REACH AND SELECTIVITY AS STRATEGIES OF RECRUITMENT FOR COLLECTIVE ACTION: A THEORY OF THE CRITICAL MASS, V*

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Theoretical investigation of a mathematical model of organizing for interdependent collective action compares the advantages of emphasizing reach, i.e. the sheer numbers recruited, to the advantages of emphasizing selectivity, i.e. the mean resources or interests of those recruited. The context is an accelerating production function in which each additional contribution has an increasing effect on the total payoff; this context is most likely at the beginning of an organizing drive. Both reach and selectivity are found to have thresholds which must be achieved before increases have any effect; these thresholds depend on the given levels of other parameters, and depending on conditions may be either discontinuous jumps or regions of steep but decelerating effects. Once the threshold region is surpassed, increasing either the reach or the selectivity for resources of recruitment has a constant positive effect, while the effect increasing the selectivity for interest becomes zero. The implications for real-life recruitment strategies are discussed.

The abstract term "collective action" has been used to cover a wide range of empirical phenomena: from raising an army to raising a barn; from building a bridge across a gulf separating states to building a faith community to span the gulf between races; from organizing a business cartel to organizing a small partnership to compete in a crowded market. For sociologists, though, the central imagery in discussions of collective action has tended to concern social movements, and has been closely associated with the development of the resource mobilization perspective (McCarthy and Zald 1977; see Marwell and Oliver 1984 for a detailed discussion of collective action theory in the study of social movements). The resource mobilization perspective focuses attention on the process by which money, time, energy and other resources are gathered together under the control of some leader or organization, so that they may be deployed in a coordinated way towards achievement of some goal. The image is one of organizers engaged in recruiting individuals to voluntarily participate in or contribute to the petition drives, lobbying efforts, strikes, boycotts and other activities that are the substance of the movement itself.

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From the point of view of the organizer, recruitment is often the central practical problem of social movement life, and organizers have been known to spend the majority of their own time and energy trying to get others to contribute time and money. An understanding of recruitment is therefore crucial to an understanding of social movements and of collective action more generally. As Snow, Zurcher and Ekland-Olson (1980) have argued

> "Further examination of movement joining and participation should give more attention ... to the factors that account for variations in recruitment strategies and their efficacy. An examination of such factors should move us beyond our current knowledge of the recruitment process, which has, according to Marx and Woods, (1975) reached a point of diminishing returns."

In this paper we extend the "theory of the critical mass," a formal micro-social theory of collective action (Oliver, Marwell & Teixeira 1985; Oliver & Marwell 1988a, b; Marwell, Oliver & Prahl 1988), to examine some factors affecting the choice of recruitment strategies. We will focus on the difference between those strategies emphasizing *reach*, i.e. the ability to cheaply contact a large, undifferentiated mass of potential contributors, and those emphasizing *selectivity*, i.e. the concentration on wooing a small number of potential participants who are most likely to contribute large amounts of time, money or other resources.

FREE RIDING AND INTERDEPENDENCE

The theory of the critical mass is one of several contemporary theoretical efforts that share a set of underlying assumptions which have come to be known as the "rational choice" paradigm (Hechter 1983), wherein individuals are assumed to choose among possible actions according to the costs and benefits that will accrue to them. We do not deny the importance of such factors as ideological commitment, group solidarity or interpersonal support, but to simplify the task of building a theory, assume that such factors can be captured abstractly as costs or benefits. As in all such models, these costs and benefits are necessarily *subjective*, and must be seen through the eyes of the actors (see Klandermans 1984). This is not the place to debate the metatheory of rational choice, but we note that although we believe that *many* important features of collective action may be illuminated through our theory we would *not* argue that *all* important features may be so captured. By using a simplified model of human motivation, we can concentrate our analysis on the structural variables that differentiate groups, and on the situational or task variables that frame the choices organizers face.

Despite its clear limitations, most resource mobilization theorists, and other sociologists working from a "rational choice" approach, have been strongly influenced by Mancur Olson's book *The Logic of Collective Action* (1965). Perhaps the most compelling feature of that work is Olson's exposition of the "free rider problem," in which he argues that it is irrational for individuals to participate in collective action despite their having a positive interest in the collective good being sought. It has repeatedly been shown that Olson's sweeping conclusion rests upon highly restrictive assumptions (see, for example, Frohlich and Oppenheimer 1970; Chamberlin 1974; McGuire 1974; Oliver 1980; Hardin 1982; Oliver and Marwell, 1988a), so that the

correct conclusion to draw is that it *may be* irrational to participate in collective action. Nevertheless, the dynamic Olson points to is important and worth reviewing, as it provides the backdrop for our work.

A collective (or public) good is one which all members of a given interest group share, regardless of whether or not they have participated in the collective action that has produced the good. For example, a black person in Mississippi can enjoy sitting in an integrated restaurant whether or not he was part of the prolonged and costly struggle that resulted in the legislation forcing that integration. What Olson argues is that while affected individuals may have an incentive to help provide a given collective good, they have an even stronger incentive to let others provide it for them, to "free ride" on the sacrifices of others. Because only a small proportion of the good is the direct result of his own contribution, an individual can enjoy almost as much of the good without contributing to it as he can with contributing. However, if everybody follows this same line of reasoning—which is what they will do, since we assume they are "rational"—nobody will sacrifice to provide the good, and the good will not be provided at all.

The public goods problem is real, and the dynamic Olson describes fits the problem of environmental pollution rather well, although it is not one of his examples. But Olson's argument depends on several *assumptions*: that each individual's maximum possible contribution is too small to make any noticeable difference in the provision of the collective good; that others' behavior makes no difference in the effect of one's contribution; and that coordination of action is not possible. When these assumptions do not hold, as they almost never do in the worlds of social movements, voluntary associations, and interest group politics, the conclusion that collective action is "irrational" cannot be drawn. However, collective action is never automatic or unproblematic in these cases, and in this sense, Olson's problem is relevant.

The central premise of what we call "critical mass theory" is that collective action arises when some individuals are able to make relatively large contributions in an interdependent context. Interdependence may be defined most generally as behavior that takes account of the effect of one's participation in collective action on the participation of others. The structural conditions for interdependent behavior are that the effect on the collective good of one actor's choice varies depending on the choices of others, and that the actors have at least some information about each others' actions.[1] In some situations, a few individuals provide the good while many "free ride." In others, a few individuals help to organize a coordinated action in which people contribute who would not be willing to contribute if they acted independently. Even in this case, however, there is generally no need for more than a minority of those interested to actually contribute.[2]

Interdependence is the rule in the empirical world of collective action. An urbanite considering joining in a riot may assume that the risk of any one individual being

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[1] Oliver, Marwell and Teixeira (1985) show that interdependence fosters collective action when the "production function" relating contributions to collective good outcomes is accelerating, and hinders collective action when it is decelerating.

[2] See Marwell, Oliver, and Prahl 1988 and the discussion below for specification of these different situations.

arrested declines with larger numbers of rioters; an office worker may consider the possibility that his contribution to United Way will increase the social pressures on others to contribute; a participant in a wildcat strike may expect his presence on the line to embolden others to participate as well. People join groups involved in collective pursuits not only out of perceived common interests, but also because they regard the groups or individuals organizing the action as in some sense efficacious. Belief in the efficacy of a group may be based on a record of previous success at stated goals, on the endorsement of a friend or relative who is already involved in the group, or even on lip service by authorities to the goals of the group. For most people, however, the most prominent and convincing evidence of a group's efficacy is probably the groups' size and command over resources. Groups which are large and rich are likely to be seen as powerful. Growth itself is often seen as further evidence of potency, and tends to attract still more contributions; groups which are stagnant or shrinking are likely to be seen as ineffective, accelerating their loss of membership. In this simple fashion, the decisions of individuals who are contacted by an organizer are clearly interdependent with the decisions of others in similar positions.

In this research we deal only with the simplest form of interdependence, one based solely on the fact that individuals understand how their choices will affect others' decisions. We have discussed elsewhere more complex forms of interdependence that arise when participants can reward or punish one another with "selective incentives" (Oliver 1980), or when they can enforce binding agreements or contracts (Marwell, Oliver, and Prahl 1988). In the present study, actors consider only the impact of their behavior on others' cost/benefit calculations. We do not investigate the impact of shared norms, or "conventions," on interdependent action (Hardin 1982).

ORGANIZERS AND RECRUITMENT STRATEGIES: REACH VERSUS SELECTIVITY

Organizers play a central role in virtually all "mass" forms of collective action. Few people decide all by themselves to sit in at a racially segregated lunch counter or to send money to help feed children in distant places threatened with starvation. Instead, a few organizers create a particular context for action and ask others to make relatively small contributions to a specific event or program. Organizers also frequently act as mediators among the members of a collectivity, offering them information (even propaganda) about the interests and activities of other members of the group, thus increasing their interdependence.

Organizers typically care a great deal about the collective good and are willing to spend substantial portions of their personal resources to help get it, but they have limited resources and limited time and cannot do everything at once. Thus, they have to think strategically about how they will go about recruiting others to participate. The recruitment strategies actually practiced by organizers for most modern social movement organizations are exceedingly complicated. As Wilson (1973) notes:

> "The means which are used to recruit new members are infinitely varied and are the occasion for the display of considerable ingenuity on the part of those who lead social movements. Ask

the question, how did this or that individual come within the ambit of the movement's activities? And a wide diversity of answers will be given. Some were brought by relatives or friends, some attended meetings open to the public out of casual interest, some were approached—in the street, on their doorsteps, at their places of work. Others read of the movement in the newspapers, saw its activities filmed on television, browsed through its literature, and, becoming convinced of its importance for them, approached the movement of their own accord."

Perhaps largely as a result of this complexity, there have been relatively few attempts to arrive at a systematic classification of recruitment strategies (for an exception to this rule, as well as an excellent review of the literature on recruitment, see Snow, Zurcher, and Ekland-Olson, 1980). Two simple and related distinctions dominate the literature. The first is between strategies that concentrate on the social networks of members of the movement in order to recruit, and strategies that use more impersonal methods (Oberschall, 1973; Wilson, 1973; Tilly, 1978; Useem, 1975; Gerlach and Hine, 1970; Snow, Zurcher, and Ekland-Olson, 1980). The second distinction is between strategies that result in the recruitment of solidary blocs of people, such as church groups, and those that result in the recruitment of isolated individuals (Oberschall, 1973; Freeman, 1973; Zald and McCarthy, 1979; Fireman and Gamson, 1979; Jenkins, 1982).

We find it useful to draw somewhat the same distinction a different way. We observe that recruiters must select recruits for quality as well as quantity. A movement that gets two thousand people to sign a petition but can motivate them to do nothing more, is generally as unlikely to succeed as a movement that can only get five highly committed people to join, no matter how willing they are to risk everything. To prosper, most social movements need both to recruit reasonably large numbers of people and to ensure that a good proportion of them will make real, substantive contributions to the movement. (See Oliver 1984 and McAdam 1986 for discussions of the differences between large and small contributors to collective action.)

Thus we distinguish between the *reach* and the *selectivity* of a recruitment strategy. The reach of a recruitment strategy is the number of people who are contacted (henceforward called "contacts" or "potential recruits"). The selectivity of a strategy is the extent to which it contacts the portion (subgroup) of the interest group (henceforward "group") that is most likely to make substantial contributions to the cause.

Thus defined, it is clear that any organizer would prefer both complete reach, in which she can contact all members of the group, and complete selectivity, in which only those likely to contribute the most resources are contacted. However, given their resource constraints, organizers must make strategic trade-offs between the two, perhaps finding an optimum compromise with moderate levels of each. For purposes of illustration, however, consider the typology of strategies contained in Figure 1, in which each of the two characteristics is classified dichotomously.

In this scheme, most of the action is in the upper right and lower left cells of the grid. It is generally impossible to achieve both a very large number of contacts and high selectivity. A small number of contacts coupled with low selectivity will generally result in inferior chances for success, and will thus be avoided by all but the worst situated organizers. Some common recruitment strategies that might fall into the category of high reach and low selectivity include mass events such as rallies, demonstrations, or mass meetings; population blanketing strategies such as canvass-

	HIGH REACH	LOW REACH
HIGH SELECTIVITY	(Impossible)	Social Networks Grapevine
LOW SELECTIVITY	Mass Events Blanketing Strategies Advertising Phone, Mail Campaigns	(Undesirable)

FIGURE 1. Reach and selectivity of common recruitment strategies.

ing, leafletting, or petitioning; and advertising strategies, such as TV, newspaper, or radio advertising. Some strategies that might be categorized as having high selectivity and low reach include personalized modes such as recruitment from social networks and grapevines.

We will have more to say on the usefulness of this scheme later. For now, however, the general questions we want a formal analysis of recruitment to address are: How is the "best" recruitment strategy related to the characteristics of the collective good, and of the groups from which they attempt to recruit? What factors determine the relative value of reach and selectivity in choosing a strategy in a particular situation?

Types of Selectivity: The Interests and Resources of Potential Recruits

The simplicity of the notion of selectivity tends to disguise the fact that there are actually many desirable qualities for which potential recruits can be selected. From the perspective of resource mobilization, however, two characteristics may be regarded as most important: the willingness of contacts to contribute resources to the cause (interest), and their ability to do so (resources). We will attempt to determine the conditions favoring selecting for high interest levels versus those favoring selecting for high resource levels.

An individual's *interest* in the collective good is the value to her of a standard increment in the amount of public good that is provided. Even though all group members have a positive interest in a good, they may differ markedly in how large that interest is. For example, the value to black people of desegregating public accommodations differed with their income, since wealthier blacks were better able to take advantage of their improved access to previously "white" hotels and restaurants, while those blacks who were poor could not afford to patronize such establishments, anyway. Of course, even though objective income level plays an important role in defining interest in this example, we reiterate that the relevant interests are those *subjectively* experienced by people, and that subjective interests do not necessarily coincide with interests defined by some external standard.

An individual's *resource* level is the amount of discretionary time or money that he could potentially contribute to the collective action.[3] We will treat resource levels as objectively determined. Although what is "discretionary" has a subjective element, it seems a reasonable working approximation to assume that perceptions of discretion are influenced by one's interests. Thus, we assume that differences in interest levels generally account for differences in contribution levels among people with the same objective amounts of free time or surplus money.

A FORMAL MODEL OF RECRUITMENT UNDER CONDITIONS OF INTERDEPENDENCE

The model of recruitment we use represents the decision process undertaken by an organizer. It consists of a set of assumptions the organizer makes about the collective good that he means to provide, the members of the collectivity among whom he attempts to recruit, and the recruitment strategies among which he must choose. The organizer's costs and benefits do not themselves enter the model. However, we do make two fundamental assumptions concerning the organizer's decision process. First, as we have already noted, we assume that he is resource constrained and thus will have to make tradeoffs between reach and selectivity in recruitment. We investigate the marginal benefit of each under varying circumstances. Secondly, we assume that the organizer has perfect information about the interests and resources of each of the group members, and understands the group members' decision rules, so that he can perfectly predict how they will respond to his recruitment efforts.

Scope Conditions

In addition to these primary assumptions, the following scope conditions apply. Each of these is discussed in more detail in the development of the model that follows. 1) The *organizer's* sole goal is to maximize the production of the public good. 2) The *organizer* puts all her available resources into recruiting other participants, rather than into direct contributions toward the collective good. 3) All *potential recruits* have a non-negative level of interest in the good, a non-negative level of resources to contribute toward its procurement, and an ability to compare the two with some common metric. 4) All *potential recruits* have perfect information and seek to maximize their net gains, that is, the difference between their payoffs and their costs. 5) All *potential recruits* take into account the effect of their participation on the participation of others. 6) The *production function* which links the number of units of input contributed to the good to the number of outputs produced, is uniformly accelerating during the period of recruitment.

Potential Recruits

We assume there is a finite group of individuals who may, at least in theory, be contacted by the organizer. To simplify the model, we assume that all members of the group have a nonnegative interest in the collective good and a nonnegative amount

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[3]In our abstract analysis, we assume that either time or money is the relevant resource, and do not consider the issues involved in trying to substitute one for the other. See Oliver and Marwell (1988c) for more discussion of the issues involved in comparing time and money as resources.

of resources that they might contribute to its provision. (Either *may* be so small as to be essentially zero.) The restriction is fairly obvious for resources, but less compelling for interest; a negative interest means only that an individual would be harmed by something that benefits others, and this happens all the time. However, any valid model of negative interests would require us to include the possibility of counter-mobilizations to prevent the good from being provided. Such a complex analysis is beyond the scope of this paper. Thus, our assumption of nonnegative interests really means that we assume that there will be no counter-mobilizations, so negative interests may safely be treated as zero.

In the model, each member of the group is assigned separate interest and resource levels. The interest and resource levels of the ith member of the group are statistically independent of each other and are represented by I_i and R_i. The resource level indicates the maximum amount the member is capable of contributing to the collective action—whether his contribution is measured in terms of money, time, risk, or other resource. The interest level indicates what the member stands to gain from the provision of 1 unit of the good, measured in the same metric as resource. We assume that while the resources a recruit contributes to a collective action campaign are not necessarily of the same nature as the benefits he enjoys, the two are psychologically commensurable. The contribution that a recruit eventually makes to a collective good is thus limited both by his resources and by his interest in the good. He is unable to contribute more than his total amount of resources, and he is unwilling to contribute at a level that is not justified by his interest in the good.

We assume that each member of the group seeks to maximize her net gain, i.e., to produce the greatest possible positive difference between payoffs and costs. Thus, she will contribute to collective action if and only if her contribution will increase her payoff from the collective good by more than the cost of her contribution; otherwise, she will be content to ride free at the level of the good that is provided by others, and to do without if this level is zero.

Developing our notation, assume that an individual (i) who has been notified of the collective campaign, contemplates making a contribution of M_i, where M_i is constrained by and measured in the same metric as his resources and interest.[4] It is possible that the recruit's level of interest in the collective good will make a contribution at one level profitable while a contribution at another level would result in a loss. Where T is the total of the contributions that have been previously pledged or given to the organizer by other recruits, the gain to i from contributing to the good (G_i) is given by

$$G_i = I_i[P(T + M_i) - P(T)] - M_i \qquad (1)$$

where P represents the production function linking contributions to payoffs at the group level, and is further discussed below. Equation (1) simply represents the gain to i as the amount of the good produced by i's contribution times her interest in

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[4]It is entirely possible that the size of the impact of M_i on the collective good is quite different from the cost to the recruit of giving an amount M_i, but this complexity can be captured in the production function P, and we simplify the equations by using the same term M_i in both places.

the good, minus her contribution. We assume that i will set her contribution so as to maximize the value of this function.

When individuals are interdependent, this calculation is more complex than it appears, since interdependence means that contributions made by other group members actually increase T. In the next section we argue that linearity in P is a special case, and that production functions for collective action are typically nonlinear. When P is nonlinear, $P(T + M_i) - P(T)$ varies as a function of T. Thus, individual i may contemplate that his contribution will make others' contributions more likely which, in turn, may increase the value to him of contributing. If contributing will induce contributions from others who would otherwise not contribute, this "indirect production" of the collective good should be factored into i's decision. Consider a second individual, j. Her initial decision equation looks like (1), with j substituted for i. If j knows that i will contribute, then j will contribute if

$$I_j[P(T + M_i + M_j) - P(T + M_i)] > M_j. \tag{2}$$

Individual i can therefore induce j to contribute if

$$I_j[P(T + M_j) - P(T)] < M_j < I_j[P(T + M_i + M_j) - P(T + M_i)]. \tag{3}$$

Individual i should consider the possibility of inducing contributions in all other group members, and should add the sum of these induced contributions to his decision equation. If we let ΣK_j stand for the sum of the induced contributions, and now understand T to be the total which will be contributed if i does *not* induce others' contributions, i's revised decision equation is

$$I_i[P(T + M_i + \Sigma K_j) - P(T)] > M_i. \tag{4}$$

Of course, the logic does not stop at this step. To be fully rational, i must base his decision also upon the indirect contributions induced by the indirect contributions which he himself induces, and so forth. Actually specifying these links for each individual can be an impossibly complex problem. We do not try to solve this individual-level problem, but instead use this reasoning as a basis for a model that identifies the most likely aggregate contribution level that would result from a whole group of people all employing the same logic. This most likely aggregate outcome is used as a basis for examining the strategic choices of an organizer.

The Collective Good

The second major component of our model is the collective good itself. There are as many collective goods as there are collective action campaigns, and they differ from one another on a wide variety of characteristics. A public accommodations law, for example, is quite different from a community picnic, although both are collective goods. The former is "lumpy"—you either get the law or you don't—while the latter is more continuous—the picnic can be small, medium, large, or king-sized. The law continues to affect one's life for years and years; the picnic is over in a day. Many more differences are apparent.

Obviously, we cannot attend to all of these characteristics in this analysis, although several of them might be worth considering in future work. Here we focus

on only one very fundamental aspect of the good, its production function, which relates the number of units of input contributed to the good to the number of units of output produced (Oberschall, 1980; Oliver, Marwell, and Teixeira, 1985). Implicit in many non-technical discussions of collective action has been the misleading assumption that the production function is linear; i.e., that a contribution of one unit of resources increases the output of the collective good by a constant amount, regardless of the point at which it is contributed. For most collective campaigns, this is not the case. Each of the first fifty calls to a city agency asking for repair of a neighborhood's potholes may have little effect; but after that, each call may act to reinforce the belief of authorities that they are dealing with a serious campaign. The first 500 person-hours spent on organizing a demonstration may guarantee that large numbers of people will attend; but 500 more person-hours after that may have little additional effect because they would be spent on niceties such as elaborate banners that are not essential for the demonstration's success.

Most explicit discussions of production functions for collective action have employed general third order curves to represent them (Oberschall, 1980). Such curves posit a slow initial acceleration in returns on contributions, followed by a sharp take-off, then finally a period of diminishing returns (see Figure 2). Although a third-order curve is reasonably realistic for many collective campaigns, Oliver, Marwell and Teixeira (1985) have argued that its generality tends to obscure important dynamics revealed by more specific types of functions. Specifically, Oliver, Marwell and Teixeira have distinguished between accelerating production functions, in which each subsequent contribution to the collective good has a greater impact than the last, and decelerating functions, in which each subsequent contribution has a smaller impact than the last (see Figure 2).

Calculating chains of indirect production of the collective good (determining whether my contribution is likely to induce contributions by others, and so forth, as described above) should enhance the prospects for collective action only for the accelerating portions of a production function. It is only in this case that each contribution increases the potential returns to the next contributor, thereby making it more likely that he will contribute. When contributions decrease the potential returns of subsequent contributions, as they do in the decelerating case, or have no effect, if the function is linear, there should be no indirect production. Thus, interdependent decision making is especially important for resolving the collective dilemma when the production function is accelerating.

For this reason, this paper assumes an accelerating production function. The analysis is also relevant to the initial accelerating phase of functions with the more usual S-shape, where the function first accelerates and then decelerates. Accelerating functions can represent the dynamics of collective action campaigns, such as demonstrations, reform campaigns, and revolutions, where initial contributors create the conditions which draw others in to a bigger and bigger action. Our analysis does not, of course, provide an adequate account of the decline of such actions; that is the proper topic for a different paper.
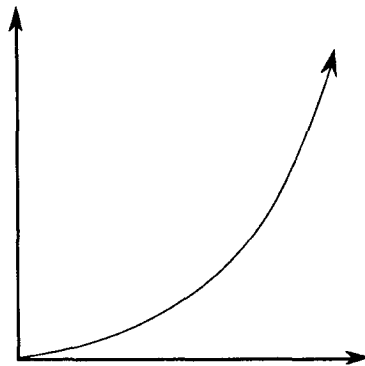
It is somewhat surprising to discover that monotonically accelerating production functions imply dichotomous contribution decisions: individuals who are contacted will either contribute nothing at all, or will contribute all their surplus resources up
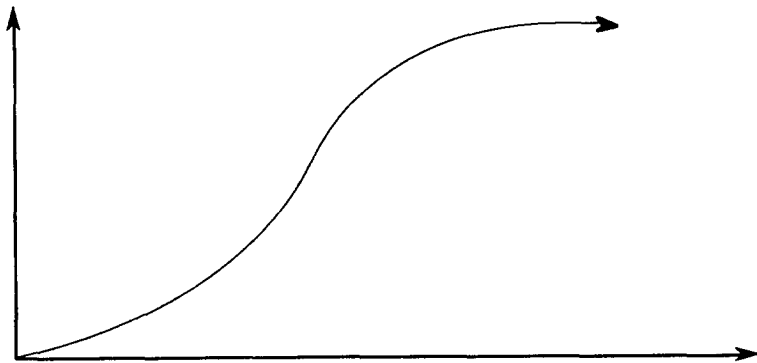
A. General Third-Order
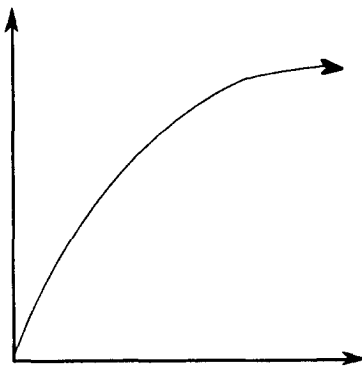
B. Decelerating

C. Accelerating

FIGURE 2. Types of production functions.

to the point at which the acceleration ends. Since the slope of the curve is always increasing, any contact who finds it desirable to contribute M_i at level T will get an even better return on a further contribution at $T + M_i$.[5] This means that, in evaluating a contribution decision, we do not have to consider all possible contribution levels (M_i) in equation (1); instead we need evaluate only one decision, that involving a contribution of size R_i, i.e. equal to his total resource level. Substituting R_i for M_i in (1) and rearranging terms gives us

$$I_i[P(T + R_i) - P(T)] > R_i \qquad (5)$$

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[5]The extreme value of a function can usually be found by setting its derivative equal to 0. Taking the derivative of (1) with respect to M_i, we get $dG_i/dM_i = I_i[dP(T + M_i)/dM_i] - 1$. Rearranging and setting dG_i/dM_i equal to 0, this gives $dP(T + M_i)/dM_i = 1/I_i$ as an equation for the contribution M_i which will result in a turning point in the gain to the recruit. The quantity $dP(T + M_i)/dM_i$ may be interpreted as the slope of the production function at the total level of contributions, including those made by i. However, because the production function is accelerating, the slope will increase with increasing levels of M_i. This means that the equation represents a minimum rather than a maximum, and that there is no upper limit to the amount which it is rational for a recruit to contribute. Under conditions of an accelerating production function, then, a recruit should rationally contribute either nothing at all or all of his available resources.

as a necessary and sufficient condition for i to contribute all his available resources to the cause for which he has been recruited. If the inequality in (5) does not hold, i will contribute nothing at all.

Since the result that an individual will contribute all her resources to a collective action seems implausible, it is worth clarifying what this result means. First, the concept "resource" has already been defined as *available* resources; things necessary for survival are not included. Secondly, the reason the individual would contribute everything is that she will make the largest possible "profit" doing so. To see the logic, imagine that the "collective action" is replaced by a machine which will—without risk—return to you money equal to the square of any amount you put in, up to some specified limit. If you put in $2, you get $4 back, a $2 profit. If you put in $20, you get $400 back, a $380 profit. If you put in $200, you get $40,000, a $39,800 profit. Obviously, if you found such a machine, you would be perfectly willing to throw in any money you could come up with, up to the limit specified. Thus, if an individual actually faces a pure accelerating production function (which is, admittedly, an idealized abstraction), she should certainly give everything she has available to give, if she is willing to give anything.

Recruitment Strategies

A recruitment strategy can be defined as a package of techniques used by an organizer to communicate information about a collective action campaign to a subset of an interest group (a subgroup). If he has good information about the specific individuals in the group, he would prefer to pick precisely the individuals who are likely to make the biggest contributions. We have investigated the consequences of this kind of individual-level selectivity elsewhere (Marwell, Oliver, and Prahl 1988; Oliver and Marwell 1988b). This kind of recruitment requires that the organizer have a great deal of prior information, and almost necessarily follows the lines of friendship and close personal acquaintance.

Organizers are not always able to recruit among people they already know well. Even if they have information about individuals, it may take the form of probabilities of contributing, rather than the actual amount a particular request will obtain. Thus, the present analysis treats recruitment strategies for which individual-level selection is *not* possible. Instead, organizers choose to target subgroups of people with known *distributions* of interests and resources. For example, advertising in a newspaper targets the readers of that newspaper. A direct mail solicitation targets the people on the mailing list. Leaflets tacked to telephone poles target those who walk in the area leafletted.

We describe the subgroup targeted by a particular recruitment in terms of: (N) the number of people contacted; (μ_R) the mean, and (σ_R) the standard deviation of their levels of mobilizible resources; and (μ_I) the mean, and (σ_I) the standard deviation of their levels of interest in the collective good. For example, recruiting through television advertisements reaches a large sample of people, but one with fairly low means and large standard deviations for both resources and interest. Recruiting at a rally on behalf of the issue in question would probably reach a modest number of people (depending on the size of the rally) with relatively homogeneous interest levels and possibly more variable resource levels. Target subgroups

that both are very large and have high interest and resource levels would be ideal, but the organizer normally has to make a strategic trade-off between larger target subgroups with lower and more diverse interests and resources, or smaller target subgroups with higher interest and resource levels. These trade-offs are the heart of the present analysis.

The success or failure of the recruitment drive hinges on the decisions of the set of people who are contacted, as they each interdependently decide how much, if anything, to contribute to the cause. However, because the organizer chooses the sample of people who make these decisions, the outcome of the drive depends ultimately on his choice of a recruitment strategy.

The Organizer's Decision

From the perspective of the organizer, the key outcome is not the decisions of targeted individuals, but the decisions of all members of the targeted subgroup as an aggregate. It is entirely possible that the organizer will be able to use her knowledge about the group and its various subgroups to predict the overall outcome of a recruitment drive without being able to predict the decisions of specific individuals. This principle is well understood in marketing, and is widely employed in professional fundraising. However, in a standard marketing problem, each consumer makes an independent decision. In this analysis, we consider the more complex problem of "consumers" who base their decisions partly on the decisions of others, and on their expectations of how their own behavior will influence others.

Using our model of interdependent decisions to predict the aggregate contribution from a subgroup requires an iterated solution. We may picture the organizer as deriving her expectations in stages. In the first stage, she expects each individual contacted to use all available information to estimate the total level of contributions with and without his own contribution, and to make an initial decision about whether to contribute or not on this basis. In the second stage, the organizer expects each contacted individual to calculate the decisions of all other members of the target subgroup in the first stage (using their full information about the others), and to use this information to make a revised decision. This continues through subsequent stages, with individuals using the information they have calculated from the previous stage to arrive at a revised decision. Because we assume full information, the estimated *total* contribution is the same for all potential recruits at each stage, although, of course, the *individuals'* contributions will vary. Because everyone has full information, including the organizer, we imagine that the organizer is able to follow through everyone's logic and end up with a good estimate for the total contribution this subgroup can be expected to make. In the remainder of this section we develop a function to represent this process.[6]

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[6]In some ways, this analysis is quite similar to Granovetter's (1978) threshold models of collective behavior. Because a given level of interest in the good corresponds to a given level on the production function at which an individual will be willing to contribute to it, the assumption of interest heterogeneity is equivalent to Granovetter's assumption of a distribution of threshold levels at which individuals are willing to contribute. Furthermore, the iterative solution to the problem of an equilibrium level in collective action is structurally similar to Granovetter's solution. A primary difference is that, while Granovetter assumes that each successive value of the function $F(A)$ actually occurs, here it assumed that $F(A)$ is calculated in the minds of recruits.

We start by assuming that the distributions of both interest and resources across a subgroup are continuous, with probability density functions given by $i(y)$ and $r(x)$, respectively. The number of members of the target subgroup ("contacts") is represented by N. The number of contacts with interest and resource levels between any two points (p_1) and (p_2), are thus given by

$$N \int_{p_1}^{p_2} r(x)\,dx, \tag{6a}$$

for resources and

$$N \int_{p_1}^{p_2} i(y)\,dy, \tag{6b}$$

for interests.

The equilibrium total contribution is found iteratively. If only resources are a factor, the total contribution will be given by

$$E = N \int_0^\infty xr(x)\,dx \tag{7}$$

which is the number of contacts times the sum of every possible value for each contact's level of resources, weighted by the probability that the value would occur. This expression simply equals N times the mean resource level, i.e., the total resources of all contacts.

However, targets of recruitment are not certain to contribute. A contacted individual will contribute only if the marginal gain from his contribution exceeds the cost of his contribution, i.e. if

$$I_i[P(A + R_i) - P(A)] > R_i \tag{8}$$

where A is the "assumed" total contribution made by all other group members if i does *not* contribute.

Thus, the estimated total contribution must be weighted by the probability that each subgroup member's interest is high enough to motivate a contribution. Adding this consideration to (7) yields

$$E = N \int_{x=0}^\infty \int_{y=K}^\infty xr(x)i(y)\,dy\,dx, \quad \text{where} \quad K = x/[P(A + x) - P(A)]. \tag{9}$$

To find the equilibrium contribution level, an initial assumed value (A) is used to calculate E. The revised value of E is than used as A in the next iteration, and the process continues until A converges to E. At equilibrium, the expected contribution is

$$E = N \int_{x=0}^\infty \int_{y=K}^\infty xr(x)i(y)\,dy\,dx, \quad \text{where} \quad K = x/[P(E + x) - P(E)]. \tag{10}$$

Verbally, the recursive equation (10) may be interpreted in the following way: at equilibrium, the level of assumed contributions will be equal to the number of contacts, times the sum of all resource values possible for each contact, weighted both by the probability that each value will occur and by the conditional probability that the contact will have a high enough interest level to want to contribute it to the cause.

Even if the explicit rounds of decisions that underlie this equation do not actually occur, it is meaningful as the equilibrium outcome of a recruitment drive: not necessarily a determinate result, but the level of total contribution at which the pressures resulting from the interdependence of contacts will be in equilibrium. An organizer would reasonably regard the solution to the equation, if there is one, as the most likely result of a particular recruitment strategy. Organizers would plausibly seek to maximize E as they choose among alternate recruitment strategies. The remainder of this paper will examine the implications of this equation.

RESULTS

We are interested in exploring how this equilibrium outcome defined by equation (10) changes as recruitment strategies are employed with higher reach (i.e. N of target subgroup) or greater selectivity (i.e. mean of resources or interest in target subgroup). The outcomes themselves, and the way they change as a function of N, μ_I and μ_R, depend on the exact nature of the distributions $r(x)$ and $i(y)$. It is impossible to evaluate all plausible functional forms of these distributions, and a very complex problem to permit both μ_I and μ_R to vary at once. For this reason, we have analyzed equation (10) in a series of cross-sections, in which some things are held constant while others are varied. Our first analysis shows the effects of varying N when both μ_I and μ_R are held constant. This shows the effect of emphasizing reach in a recruitment strategy. Our second and third analyses hold individual resources and interest (and hence μ_I and μ_R) constant across the group in turn, thus permitting us to see the effects of emphasizing selectivity for interest versus resources.

Our analysis uses lognormal distributions for interest and resources because they are statistically tractable, unimodal, always positive, and positively skewed—characteristics which satisfy our theoretical assumptions within our practical constraints. Replications with truncated normal distributions yield substantially similar results, and our detailed interpretation of the results permits us to show why the patterns of the findings do not depend upon the particular distribution chosen. Since we are interested in the effects of increasing the *mean* of a distribution, we hold the "shape" of each distribution constant by setting its standard deviation equal to a constant proportion of the mean.

All analyses use the production function $P(T) = T^2$, i.e. the payoff level of the collective good equals the square of the total contribution level. Our reasoning and general conclusions will be shown below to apply to any accelerative function. This particular choice is essentially arbitrary. We selected it because it makes the solution to equation (10) tractable and permits us to give very clear numerical examples of how the model is behaving. Substantively, this is a rather sharply accelerating function which accentuates the possibilities for contributions inducing other contributions.

Resources and Interest Constant: A Baseline

We begin with the simplest, and perhaps the least realistic, of all possible cases, in which both interest and resources are constant across the entire group. In this case, the integrals for their cumulative distributions are replaced by constants. The contribution of each contact, should he decide to contribute at all, is simply R. Because all contacts have identical resource and interest levels, all will make the same (dichotomous) decision about whether or not to contribute. Thus, A, the assumed contribution level in equation (8), will be the amount produced if everyone else contributes, i.e. $R(N - 1) = (RN - R)$. Making this substitution into (8) and rearranging terms gives

$$I > R/[P(RN) - P(RN - R)] \tag{11a}$$

which simply says that everyone's interest level has to be greater than the ratio of his contribution level to the increment in the collective good produced by the *last* contributor. Rearranging to solve for the resource level, we obtain

$$R > 1/\{[P(RN) - P(RN - R)]\}I \tag{11b}$$

Since the units for I and R are arbitrary, but are assumed to be in the same metric, it is often more useful to rearrange the terms to obtain an expression for the ratio of resource level to interest level.

$$R/I < P(RN) - P(RN - R). \tag{11c}$$

Equation (11c) says that the ratio of resource level to interest level has to be less than the difference the last contributor would make in the payoff from the collective good. Because P is accelerative, of course, treating one's own contribution as the last contribution is the most favorable assumption possible for evaluating the marginal impact of a contribution.

Our assumed production function, $P(T) = T^2$, can provide a particularly transparent case with which to illustrate how the variables affect collective action. Because this form of the accelerative production function is itself mathematically simple, we have no trouble simplifying (11a) to read

$$I > 1/[R(2N - 1)] \tag{12a}$$

Rearranging terms to obtain the equivalent of (11b), we obtain

$$R/I < 2N - 1. \tag{12b}$$

It will also be helpful later to isolate R and N in this inequation:

$$R > 1/[I(2N - 1)] \tag{12c}$$

$$N > 2(R/I + 1) \tag{12d}$$

Equation (12b) makes it clear that steeply accelerating production functions are highly favorable for collective action. Even if $N = 1$, contribution is desirable if I simply exceeds R. As N gets larger and larger, R can exceed I by larger and larger

multiples: it can be up to three times as large for $N = 2$, up to 9 times as large for $N = 5$, 39 times as large for $N = 20$, and 1999 times as large for $N = 1000$.

Another angle on the same basic relationship can be seen by substituting $P = T^2$ into equation (1), for the net gain (G) of contributing, and taking the derivative of G with respect to N, obtaining $2IR^2$. As this derivative does not depend on N, there is no optimum N; the effect of contacting one more person is constant regardless of how many have already been reached. Since I and R are assumed constant and positive, this means that the value *to each potential recruit* of contributing to the collective action goes up as the size of the pool of potential recruits (N) goes up. Within the framework of these assumptions, *larger* target subgroups are more likely to give rise to collective action than smaller ones.

To summarize, if resources and interests are constant, there is no value in attempting to be "selective" in recruitment, and only increasing the reach of recruitment has any advantage. If the production function is accelerating, increasing the reach of a recruitment strategy has a strong positive effect on the payoff each individual can receive from the collective good and, thus, on the prospects for collective action.[7] Each additional person added above the threshold simply adds R to the expected total contribution.

Selectivity for Interest

In this section of the analysis, we hold resources constant and compare the gains from increasing the reach of recruitment to the gains from increasing the selectivity for interest. This case would apply if the collective action is such that each individual who decides to contribute must necessarily make the same size contribution. This would be the case if people are being asked to march in a demonstration, sign a petition, or vote in a referendum. In such cases, the organizer cannot affect the average resource level of the target subgroup, but might employ a selective recruitment strategy focusing on those who are especially likely to be interested in the collective good. In this case, equation (10) simplifies to

$$E = NR \int_{X=K}^{\infty} i(y)\,dy, \quad \text{where} \quad K = R/[P(E+R) - P(E)] \quad (13)$$

which may be read as the number of contacts times the resource level, times the proportion whose interest is high enough to make them willing to contribute. All contributions will be of the same amount, so the only question is how many people will contribute.

We investigated the behavior of equation (13) when $i(y)$ is a lognormally distributed random variate with mean μ_I and standard deviation σ_I. A large number of "experiments" were conducted. The first step for each was to select baseline levels of N, R, μ_I and σ_I; these were generally chosen to as low as possible without making a successful recruitment drive impossible. Then, with everything else held

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[7]For more general arguments which do not depend on accelerating production function about why group size can increase the prospects for collective action, see Oliver and Marwell (1988a).
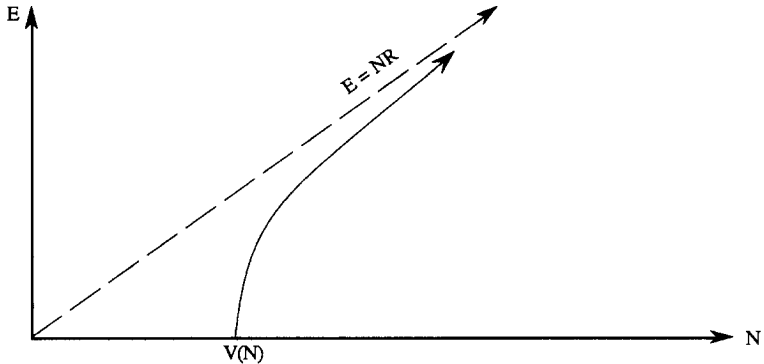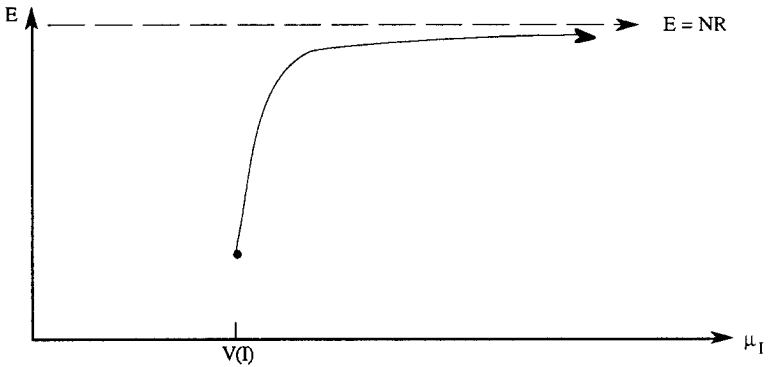
A. Number of Recruits by Expected Outcome (R, μ_I constant)

B. Mean Interest of Recruits by Expected Outcome (R, N constant)

FIGURE 3. Expected outcome of a recruitment drive by reach and interest selectivity. Resource constant, interest distributed log-normally.

constant, first N and then μ_I was increased incrementally and a plot was produced showing how its increase affected E.[8]

The results are shown in Figure 3. Verbally, they may be described as follows. The plot relating number of contacts (N) to the outcome of the drive traces the X-axis until it reaches a threshold value, $V(N)$. Thereafter it forms a monotonically increasing but decelerating curve, reaching an asymptote with a slope equal to R. The curve decelerates while N increases the probability that others will contribute. As it approaches the asymptote, all N persons are already contributing, and adding a person to N simply adds (his) R to E.

The plot relating mean interest of potential recruits to the outcome of the drive shows both similar and dissimilar effects. This curve also traces the X-axis until it reaches a threshold value, $V(I)$. However, it then jumps *dis*continuously to a positive value. The discontinuity arises because it never happens that just one person contributes R; instead, the mean interest of the subgroup has to be high enough that a good number of people will all be motivated to contribute in one interdepen-

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[8]These computations were performed with a computer program written in Simscript™.

dent swoop. After this jump, further increases in the mean subgroup interest will increase the expected total contribution, but the curve decelerates until it reaches an asymptote with a slope of 0. Once the mean interest level is high enough to ensure that even the least interested members in the subgroup are willing to contribute, increases in μ_I add no more to the expected payoff level.

When I varies, the locations of the thresholds $V(N)$ and $V(I)$ depend on the specific form of the production function being used, as well as on the probabilistic distribution of I. They are therefore difficult to solve for directly. However, the locations of these thresholds both follow a similar logic, in which changes in N or μ_I affect the probability (q) that one or more group members will have interests higher than some critical value (i_q). It is these individuals who will actually contribute at the threshold, and "start the ball rolling" for further contributions by other group members. Increases in either μ_I or N increase q.

We may illustrate these processes by considering again the relatively simple case in which $P(T) = T^2$. For this production function, the threshold value of μ_I occurs when μ_I is high enough that there is some i_q that satisfies

$$i_q > 1/R[2Nq - 1], \tag{14}$$

where the term Nq is the *number* of people in the upper tail of the interest distribution who have interest greater than i_q. When this inequality is satisfied, it means that as defined for this particular production function, there exists a large enough subset of target subgroup members with sufficiently high interest that they will actually contribute.

Similarly, the threshold value of N occurs when N is high enough that the probability function produces a sufficiently large number of target subgroup members in the tail of the interest distribution above the critical value (i_q), to form a subset for which

$$N_q > 2(R/i_q + 1). \tag{15}$$

Selectivity for Resource

In this section we consider the case in which resource levels vary while interests are fixed. Although interest levels are never actually constant in real-world groups, we can conceive of a situation in which the variability in resources is high enough relative to the variability in interest levels to make interest levels act almost like a constant. This would be especially true if the group is defined so as to include only people with a known positive interest in the good, and if the collective action requires the kind of resources that are heterogeneous in the group. Collective actions requiring monetary contributions are especially likely to fall in this category, as wealth is generally distributed quite unequally. In this case, organizers attend to the average resources of different subgroups. Examples of campaigns in which selectivity for resource was dominant include the NAACP, which, for most of its formative years, emphasized contributions from whites and middle or upper class blacks on the grounds that they had more to offer; the "Live Aid" Rock Telethon of July 13, 1985, which according to one of its organizers (New York Times, July 18, 1985) concentrated on musical acts that would appeal to people in the more affluent

age brackets; and "large donor" charitable fundraising, which concentrates on the very wealthy and corporations.

When interest is held constant, equation (10) simplifies to

$$E = N \int_{X=L}^{\infty} xr(x)dx, \quad \text{where} \quad L = I[P(E + x) - P(E)] \tag{16}$$

which is the number of contacts times the expected contribution of each. The contribution expected from each contact is calculated by weighting all resource levels that are high enough to produce a contribution by the probability that those levels will occur. Here the lower bound of the integral is a recursive but determinant expression representing the minimum amount of resources that a contact must control in order to be able to choose rationally to contribute it to the cause. At levels above the cutoff point established by this expression, a contribution will yield a profit, while at levels below the cutoff point any contribution will yield a loss.

The behavior of equation (16) was investigated through repeated experiments in a manner directly parallel to that of the previous section. Here, the first step is to specify baseline levels of N, I, μ_R and σ_R. Then N and μ_R are each increased incrementally and the effects on E are plotted. The main difference between the algorithms is that, while the lower bound of the interest distribution can be calculated directly, the lower bound for the resource distribution must be calculated iteratively, making the numerical calculation of the solution more difficult.

The results for in this section are rather different from those preceding. Consider first the effects of expanding the reach of recruitment (i.e., increasing N) as shown in Figure 4a. Once again there is a threshold; but here the jump is discontinuous. Because interest is constant, when N gets high enough relative to μ_R and I to make contributing rational, everyone in the subgroup contributes. From this point on, each additional unit increase in N simply adds one more contributing person to the total. Although the resource level varies randomly from individual to individual, on the average each additional subgroup member adds μ_R to the total, making the outcome E a linear function of N with slope μ_R. Comparing Figures 3a and 4a, we see that the differences in the effects of increasing recruitment reach (N) in the two cases are concentrated around the threshold. If interests are constant, either all the subgroup or none of it contribute. When interests vary, there is a period above the threshold where only part of the targeted subgroup contributes. Once N is large enough to make it rational for even the least interested subgroup members to contribute, the linear relations between N and E in Figures 3a and 4a are identical.

The effect of selectivity for resources is very different from selectivity for interest. Once again there is a threshold that must be obtained. However, once this threshold is obtained, *all* members of the group will be willing to contribute (since they have the same interest) and the total contribution will be $N\mu_R$. Each additional increment in μ_R raises E, the expected total contribution, by N times the size of the increment.

Because the effects of variation in resources are so much more straightforward than are those of variation in interest, it is much easier to calculate thresholds for a given production function. Returning to our simple case, in which $P(T) = T^2$, the
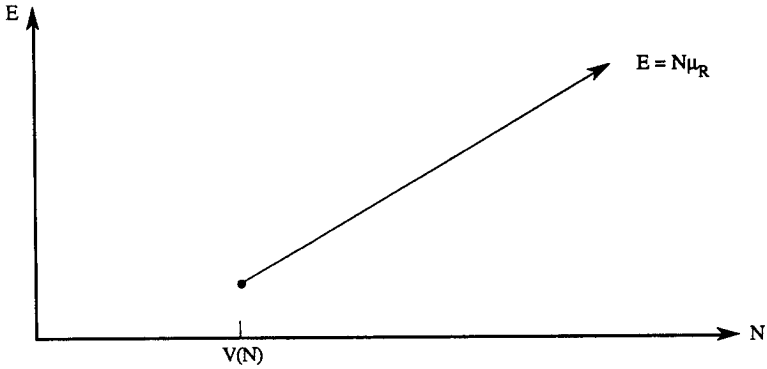
A. Number of Recruits by Expected Outcome (μ_R, μ_I constant)
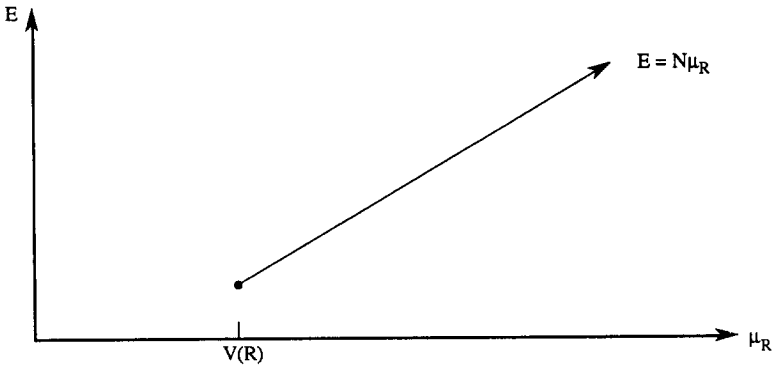
B. Mean Resource of Recruits by Expected Outcome (N, μ_I constant)

FIGURE 4. Expected outcome of a recruitment drive by reach and resource selectivity. Interest constant, resource distributed log-normally.

threshold for reach (N), occurs when $N = 2(\mu_R/I + 1)$. For selectivity on resources, the threshold occurs when $\mu_R = 1/[I(2N - 1)]$.

Summary of Results

It will be useful to pull together the results of our analysis in a brief review. It should be recalled that the specific results are for the production function $P(T) = T^2$. However, the general patterns of relationships will hold true for all accelerating production functions.

Expanding Reach (N). When both resources (R) and interest (I) are constant in the group as a whole, the expected contribution level (E) is zero until a threshold is reached. This threshold is a function of I, R, and the production function (P). For $P(T) = T^2$, the threshold is $N > 2(R/I + 1)$. After this threshold, each additional person contacted adds R to E. Each additional person contacted adds $2IR^2$ to G, the gain each *individual* obtains from the collective action, so that larger contacted subgroups are much more profitable for their members than smaller subgroups. If I is constant but R varies around mean μ_R, the results are the same except that μ_R is substituted for R.

If R is constant but I varies around mean μ_I, the threshold value of N has a probabilistic element depending on μ_I, σ_I, and the form of $i(y)$, the probability density function for the interest distribution. The threshold is the point at which some of the subgroup's members' interests are high enough to make them willing to contribute. The slope of the relationship between N and E immediately beyond the threshold depends on the nature of $i(y)$ and P, but the curve in this region is decelerating toward the asymptote $E = NR$, which is reached when N is high enough that even the subgroup members with the lowest interest levels are willing to contribute.

Selecting for Interests. For a given resource R and targeted subgroup size N, the threshold for an individual's interest level is $I > R/[P(RN) - P(RN - R)]$. For the production function $P(T) = T^2$, this threshold is $I > 1/[R(2N - 1)]$. If interests are constant within a group, and hence within any subgroup, the interest level (I) acts as an on-off switch for collective action: either no one contributes and $E = 0$, or everyone contributes and $E = NR$. If interests vary, there is a threshold value of μ_I with a probabilistic element depending on the nature of $i(y)$ and P which is the point at which some subgroup members' interests are high enough to make them willing to contribute interdependently. There is a region beyond this threshold with a positive but decelerating slope where increases in μ_I make a greater proportion of the subgroup willing to contribute. As μ_I gets high enough that virtually all individuals contacted are willing to contribute, the curve relating E to μ_I approaches the horizontal line $E = NR$.

Selecting for Resources. For a given subgroup size N and interest level I, an individual will contribute if her resource level surpasses the threshold $R > 1/I[P(RN) - P(RN - R)]$. For the production function $P(T) = T^2$, the threshold is $R > 1/[I(2N - 1)]$. If the interest level is constant across individuals contacted, each increment in R above the threshold, if resources are constant, or μ_R, if they vary, raises E by N times the increment.

DISCUSSION

Our analysis points to two key features of recruitment to collective action: the importance of thresholds, and the relative ineffectiveness of recruitment strategies focused on interest, rather than on resources or numbers. We will draw out the implications of each in more detail.

Threshold Effects in Recruitment

Perhaps the most striking feature of our results is the universality of threshold effects. For a given combination of all other variables, each variable has a threshold below which increments in it make no difference in the prospects for collective action. Contacting another person increases the chances of success only if enough other members have already been contacted to reach the threshold. Shifting a recruitment strategy so that it is somewhat more selective, i.e. so that there is an increase in the mean level of resources or interest in the targeted subgroups, increases the chances of success only if the subgroup is already resourceful or interested enough to reach the threshold. That is, threshold levels of interest, resource,

and raw numbers of contacts must be met in order to avoid a complete organizing failure. This finding has profound implications for organizers.

First, and perhaps most important, it can help to explain the sometimes dramatic fluctuations in the level of activity in various collective action campaigns. These fluctuations have sometimes been taken as evidence of the dominance of extra-rational motivations in collective action. However, because of the existence of threshold effects, it is possible that relatively small fluctuations in the recruitment efforts of organizers can have a dramatic effect on the total level of contributions to their cause. Instead of being evidence of non-rational behavior, sharp fluctuations in the level of collective action may simply indicate the presence of interdependence. If people are willing to act if, but only if, enough others also act, a slight increase in the number willing can push a subgroup across the threshold and start a cascade of interdependent action.

Second, an organizer unable to find a recruitment strategy that achieves threshold levels of reach and selectivity (on either resources or interest or both) will be unable to recruit any contributors to his collective action. This suggests that, in some situations, it will be irrational for organizers to attempt to recruit new members to their cause, despite the obvious desirability of doing so, simply because any such attempt will be doomed to failure. Organizers who do not perceive the problem may conscientiously expend a great deal of effort on recruitment but achieve nothing. The failure would lie not with the recruiting ability of the organizer, but with the lack of a critical mass for action within the group as a whole.

There are two main reasons why an organizer may be unable to meet the threshold levels necessary to successfully recruit new members to his cause. Each has significant implications.

First, an organizer may be unable to succeed simply because she cannot afford to pay the recruitment costs necessary to reach the threshold levels. Both high reach and high selectivity will usually have high associated costs, and poorer organizers may be unable to meet these costs to the extent necessary. This suggests that, quite apart from the fact that well-to-do collectivities have more resources to mobilize on their behalf than do poor ones, poor collectivities may not contain any potential organizer who herself has sufficient resources to be able to organize successfully. This lends credence to the idea, long an article of faith among activists, that poor collectivities frequently need an organizer from outside the group to catalyze them into action.

Second, an organizer may be unable to reach the necessary threshold levels because of the characteristics of the group from which he must select a subgroup to contact. An obvious example of this possibility is the case of a collectivity in which there is a negative correlation between the resource and interest level of members—a situation that may exist for many collective goods that primarily benefit underprivileged groups. When resource and interest levels are negatively correlated in this way, it may be difficult or impossible for organizers to find a target subgroup that meets threshold levels for both variables. Targeting more people will not help because the new contacts will still be unable to act. Selecting a more interested or resourceful subgroup will not work, because selection for one entails selection against the other, and both are necessary. Instead, the organizer will have to act

directly to increase the interest in the collective good of resourceful members of the group, or increase the resources available to those members with high interest.

Both approaches are employed by activists, under the names of "consciousness building" and "empowerment." Consciousness building usually entails training members of a collectivity to have a better understanding of their objective interests or of their class position, so that they will be more inclined to work toward ends that are desirable from the point of view of the organizer. Empowerment usually means training potential participants in collective action to make better use of resources that they already command, thus effectively increasing their resource level. While there is nothing new in saying that consciousness building and empowerment are important elements in collective action, the threshold effects discovered in the previous section suggest that in some cases organizers may need to use such strategies in order to successfully mobilize any new participants at all.

A third major implication of threshold effects in the resource level, interest level, and number of contacts for a collective action is that they create a strong pressure for organizers to devote more or less equal attention to all three of these parameters. Even the most mass-oriented of movements must devote some attention to the resourcefulness and interest levels of their potential recruits; even the most conspiratorial or elitist must devote some attention to raw numbers. This suggests that, when organizers employ simple recruitment strategies, these will usually include some emphasis on both reach and selectivity.

However, in some cases it may be different to meet all the necessary thresholds with a single strategy. Strategies that result in the recruitment of large numbers of people, such as advertising in mass media, tend to be very unselective for levels of interest and resource. Strategies that allow the organizer to be highly selective, such as direct recruitment from social networks or appeals through "movement" publications, tend to result in relatively small numbers of actual recruits. Organizers are therefore pressured to adopt complex combinations of strategies which emphasize one or another of these concerns, thereby assuring between them that all necessary threshold levels are met.

Organizers are frequently aware of the need to combine recruitment strategies in this fashion. As Wilson (1973) has noted:

> "Peace groups like CND, civil-rights groups like CORE, new left groups like SDS, Fascist groups like the Mosleyites, adventist movements like the Jehovah's Witnesses have all combined an openness for general support with a shrewd assessment of those who are most likely to contribute to the cause. The result has usually been a two-step sequence of recruitment in which the initial contact is made at rallies, demonstrations, mass meetings, and through the mass media. This diffuse approach is then followed up with personal contact and a more individualized approach in which the scarce resources of members' time and money can be allocated more discriminately in the direction of the probables."

The first step of this two-step process of recruitment may be seen as emphasizing the sheer number of contacts. Rallies demonstrations, mass meetings, and advertising in mass media are all alike in that, if successful, they guarantee the presence of large numbers of people with at least a moderate interest in the collective good being sought. The second step may be seen as a way of sifting through this large number of potential recruits to find those individuals who have the most interest in the collective good and the most resources available to help provide it. Although

this example represents a sequential combinations of strategies, organizers may also employ different recruitment strategies simultaneously. For example, an environmental organization may garner large numbers of contributors by canvassing, while simultaneously reaching a few highly resourceful and interested individuals by more selective means.

Limits to the Effectiveness of Recruiting for Interest

Our analysis showed that increasing the number of contacts or increasing the average resource level of those contacted both continue to improve the collective outcome throughout the accelerative range of a production function, while increasing the average interest level of those contacted is beneficial only if the initial level of interest among those contacted is relatively low. Once the interest is high enough that everyone is willing to contribute, increasing the interest adds nothing. As figure 3 shows, most of the variation in the impact of interest selectivity occurs in a very small range around the threshold point.

This suggests that organizers who face no problem exceeding the threshold for all factors will find it much more rewarding to emphasize the raw numbers or the resource level of their potential recruits, rather than their interest level. Organizers should stress selecting for interest or raising interest only if the average interest in the group is so low that no one is willing to act.

This suggests that interest levels are most problematic at the beginnings of recruitment drives. These results seem to imply that, as organizers become more successful over time, they will tend to become more concerned about the resources and number of their contacts, and less concerned about the contacts' interest in the collective good. In short, success changes the rules by which organizers must operate. If we assume that the "natural" constituency of a collective action is that subgroup of people who have the most interest in the collective good, this suggests that social movements would tend to move away from their natural constituencies, and toward constituents with greater resources, as they become more successful.

Implications for Specific Strategies

Finally, we return briefly to the typology of recruitment strategies presented at the beginning of this paper (see figure 1). The first thing which must be noted about this scheme in light of the discussion in the previous two sections, is that it must be refined. We now know that the effect of selectivity vis-a-vis reach will depend to a large extent on whether selectivity for resource, interest, or both is the dominant concern for organizers.

Furthermore, the strong pressure on organizers to diversify their repertoire of recruitment strategies to meet various thresholds means that this typology may be too simple to adequately represent the kinds of choices that organizers must make. Rather than choosing a specific type of recruitment strategy, it may be that most organizers choose how to best combine strategies to fit their needs.

These provisos noted, however, there are two specific hypotheses suggested by this paper that may be discussed in relation to the specific strategies listed in the

table. The first is that most strategies, or combinations of strategies, commonly employed by organizers of moderate resources will devote more or less equal attention to reach and selectivity. The second is that the organizers most able to mount large campaigns will tend to devote less emphasis to interest selectivity than to resource selectivity and reach, due to limitations on the efficacy of recruiting for interest.

A closer examination of the strategies listed in the table shows that few, if any, emphasize either reach or selectivity exclusively. Rallies, demonstrations, and other events staged for mass consumption are primarily reach-oriented strategies; however, they also have the useful feature that they tend to select only those members of the group who have the modicum of interest required to attend the event. Technologically mediated strategies, such as mass mailings and telephone campaigns, would seem to be clear examples of sacrificing selectivity for raw numbers of contacts; however, as McCarthy and Zald have pointed out (1973, 1977), techniques such as market research and sophisticated mailing lists, which afford recruiters a good deal of information about the potential targets of their actions, are becoming increasingly common. Advertising in mass media would appear to be another reach-oriented strategy. However, what appears to be increasingly popular is recruitment through specialized media: Civil rights organizers advertise in black newspapers, a musician's cooperative buys time on a progressive radio station, crusaders against gun control buy space in a magazine for hunters. In each case the number of people reached by the advertising is diminished compared to less specialized media, but the probability that those reached will have a significant interest in the good is increased. The same type of selectivity is frequently the goal of blanketing strategies such as leafletting and canvassing. Leafletters choose carefully which streets to work, frequently maximizing the efficiency of their efforts by working the busiest streets available. Canvassers frequently clamor for the most well-to-do or generous neighborhoods. In each case, the apparent primacy of either the reach or selectivity of a strategy is mitigated by techniques which place added emphasis on the other factor.

Large, well-established campaigns for collective goods can take interest levels for granted and focus on numbers or resources. The United Way can mount numbers-focused campaigns attempting to saturate whole workplaces and neighborhoods in order to create significant social pressures on individuals to contribute. The United Way and all other major charities devote a great deal of their efforts to large-donor fundraising, particularly from corporations. Established pressure groups such as the NRA or NOW can emphasize both the numbers and the resource levels of their contacts, simultaneously advertising on network television and seeking a few large contributions through more private means. Well-endowed university foundations usually concentrate more on locating the most resourceful alumni than on locating those with the strongest school spirit. These strategies make sense for organizations that are generally popular, and that anticipate no difficulty in meeting threshold levels. For these organizations it is more rewarding to concentrate their efforts on the number and the resourcefulness of their contacts than on their interest.

By contrast, organizers of relatively unpopular causes, such as American Communists or those opposed to animal nudity, nearly always target their appeals to an

audience which has been highly selected for interest or at least potential interest, because more generalized populations can never exceed the threshold interest level.

In conclusion, we turn to the issue of specific, testable hypotheses which flow from the model presented here.

1. If threshold effects or pronounced gyrations in the outcomes of actual collective action campaigns occur at all, they will occur immediately after some event significantly changes the size, resourcefulness, or mean interest level of the collectivity.
2. Complex recruitment strategies, which combine attention to numbers, interest levels, and resource levels, will tend to promote more successful collective action campaigns.
3. As movements thrive, the mean resource levels of new recruits will increase relative to their mean interest levels.
4. Movements in which there is a negative correlation between interest and resource levels among potential recruits will tend to achieve very little until organizers take action to influence one or the other of these variables; thereafter, threshold effects are likely to occur.

Some of these hypotheses might yield to testing through a carefully designed experiment in which a large number of small groups, each including an organizer and a set of potential recruits with stochastically assigned resource and interest levels, attempt to attain a collective cash incentive offered by the experimenter. However, a more fruitful approach to hypothesis testing might be to focus on historical assessments of the extent to which the hypotheses have held true in major collective action campaigns and social movements.

REFERENCES

Aitchison, J., and Brown, J. A. C. (1963) *The lognormal distribution*. Cambridge: Cambridge University Press.

Chamberlin, J. (1974) Provision of collective goods as a function of group size. *American Political Science Review* 68: 707–716.

Fireman, B., and Gamson, W. A. (1977) Utilitarian logic in the resource mobilization perspective. In Mayer Zald and John D. McCarthy, *The dynamics of social movements*. Cambridge, MA: Winthrop Publishers.

Frohlich, N., and Oppenheimer, J. A. (1970) I get by with a little help from my friends. *World Politics* 23: 104–120.

Freeman, J. (1973) The origins of the women's liberation movement. *American Journal of Sociology* 78: 792–811.

Gerlach, L. P., and Hine, V. (1970) *People, Power, Change: Movements of Social Transformation*. New York: Bobbs-Merrrill.

Granovetter, M. (1978) Threshold models of collective behavior. *American Journal of Sociology* 83: 1420–43.

Hardin, R. (1982) *Collective Action*. Baltimore: Johns Hopkins University Press for Resources for the Future.

Hechter, M. (1983) *The Microfoundations of Macrosociology*. Philadelphia: Temple University Press.

Jenkins, L. C. (1983) Resource mobilization theory and the study of social movements. *Annual Review of Sociology* 9: 527–53.

Jenkins, L. C. (1982) The transformation of a constituency into a movement. In J. Freeman, (ed.) *The Social Movements of the 1960s and 1970s*. New York: Longmans.

Klandermans, B. (1984) Mobilization and participation: social-psychological expansions of resource mobilization theory. *American Sociological Review* 49: 583–600.

Marwell, G., and Ames, R. E. (1979) Experiments in the provision of public goods, I. *American Journal of Sociology* **84**: 1335–60.

Marwell, G., and Ames, R. E. (1979) Experiments in the provision of public goods, II. *American Journal of Sociology* **85**: 926–37.

Marwell, G., and Oliver, P. (1984) Collective action theory and social movements research. *Research in Social Movements, Conflicts and Change* 7: 1–28.

Marwell, G., Oliver, P., and Prahl, R. (1988) A theory of the critical mass, III. Social Networks and Collective Action. *American Journal of Sociology* **94**: 502–34.

Marx, G. T., and Wood, J. L. (1975) Strands of theory and research in collective behavior. In A. Inkeles (ed.) *Annual Review of Sociology*. Volume 1. Palo Alto: Annual Reviews.

McAdam, D. (1986) Recruitment to high-risk activism: the case of freedom summer. *American Journal of Sociology* **92**: 64–90.

McCarthy, J. D., and Zald, M. N. (1977) Resource mobilization and social movements: a partial theory. *American Journal of Sociology* **82**: 1212–41.

McCarthy, J. D., and Zald, M. N. (1973) *The Trend of Social Movements in America: Professionalization and Resource Mobilization*. Morristown, NJ: General Learning Press.

McGuire, M. C. (1974) Group size, group homogeneity, and the aggregate provision of a pure public good under Cournot behavior. *Public Choice* **18**: 107–126.

Oberschall, A. (1973) *Social Conflict and Social Movements*. Englewood Cliffs, NJ: Prentice-Hall.

Oberschall, A. (1980) Loosely structured collective conflict: a theory and an application. *Research in Social Movements, Conflict and Change* 3: 45–68.

Oliver, P. E. (1980) Rewards and punishments as selective incentives for collective action: theoretical investigations. *American Journal of Sociology* **85**: 1356–1375.

Oliver, P. E. (1984) If you don't do it, nobody else will: active and token contributors to local collective action. *American Sociological Review* **49**: 601–610.

Oliver, P. E., and Marwell, G. (1988a) The paradox of group size in collective action. A theory of the critical mass, III. *American Sociological Review* **53**: 1–8.

Oliver, P. E., and Marwell, G. (1988b) A theory of the critical mass, IV. Selectivity, group size, organizing cost and heterogeneity in mobilizing for collective action. Unpublished manuscript.

Oliver, P. E., and Marwell, G. (1988c) Mobilizing technologies and the micro-meso link. Presented at the conference on Frontiers in Social Movement Theory, Ann Arbor, MI, June 8–11, 1988.

Oliver, P., Marwell, G., and Teixara, R. (1985) A theory of the critical mass, I. Interdependence, group heterogeneity, and the production of colllective goods. *American Journal of Sociology* **91**: 522–556.

Olson, M., Jr. (1965) *The Logic of Collective Action*. Cambridge, MA: Harvard University Press.

Snow, D., Zurcher, L. A., and Ekland-Olson, S. (1980) Social networks and social movements. *American Journal of Sociology* **45**: 787–801.

Tilly, C. (1978) *From Mobilization to Revolution*. Reading, MA: Addison-Wesley.

Turner, R. H. (1981) Collective behavior and resource mobilization as approaches to social movements: issues and continuities. *Research in Social Movements, Conflict and Change* 4: 1–24.

Useem, M. (1975) *Protest Movements in America.*. Indianapolis: Bobbs-Merrill.

Wilson, J. (1973) *Introduction to Social Movements*. New York: Basic Books.

Zald, M. N., and McCarthy, J. D. (eds.) (1979) *The Dynamics of Social Movements: Resource Mobilization, Social Control, and Tactics*. Cambridge, MA: Winthrop Publishers.