The validity of this assumption, however, is a factual matter that deserves more study.

My approach is to estimate the extent of demand for and against some collective-type commodity or activity by determining the degree to which persons in various subgroups of the population favor or oppose the activity. If the relative support and opposition vary among income classes, for example, the interpretation would be that the distribution of net benefits--as perceived by individuals--varies by income class, with some classes being net gainers and others either nongainers or net losers.

This behavioral model is one in which we assume that (1) people support or oppose any activity depending on whether they believe they would gain or lose--in the broadest sense of those terms--if the policy or action were undertaken; and (2) people act as if they "calculate" the net benefits or disbenefits they would (or do) receive from the given activity (a calculation that also involves considering tax burdens as well as gross benefits or disbenefits). The second assumption relates to perceptions of net benefits, for as pointed out above, the true effects of any activity for any given person may be different from those that form the basis for the individual's expression of demand or want.

A number of aspects of this model are summarized in Figure 1. It shows hypothetical demand functions for four types of persons. These demands may be thought of either as "actual" demands, reflecting differences among people in preferences as well as in income and wealth, or as "adjusted" demands (wants), reflecting differences only in preferences--showing, for example, what demand patterns would be if all persons had the same income and wealth.[2]

Figure 1 illustrates persons who value the collective good highly (D_1), persons who place a lower value on it (D_2), those who are indifferent

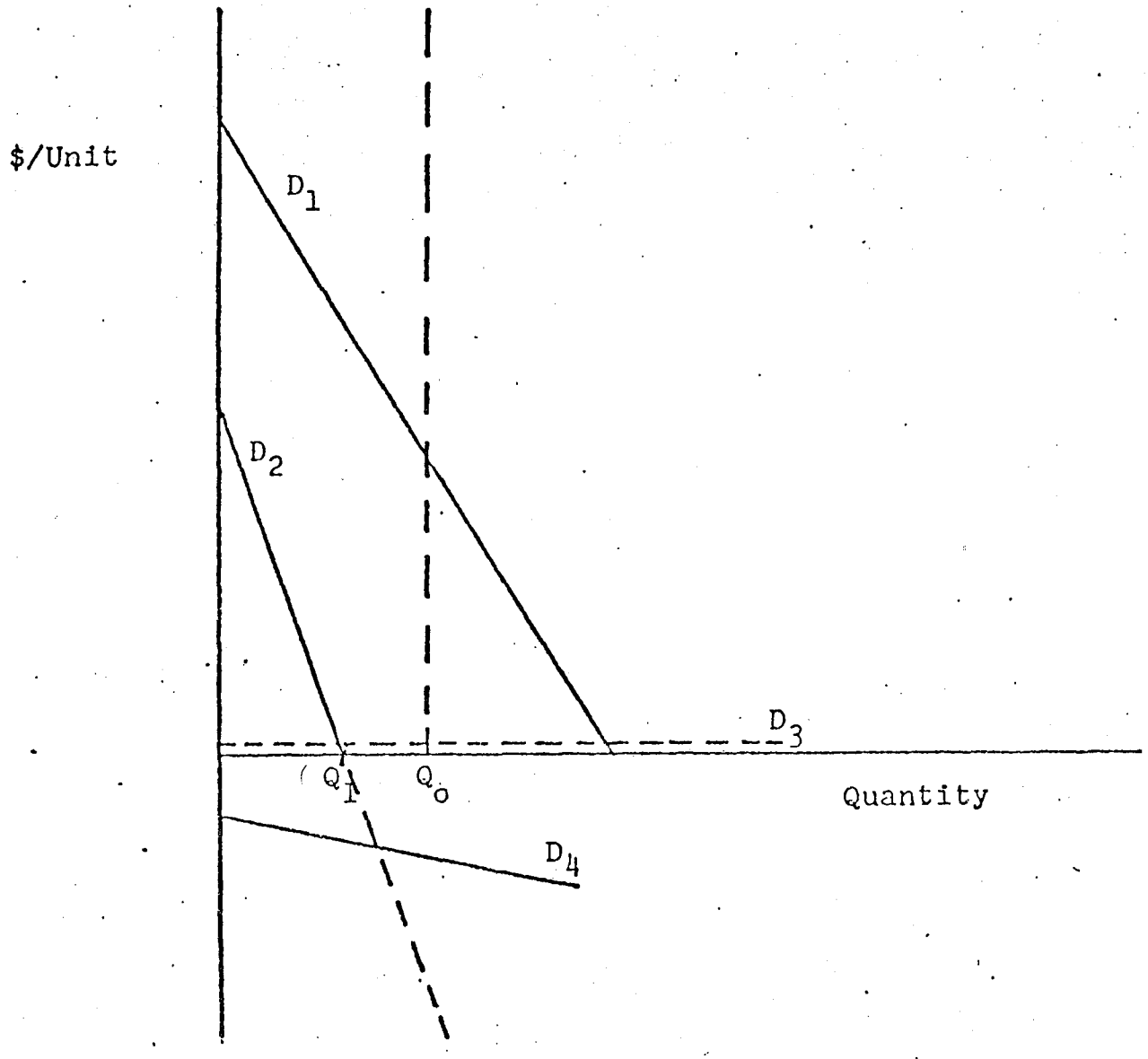

Figure 1. Hypothetical consumer demands for a collective good.

Source: Weisbrod, 1975, pp. 171-195.

to it (D_3), and those who view the particular good as a "bad" (D_4)--who prefer not to have it at all. In general, for any good, however great its gross collective-good potential may be, there are likely to be consumers of all four types.[3] Increments of "national defense," for example, would not be favored by all persons, even at a zero private tax price. In short, whether and to what extent some commodity is a collective-type good is a function not of any characteristic of the commodity itself, but of the utility functions and incomes of consumers.

Figure 1 also highlights the situation in which a collective-type commodity is wanted in some quantities but not in others; for persons having demand D_2, increments beyond Q_1 are viewed as providing dis-benefits. Thus, ideally, we wish to know entire demand functions. A single descriptor of demand as being "high," "low," or "negative" is likely to be misleading when the consumer's valuation of an increment of a collective-type good depends on the quantity, as it generally does.

Since I am interested in describing and predicting distributional effects of collective goods, I want to characterize the types of people who have the various demand patterns shown in Figure 1. We turn now to an operational--though conceptually imperfect--approach for developing such characterizations and describing the types of people who are likely to be in the various demand categories; some receive "large," others "small," and still others, even negative benefits from particular collective goods.

2. THE PERCEIVED DISTRIBUTION OF BENEFITS: THE OPINION POLL APPROACH AND WHAT MIGHT BE LEARNED WITH IT

Consider the following operational approach and what might be learned with it. Ask a random sample of the population whether they favor or

oppose a specified change in provision of some collective-type activity--e.g., environmental preservation or greater consumer protection. Allow each respondent to reply by indicating a number ranging arbitrarily from, say, 1 to 5, where 1 means strong support, 5 means strong opposition, and 3 means indifference--neither support nor opposition. Granted certain plausible, although not entirely uncontroversial assumptions to be discussed below, we can describe the types of people who benefit from the specified form (and quantity of increment) of collective activity, the types who, in their judgment, are hurt by it, and the types that are essentially unaffected on balance.

As already pointed out, there is reason to doubt that such perceptions are perfectly accurate. We know, for example, that people respond to questions, or vote at elections, even when totally misinformed as to the issue. But, in addition to the imperfect-information problem, there is another aspect of public opinion polling that is often troubling, and that probably goes far to explain the low level of economists' use of such data: Opinion poll respondents are seldom explicitly confronted with a price tag on the commodity or activity in question. As economists, we take a person's statement of preference more seriously when he or she reveals it by actually paying for a commodity (by buying it) than we do a mere expression of preference--as to a pollster--when no payment is required. The preference for information on <u>revealed</u> preferences over <u>stated</u> preferences is partly a matter of how well the consumer understands the question; partly a matter of how much effort he or she will put into offering a serious response when he/she knows it may have no consequences; and partly a matter of how honest he or she is in indicating how much

he/she would be willing to pay for the good under consideration. Because of these concerns, economists have generally avoided reliance on opinion polls as indicators of consumers' true demands. The reason for the concern with honesty is that to ask people how much they would be willing to pay for various quantities of some collective-type good is to elicit understatements because of free-rider behavior. A consumer who on one hand expects that the greater the demand he or she indicates, the more he/she will be required to pay, and on the other hand expects that if the good is paid for by other people he/she can benefit anyway, can be expected to understate his/her true demands.[4] Insofar as people do behave in this manner, it would be true that the responses from direct questions would understate, perhaps enormously, the aggregate demand for collective goods. If, by contrast, people thought that there was no connection between the amount they would be required to pay, in taxes, and the extent of their stated valuations, then individuals could be expected to overstate their demands. In either case the resulting aggregated demands would be erroneous.[5]

This is a potentially serious limitation insofar as we are interested in estimating demand functions (i.e., willingness to pay); and since estimating demands is a frequent interest of economists, it is a valid objection to using opinion poll data. It is less serious, however, insofar as we wish only to determine the demographic characteristics and the relative numbers of people who judge that they would be made better or worse off by the particular activity.

The absence, in general, of any explicit reference to a price or tax in opinion poll questions poses a problem that can and should be dealt

with in future polls; namely, what assumption is each respondent implicitly making about the price or tax he or she will have to pay when he/she responds in favor of or opposition to some action? Two alternatives seem likely. First, the respondent may implicitly assume a price of zero; that is, that the commodity would cost him or her nothing, and he/she may therefore respond simply in terms of whether he/she likes or dislikes that commodity, whether he/she would receive positive or negative marginal utility from it, other things equal. A second alternative is that the respondent might make some assumption about his or her "share" of the cost of providing the commodity. In this case the respondent would answer that he or she favors the commodity only if the gross benefits he/she would expect to receive (as he/she perceives them) would exceed the estimated cost. It may be reasonable to assume, although it is certainly not self-evident, that in responding to an opinion poll question, people take into account the actual, or expected effects on them, not only of the specific activity but also of the financial burden accompanying it; they may, or may not, however, be even approximately correct in judging the tax price they would pay.

Another limitation of most current opinion poll questions is that the quantity of the commodity involved is typically not stated. What quantity, or change in quantity, of the good does the respondent have in mind when he or she answers? As Figure 1 indicates, people might honestly respond quite differently depending on the quantity of the good being considered. Future opinion polls could be explicit about quantity (as well as price), but at present they rarely are.

Despite these infirmities of opinion polls--as presently constituted, but not as they could be--and given the unavailability of revealed private market behavior or other low-cost sources of information on effective demand or intensity of wants for collective goods, a procedure such as opinion-polling can be useful. The important point is this: If one accepts the proposition that distributional effects are relevant to overall policy decisions on the desirability of changing the level of provision of collective goods, whether by governments, voluntary groups, or other instrumentalities, then the question of how to obtain distributional information must be confronted. Observations from actual behavior are preferred, but when collective goods are involved, obtaining information through observing actual purchases in private markets is likely to be difficult. Hence, although there is an advantage to using preference information when it is actually revealed in the marketplace, if that alternative is not available--and it is systematically not available for collective goods--we must seek a "second best" approach. I suggest, and will defend below, the proposition that responses to opinion polls, when carefully interpreted, can be useful for answering the question that motivates this paper: Who gains and who loses from collective good activities?[6]

Theoretic Analysis of Opinion Poll Responses

The analysis sketched above may be summarized more formally.[7] If the following assumptions hold to a reasonable degree, opinion poll responses will be useful indicators of the distributional effects of a program to alter the level of provision of some collective goods.

The failure of any assumption to hold precisely does not imply that opinion responses are useless as distributional indicators, but only that they must be used more cautiously.

Assumptions:

1. The quantity of the collective good is known by each respondent, and is the same for all respondents. In fact, most opinion polls fail to state any information on quantity; this is a defect that could be corrected without great difficulty, but until it is, there is some question about the validity of assuming that all respondents implicitly presume that the same quantity of the good is involved. Actually, in order to make meaningful comparisons across groups, it is sufficient if the mean quantity of the collective good assumed in each group is the same; it is not necessary that every respondent contemplate the same quantity.
2. The price of the collective good is known by each respondent, but it may be equal or unequal among respondents. Seldom do opinion polls state anything explicitly regarding price, but this, too, could be corrected.
3. Responses by any person are based solely on net benefits--gross benefits minus disbenefits minus tax burden--expected by that person. The concept of "benefit" is broad enough to encompass all consequences regarded by that person as favorable or unfavorable, including any distributional effects, direct and indirect, from which he or she expects to derive positive (or negative) utility. Implicit in this assumption is that responses are honest statements of the net benefits expected. If expected net benefits are positive (negative) the respondent is in favor of (opposed to) provision of the good; if expected

net benefits are approximately zero, the respondent is indifferent. (That is, we assume that people do not oppose provision of the good when they expect positive net benefits even though their net benefits could be greater if the quantity or price were changed.)

4. Respondents are sufficiently well informed about the direct and indirect effects of the collective good in question, and about the price and quantity (assumptions 1 and 2, above) that public policy should attempt in order to satisfy consumers' demands or wants.

Assumptions 1-4 imply that a consumer's responses to a poll can be treated as a reasonable indicator of his or her net benefits. The question, then, is how, if at all, can responses be aggregated. Aggregation is necessary if we are to use the opinion poll data to rank groups of consumers by total or per capita gains and losses. Additional assumptions are required. Even without further assumptions, however, it is possible to state descriptively that, for example, x% of some population group expects to receive positive net benefits from the given collective good, whereas y% of another group expects such benefits; yet without some weights we cannot say whether the total, or even the average, net benefits are greater for one group than for the other.

The following is one assumption which, while rather strong, would permit one to go beyond simple descriptions of percentages of gainers and losers. The assumption is not argued here to be valid, and, indeed, further research is needed on means for weighting responses that employ weaker assumptions.

5. Average perceived net benefits (effective demands or some other measure of intensity of wants) are equal--whether positive or

negative--for all persons who respond in any given way (for example, for all who "favor" provision of some particular collective good). That is, all respondents are assumed, in effect, to use the same cardinal scale for determining responses.

If this assumption (admittedly strong) is accepted as even an approximation, it is possible to rank population groups by the magnitude of expected net benefits per person. For example, consider Table 1, which shows the percentages of persons in groups 1 and 2 who favor, oppose, or are neutral with respect to a given commodity, given its price and quantity. Group 1 persons can be said to be greater gainers (or smaller losers) per person than persons in group 2, since the average person in group 1 is more likely than the average person in group 2 to favor provision of the commodity.[8]

In general, whenever responses are as in Table 1--with the percentage neutral being the same for each group--groups can be ranked on the basis of per capita benefit, if assumptions 1-5 are accepted. That is, an ordinal ranking of groups is possible according to percentage of persons who favor the collective action. But consider a distribution of attitudes such as that in Table 2, which shows that the percentage of persons who favor the program is greater for group 1, but the percentage who oppose it is also greater. The essential characteristic of Table 2 is that a larger percentage in one group favors the action, and a larger percentage of the same group opposes the action. It can no longer be said whether the average person in group 1 or 2 benefits more, or loses less--unless another assumption on scaling is made. One such scale would result from the following symmetry assumption:

Table 1

Hypothetical Responses for Two Groups

Response	Group	
	1	2
Favor	60%	40%
Oppose	30	50
Neutral	10	10

Table 2

Hypothetical Responses for Two Groups

Response	Group	
	1	2
Favor	60%	40%
Oppose	35	25
Neutral	5	35

6. Persons who "favor" and persons who "oppose" a program are affected to the same degree but with opposite signs. In other words, the average net benefit received by a gainer is equal in magnitude to the average net loss to a loser.

This, like assumption 5, is a strong assumption. Future research will, we hope, explore alternative, weaker assumptions. If assumption 6 is accepted, however provisionally, then the magnitude of net benefits for any group can be measured by the difference between the percentages of persons in that group who favor and who oppose the given activity. Thus, for the data in Table 2, and assuming again that assumption 5 holds--that benefits and losses for each person who favors or opposes the program is the same regardless of which group the person belongs to---we have

$$(1)\quad \overline{B}_1 - \overline{B}_2 = (.6 - .35)b - (.4 - .25)b$$

$$= .25b - .15b > 0, \text{ since } b > 0 \text{ (that is, the percentage in favor exceeds the percentage who oppose). Therefore the average net benefit per person is greater for group 1.}^{9}$$

This analysis of interpretations for opinion poll responses points up, among other things, the importance of posing questions that are clear in terms of the quantity and price (tax) confronting the consumers. In reality, such clarity is not generally present. Therefore, even if all respondents do answer honestly in terms of perceived net benefits, and even if those perceptions are not grossly distorted, we cannot be certain whether respondents are all anticipating the same quantity of the collective good, and whether they are assuming a set of mutually compatible prices. It is not necessarily serious, however, if such

incompatibilities exist, provided that relative responses--net benefits--among groups are not highly sensitive to variation in quantities and tax prices over the relevant ranges. Moreover, any such incompatibilities need not be serious if individuals' assumptions about prices and quantities are randomly distributed across demographic groups.

Our analysis also points up the importance of building explicit models with clearly articulated assumptions. These are essential if interpretation of responses is to be susceptible to careful scrutiny and analysis. The assumptions made in this paper focus attention on crucial issues, involving respondent information and comparability of responses across respondents.

3. PERCEIVED DISTRIBUTION OF BENEFITS: SOME EMPIRICS

In spite of limitations, I believe that for the purpose of determining the nature of the distributional effects of collective activities, opinion polls can be helpful. We turn now to some actual opinion polls that deal with provision of various collective goods. We shall not generally carry the analysis of the data as far as assumptions 1-6 would permit, simply because of the controversiality of the last assumptions (5 and 6) in particular. Indeed, most of our findings about distributional effects do not require assumptions 5 or 6.

Distributional Effects of School Busing to Achieve Educational Integration

Much collective-good activity involves efforts to increase enforcement of laws, including constitutional guarantees, in the areas of education, health, and social welfare. It is the theme of this paper that such efforts,

to the extent they are successful, are not perceived as benefits by everyone, and certainly do not bring equal benefits to all who are, in their own judgment, made better off. In this section, I examine an opinion poll on school busing for racial integration and seek to ascertain and describe the distribution of benefits and disbenefits--as they are perceived by individuals--from busing. Through such an examination we can, in effect, analyze the distributional pattern of benefits from any actual, or prospective collective activities directed toward enforcement of school busing laws and court decisions. Once again, my interest is not in passing judgment on the desirability (whether in terms of efficiency or distributional equity) of increased collective efforts in this area; I wish only to advance and illustrate the argument that an evaluation of the actual or potential role of such activities should recognize that they bring distributional effects, and that those effects may be judged as either enhancing or diminishing--but in any event, affecting--equity.

In 1972, a national randomized public opinion poll of 1,252 persons was taken by the Center for Political Studies (see Miller et al., 1975). Respondents were asked whether their attitudes toward busing to achieve racial integration of schools could be described as favoring busing, neutral, or opposing busing.[10] Responses were given on a 7-point scale, where 1-3 indicated support for busing, 4 indicated "at the margin," and 5-7 indicated opposition to busing.

Before turning to the findings, bear in mind the interpretation I propose. A person who states that he favors busing is judged to be saying that he or she believes that the net effects of all the consequences of busing are beneficial to him/her. A person who, by contrast, states that

he or she opposes busing perceives negative net effects for him/herself.

Some of the results appear in Table 3 where, for the sake of simplicity, answers were aggregated over points 1-3 (favor busing) and 5-7 (oppose it). My objective is not to do a thorough analysis of the busing issue, but only to show the extent of variation in attitudes--that is, net benefits--among population groups. Columns 1, 3, and 5 show the percentage of persons in any given age, education, income, or race groups who favor busing (column 1), are neutral toward it (column 3), or who oppose it (column 5). Columns 2, 4, and 6, by contrast, show how the persons who favor busing are distributed among the various demographic groups (column 2), how those who are neutral toward busing are distributed (column 4), and how those who oppose it are distributed (column 6). The figures in columns 2, 4, and 6 reflect, of course, both the variation in responses among demographic groups and the relative sizes of the groups (and they can be calculated from the data in columns 1, 3, 5, and 7). They show, for example, that while 6% of the persons who oppose busing are black, 39% of those who favor it are black; the "representative person" who opposes busing is far less likely to be black than is the one who favors it.

The information in Table 3 is classified by only one variable at a time, a limitation imposed by the available data. It shows that although there is not a single age, education, income or racial group for which a majority favors busing, there is systematic variation in expressed attitudes --that is, in perceived benefits--among groups. Column 5, for example, shows that opposition to busing increases with age, decreases (generally) with education and income, and is far stronger, in terms of relative

Table 3

Attitudes Regarding Busing to Achieve
Racial Integration of Schools, 1972
(in percentages)

Characteristic	Favoring Busing		Neutral		Opposing Busing		Sample Size
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age:							
0-18 years	18	5	12	7	67	2	33
19-44	12	62	6	66	81	51	664
45-64	8	23	3	18	87	31	371
65 & over	7	10	3	9	89	16	184
		100		100		100	
Education:							
0- 8 years	7	12	3	12	86	18	221
9-11	9	15	1	4	89	18	206
12 (high school graduate)	9	20	5	25	85	23	285
13-15	8	24	6	39	84	30	373
16 (college graduate)	22	21	5	10	72	8	120
Advanced Degree[a]	22	8	13	10	65	3	46
		100		100		100	
Income:							
Under $5,000	11	27	4	22	82	24	300
5,000 - 19,999	9	58	4	59	86	65	784
20,000 - 34,999	12	10	7	13	80	8	99
Over 35,000	15	5	8	6	77	3	39
		100		100		100	
Race:							
White	7	61	4	86	88	94	1106
Black	40	39	6	14	49	6	124
		100		100		100	
Total Sample	10		5		84		1252[b]

Note: Rows do not add to 100% because of nonresponses.

[a]Persons completing some postgraduate work but not obtaining a degree are apparently not included in this class, but are in an uncoded class for which responses are not shown here.

[b]Includes respondents for whom income or race were not given, and, in the case of race, "other nonwhites."

Source: Miller et al., 1975, question #G-4, forms 1, 2.

numbers of persons, among whites than among blacks. (Education and income are, in general, positively correlated, as are age and income; but age and education are negatively correlated, at least for persons over age 25 or so.) Column 1 shows a similar, though sometimes more distinctive, pattern. In the panel for education, column 1 indicates that support for busing is essentially the same for all education groups, except for persons who have graduated from college or gone beyond that level. Among those most highly educated groups, support for busing, although only 22%, is two-and-one-half times as great as the level of support among persons with less education. Whatever the rationale for school busing, our data show that characteristics of supporters and opponents of this device differ materially.

If we adopt the six assumptions discussed above, we can rank groups in terms of the average net benefits per person in the group by ranking the differences between the percentage of persons who favor and who oppose the collective good (or collective bad), school busing. Thus, we would obtain Table 4 by taking, for each group in Table 3, the differences between the percentages in columns 1 and 3.

Table 4 suggests that, on average, the older a person is, the more he or she perceives negative net benefits from school busing. By contrast, the more schooling one has, and the higher one's income, the smaller the perceived net disbenefits. For every age, education, income, and race group --except blacks--perceived net benefits are overwhelmingly negative. It should be recalled that the concepts of benefits and disbenefits encompass all favorable and unfavorable consequences regardless of form. Persons having advanced education, for example, do not necessarily expect higher incomes or other direct benefits from busing; they may "benefit" only in

Table 4

Measures of Average Group Net Benefits
From School Busing

Group	Index of Net Benefits per Person in the Group, 1972
Age:	
0-18 years	-49
19-44	-69
45-64	-79
65 & over	-82
Education:	
0- 8 years	-79
9-11	-80
12 (high school graduate)	-76
13-15	-76
16 (college graduate)	-50
Advanced Degree	-43
Income:	
Under $5,000	-71
5,000 - 19,999	-77
20,000 - 34,999	-68
Over 35,000	-62
Race:	
White	-81
Black	- 9
Total Sample	-74

Source: See Table 3.

the sense that they derive positive utility from greater equality of educational opportunity.

Pollution Control

In the same survey that queried attitudes toward school busing, a question was asked concerning governmental regulation of industrial air and water pollution. Since this is also a collective good we turn now to an examination of the distributional effects of such efforts as they are seen by a random sample of citizens.

The survey statement was this:

> There are many sources of air and water pollution; one of them is private industry. Some say government should force private industry to stop its polluting. Others believe industries should be left alone to handle these matters in their own way.

On a 7-point scale, respondents replied 1-3 if they favored government action against industrial pollution, 4 if they were "at the margin," and 5-7 if they favored leaving private industry alone. Responses are in Table 5.

The age pattern of support for governmental antipollution efforts--a pattern I interpret as the age pattern of perceived net benefits--is evident. Activities oriented toward increasing the level of governmental enforcement of antipollution laws and regulations are seen as beneficial by the vast majority of persons of all ages, but the proportion of persons who perceive positive net benefits decreases with age, from 88% among the young to 70% among the oldest. And whereas only 6% of the 18-and-under group oppose these governmental interventions, opposition is more than three

Table 5

Attitudes Regarding Governmental Action
Against Private Industrial Polluters, 1972
(in percentages)

Characteristic	Favoring Government Intervention	Neutral	Opposing Government Intervention	Sample Size
	(1)	(2)	(3)	(4)
Age:				
0-18 years	88	3	6	32
19-44	84	6	8	639
45-64	73	9	17	355
65 & over	70	5	20	167
Education:				
0-8 years	64	6	24	200
9-11	79	4	16	193
12 (high school graduate)	85	7	8	267
13-15	83	6	10	366
16 (college graduate)	80	10	9	120
Advanced Degree[b]	80	15	4	46
Income:				
Under $5,000	71	8	17	265
5,000 - 19,999	81	6	12	759
20,000 - 34,999	82	8	8	100
Over 35,000	69	15	13	39
Race:				
White	79	7	13	1064
Black	80	3	11	110
Total Sample:	79	7	13	1193

Notes: See Table 3.

Source: Miller et al., 1975, question #G-5, form 2.

times as high in relative terms--20%--in the 65-and-over class. If we interpret opposition as reflecting a judgment that net benefits to the respondent would be negative, one-fifth of the aged believe they would be disbenefited. In general, those people who see negative net benefits for themselves are, as column 3 in Table 5 shows, disproportionately older (top panel), less-educated (second panel), and low income (third panel). Overall, 13% of the total population expect negative net benefits and another 7% see net benefits as essentially zero (see bottom row of Table 5).

As with school busing, we can rank a group's per capita net benefit by noting the difference between the percentage of persons who favor and who oppose the collective good, governmental action to reduce industrial pollution. This procedure disregards persons who state that they are "neutral"--which we assume to mean that expected net benefits are zero--and also disregards nonrespondents, who therefore are treated implicitly as if they received essentially zero net benefits. Thus, we have Table 6, which summarizes Table 5 by subtracting the number in column 3 from the corresponding number in column 1.

Table 6, as Table 4, may be interpreted in terms of probability. It suggests that a yong person has an expectation of .82 of receiving positive net benefits (.88 minus .06), whereas for an older person the expectation drops to .50. The pattern for persons classified by level of schooling discloses markedly lower expectation of positive net benefits for people with little schooling, but little variation among persons with 12 years or more of schooling.

The relationship between the level of income and my index of net support is rather different for busing and antipollution efforts.

Table 6

Measures of Average Group Net Benefits
from Reduced Industrial Pollution, 1972

Characteristic	Index of Net Benefits per Person in the Group
Age:	
0-18 years	82
19-44	76
45-64	56
65 & over	50
Education:	
0- 8 years	40
9-11	63
12 (high school graduate)	77
13-15	73
16 (college graduate)	71
Advanced Degree	76
Income:	
Under $5,000	54
5,000 - 19,999	69
20,000 - 34,999	74
Over 35,000	56
Race:	
White	66
Black	69
Total Sample	66

Source: See Table 5.

Perceived net disbenefits from busing were greatest among the vast middle-income class--$5,000-19,999 (Table 4), and smallest among the extremely well-off; whereas support for antipollution activities as lowest among persons at both income extremes, and highest among the middle and upper-middle income groups (Table 6). And most dramatically, the racial division in stated attitudes toward busing was strong, indeed, but was virtually nonexistent with respect to pollution.

It would be useful with all of the opinion questions considered in this paper to have finer cross-classifications, or multiple regression estimates so that the independent effect of varying one variable, holding other variables constant, could be determined. The cost of obtaining the raw data is an obstacle to regression analysis, but we summarize now, for illustrative purposes, one set of regression estimates, of the relationships between the probability of a person's favoring increased governmental action against private industrial polluters, and a number of characteristics of the persons.

The degree of support for--or perceived benefit from--a particular collective activity can be viewed as being influenced by a number of factors correlated with the respondents' demographic characteristics. Specifically, in the case of the pollution question, the relationship might be posited as

$$Y = f(X_1, X_2, \ldots, X_n),$$

where, in general, Y is the response to the question related to collective action, and the X's are demographic characteristics of respondents. In this case,

Y is the attitude of respondents to increased government action against private polluters:

"favor" = 1

"not favor" = 0 (includes persons who oppose and those who neither favor nor oppose).

$\overline{X}_1$ is a vector of dummy variables corresponding to age.

$\overline{X}_2$ is a vector of dummy variables corresponding to education level.

$\overline{X}_3$ is a vector of dummy variables corresponding to income class.

Results of ordinary least squares regression are as follows, with standard errors in parentheses and, below them, significance levels (assuming normal distributions):[11]

$$Y = .726 - .096\ (Age_1) - .058\ (Age_2) + .103\ (Educ_1)$$
$$(.040)\quad (.026)\qquad (.039)\qquad (.041)$$
$$.000\quad .000\qquad .141\qquad .012$$

$$+ .123\ (Educ_2) + .121\ (Educ_3) + .078\ (Educ_4) + .116\ (Educ_5) + .030\ (Income_1)$$
$$.041\qquad (.039)\qquad (.050)\qquad (.067)\qquad (.029)$$
$$.003\qquad .002\qquad .121\qquad .085\qquad .306$$

$$+ .038\ (Income_2) - .075\ (Income_3).$$
$$(.049)\qquad (.070)$$
$$.434\qquad .287$$

$R^2 = .035$

F-ratio = 4.27

Significance of F-ratio = .000

Age_1 means respondent is between 45 and 64 years of age.

Age_2 means respondent is 65 years of age or older.

$Educ_1$ means respondent has 9-11 years of schooling.

$Educ_2$ means respondent has a high school diploma, or the equivalent.

$Educ_3$ means respondent has 13-15 years of schooling.

$Educ_4$ means respondent is a college graduate.

$Educ_5$ means respondent has an advanced degree.

$Income_1$ means respondent has annual income between $5,000 and $19,999.

$Income_2$ means respondent has income between $20,000 and $34,999.

$Income_3$ means respondent has annual income of $35,000 or more.

The regression estimates thus indicate that support for increased government action against private polluters is 9.6% (.096) lower for persons aged 45-64 than for persons aged 17-44 (the omitted age class), but only 5.8% lower for persons aged 65 and over, holding constant the level of respondents' education and income. Similarly, support for government antipollution action is 8-12% higher among persons in all four education classes than among persons with 8 years or less of schooling (the omitted education class), holding age and income constant. Finally, support for government action increases as income increases from under $5,000 (the omitted income class) through the two higher income classes, but in the highest income class, $35,000 and over, support was 7.5% lower than in the lowest income class, holding age and education constant. (The coefficients attached to income are not as significant statistically as those for education and age.)[12]

This brief description was designed only to illustrate one analytic approach that can be used to learn more about the relationship between individuals' characteristics and their attitudes toward, or perceived benefits from, particular collective-type activities. In addition to being costly, the approach has certain theoretic-statistical limitations, which are considered briefly in Footnote 11.

Consumer Protection

Consumer interests have occupied much governmental attention in recent years. In this section I analyze data from a January 1975 poll

on American attitudes toward establishing a governmental Consumer Protection Agency.

One precise question seemed to be probing whether respondents perceived a failure of government to adequately represent interests of people as consumers. The question was as follows:

> Those in favor of setting up an additional federal consumer protection agency on top of all the other agencies say it is needed because the agencies we have are not getting the job done by themselves. Those who oppose setting up the additional agency say that we already have plenty of government agencies to protect consumers, and it's just a matter of making them work better. How do you feel? Do you favor setting up an additional consumer protection agency over all the others, or do you favor doing what is necessary to make the agencies we now have more effective in protecting consumers' interests?

The results, shown in detail in Table 7, were that 10% of the 2,038 persons sampled favored the new agency, whereas 75% opposed it (see bottom row). Variation in support existed among population subgroups, but the variation was modest. Opposition was lowest among the young (70%) and the elderly (71%), among persons with the least schooling (73%) and with the lowest family income (67%), and among nonwhites (66%).

Support for a federal consumer protection agency (CPA) was found to drop sharply when those who favored it were confronted with an aggregate price tag. Those persons who favored establishment of a CPA were asked the following question:

> Well, to get the additional federal consumer protection agency set up and started will cost at least 60 million new tax dollars in the first three years. Would you still be in favor if it means spending that kind of money?

As Tables 7 and 8 show, support fell by half--from 10 to 5%--when a $60 million cost was mentioned, but it dropped least precipitously for persons with the most schooling and with the highest family incomes.

Table 7

Attitudes toward Establishment of a Federal Consumer Protection Agency, January 1975 (in percentages)

Characteristic	Favor New Agency	Make Existing Agencies More Effective	Both, or No Opinion	Sample Size
	(1)	(2)	(3)	(4)
Age:				
18-29 years	12	70	18	522
30-39	8	77	15	421
40-49	8	79	13	328
50-59	10	82	8	311
60 or over	9	71	20	456
Education:				
Less than high school complete	9	73	18	666
High school complete	10	75	15	712
Some college	10	79	11	648
Family Income:				
Under $5,000	11	67	22	349
5,000- 6,999	8	72	20	229
7,000- 9,999	11	74	15	346
10,000-14,999	9	82	9	464
15,000 or over	9	80	11	595
Race:				
White	10	76	14	1803
Nonwhite	12	66	22	226
Total Sample	10	75	15	2038

Source: Unpublished data from Opinion Research Corporation, Princeton, New Jersey. For exact wording of question, see text, above.

Table 8

Attitudes toward Establishment of a Federal Consumer Protection Agency, Given an Estimated Tax Cost of $60 Million or More in the First Three Years (in percentages)

Characteristic	Favor CPA Despite The Cost	Do Not Favor CPA At That Cost	No Opinion	Percentage Asked This Question
	(1)	(2)	(3)	(4)
Age:				
18-29 years	6	8	2	16
30-39	4	6	2	12
40-49	4	5	1	10
50-59	5	5	2	12
60 or over	5	7	1	13
Education:				
Less than high school complete	3	7	1	11
High school complete	5	7	2	14
Some college	8	4	1	13
Family Income:				
Under $5,000	5	9	1	15
5,000- 6,999	3	5	3	11
7,000- 9,999	4	8	2	14
10,000-14,999	4	4	1	9
15,000 or over	7	5	1	13
Race:				
White	5	6	1	12
Nonwhite	6	8	2	16
Total Sample	5	6	2	13

Note: Asked only of those favoring establishment of a CPA, or who favored both establishment of a CPA and also making existing agencies effective.

Source: See Table 7.

Since a $60 million cost would amount to only about $1 per federal income tax payer (whether per year or for the total of three years is not clear from the wording), the substantial drop in support suggests that the intensity of demand was quite low.[13] To the extent that governmental activities are, or may in the future, be directed at something similar to the establishment of a CPA, these findings suggest both a low level of demand and one that does not vary markedly among population subgroups, with the exceptions indicated above.

Employment Discrimination

Still another area of collective activity is employment discrimination. A 1968 U.S. National sample of 1155 persons was asked the following:

> How do you feel about fair employment laws--that is laws that make white people hire qualified Negroes, so that Negroes can get any job they are qualified for--do you favor or oppose such laws?

If responses to this question may be interpreted as indicating how respondents feel about greater enforcement of "fair employment" laws applied to blacks, and if attitudes toward employment opportunities for blacks are positively correlated with attitudes toward minorities in general, responses to this question can tell us something about the perceived distribution of benefits (in 1968) from reduced discrimination in employment (presumably a collective good for some persons and a collective "bad" for others).

Table 9 indicates broad support for--and presumed net benefits from --more enforcement of employment discrimination laws. But the degree of net support, as reflected by column 3, is lowest in the 45-64 year age group, in the lowest income group, and among farmers. The variance in

Table 9

Attitudes toward Antiemployment Discrimination Laws, U.S., 1968
(in percentages)

Characteristic	"Favor" or "Strongly Favor"	"Oppose" or "Strongly Oppose"	Net Percent (col. 1 less col. 2)	Sample Size
	(1)	(2)	(3)	(4)
Age:				
18-44 years	86	14	72	577
45-64	82	16	66	367
65 & over	83	13	70	204
Occupation:				
Professional & business	81	17	64	212
Nonprofessional				
White collar	90	9	81	289
Skilled blue collar	83	17	66	154
Semiskilled blue collar	82	14	68	295
Unskilled laborer	83	13	70	23
Farmer	77	20	57	61
Not in labor force	82	14	68	121
Income:				
Under $5,000	82	14	68	379
5,000-15,000	85	15	70	677
Over 15,000	89	9	80	90
Total Sample	84	14	70	1155

Note: "No opinion," and "no answer" responses have been omitted. Thus, the sum of columns 1 and 2 responses for any respondent class is less than 100%.

Source: Roper Public Opinion Research Center, Williamstown, Mass., NORC Survey SRS-4050, April 1968.

support among occupational groups was particularly notable. Activities in this area are perceived as being beneficial, in one way or another, to 84% of respondents, but to a high of 90% of nonprofessional white collar workers and a low of 77% of farmers.

Medical Insurance

Table 10 shows that the relative support for government provision of medical insurance increases with age, decreases with income, and is sharply higher for nonwhites than for whites. Over most of the education range there is no systematic variation between age and relative support, with approximately equal support and opposition, but in the lowest and highest education classes those who favor government activity are twice as numerous as those who oppose it (40 vs. 23% in the 0-8 year education class, and 54 vs. 24% in the "advanced degree" class).

Military Spending

Perceived benefits from military spending show dramatic variation. "National defense" is frequently used as an example of a collective good, but the evidence in Table 11 suggests that, at least at the margin, national defense (that is, military spending) is not perceived as benefiting everyone. In every age, education, income, and race group, a large fraction favor reducing military spending. Young people are evenly divided between those favoring and opposing cuts (although the sample is quite small for this group), but as age increases the relative support for cuts diminishes; the ratio of the figure in column 1 to that in column 2 decreases from 1 in the youngest age group to 1/2 in the oldest. The ratio also falls as

Table 10

Attitudes Regarding Government Provision
of Medical Insurance, 1972
(in percentages)

Characteristics	Favoring Government Medical Insurance	Neutral	Opposing Government Medical Insurance	Sample Size
	(1)	(2)	(3)	(4)
Age:				
0-18 years	21	13	29	24
19-44	38	12	34	673
45-64	34	11	37	436
65 or over	40	12	20	226
Education:				
0- 8 years	40	10	23	282
9-11	36	10	33	240
12 (high school graduate)	33	13	35	447
13-15	35	12	36	214
16 (college graduate)	41	10	40	140
Advanced Degree	54	15	24	46
Income:				
Under $5,000	42	10	22	322
5,000-19,999	36	11	36	867
20,000-34,999	37	22	31	97
Over 35,000	19	15	50	26
Race:				
White	34	12	34	1221
Nonwhite	57	7	19	151
Total Sample	37	12	33	1372

Note: Rows do not add to 100% because of nonresponses.

Source: Miller et al., 1975, question G5, form 7.

Table 11

Attitudes Regarding Cuts in Military Spending, 1972

Characteristics	Favoring Cuts	Opposing Cuts	Sample Size
	(1)	(2)	(3)
Age:			
0-18 years	45	45[a]	20
19-44	40	56	555
45-64	28	62	350
65 or over	29	55	185
Education:			
0- 8 years	29	54	223
9-11	25	66	198
12 (high school graduate)	34	60	359
13-15	37	57	183
16 (college graduate)	48	50	118
Advanced Degree[b]	62	32	37
Income:			
Under $5,000	29	55	265
5,000-19,999	36	58	717
20,000-34,999	38	59	79
Over 35,000	17	65	23
Race:			
White	33	59	996
Nonwhite	45	43	123
Total Sample	34	57	1119

Notes: [a]Rows do not add to 100% because of nonresponses. The percentage of persons who gave "neutral" responses--neither favoring nor opposing cuts--was zero (rounded) for all categories.

[b]Persons completing some postgraduate work but not obtaining a degree are apparently not included in this class, but are in an uncoded class for which responses are not shown here.

Source: Miller et al., 1975, question #J2C, form 1.

income increases, from 1/2 in the lowest income group to 1/4 in the highest. But the ratio increases with respect to level of education--from 1/2 and less in the lowest education classes to 2 in the highest. Related to these patterns, the relative support for cuts in military spending among whites and nonwhites is sharply different; whereas nonwhites are evenly divided, whites oppose cuts by nearly 2 to 1. The perceived net benefits from marginal changes in military spending (although changes of unspecified magnitude) vary considerably, with substantial proportions of persons in all demographic groups apparently discerning negative marginal net benefits even though majorities in most groups see positive marginal net benefits.

4. SUMMARY AND CONCLUSIONS

Judging from the collective-good areas for which I have found relevant survey questions--busing, pollution control, consumer protection, anti-employment discrimination, governmental health insurance, and military spending--the effects of collective activities can be expected to be non-random in the population, and quite different depending on the particular type of activity that is involved. The survey responses support the a priori expectation that there are inevitably persons who feel they would be hurt, and others who feel they would be helped, if some particular collective-type activity were expanded (or contracted). Moreover, the kinds of people who apparently believe they would be hurt or helped vary with the collective-type good involved.

Since perceived benefits across demographic groups vary according to the activity area, we may ask what are the overall distributional

effects of governmental activities. Table 12 brings together many of the findings from the opinion-poll responses discussed above. In each panel the first six rows are derived from data in Tables 3, 5, 7, 9, 10, and 11. Row 7 in each panel averages the six numbers above it, weighting them equally.

Table 12 shows that whereas support and opposition vary among program areas, income groups and age groups, there are substantial offsetting effects across programs. This result could be interpreted as showing that overall there are likely to be no substantial redistributional effects among either income or age groups as a result of governmental activities in these program areas--but such an interpretation must be guarded. It requires the assumption that the intensity of given response is equal across program areas; that is, when a person "favors" government action against polluters, for example, the degree of his support (the economic demand) is, on average, the same as when a person favors, say, establishment of a Federal Consumer Protection Agency. Such an assumption is a strong one, however, and there is currently no evidence to either support or refute it. But whether it is approximately valid or not, the row 7 data in Table 12 do show the mean percentages of persons in a given age or income class who favor, oppose, or are neutral to the given programs, and therefore, the data do suggest the relative number of persons in each class who would favor or oppose governmental activity in those areas. What is less clear is whether those relative numbers of <u>persons</u> may be interpreted as relative economic <u>demands</u>.

Additional research, theoretic and applied, is needed in an effort to improve our understanding of intensities of preferences and of economic demands. As this research proceeds it would seem to be able to benefit

Table 12

Attitudes toward Four Types of Collective Programs,
by Income and Age of Respondents

Program 1	Income Group ($) <5000	5-1500	>15000	Age Group (Years) 0-18	19-44	45-64	65+
Percentage Likely to Favor Increased Collective Activity							
(1) Busing to Achieve Racial Integration	11	9[1]	13[2]	18	12	8	7
(2) Government Action Against Private Polluters	71	81[1]	78[2]	88	84	72	70
(3) Establishment of a Federal Consumer Protection Agency	11	9[3]	9	-	10[4]	9[5]	9[6]
(4) Antiemployment Discrimination Laws	82	85	89	-	86	82	83
(5) Medical Insurance	42	36[1]	34[2]	21	38	34	40
(6) Military Spending	55	58[1]	64[2]	45	56	62	55
(7) Unweighted Mean	45	46	48	43	48	44	44
Percentage Likely to Favor Decreased Collective Activity							
(1) Busing to Achieve Racial Integration	82	86[1]	79[1]	67	81	87	89
(2) Government Action Against Private Polluters	17	12[1]	9[2]	6	8	18	20
(3) Establishment of a Federal Consumer Protection Agency	67	77[3]	80	-	73[4]	80[5]	71[6]
(4) Antiemployment Discrimination Laws	14	15	9	-	14	16	13
(5) Medical Insurance	22	36[1]	35[2]	29	34	37	20
(6) Military Spending	29	36[1]	34[2]	45	40	28	29
(7) Unweighted Mean	38	44	41	37	42	44	40
Percentage Likely to be Neutral							
(1) Busing to Achieve Racial Integration	4	4[1]	7[2]	12	6	3	3
(2) Government Action Against Private Polluters	8	6[1]	10[2]	3	6	8	5
(3) Establishment of a Federal Consumer Protection Agency	22	13[3]	11	-	17[4]	11[5]	20[6]
(4) Antiemployment Discrimination Laws	4	0	2	-	0	2	4
(5) Medical Insurance	10	11[1]	20[2]	13	12	11	12
(6) Military Spending	0	0[1]	0[2]	0	0	0	0
(7) Unweighted Mean	8	6	8	9	7	6	7

Notes: See next page.

Notes to Table 12

[1]Percentage of those giving indicated response--i.e., favor, oppose, or indifferent--with incomes between $5000 and $19,999.

[2]Average percentage, weighted by number in sample, of those giving indicated response with incomes greater than or equal to $20,000.

[3]Average percentage, weighted by number in sample, of those giving indicated response with incomes between $5,000 and 6,999, $7,000 and 9,999 and $10,000 and 14,999.

[4]Average percentage, weighted by number in sample, of those between 18-29 years and 30-39 years.

[5]Average percentage, weighted by number in sample, of those giving indicated response between 40-49 years and 50-59 years.

[6]Percentage of those 60 years or older giving indicated response.

from greater utilization of the considerable information that is already available from opinion polls and the improved data that could be obtained through increased involvement by economists in the design of questions. This source of information may well be useful for determining minimum efficient levels of collective-good provision, for even if free-rider behavior produces downward biased responses, at least lower-bound estimates of demand may be obtained. The emphasis of this paper, however, is on distributional considerations, and it seems less controversial to suggest that opinion polls, particularly if they were improved by the addition of explicit price and quantity information, can provide useful data for this ingredient to the process of determining what collective goods will be provided and how they will be financed. Opinion poll responses may elicit unbiased estimates of relative benefits (or disbenefits) among population groups, whether or not they produce unbiased estimates of absolute benefits (or disbenefits).

NOTES

[1]The problems associated with getting consumers to reveal their demand functions in order to permit the setting of Lindahl prices are well known, and although recent research has produced progress at the theoretic level, practical solutions to the demand-revelation problem are not yet at hand. On these mechanisms, see Tideman and Tullock (1976); Groves and Ledyard (1976); and Green and Laffont (forthcoming).

[2]In the adjusted demand case, however, the pattern of demands would generally differ, depending on the level of income and wealth.

[3]The existence of persons for whom some collective good is actually a "bad" has been recognized earlier. See, for example, Wicksell (1967, p. 89); and Tanzi (1972).

[4]For a clear exposition of the expected free-rider behavior, see Buchanan (1968). For a recent statement questioning the evidence that free-rider behavior is a significant problem, see Brubaker (1975).

[5]Although the predictions presented above have been deduced from theoretical models, the degree of honesty exhibited by respondents to questions on the valuation of collective goods is a factual matter, and there has been little testing of it. For a recent discussion of such tests, see Bohm (1971).

[6]My objective is not to determine optimal <u>levels</u> of production of collective goods, but to describe or to predict the <u>distribution</u> of benefits and disbenefits from whatever level occurs. It is reasonable to believe that direct questioning--for example in an opinion poll--can

provide useful information on the relative (ordinal) intensities of demands (actually net benefits) for a collective good among population groups, whether it is or is not a good source for information on absolute intensities. Unless respondent distortions vary systematically among population groups, relative comparisons among groups will not be biased, even if every individual respondent were to give a biased answer.

For two recent attempts to use opinion poll responses to infer demands for collective goods, see Maital (1976), and Strauss and Hughes (1976).

[7]This section benefited greatly from discussions with Joseph Cordes.

[8]The reasoning is as follows:

1. $\bar{B}_1 = .6\bar{b}_1 - .3\bar{c}_1$

2. $\bar{B}_2 = .4\bar{b}_2 - .5\bar{c}_2$, where

   $\bar{b}_n$ = average net benefits expected by gainers in the nth group (n = 1, 2 in Table 1)

   $\bar{c}_n$ = average net costs expected by losers in the nth group

Since by assumption 5, $\bar{b}_1 = \bar{b}_2 = b$, and $\bar{c}_1 = \bar{c}_2 = c$, it follows that

3. $\bar{B}_1 - \bar{B}_2 = (.6 - .4)b - (.3 - .5)c = .2b + .2c > 0$

Group 1 would benefit more, per person, than group 2.

[9]The preceding discussion has been in terms of benefits per capita. One might also be interested, however, in aggregate benefits to all persons in the group. Assuming that all persons within a given group are counted as of equal importance, each of the percentages of gainers and losers could be multiplied by the number of persons, N, in the group.

Thus, for example, if the number of persons in group 2, Table 2, were twice the number in group 1, then the total net benefits would be

B_2, for group 2 -- 2(.4 - .25) = .30, and

B_1, for group 1 -- 1(.6 - .35) = .25.

Group 2 would be a greater total net beneficiary, even though its members were, on average, smaller net beneficiaries.

[10]The respondent was asked for a reaction to the following specific statement:

> There is much discussion about the best way to deal with racial problems. Some people think achieving racial integration of schools is so important that it justifies busing children to schools out of their own neighborhoods. Others think letting children go to their neighborhood schools is so important that they oppose busing.

[11]There are problems associated with using ordinary least squares (OLS) when the dependent variable is dichotomous. However, a recent survey of both the theoretic and empirical literature on estimation with dichotomous dependent variables (Goodman, 1976) concludes that OLS will perform as well as alternative but more complex and costly techniques provided that the following conditions are fulfilled: (1) The sample size must be "large" (with at least 100 degrees of freedom); (2) the independent variables must be scaled as categorical (i.e., dichotomous) variables; (3) the mean value for the dichotomous dependent variable must be as close as possible to .5 and at least within the .2 to .8 range; and (4) the estimated standard errors and R-squared statistics must be cautiously interpreted. In the regression presented in the text above, criteria (1) and (2) are clearly fulfilled. Criterion (3) is barely fulfilled when the dependent variable is measured as the "probability of favoring," since the mean for the sample

equals roughly .8; and is violated when the dependent variable is measured as the "probability of opposing," since the mean for the sample equals roughly .13. Finally, with regard to both the standard errors and the R^2 statistics, the following two caveats are in order:

1. Since the disturbance term in a regression with a dichotomous regress and is heteroskedastic, the estimated standard errors will be biased estimates of the "true" standard errors. However, Smith and Cicchetti (1972) have shown that the absolute size of the bias declines with increasing sample size. Moreover, Goodman (1976) remarks that "[f]or large samples, any coefficient large enough to be of substantive significance is likely to be of statistical significance as well, so precise estimates of standard errors are not crucial." Hence, it would seem reasonable to treat as "significant" those variables with fairly large coefficients, and low standard errors: AGE_1, $EDUC_1$, $EDUC_2$, and $EDUC_3$.

2. The R^2 statistic will always be quite low in dichotomous regressions. Moreover, it does not have the same "neat" interpretation that it does for normal regressions. It is instead an estimate of the between-category variance of the independent variable relative to the total variance of the dependent variable.

[12]In addition to the regression equation reported in the text, I have estimated an equation in which the dependent variable, respondent's stated preference, is either "oppose" or "not oppose," where the latter includes persons who favor the action and also persons who neither favor nor oppose it. The resulting equation follows:

$$Y_2 = \underset{\substack{(.033)\\.000}}{.196} + \underset{\substack{(.022)\\.004}}{.065(AGE_1)} + \underset{\substack{(.033)\\.024}}{.075(AGE_2)} - \underset{\substack{(.034)\\.024}}{.077(EDUC_1)} - \underset{\substack{(.0347)\\.000}}{.136(EDUC_2)}$$

$$- \underset{\substack{(.032)\\.000}}{.118(EDUC_3)} - \underset{\substack{(.0422)\\.006}}{.1168(EDUC_4)} - \underset{\substack{(.056)\\.001}}{.1945(EDUC_5)} + \underset{\substack{(.024)\\.95}}{.001(INCOME_1)}$$

$$- \underset{\substack{(.041)\\.757}}{.0127(INCOME_2)} + \underset{\substack{(.059)\\.553}}{.035(INCOME_3)}$$

$R_2 = .043$

F-Ratio = 5.17

Significance of F-ratio = .000

[13]The price elasticity of support for a CPA, however, was only around minus one-third, if the elasticity is calculated using the mid-points as bases.

$$\text{Elasticity} = -\frac{10\% - 5\%}{(10\% + 5\%)/2} \div \frac{\$1.00 - \$0.00}{(\$1.00 + \$0.00)/2} = \frac{5}{7.5} \div \frac{1}{0.5} = -\frac{1}{3}.$$

In Table 7, in addition to the 10% who favored the new agency, 3 of the 15% (col. 3) favored both the new agency and a strengthening of existing agencies. If these 3% are added to the 10%, then the total support for the new agency was 13%. The decline in support from 13% to 5% implied a price elasticity of $-\frac{1}{2}$ rather than the $-\frac{1}{3}$ calculated above.

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