

VOLUNTARY PARTICIPATION IN ORGANIZATIONAL
DECISION-MAKING: A MODEL AND AN EXPERIMENTAL TEST^{*}

by

Anne McMahon
Stanford University

and

Santo F. Camilleri
Michigan State University

Technical Report No. 44

1972

* This study is part of the first author's doctoral dissertation submitted to the faculty of the graduate school of Michigan State University (1970). We refer you to that document for a more detailed elaboration of the model and research presented in this paper. The project was supported in part by the Human Learning Research Institute of Michigan State University and by the National Science Foundation who supported the first author during the early stages of this research.

NOT TO BE QUOTED OR CITED WITHOUT PERMISSION
OF THE AUTHORS.

ABSTRACT

Voluntary participation is posed as a problem in choice behavior. We are concerned here with the effect on that choice of certain organizational variables which seemed central to some major arguments and research in the literature. A stochastic model is presented whose parametric composition is specified by particular combinations of those variables. After its presentation in the abstract, the model is used to analytically examine a set of specific structural situations, four of which were then chosen for experimental investigation. These particular four were selected because we believe they speak to a major dispute in the literature--that between Robert Michels and Lipset, Trow and Coleman. The results of the experiments are then used in a preliminary empirical evaluation of the model.

VOLUNTARY PARTICIPATION IN ORGANIZATIONAL DECISION-MAKING:

A MODEL AND AN EXPERIMENTAL TEST

This paper is concerned with structural factors which affect voluntary participation in organizational decision-making. Our purpose is to specify the relationship between a member's choice to participate or not and certain organizational variables which we considered central to some classic arguments and research in the area. Our specification takes the form of a stochastic model whose parametric composition is determined by specific combinations of those variables. After presenting the model in the abstract, we use it to examine some structural situations of particular interest to us, four of which were investigated in the experiment described later in the paper.

The focus upon participation rates emerged from our efforts to understand what modifications were implied for Michels' argument (1915) about the inevitability of oligarchy in light of the contradictory evidence described in Union Democracy (Lipset, et. al., 1956). In the process of analyzing these two works, our conception of the problem grew in generality and complexity and we then turned to more recent literature to overcome the limitations imposed upon both Michels' and Lipset, et. al.'s arguments by their concentration on particular empirical instances of interest to them. In doing this we were influenced by many people, but particularly by Mancur Olson's discussion of collective goods in Logic of Collective Action (1965) and by William Gamson's Power and Discontent (1968). Our indebtedness to these two men is considerably more pervasive than might be inferred from the few citations made below.

We will begin by sketching out those aspects of Michels' and Lipset, et. al.'s arguments which posed problems to be resolved or shaped our thinking in some important way. This will serve to facilitate the reader's understanding of our formulation, acknowledge the importance of these two works to its development, and indicate the bearing of our work upon theirs.

LIPSET AND MICHELS

In Michels' argument, one essential difference between oligarchy and democracy is that in the former, organizational decision-making is an exclusive activity involving the small group of people who occupy positions at the top of the hierarchy while in the latter, decision-making entails the active participation of the rank-and-file.¹ The essence of the "Iron Law" is that the very form of division of labor which defines an organization--i.e. a formally-designated administrative hierarchy--makes the concentration of decision-making activities in the hands of the leaders inevitable, even in organizations which have explicitly intended democratic goals and procedures at their inception. In his discussion of the dynamics of this inevitability, Michels focused upon the process by which rank-and-file come to abrogate the decision-making rights they do possess by failing to exercise them and upon how, over time, this differentiation of function is legitimated in the rules and ideology of their organization.

In taking this approach to explaining the differential participation between leaders and non-leaders in organizational activities, Michels was led to an explicit discussion of individual motivation processes. That is, he considered what factors motivate individuals to seek and then protect positions of leadership and what motivates the rest of the membership to abdicate their decision-making rights. He argued that leaders are specifically and differentially rewarded for their activities--sufficiently so that, in his opinion, understanding why individuals might seek such positions was unproblematic. Concerning the rank-and-file, he argued that there are no significant rewards which accrue to them for participation in organizational decision-making. The benefits which account for an individual's interest in belonging to the

organization in the first place are sufficient to produce passive membership only; all major motivational sources of active participation are associated with high office.²

In addition to postulating a general absence of organizational rewards for rank-and-file participation, Michels argued that there are factors in any group with an explicit vertical division of labor which operate to inhibit what little motivation might exist. The most important of these are the value placed on the expertise of the leader, the belief in the efficiency of small decision-making units, and the various techniques of insulation available to leaders with vested interests in maintaining their positions. The combined effect of all these is to create what Michels identified as the source of the inherent instability of all democracies--the apathy of the masses.

The argument in Union Democracy is in basic agreement with Michels' regarding the motivations for seeking and protecting positions of leadership; however, it takes issue with him about the possible existence of motivational structures which would produce and maintain high rates of rank-and-file participation. Lipset and his colleagues contended that at least one such structure does exist (The International Typographical Union) and that this organization is stable and persistent, not merely in a temporary stage of the dynamic expressed in the Iron Law. The particular feature of the ITU which they identified as accounting for its being an exception to Michels' thesis is, of course, its two-party political system. The authors contended that such a system not only can reduce the impact of the dynamics Michels described,³ but that it also ensures direct positive motivation for rank-and-file participation in decision-making. It is this last which we take to be most crucial to Michels' argument about the inevitability of membership apathy.

To understand how the two-party system bears on participation and thereby speaks to Michels' thesis, we must recognize that both authors had in mind a specific kind of organization--one in which the outcomes of many of its decisions are what Mancur Olson (1965) calls collective goods; i.e. outcomes which accrue to everyone in the organization by virtue of the simple fact of membership. The material or substantive aspect of any particular collective good is identical for all members, but its worth or value is not necessarily the same for each of them. For some it may be highly rewarding; for others, it may actually have negative utility.

An important characteristic of organizations providing collective goods is that an individual's participation is not normally rewarded in the sense of a unit of reward for a unit of participation. For the reward value of a collective good to accrue to some particular member, it is necessary that a decision get made but not that he participate in making it. This would seem to imply that Michels might have been correct in assuming that organizational collective benefits are not sufficient sources of motivation for participation. In contrast to the rank-and-file, leaders receive additional direct rewards for their participation (e.g. prestige, deference, perhaps even financial compension).

There are times when rank-and-file participation is also directly rewarded. Lipset, et.al., for example, contended that the existence of a strong friendship system among the membership encourages participation by providing social rewards for it. It seems to us, however, that the main thrust of the Union Democracy argument was that the case of the ITU counters Michels' argument NOT because its unusual friendship structure directly rewards participation, but primarily because of its two-party political system. The importance of the friendship

system of the ITU lies in the second function the authors' attribute to it-- namely that it serves to maintain the political system. We shall proceed, therefore, in our specification of the problem in a way which assumes that rank-and-file participation is not directly rewarded.

Lipset and his colleagues were describing an organization in which it is usual to have patterned and open disagreement about what constitutes a satisfactory collective good. The ITU has a formally articulated, decentralized authority structure in which two or more alternatives (each of which designates different collective goods) are regularly produced for rank-and-file valuation and selection. A member of one party knows that there is another group in the organization which consistently evaluates outcomes differently. Prior to a decision opportunity, he expects that the members of the other group will want a different alternative from the one he prefers. Since the selection of a collective good means deciding upon one and only one alternative, it is to the individual's advantage to do what he can to ensure that the alternative most rewarding to him gets chosen. If, through inactivity, he permits the decision to be made by members of an opposing group (or by leaders who may be members of that group), he can be fairly confident that the outcomes will not be those most rewarding to him. Rank-and-file participation in such an organization is motivated by a desire to improve the probability of preferred decisional outcomes.

Both authors, then, postulate certain structural conditions which affect the stability of a decentralized authority distribution by virtue of their effects on rank-and-file participation rates. Michels argued that the reward structure of an organization providing collective goods is such as to make the active exercise of decision-making rights by non-leaders unlikely. The resultant

inactivity operates to increase the centralization of actual decision-making in the hands of leaders, who are directly rewarded for such activity and who are generally regarded as more competent. Due to vested interests which leaders develop in maintaining their positions and to the value of decision-making control in doing so, this centralization is protected and eventually becomes irreversible. Lipset et.al.'s discussion suggests that if members are not directly rewarded for participation and if they find themselves already receiving rewarding collective goods without participation, such a trend towards centralization might well be expected and, once institutionalized, would be difficult to reverse. However, if for some reason a persistent pattern of disagreement over decisional alternatives is created at a point before the rank-and-file have lost their decision-making rights, motivation for the active exercise of those rights is likely and Michels' process is aborted at the very beginning.

STATEMENT OF THE PROBLEM

At this point we shall move away from the specifics of these two works and cast the argument in more general terms. Within every organization providing collective goods, there are specifiable structural conditions which differentially affect the way in which members will be able to and will want to become actively involved in the decision-making of their organization. In turn, the pattern of their activity affects the expected persistence of the organization's current authority structure directly or does so indirectly by permitting other processes to operate. Our primary focus in the remainder of this paper is upon the first step of this sequence--that is, upon a formal specification of the effects of structural variables upon the individual's choice to

participate. We will be concerned to some extent with the second step in the process (i.e. with the effects of participation patterns on the stability of the authority system); but we shall not treat this problem in a formal manner.

We shall discuss the effects of two variables suggested by the preceding discussion. The first is the nature of the organization's authority distribution--whether it is centralized or decentralized. The second is the presence or absence of patterned disagreement, either of the sort Lipset et.al described between subgroups of the rank-and-file or that between leaders and their followers as Michels predicted was inevitable. We shall refer to these two patterns of disagreement as horizontal and vertical disagreement respectively. An explicit focus upon disagreement patterns suggests another variable not directly discussed in the previous paragraphs, namely whether the parties in disagreement can be influenced by each other.

THE MODEL

In order to specify rigorously how these variables affect the choice to participate we will first examine the process by which individuals choose among alternatives. Imagine an organizational decision-making situation which has two alternatives, Y_1 and Y_2 . Alternative Y_1 has positive utility value for a given actor (A); Y_2 has no utility value for him. If he is given the opportunity to participate in the selection of one of these as the group outcome, we argue that his decision to accept or decline that opportunity will be a function of: a) whatever he must expend in order to participate [designated $u(E)$], b) the utility to him of the two alternatives, [$u(Y_1)$ and $u(Y_2)$], and c) his subjective assessment of the likelihood that each alternative will be selected with and without his participation. If we let α designate his expectation

that Y_1 (his preference) will be chosen given that he does participate and β symbolize his subjective expectation that Y_1 will be selected even if he does not, then his utility structure can be expressed as follows:

Figure 1 Here

What the diagram indicates is that if the individual does participate, he forfeits whatever he has to expend in order to do so [$u(E)$], and with probability α expects to gain the rewards he associates with alternative Y_1 . He is aware that even if he does participate, with some probability [designated $\bar{\alpha}$], he will lose--i.e. Y_2 will be chosen as the group outcome. If he loses, he expends $u(E)$ but gains nothing since $u(Y_2) = 0$.⁴ If the individual decides not to participate, he expends nothing and may yet, with probability β , gain the rewards he associates with Y_1 .

Which choice the individual makes is a function of the composition of the two branches of the utility structure (i.e. participation and non-participation). In order to know whether an individual will participate or not, we must identify that function and specify the parameters and utilities for the particular structural contexts of interest to us.

The Choice Function: The function we will use is the one developed by Camilleri and Berger (1967). That function asserts that the ratio of the choice probabilities of two, mutually exclusive alternatives (e.g. participation and non-participation) is equal to the ratio of their expected gains. The expected gain of a particular alternative equals the sum of the positive utilities associated with that alternative, each weighted by its probability, minus the sum of the negative utilities associated with the rejected

alternative(s), each weighted by its probability. The approach is p-centric; we are dealing with the actor's evaluations of events and his subjective expectations about their likelihood of happening. Because the sum of the choice probabilities of two exhaustive but mutually exclusive alternatives must be unity, the probability of one alternative being selected is simply the ratio of its expected gain to the sum of the expected gains in both.

Applying this function to the hypothetical utility structure just sketched in figure 1, the probability that an individual will participate is equal to the ratio of the expected gain in participation to the combined gain of both courses of action. The expected gain in participation is simply $\alpha u(Y_1)$, since in this case we have set $u(Y_2) = 0$. The expected gain in not participating is $\beta u(Y_1) + u(E)$; $u(Y_1)$ is, in this case the only positive utility associated with not participating; and in choosing that course of action, the individual avoids whatever "expense" participation would have entailed for him. The total expected gain in the situation is simply the sum of the expected gains in both: $\alpha u(Y_1) + \beta u(Y_1) + u(E)$. The probability that

A decides to participate is:
$$\frac{\alpha u(Y_1)}{\alpha u(Y_1) + \beta u(Y_1) + u(E)}$$
 Similarly, the

probability that he will not participate is:
$$\frac{\beta u(Y_1) + u(E)}{\alpha u(Y_1) + \beta u(Y_1) + u(E)}$$

Having identified the choice function we will use, it remains for us to specify the utilities and to identify how the structural variables we have discussed determine the parameters α and β .

Utilities: Our discussion of utilities will be brief since we are not concerned here with the impact of variations in the cost-reward structure upon participation. The choice function does preserve our intuitive idea about the

importance of the issue up for decision in the organization. As the subjective worth of a decisional alternative increases, so does the probability of A's participation (when α and β are held constant). Similarly, as the cost entailed in participation increases, the probability of A's participation declines. If none of the decisional alternatives has any utility for A, the model predicts he will not participate. However, to isolate the effects of structurally different situations upon participation, variations in the utilities of the decisional alternatives and in $u(E)$ must be controlled. Consequently, our discussion will proceed as if these utilities were the same for all situations; and we attempted to ensure that our experimental conditions did not differ in this regard. To predict the participation rates for the four experimental conditions, we estimated the ratio of $u(Y_1)$ to $u(E)$; and that ratio takes on the same value in each of the four equations. The exact estimation procedures are described later.

Parameters: The specification of α and β is our main concern since these parameters represent expectations which are based upon the organization's authority distribution and agreement structure--features which affect participation rates because they affect members' beliefs about how participation determines decisional outcomes.

With the cost-reward ratio held constant, the probability of A's participation increases as the difference between α and β increases; and for any given difference between α and β , participation increases as the value of β increases. β represents A's expectations that the organization will select his preference even if he does not participate, and α represents his expectation that his preference will be selected if he does. To avoid discussing the case in which an individual expects his own participation to reduce the likelihood of his preference being selected, we assume that α is never less than β .

Consider a decentralized authority system in which the right to make binding decisions resulting in collective goods is dispersed among all franchized members. The actions of the officers may be necessary for a decision to be binding,⁵ but it is not sufficient. A vote by some quorum of the general membership is essential. All who vote, officers and non-officers alike, must influence anyone who is franchized to secure their preferred outcome. Compare this with an oligarchy in which the right to make binding decisions belongs to the incumbents of high office. They need to influence the rank-and-file only because they value consensus or morale per se, because consensus is valuable in maintaining their positions, or because they wish to spare themselves sanction costs.

Rank-and-file participation in these two systems is different. In a centralized system, β represents A's expectation that the leaders will, without his participation, select his preference as the group's outcome. If β is high then either A sees that the leaders already agree with him or, if they disagree, that they are very likely to be persuaded by someone else in the organization who does. If α is greater than β , then the member sees his participation as having some influence over the leaders' choice--either directly or indirectly in conjunction with other members' participation. In a centralized system, then, α and β are based on the leaders' preference patterns and upon their susceptibility to influence from the rank-and-file.

In a decentralized system, β represents the likelihood that the quorum rule will be met and that a majority of those voting will share A's preference. A difference between α and β may be due to A's expectation that his participation has any of three effects. His participation can contribute to the

existence of a quorum, without which a decision cannot be reached. Second, his participation includes a vote which directly affects the probability of his preference being selected as the group outcome. The degree to which this produces a large difference between α and β is mediated by the size of the organization and by what A believes to be the pattern of agreement over the issue. For example, if A believes that the membership which is likely to participate is very closely split on the issue, then even if the organization is quite large, he may attribute great weight to the effect of his vote. Third, A's participation may include influencing any other voters--leaders and non-leaders. In a decentralized system then, α and β are based upon the preferences and participation patterns of all franchised members and upon their susceptibility to influence from A.

In the decentralized system, α can be greater than β even if the member feels he has no influence, direct or indirect, over the leaders and even if the leaders are believed to be unalterably opposed to his preference. Whenever A believes the leaders in a centralized system are unalterably opposed to him, $\alpha = \beta = 0$. However, while we do believe that decentralized systems provide greater sources for a difference between α and β , this should not be taken to mean that the model always predicts higher participation rates in decentralized than centralized systems. Highly persuadable leaders can result in participation predictions for centralized systems which are higher than, for example, a decentralized system in which everyone agrees on what is the best alternative.

In the following discussion and in our experimental design, we are interested in specifying utility structures which are representative of the agreement structure which is generally characteristic of the group. For

example, the probability of A's participation is lowest as α approximates β and as they both approximate 0. This describes the situation of an actor in the centralized system characterized by vertical disagreement who believes that the leaders are unalterably opposed to his preference. It also describes the member of a decentralized system who feels that virtually everyone else in the organization disagrees with him. By saying that the group in the first example is in vertical disagreement, we have said that most of the members feel as A does, that a difference between α and β nearly equal to zero is characteristic of the rank-and-file, and that this will reflect itself in very low participation rates in the organization. To understand the participation patterns in our second example, a value for β which approximates 1 would be much more appropriate, although α might still approximate β . This would result in a higher participation prediction than for the first group, although according to the model it would not exceed 1/2.

SPECIFIC STRUCTURAL SITUATIONS

Having discussed in a general way how α and β are specified by the structures we are interested in, we shall now examine in detail some very specific situations. This permits the identification of substantive propositions which develop out of the formalization procedure itself and it also forces our consideration of analytic properties of the variables in combinations which may not be suggested by the empirically usual. A specification of α and β is not simply estimating their values in different situations; rather it involves using the general ideas in the previous section to sketch detailed utility structures which represent the decision-making rules and the agreement structure of the organization. In the interest of keeping this process clear and analytically manageable, a number of very simplifying constraints have been put upon the situations we are about to examine.

The first concerns our focus upon decentralized systems. While centralized systems are important to an investigation of the model and to a substantive understanding of the general problem, they do not directly speak to the major disagreement between Michels and Lipset et al. They disagreed about the inevitability of low participation rates in decentralized authority systems. To address that disagreement, we will examine the model for a series of situations which are characterized by the same decentralized distribution of decision-making rights but which have different agreement structures. We will comment only informally upon the parallel problem in centralized systems and upon the possible implications for the stability of the authority distribution.

We will examine only three-person groups composed of a leader (L), the actor (A), and another non-leader (O). In each case we are interested in the probability of A's participation. We have not tried to represent all forms of rank-and-file participation. In particular, we do not consider informal influence processes nor participation aimed at securing leadership positions. The situation under consideration is similar to that which Union Democracy describes in discussing why a member decides to go to a union meeting and vote; under what conditions will a rank-and-file member choose to accept a legitimately offered opportunity to participate in a decision which will result in a collective good.

Each situation involves a two-alternative choice where Y_1 refers to A's preference and Y_2 names the other alternative. Y_3 designates the outcome which occurs when the group cannot arrive at a decision between Y_1 and Y_2 . In each situation Y_1 and Y_2 have some positive utility for everyone and $u(Y_3) = 0$. This means that stalemates and quorum failures have neither positive nor negative utility for anyone in the group. We assume further that A believes everyone has a preference ordering of the two alternatives. The subjective utilities

associated with the decisional alternatives are discussed as if they were non-probabilistically associated with their respective outcomes. That is, if some alternative (e.g. Y_1) is selected by the group, A is assured his subjective utility for that alternative.

Whenever it is reasonable to do so, parameters are fixed in the extreme. For example, under the condition of vertical disagreement, A expects L to disagree with him every time; and he expects to agree with O every time O participates. Similarly, when we say L is perceived as not susceptible to influence, we mean that A expects L never to be influenced.

The variable most heavily constrained throughout is influence. We assume, for example, that A and O are always equal in their relative ability to influence L. Downward influence is completely neglected; we concern ourselves only with L's susceptibility to influence.

With the exception of the currently insoluble complications introduced by permitting the operation of any and all influence processes, these constraints could be modified or relaxed individually. We have introduced some constraints however which are substantively meant and should not be confused with the other simplifying conditions. The more important among these are the following: Consensus is neither valued nor rewarded in and of itself; and participation is rewarded only indirectly by its effects upon securing more preferred collective goods.⁶

The Authority Distribution: In our three-man representation of a decentralized system of authority (hereafter called the Committee), decisions are made by a one-man-one-vote system; any two agreeing votes constitute a binding decision. L always participates; but if neither A nor O participate, his choice is not binding. This last asserts that the group has a quorum rule. The

"leader" of the committee, then, is a constant participator; and under less constraining conditions that we are undertaking here, he is undoubtedly highly influential. When we refer informally to the centralized system in the following pages, we are referring to the situation in which L is a one-man representation of a subset of the membership whose decision is binding on all members. A and O's participation constitutes influence aimed at affecting the content of L's choice. In that situation (hereafter called the Advisory Group), L is clearly the decision-maker.

The Agreement Structure: Consensus: Consider first the condition of high agreement in the Committee. Influence is not represented at all in figure 2 since it has little meaning if contention over outcomes is absent.

Figure 2 Here

A, L, and O all agree that Y_1 is the preferred alternative. If A participates he will surely get $u(Y_1)$; however, in acting he forfeits $u(E)$. If he does not act, he saves that expense but runs the risk of getting nothing due to the lack of a quorum. Either he or O must participate if $u(Y_1)$ is to be had. Applying our choice function to this utility structure yields:

$$\text{Eq. 1: Prob. (A participates)} = \frac{u(Y_1)}{u(Y_1) + au(Y_1) + u(E)} .$$

Under prolonged experience with this situation, it is reasonable to hypothesize with Michels that the quorum rule will not be protected and that L will gradually assume increased decision-making rights. The model itself, of course, does not generate stability predictions.

Complete consensus in the Advisory group results in a situation in which $\alpha = \beta = 1$. This represents a determined situation (i.e. A does not see that the decisional outcome is at all probabilistic) and non-participation would seem to be a dominating response for A.⁷ It is reasonable, however, to expect that the members would receive high collective benefits and might well feel very satisfied with their organization as long as the consensual agreement pattern remained stable. If so, then participation and satisfaction are probably not related in a simple linear fashion.

Vertical Disagreement: Figure 3 outlines a utility structure for A, who is a member of a Committee characterized by a vertical pattern of disagreement.

Figure 3 Here

L prefers Y_2 while A and O both prefer Y_1 . As long as A and O vote in agreement, the leader's behavior is irrelevant to the outcome. If either A or O fails to participate, no decision is made. Applying the choice function to figure 3 yields:

$$\text{Eq. 2: Prob. (A Participates)} = \frac{au(Y_1)}{au(Y_1) + u(E)} .$$

Let us now introduce a very minimal kind of influence into this situation. If we assume that, for whatever reason, any decision is better than none from L's point of view, then under a stalemate condition he is persuadable--i.e. he will change his vote to agree with that of the disagreeing member. This situation is outlined in the extreme in figure 4.

Figure 4 Here

Note that this is not the same as giving the leader the increased power to break ties, since that generally means he can break them by making a decision consistent with his own preference. Figure 4 represents an empirically unusual direction of influence; the same susceptibility to influence could be postulated for the non-leader in stalemate with L. Applying the choice function to figure 4:

$$\begin{aligned} \text{Eq. 3: Prob. (A Participates)} &= \frac{u(Y_1)}{u(Y_1) + au(Y_1) + u(E)} \\ &= \frac{au(Y_1) + \bar{a}u(Y_1)}{au(Y_1) + u(E) + u(Y_1)} \end{aligned}$$

Equation 3 is rewritten to show that it consists of the terms in the predicted equation for the same situation without influence (equation 2) plus the additional terms at the right which indicate the change in A's probability of participation due to this particular influence process. The ability of the model to algebraically identify the effect of certain influence processes upon expected participation is one of its most attractive features--particularly in the examination of centralized systems in which L's susceptibility to influence is so important.

This particular situation suggests one other interesting comparison. Equation 3 is identical to that for full consensus in the committee (Eq. 1). Formally, the situations are similar in terms of the predicted participation. However, previous arguments suggest markedly different predictions about the relative stability of their authority distributions. Under full consensus, it is reasonable to argue that A and O would come to accept L's choice as binding, thus setting Michels' dynamic in motion. Under the condition of vertical disagreement, however, that does not seem an obviously sensible hypothesis.

If the similarity between these two predicted participation patterns proved empirically sound, it would suggest that the link between participation rates and structural change must be more complex than the simple relationship which underlies the membership apathy argument.

Sketching a utility structure for the Advisory Group in vertical disagreement does not seem reasonable unless L is susceptible to influence. If he is not, $\alpha = \beta = 0$, the situation is no longer probabilistic, and non-participation appears to be a dominating response. The influence situation can be represented and results in an equation which permits a prediction for A's participation which can be greater than 1/2. However, that equation contains a persuasion parameter which does not allow a straightforward algebraic comparison with equation 3.

Horizontal Disagreement: Imagine now that the Committee is characterized by the pattern of disagreement similar to that described in Union Democracy. A and O consistently disagree with each other; A always prefers Y_1 , and Y_2 names O's preference. Imagine further that L has no such consistent preference pattern; sometimes he prefers Y_1 and sometimes Y_2 . (In a larger group it would be reasonable to have L be a member of one of the two disagreeing contingents.) Figure 5 represents this situation under the condition that L cannot be influenced.

Figure 5 Here

Applying the choice function to figure 5 yields:

$$\text{Eq. 4: Prob. (A Participates)} = \frac{pu(Y_1) + \bar{a}pu(Y_2)}{pu(Y_1) + 2\bar{a}pu(Y_2) + u(E)}$$

If we were to sketch out the same situation allowing the very minimal influence process described earlier (i.e. L will be influenced in a stalemate), the resulting equation would be:

Eq. 5: Prob. (A Participates)

$$\begin{aligned} &= \frac{pu(Y_1) + \bar{\bar{a}}pu(Y_1) + \bar{a}pu(Y_2)}{pu(Y_1) + \bar{\bar{a}}pu(Y_1) + \bar{a}pu(Y_2) + au(Y_2) + u(E)} \\ &= \frac{pu(Y_1) + \bar{a}pu(Y_2) + \bar{\bar{a}}pu(Y_1)}{pu(Y_1) + 2\bar{a}pu(Y_2) + u(E) + \bar{a}pu(Y_2) + \bar{\bar{a}}pu(Y_1)} \end{aligned}$$

As before, equation 5 can be rewritten to permit a comparison with equation 4 regarding the effect of influence upon participation. In addition, comparisons between equations 4 and 5 and equations 2 and 3 permit the possibility of identifying the differential effects of the same influence process in different structural contexts.

THE EXPERIMENT

Four Committee situations for which the model generates a clear pattern of participation predictions were selected for experimental investigation. Since we feel that the effects of different agreement structures are more central to the Lipset-Michels disagreement than is the issue of influence, all four conditions involved leaders who were not susceptible to influence. Only vertical and horizontal disagreement patterns were investigated, since financial considerations precluded testing the consensus situation. Consensus results in a very high probability of the group's choosing the subject's preference and we used money pay-off to establish the preference ordering.

There were two experimental conditions composed of groups with vertical disagreement structures and two conditions consisting in groups with horizontal

disagreement patterns. The groups in one of the conditions for each disagreement situation were specified for an O who is a frequent participator and, in the other, for an O who seldom participates. This variation was chosen because the model implies that for some situations (our horizontal disagreement groups, for example), O's participation rate produces relatively small changes in A's participation; while under other circumstances (such as our vertical disagreement situation), it produces rather marked differences. In brief, the experiment was designed to permit an empirical comparison of equations 2 and 4 for two different values of a.

In order to construct appropriate experimental analogues, it was necessary that:

- 1) each subject have membership in a group with a designated leader and a decentralized authority system;
- 2) each subject be provided with preferences appropriate to his experimental condition;
- 3) each subject have appropriate expectations for the preferences and participation patterns of the other group members;
- 4) collective goods be provided for each group decision; and
- 5) participation entail some expense for the subject.

The following procedures represent as simple and inexpensive an experiment as possible which still meets these conditions.

All subjects were male student volunteers at Michigan State University. They were guaranteed \$1.50 for a brief visit to the study center and were told they would receive an opportunity to earn as much as \$10.00; discovering only after arriving at the laboratory that this opportunity involved repeated participation.

Procedure:

The subject was told that in volunteering for the study, he had become a member of a very rudimentary group which, in addition to himself, included a leader and one other non-leader. His group was to hold a series of meetings which he was free to attend or not as he chose. Each meeting consisted in his coming to the laboratory and voting for his preference on a decision relevant to his group. Each decision would have two alternatives; one would be his preference and the other was the preference of some other member of his group. Each time the group chose his preference, he would receive \$1.00; each time it chose the other alternative, he would receive 25¢. If the group failed to arrive at any decision, he would receive nothing. The subject correctly understood that he would receive the money whether or not he came to the meeting, provided the other two members were able to arrive at a decision. If he chose not to attend a meeting, he would find a report about its results, together with any money due him, in his mail box the following day.

Decisions were made by a one-man-one-vote system; any two agreeing votes determined the outcome. In the absence of a quorum (two members), the leader's vote was not binding; and the leader did not have veto power. Preferences were established by the financial payoffs associated with the alternatives, and each member always voted for his own preference. For all subjects, the expense involved in participation was the time and effort he spent in coming to the laboratory at the designated time for the meeting.

Horizontal Disagreement: There were two experimental conditions with this disagreement pattern. In order to provide the subject with the appropriate expectations for the preferences of the other group members, he was told that we were interested in groups whose members did not always agree about what was the best decision; consequently we had arranged it so that he and the other non-leader in his group would always disagree if and when they voted. That is, they would never have the same preference. The subject was then told how often he could expect the other member to participate (either 1/4th or 3/4ths of the time, depending upon which of the two conditions the subject was in). It was further explained that we were interested in groups with fair and neutral leaders, so the subject could expect that the leader would agree with him about half the time and with the other member about half the time. The leader could be expected to attend every meeting and he would always vote.

Vertical Disagreement: There were also two experimental conditions with this disagreement pattern. As before, the other non-leader could be expected to participate 1/4th of the time in the first and 3/4ths of the time in the second. To establish the appropriate expectations, the subject was told that we were interested in groups in which there was disagreement about what was the best choice. In particular, we were interested in the situation in which the leader often disagreed with his followers. Consequently, he could expect that the leader would attend every meeting and would always vote against the subject's preference. The other group member could be counted upon to share the subject's preference and would always vote for it if and when he attended.

Expectation Manipulations: In order to ensure that the subject could count upon what we had told him, an appropriately specified "drawing of lots" was used to represent the behavior of the other members in his group. If the subject attended a meeting, a vote for his preference was recorded, he placed colored marbles in an urn and then he drew one to represent the behavior of each other member in his group. The vote of each "member" was noted, the group decision was recorded, and the financial outcome, if any, was paid to the subject. If he did not attend a particular meeting, the experimenters drew from the urns to identify the behavior of the other two "members", recorded a "no vote" for the subject, and sent a report about the decisional outcome and how it was reached, to the subject's dorm. Any money due the subject as a result of the decision was enclosed with the report. Concern over whether the subject would believe we were "honest" in drawing in his absence proved to be unwarranted.

Each "group" consisted of one subject and two hypothetical members and held a series of 12 meetings over 6 weeks. Each experimental condition involved both risk and uncertainty for the subject; in no case was participation or non-participation a dominating response for him.

The appropriate utility structures were specified for each experimental condition by using the numbers in the experimental manipulations to identify the parameters. Equation 2 was specified for $a = 1/4$ and $a = 3/4$ for the two conditions involving vertical disagreement. Equation 4 was identified for $p = 1/2$ and $a = 1/4$ or $a = 3/4$ for the conditions in horizontal disagreement.

RESULTS AND INTERPRETATION

To evaluate the degree of fit between the model's predictions and the observed rates of participation, the ratio, $\frac{u(\$1.00)}{u(\text{Effort})}$, was estimated from the data. Since this ratio is, by hypothesis, constant across all the conditions, the appropriate equation for anyone of the four conditions is as valid an estimator of that ratio as any other. Therefore, each of the four equations was solved separately and the four estimates were then weighted by sample size and averaged. The final estimate (2.37) was used in those same equations to solve for the theoretical participation rates.

This procedure also assumes that the ratio of any two utilities is approximately the same across subjects and that, for any given subject, it remains essentially unchanged over trials. More precisely, we assumed that an individual's utility for some object (e.g. \$1.00) takes the form of a distribution with a very small variance around a fixed mean. Averaging over individuals assumes that all subjects share the same fixed mean utility for that object. While these assumptions are fairly usual in research of this sort they are by no means obviously appropriate. For example, the utility of the effort involved in participation was probably not that similar for all the subjects in these experiments nor for any given subject over trials. We suspect that the utility estimates contain some degree of error; secondary analysis supported the assumption that the error was random and did not systematically bias the findings.

The following table presents the predicted and observed rates for the four experimental conditions.

Table 1 Here

The rank ordering of the participation rates is as predicted. The rates for conditions 1 and 2 fit the model's predictions correctly. What is problematic is the difference between the rates for conditions 2 and 3 and the difference between the rates for conditions 3 and 4. With respect to the former, the predicted difference and the observed difference are both so small that it is difficult to say in any conclusive way whether the data confirm or disconfirm the model. The observed rates for conditions 2 and 3 are within .05 of each other, however, and this is the maximum difference which the model

predicts for these two conditions. Neither is widely divergent from the predicted .53. However, the observed rate of participation for condition 4 is simply too high. No set of hypothetical numbers leads to the model's predicting rates for conditions 3 and 4 which are as close together as those observed. Detailed examination of the data as well as careful scrutiny of the residence patterns of the subjects did not suggest an explanation for this high rate in which we had any confidence.

In one attempt to identify the source of lack of fit, the data were separated into two parts by day of trial (Monday or Thursday). When new predictions were generated for each of the two partitions, the pattern of fit was essentially unchanged except for the problematic fourth condition. The six Thursday trials showed closer fit (.32 predicted, .36 observed) and most of the lack of fit seems to have occurred on the Monday trials (.43 predicted, .52 observed).

In spite of the lack of fit for condition 4, we feel the results are very encouraging. Rank order predictions were correct and stable. Numerical predictions were close to the observed rates for all conditions but one, and secondary analysis suggests that the model's predictions may be inaccurate for only half of the trials in even that condition. The overall degree of fit does support the idea that markedly different participation rates are possible in decentralized systems and that the theoretical propositions discussed as accounting for those differences may be largely correct.

Empirical investigation of the fine-structure of the model was less supportive. The model implied that the experiment would be an independent trials process;⁸ however a strong one-step inter-trial dependency was observed and it did not appear to be a function of the pay-off structure. It is not

clear whether the observed inter-trial dependency is a result of some artifact of the experiment which is relatively unimportant theoretically or whether it reflects some as yet unattended to dynamic which is intrinsically important to an understanding of the participation process. Even if the latter is the case, however, our guess is that variations in the every-day empirical world are sufficiently strong as to make the effect of this dependency negligible, and it does not differentiate between structurally different situations. Nevertheless, the sequential nature of the process requires further theoretical and empirical study.

DISCUSSION AND IMPLICATIONS

The main impetus for this particular research design was to provide preliminary empirical data with which to evaluate the theoretical formulation and to do so in a way which bears on the argument between Lipset and Michels regarding the conditions which affect rates of participation in decentralized authority systems. The evidence does, we think, support the contention that it is possible to have a wide range of participation rates in decentralized systems and that stable patterns of disagreement do affect where in that range the rate will fall. However, the conclusion which must be drawn to settle the full argument is the one which neither Lipset nor Michels questions--namely, that high participation rates do, in fact, prevent centralization. While we have made informal comments about that issue throughout this paper, in no way have we even attempted to empirically test that idea.

Examination of the stability hypothesis is not straightforward unless one considers only the narrow case of whether subjects who are active in a decentralized authority system will refuse to accept as binding decisions which are made illegally. If our previous discussion is correct, an adequate empirical

investigation of the stability hypothesis entails not only that but at least:

- a) verifying that members of a high-consensus, decentralized system will not protect their rules of decision and will, in fact, choose to give their leader increased discretion rights;
- b) investigating how the variables discussed here affect participation in centralized systems and how participation affects the stability of such systems; and
- c) investigating the relative stability of the various patterns of agreement and disagreement in both centralized and decentralized systems.

In addition to an empirical investigation of the stability hypothesis and to research bearing upon the fine structure of the model, our discussion strongly argues for a specification of the relationship between morale (or satisfaction) and participation, since it does not appear that they have a simple linear relationship to each other. Our discussion also suggests a way to go about a systematic investigation of specific influence processes as they operate in structurally different groups.

Finally, the issue in most immediate need of further study is one raised by the size of our experimental groups. Since there were only three members per group, each individual vote had a strong impact on the decisional outcome. Such high individual efficacy produces marked differences between α and β . The model predicts the highest participation rates when α is substantially greater than β , and we believe that captures an empirically sound proposition. (Participation does not depend solely upon such high efficacy; the model predicts total inactivity only if all the decisional alternatives have no utility for the member). Under many structural conditions, increasing group size reduces the difference between α and β . (That is, as membership size gets large, the individual feels that his own participation is not likely to increase the probability of the group's choosing his preferred outcome). As

the differences between α and β approximates 0, the model's predictions have a ceiling of 50%. Theoretically, that ceiling is attractive; we believe that a model which routinely predicted participation rates in excess of that for large organizations would be empirically untenable.

In spite of its theoretical attraction, this feature created a difficulty in designing this first set of experiments. As suggested above, the use of large groups entails discriminating between participation rates with a much narrower range than the ones we studied (all of them would have been below 50%). Since our design was longitudinal and there was no way to estimate the effect of uncontrolled factors which might operate between trials, we anticipated possible interpretation problems. Exaggerating the effects in which we were interested by restricting group size permitted us to generate a very unambiguous pattern of predictions (one very high, one very low, and two clearly different from the others but within .05 of each other).

In addition, the use of large groups requires a theoretical decision we preferred to delay until preliminary evidence was in. We have argued that in small groups, the individual has expectations about each other member. At some point, the group undoubtedly becomes too large for such an individualized process. Since there are several alternative ways a member might aggregate information he has about large numbers of people, interpretation of ambiguous findings might have been complicated by our wondering whether we had appropriately conceptualized and operationalized this aggregation process.

In brief, we chose to construct three-person groups to avoid a set of problems which might have made interpretation impossible. However, in view of the encouraging results reported here, the obvious next step is to test the

discriminatory power of the model in larger and structurally more complex situations. Succeeding in that means we will be able to exploit our formulation to say something about what "size" most properly names--a substantive variable, not a problem in methodology.

FOOTNOTES

1. This criterion of difference is still generally accepted among sociologists; even Craig and Gross (1970,p. 22) who heavily criticized the simple linear use of observed participation rates at union meetings and the like to infer degree of democracy, admit; "Nevertheless, it would seem that one can hardly speak of any organization as democratic if at least the opportunity for participation is not present."

2. Michels did imply that dissatisfaction with the actions of leaders could motivate the rank-and-file to action; but in his dynamic this occurs only after the development of an entrenched oligarchy which has been coopted into the ruling class, at which point the rank-and-file are already so removed from decision-making activities that their participation is ineffective.

3. Lipset, et.al, argued that in a two-party system: 1) the members can keep rewards of high office low and thereby reduce the amount of vested interests that leaders develop in keeping them (pp. 59-67; 238-246); 2) multiple leadership levels internal recruitment of leaders and high turnover in office are likely, and all of these serve to reduce the differential task competence between leaders and non-leaders (chapters 10-11); and 3) the belief in the efficiency of small decision-making units is weakened by the "suspicion of officialdom" which legitimacy of opposition induces (pp. 60-69; & chapter 12).

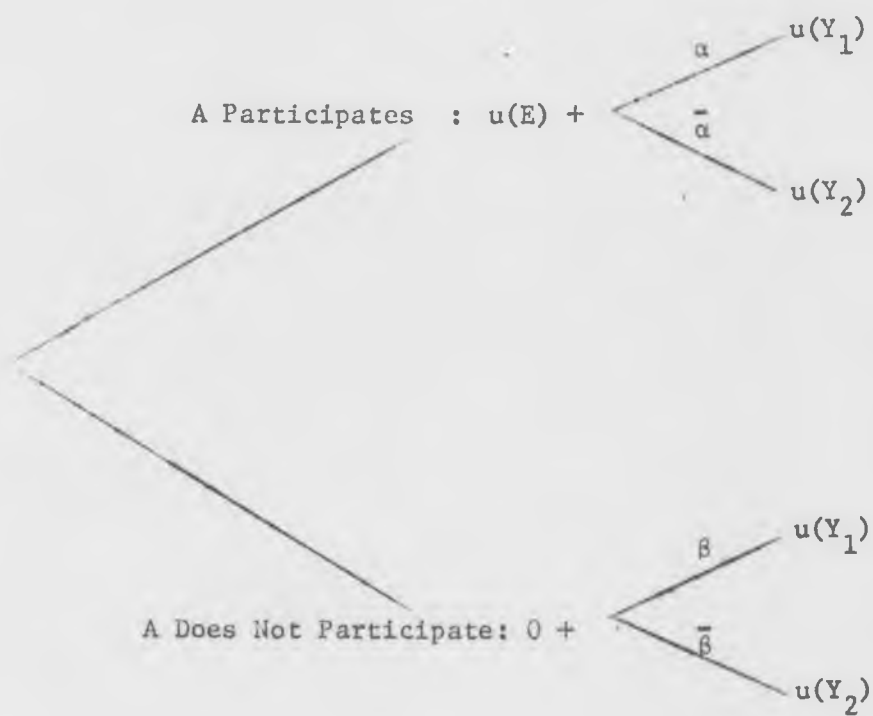
4. The decision to let $u(Y_2) = 0$ was made primarily to simplify presentation although its substantive interpretation is reasonable; it can, of course, take on other values, both positive and negative.

5. The following discussion of authority and binding decisions is based heavily upon chapter 2 in Gamson's Power and Discontent. We refer the reader to that chapter for a more detailed elaboration of the arguments we make in the next few paragraphs.

6. This line of reasoning does not contradict the Union Democracy contention that social rewards associated with participation ought to be built into the utility structures. We have also chosen not to deal with that proposition for reasons discussed earlier in the paper.

7. We refer the reader to another paper by the second author (Camilleri, et. al., forthcoming) for a detailed discussion of the problem of dominance with regard to the use of this choice function. While we plan to reconsider this issue, at present we choose not to apply the model whenever $\alpha = \beta$, since by the criteria in that paper, non-participation is a dominating response under that condition for the particular situation (s) we describe here.

8. We were not attempting to simulate the typical participation sequence of a member of a labor union, for example, in which changes in the utility of decisional alternatives between any two meetings can be great. From our point of view, the same experiment could have been executed using a larger sample and having each subject participate once.

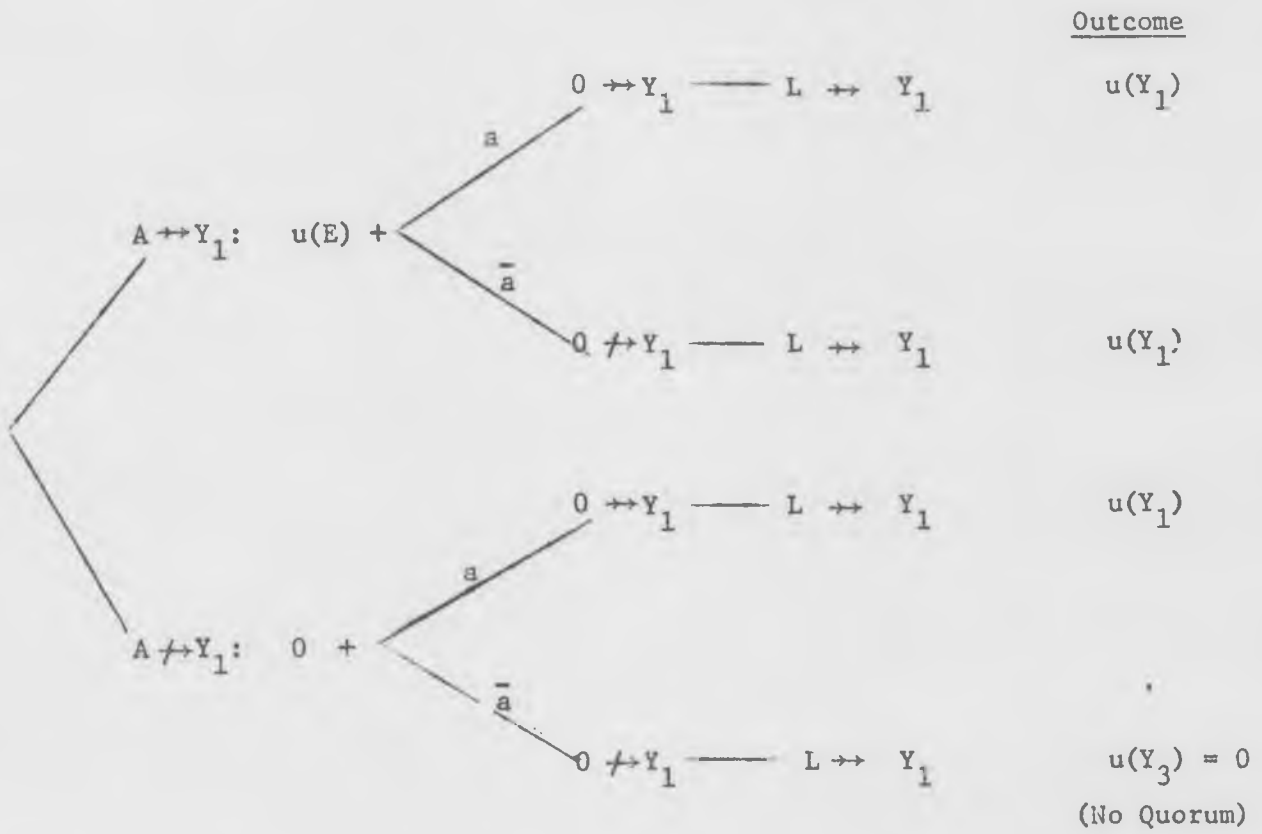


$$u(Y_2) = 0$$

$$u(Y_1) > 0$$

$$\alpha \geq \beta$$

Figure 1: General utility structure for Actor

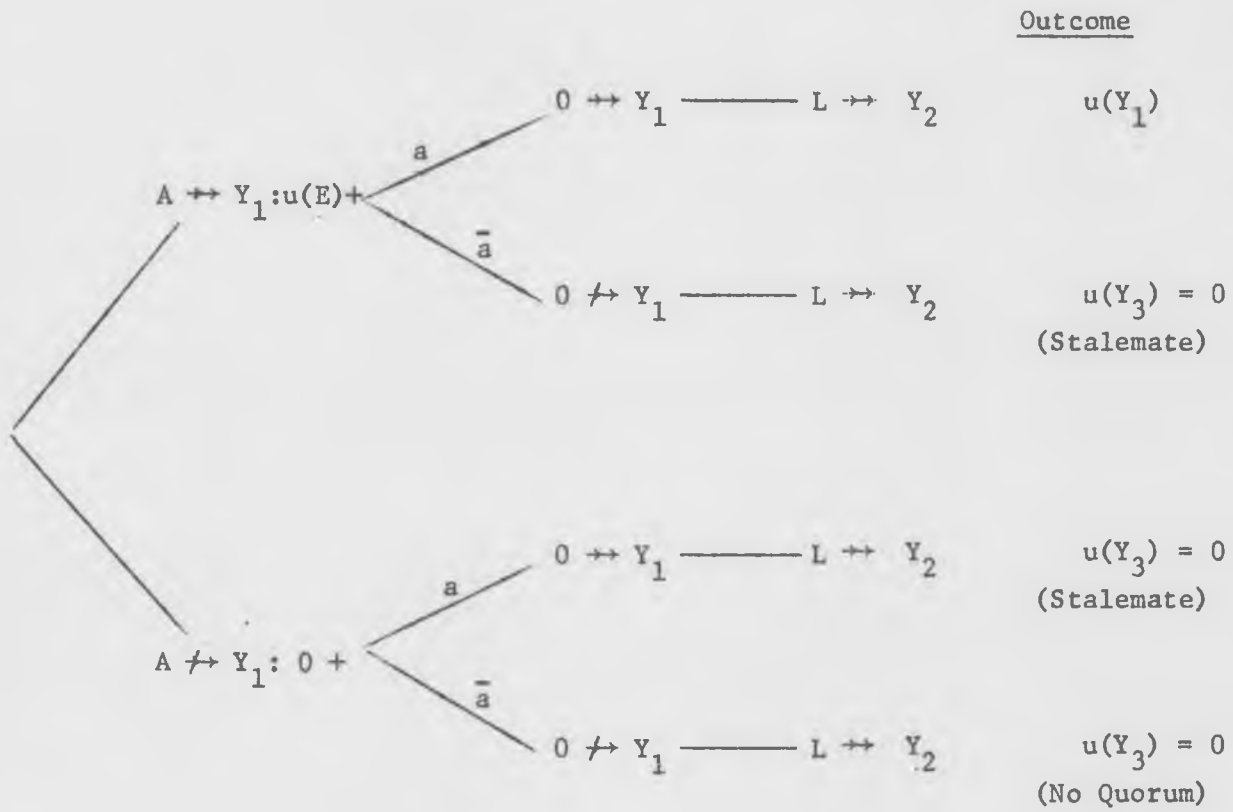


$\leftrightarrow Y_1$: Participates by voting for Y_1

$\nrightarrow Y_1$: Does not participate

a: A's expectation of the likelihood that 0 will participate

Figure 2: Utility structure for an Actor in a Committee characterized by consensus. All members prefer Y_1 .

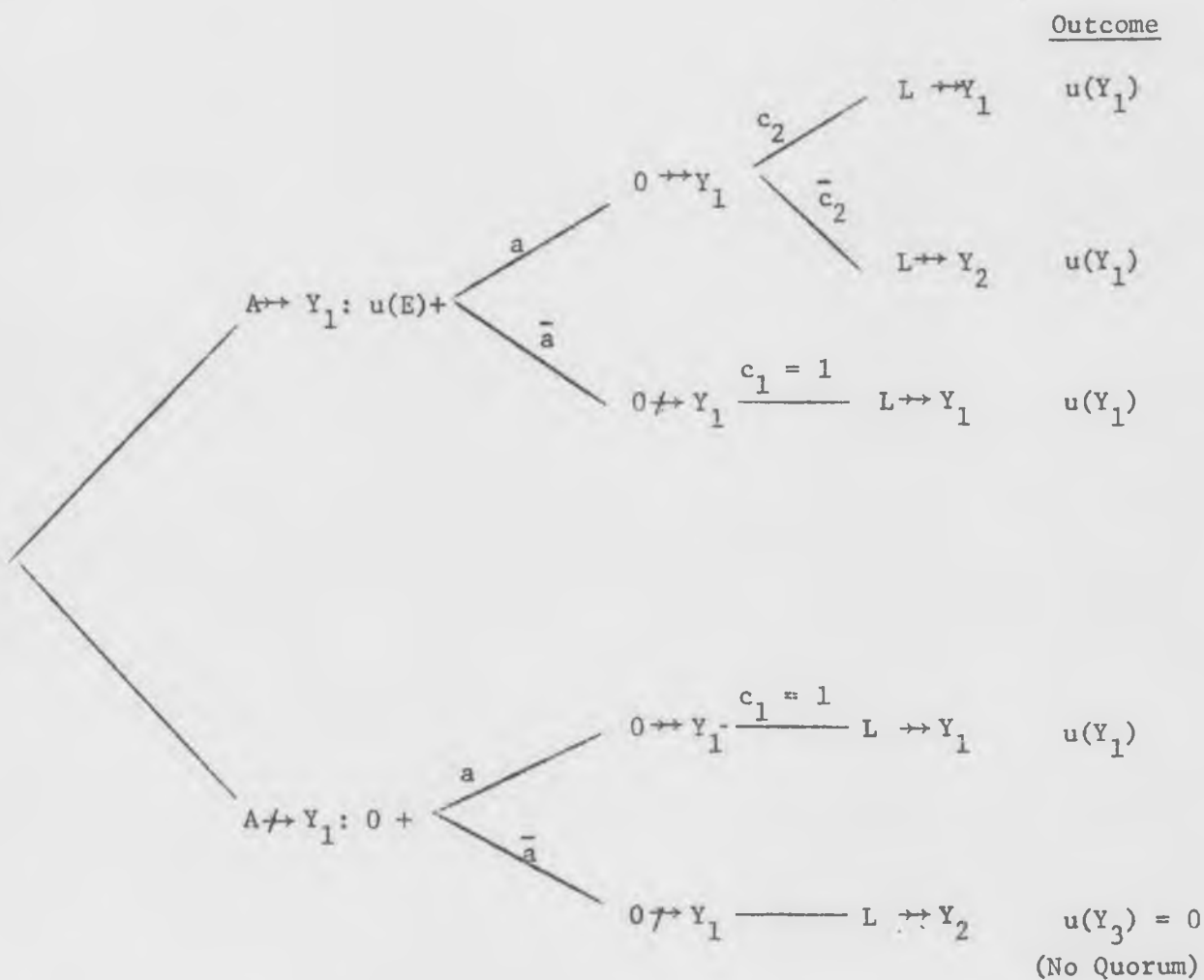


$\leftrightarrow Y_1$: Participates by voting for Y_1 .

$\nrightarrow Y_1$: Does not participate.

a: A's expectation of the likelihood that 0 will participate.

Figure 3: Utility structure for an Actor in a Committee characterized by vertical disagreement. A and 0 prefer Y_1 , L prefers Y_2 , and L cannot be influenced.



$\rightarrow Y_1$: Participates by voting for Y_1 .

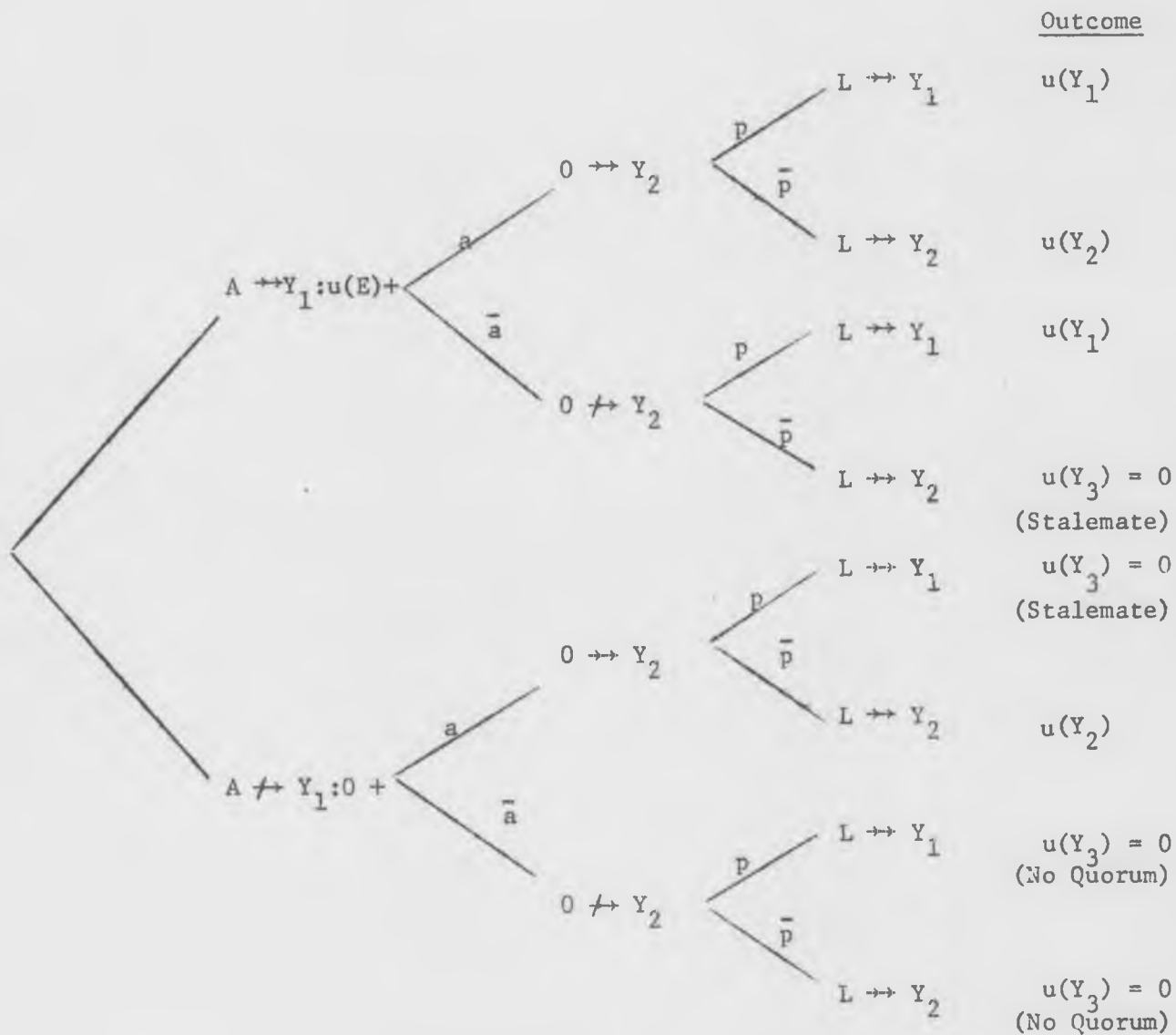
$\nrightarrow Y_1$: Does not participate.

a : A's expectation of the likelihood that 0 will participate.

c_1 : Change parameter; A's expectation that L can be influenced to vote against his preference if in a stalemate.

c_2 : Change parameter; A's expectation that L can be influenced to vote against his preference if both A and 0 disagree with him.

Figure 4: Utility structure for an actor in a Committee characterized by vertical disagreement. A and 0 prefer Y_1 ; L prefers Y_2 . L can be influenced.



$\rightarrow Y_i$: Participates by voting for Y_i

$\nrightarrow Y_i$: Does not participate

a: A's expectation of the likelihood that 0 will participate

p: Preference parameter; A's expectation that L will prefer Y_1

Figure 5: Utility structure for an actor in a Committee characterized by horizontal disagreement. A prefers Y_1 ; 0 prefers Y_2 ; L cannot be influenced.

Table 1

RESULTS

<u>Condition</u>	<u>Predicted Rates</u>	<u>Observed Rates</u>	<u>N</u>	<u>(N X No. of Trials)</u>
1. Vertical Disagreement Active Other	.64	.65	21	(252)
2. Horizontal Disagreement Active Other	.53	.52	21	(252)
3. Horizontal Disagreement Inactive Other	.53	.47	23	(276)
4. Vertical Disagreement Inactive Other	.37	.44	19	(228)

REFERENCES

Arrow, Kenneth J.

1964 Social Choice and Individual Values. New York: John Wiley & Sons.

Camilleri, Santo F., and Joseph Berger

1967 "Decision-making and social influence: a model and an experimental test." Sociometry 30(December):365-378.

Camilleri, Santo F., Joseph Berger, and Thomas L. Conner

(forth- "A formal theory of decision making." In Joseph Berger,
coming) Morris Zelditch, Jr., and B. Anderson, (eds.), Sociological
Theories in Progress.

Craig, John G., and Edward Gross

1970 "The forum theory of organizational democracy: structural
guarantees as time-related variables." American Sociological
Review 35(February):19-33.

Festinger, Leon

1957 A Theory of Cognitive Dissonance. Stanford: Stanford University
Press.

Gamson, William A.

1968 Power and Discontent. Homewood, Illinois: The Dorsey Press.

Goldberg, Samuel

1961 Introduction to Difference Equations. New York: John Wiley & Sons.

Homans, George C.

1961 Social Behavior: Its Elementary Forms. New York: Harcourt,
Brace and World, Inc.

Lipset, Seymour M., Martin Trow, and James Coleman

1956 Union Democracy. Glencoe, Illinois: The Free Press.

Luce, R. Duncan, R.R. Bush, and E. Galanter

1965 Handbook of Mathematical Psychology. Volume III. New York:
John Wiley & Sons.

Michels, Robert

1915 Political Parties. Glencoe, Illinois: The Free Press.

Olson, Mancur

1965 Logic of Collective Action. New York: Harvard University Press.