THE FORMATION OF CLIQUES IN COLLECTIVITIES
AS A CONSEQUENCE OF INITIAL DISTRIBUTIONS
OF DIMENSIONS OF WEALTH

by

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ABSTRACT

Past approaches to the understanding of the occurrence of exchange interactions and the generation of sentiments of social approval and social disapproval within collectivities are reviewed and a new theory is formulated. The new theory focuses on initial, unequal distributions of dimensions of wealth within the collectivities.

On the basis of knowledge about the differences between the members' net wealth levels, four hypotheses regarding the patterns of exchange interactions in the collectivities are derived for testing. These hypotheses concern: (i) the emergence, and order of emergence, of cliques within the collectivities, and (ii) the generation of sentiments of approval between fellow clique members and sentiments of disapproval between the members of the different cliques in each collectivity. An experimental paradigm is then described and the results of actual, laboratory experiments presented. It is concluded that all four hypotheses are supported by the data.

Finally, the theory is placed within the wider context of the sociology of social stratification in general.

Abstract checked by
Professor R.A.H. Robson
Chairman advisory committee
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CHAPTER I

INTRODUCTION

This dissertation is concerned with the relationship between sequences of exchange interactions and the manifestation of certain aspects of social stratification within collectivities that exhibit specified characteristics.

For the purposes of this chapter, it will suffice if the term 'exchange interactions' is taken to refer to interactions between pairs of members of a collectivity that involve the voluntary swapping of valued effects. The words 'valued effects' are used deliberately because, as will be noted below, exchange interactions can implicate material as well as non material goods. It should be noted, also, that 'valued effects' will be referred to as 'resources'.

After Simmel\(^1\), gratitude in return for gifts has been seen to be both a determinant of social cohesion and a determinant of social inequality in collectivities. The idea of the emergence of social inequality in collectivities as a consequence of gift giving is elaborated by Schwartz\(^2\) who focuses on Gouldner's statement of the norm of reciprocity.\(^3\) Gouldner claims that the norm of reciprocity demands that people should help and not hurt those who have helped them. The achievement and maintenance of social status through the general exploitation of the norm of reciprocity has been reported, for example, by Whyte\(^4\), Blau\(^5\) and Belshaw\(^6\) and the notion of deference as payment for service in a collectivity has been theorized about by Harsanyi.\(^7\)

The notion of the norm of reciprocity and the notion that people can create, and manage, networks of obligation have defined one approach for
investigating the general relationship between wealth and social inequality in collectivities. It should be noted, however, that this approach specifically deals with situations in which one person gives something to, or does something for, another who is not in a position to reciprocate immediately in any other way than by giving esteem or approval in return for the gift or service. If we assume that people cannot make many distinctions along the dimensions of high esteem-low esteem or approval-disapproval, we might also assume that this approach will have a limited utility in that the situations it focuses on are unlikely to give rise to prolonged sequences of exchange interactions between the same people. It does not seem convincing to argue, for instance, that person A can engage person B in an extended sequence of exchange interactions by successively giving B warmer and warmer esteem or more and more extreme indications of approval. What is in question here is whether successive expressions of esteem or approval can be received as having at least, similar values to the preceding ones. The problem is that it is not obvious that successive expression of esteem or approval could be seen as being separate. It may be the case that expressions of esteem or approval are like keys to a city: it may not make much sense to give them again and again. It would seem that expressions of esteem or approval cannot be accumulated in the same way that amounts of material commodities can be accumulated. For this reason, it might be argued that situations in which one person gives amounts of some valued material commodity in return for amounts of some other valued commodity would be more likely to be associated with extended sequences of exchange interactions than situations in which one person gives something to another who is not in a position to reciprocate immediately in any other way than by giving esteem or approval in return. Because we are interested in the relationship between sequences of exchange
interactions and certain aspects of social stratification in collectivities, we will focus on situations which can be seen as being most likely to allow extended sequences of exchange interactions. This means that we will focus on situations in which one person gives amounts of some valued material commodity in return for amounts of some other valued material commodity. This choice should be seen as a matter of strategy rather than as an outright denial that extended sequences of exchange interactions can be associated with situations involving non material commodities.

Most exchange theorists, for example: Thibaut and Kelley, Kuhn, Longabough, Blau and Boulding focus on the mechanics of single exchange and for this reason their works will not be gone into here. It could be noted, however, that Thibaut and Kelley see the relevance of ideas related to adaptation level theory to exchange theory (i.e., they use the notion that people with a lot of a resource deal in large amounts of it while people with a little deal in small amounts). And theorists like Boulding and Blau try to utilize the notion of diminishing marginal utility (i.e., they contend that the more a person has of a resource the less he will want more of it). Both the notion of adaptation levels and the notion of diminishing marginal utility have been incorporated into the theory presented in the next chapter.

It is generally assumed that an exchange interaction will only occur if both parties involved have somehow perceived that they will be better off after it has taken place. Some work has been done on the problem of how the parties manage to agree on how much of one resource will be exchanged for how much of the other but, given that we are interested in the consequences of series of exchanges, we will not dwell on this aspect of exchange theory.

While it is clear that reciprocal giving or, more formally, exchange interactions can be seen to be a determinant of social cohesion, it is not
clear that exchange interactions that do not directly involve approval or esteem as one of the resources should be seen to be related to the generation of social status. If it is assumed that people enter into exchange interactions because they find them mutually rewarding, however, it might also be assumed that people will like or approve of those with whom they can enter into exchange interactions (or more particularly series of exchange interactions). This, in fact, is the theme that underlies the theory presented in the next chapter.

If exchange interactions are mutually rewarding to the parties involved, series of exchange interactions can be viewed as sequences of reciprocal, positive reinforcements. This view opens up the possibility of linking exchange theory to learning theory. The first attempt to do this was made by Homans. He was criticized for ignoring the question of how amounts of different resources can be equated to one another. He was accused of failing to give a set of correspondence rules for central concepts (e.g., cost, profit, etc.) and of defining these central terms tautologically. He was accused of using operant conditioning principles badly; for instance, it was noted that he had ignored the important finding that intermittent reinforcement is more effective than continuous reinforcement in delaying the extinction of a response. As a consequence of these shortcomings and the fact that he failed to make all the propositions he employed explicit, Homans' claim that he had formulated an axiomatic theory of social exchange has been widely challenged.

In spite of the criticisms, it would be unfair to lose sight of the impetus Homans has given to the theorizing about status systems. His argument that a man's control over scarce resources enables him to reward
others and thus achieve high social status or authority\(^{25}\) is similar to the view that is advanced in the next chapter.

A more sophisticated attempt to link learning theory to exchange theory than Homans' has more recently been made by Leik, Emerson and Burgess.\(^{26}\)

Since the theory advanced in the next chapter was directly stimulated by Leik et al's work, a portion of their paper is reproduced here to: (i) indicate the general character of their theory, and (ii) give subsequent comments substance.

"...Social interaction between two actors (call them \(a_1\) and \(a_1'\)) can be described in terms of reciprocal 'expectations', leaning heavily upon cognitive psychology. By contrast, the same social process can be described in terms of reciprocal reinforcements, leaning almost exclusively upon operant psychology. The latter approach is the starting point for this social exchange theory.

Let us assume that a social relation involves some specifiable behavior \(j\) which \(a_1\) repeatedly performs in the relation, and behavior \(j'\) which \(a_1'\) performs. Assume further that \(j\) and \(j'\) are both operant behavior. If, in addition, \(j\) is a reinforcing stimulus (or mediates reinforcement) for \(a_1'\), then we say that \(a_1'\)'s ability to perform \(j\) is a resource of \(a_1\) in his relation with \(a_1'\). The magnitude of this resource is a function of the value of \(j\) to \(a_1\), and the ability of \(a_1\) to provide it. This social relation can be symbolized as the exchange relation \(a_1 \leftrightarrow a_1'\), where \(j\) and \(j'\) are behavioral resources of \(a_1\) and \(a_1'\), respectively. The two persons are said to 'exchange' \(j\) and \(j'\) in a process of reciprocal reinforcement which sustains the relation through time. (For simplicity, the relation may be symbolized \(a_1 \leftrightarrow a_1'\), with the resources understood).

As an interactive process through time, the exchange relation is conceived further as a set of temporally interspersed events called opportunities, initiations and transactions. If \(a_1\) is 'accessible' to \(a_1\) at a given time, \(a_1\) is said to have an opportunity. Given an opportunity, if \(a_1\) performs (or symbolically 'promises to perform') \(j\), then we say that \(a_1\) has initiated a possible episode of exchange. Either party might initiate, and we introduce the term because who initiates often
makes a difference. Finally, given an initiation by \( a_{1} \), if \( a_{1} \) accepts by performing \( j' \) we say that a transaction has been consummated or agreed upon. Since both \( j \) and \( j' \) are assumed to be operants and reinforcing stimuli, the exchange relation as an interactive relation across time (a history of prior transactions) is governed by three propositions:

1. Holding the probability of acceptance constant and greater than zero, the probability of initiation is an increasing function of the resource magnitude of the actor to whom initiation is made.

2. Holding the resource magnitude of the actor to whom initiation is made constant and greater than zero, the probability of initiation is an increasing function of the probability of acceptance during previous transactions.

3. The probability of acceptance is an increasing function of the resource magnitude of the initiator during previous transactions.

These propositions assume that transactions in any relation compete for available time with possible transactions in alternative relations...."

Leik et al go on to use their three propositions to deduce that when there is an unequal and fixed distribution of resources across a set of actors, the network of exchange relationships will tend to stratify into two or more closed networks or classes with the higher classes forming before the lower classes. That is, they make the resource distribution their independent variable and the emergence of a stratified structure their dependent variable.

Having formulated their theory, Leik et al designed an experiment to test it. They gave each subject a set amount of play money to begin with and had groups of six sit around a table. On each trial, two of the subjects were given an opportunity to invite one or two (whichever they wished) of the other four subjects to attend an exchange booth with them. (There were two exchange booths.) If a subject was either a host or invited to attend a booth
and wanted to accept the invitation he had to pay $50 to the booth which
would pay him an amount that depended upon which of the other subjects
attended the booth with him. This amount was set by the fact that two of the
subjects were weighted as worth $60 each, two were weighted as worth $40 each
and two were weighted as worth $20 each. A subject was paid the total
weightings of the subjects that attended a booth with him. No subject was
informed about this weighting system. Rather, subjects learnt that they were
paid more if they attended the booth with some subjects than with others.
Because subjects were only allowed to attend one booth on any given trial, a
subject often had to choose between two invitations. At the end of the
experiment, the play money each subject had managed to accumulate was exchanged
for real money.

Notice that Leik et al do not clearly state whether 'resource magnitude'
refers to the magnitude of the total amount of a resource that an actor has
or to the size of the amount an actor brings to a relationship. In defining
'resource magnitude' as the ability to provide a reinforcing stimulus, Leik et
al seem to be focusing on the total amount of a resource that an actor has and
yet, the way propositions 1 and 3 are worded, it would seem that the size of
the amount that an actor brings to a relationship is the required meaning.
The unfortunate thing is that the meaning required may depend upon the resource
in question. If the resource is the ability to perform a behavior (i.e., a
service), the quality of a single performance might be the important
consideration. If the resource is of a material nature (e.g., money), the
total amount that the actor has might be the important factor.

Perhaps an even more serious shortcoming of the Leik et al formulation
is the fact that they do not give any explanation for either the first or the
third propositions. It is not clear why they would use these propositions.
Exchange interactions occur between pairs of actors and the occurrence of an initiation is as dependent upon the amount that a would-be initiator holds of it as it is dependent upon the amount that a would-be receiver of the initiation has. Because both actors need to have an excess of a resource that the other wants before exchanges can be perceived as desirable, propositions that focus on the amount of a resource that one party holds without reference to the amount of another resource that the other party holds do not make a great deal of sense. The attempt to provide a set of more defensible propositions is one of the main thrusts of this dissertation.

Leik et al's first proposition would seem to ensure that ego will make a perceived gain providing alter accepts his initiation, and their third proposition would seem to ensure that alter will make a perceived gain each time he accepts an initiation from ego. Unfortunately, since they treat ego and alter separately, their propositions do not give us any basis for believing that exchange interactions will ever take place. Regardless of the perceived gains that ego would make, alter will reject ego's initiations unless he stands to make perceived gains too. Hence it might be concluded that, if ego is to successfully interact with alter, he must be able to adjust his behavior, either by trial and error or insight, to alter's requirements at the same time as he pursues his own interests. This means, presumably, that we need a set of propositions that deal with ego's and alter's resource levels at the same time rather than one at a time.

Although Leik et al hypothesize that the network of exchange relationships will tend to stratify into two or more closed networks, they do not discuss the actual mechanics of this process. If they had, they would have found that, in the absence of descriptive details about the "unequal and fixed distribution of resources" that they assume, the predictions they want to make do not flow
from their theory. Indeed, they could have just as easily predicted a
continuous hierarchical order instead of the hierarchy of discrete classes
that they chose to predict.

While arguing that the experimental situation they used was relevant
to their theoretical formulation, Leik et al advance the notion of "intra-
category exchanges" by which they refer to situations in which interactants
supposedly exchange resources that are "qualitatively similar". Actually,
they operationalize "qualitatively similar" as "the same". That is, subjects
had to deposit money at a booth in order to receive money. The notion of
intra-category exchange is not very convincing. It hardly seems reasonable
to suppose that people will generally exchange amounts of one resource for
amounts of the same resource.

Further problems arise for Leik et al because: (i) up to three
subjects were allowed to attend the same booth at the same time, and (ii) none
of the subjects were told that the experimenter would inject new amounts of
the resource into the situation dependent upon which subjects attended the
booths during each opportunity for exchange.

Presumably, Leik et al felt that subjects could extract information
about other subjects from triadic interactions. Yet it cannot be taken for
granted that the subjects have the capacity to do this. Host subjects may
have learnt to direct single initiations to pairs of other subjects rather
than have learnt to direct two initiations to two different subjects. Moreover,
in spite of Leik et al's claim that they lean almost exclusively upon operant
psychology, their research design does not allow subjects to differentiate one
another, at the beginning of an experiment, in terms of some attribute or
characteristic that is related to their respective resource levels. Each
subject's resource level can only be known after the differential outcomes for
the different subjects have become apparent (i.e., after several opportunities for exchange). In other words, it is not clear that Leik et al can claim that \( a_i \) could associate \( a_i \), with a stimulus that could be differentially reinforced.\(^{27}\) At best, such a claim might hold after several opportunities for exchange when the subjects might be able to differentiate one another in terms of the magnitudes of the piles of play money in front of them. At worst, the claim might never hold because other learning factors (e.g., reinforcement associated with past outcomes, etc.) might negate the salience of the supposed differential stimulus. In any case, the problem can be summed up by saying that the situations created by the research design are too complex for operant psychology to provide an adequate inferential structure.

The criticisms set out in the preceding paragraphs tempt one to the conclusion that the research design employed by Leik et al neither focuses on exchange behavior nor tests the hypotheses that they were interested in. Instead of engaging in exchange behavior, the subjects could only learn to seek lucky situations. These criticisms arose because: (i) there was only one type of resource in the situation, (ii) the experimenters kept injecting new amounts of the resource into the situation in spite of the fact that their theory calls for a "fixed set of resources across a fixed set of actors", and (iii) subjects could not visually differentiate one another in a way that would be meaningful in terms of operant theory.

In the next chapter, an attempt is made to advance a theoretical formulation that, though similar to Leik et al's, meets the criticisms that have just been set out and, in chapter three, an experimental paradigm is described that will: (i) allow more valid tests of the theory advanced than the Leik et al's paradigm allowed for their theory, and (ii) serve as a basis for a series of experimental investigations. The results of actual experiments
are presented and evaluated in chapter four. A final chapter tries to relate these interests to other interests in the sociology of social stratification.
FOOTNOTES


5 P.M. Blau, Blau, Bureacracy in Modern Society. (New York: Random House, 1956), p. 72: "...The mere knowledge that the rule exists and possibly that it is enforced elsewhere instils a sense of obligation to liberal superiors and induces subordinates more readily to comply with their requests...."

6 C.S. Belshaw, Traditional Exchange and Modern Markets. (Englewood Cliffs, New Jersey: Prentice-Hall, 1965), p. 48: "...The man who can call forth resources, who controls wealth, does not hold the resources in his own name necessarily. He has given the cow to another in a tutia relationship, he has given his vaygu's to a trading partner, he has passed marriage goods to his son's affines. But having dispersed material wealth in this way, he has through capital investment gained continuing control over future services. His command over wealth has been secured and has been expanded. And he is known to have such power. This is the true wealth in a prestation system, and it is the mainspring of entreprenural activity...."

P.M. Blau, The Dynamics of Bureacracy: A study in interpersonal relations in two governmental agencies. (Chicago: University of Chicago Press, 1955), p. 108: "...A consultation can be considered an exchange of values; both participants pay a price. The questioning agent is enabled to perform better than he could otherwise have done without expressing his difficulties to the supervisor. By asking for his advice, he explicitly pays respect to the superior proficiency of his colleague. This acknowledgment of inferiority is the cost of receiving assistance...."


See: Homans, Ibid., p. 65. Homans seems to be aware of this problem because he notes the possibility of A changing the character of the exchanges by asking B for advice about personal matters instead of office affairs in return for esteem for a new aspect of B.


R. Longabough, A category system for coding interpersonal behavior as social exchange. Sociometry 26 (1963), pp. 319-345.


21J.A. Davis, Ibid.


CHAPTER II

THEORY

The coupling of the notion of sequences of exchange interactions between two parties to principles of operant and perceptual psychology and the view that these principles apply to both parties involved in the sequences are the bases of the theory presented in this chapter. This theory focuses on a predicted tendency toward selective interactions in collectivities whose members need to exchange amounts of resources with one another. It constitutes an attempt to explain how certain unequal distributions of two dimensions of wealth can: (i) give rise to the emergence of cliques within the collectivity, and (ii) cause the members of the collectivity to approve of the members of the cliques to which they belong and to disapprove of the members of the cliques to which they do not belong.

The theory being advanced will be presented in sections that center on the following four areas of concern: (i) the definition of basic concepts, (ii) the scope conditions or essential features of the empirical situations to which the theory is relevant, (iii) the psychological principles that are assumed to govern the behavior of the members of collectivities that meet the scope conditions, and (iv) the formal derivation of hypotheses regarding the issues we are interested in.

I. THE DEFINITION OF BASIC CONCEPTS

Seven concepts will be defined, here, because they are basic to the theoretical statements that will be made in succeeding sections.
1. **Resource Dimension.** A resource dimension is any effect (i.e., behavior or material or non-material commodity) that is both valued by another individual and can be transferred to that individual.¹

2. **Initiation of Exchange.** An initiation of exchange is said to occur when a person X offers an amount of some resource to another person Yi in return for an amount of some other resource from Yi.

3. **Exchange Interaction.** An exchange interaction is said to occur when a person X makes an initiation of exchange to another person Yi and this initiation of exchange is accepted by Yi.²

4. **The joint operant conditioning paradigm.** An exchange situation is seen to imply a sort of double Skinner box in which not only does the rat respond to the box but the box responds to the rat. Just as Yi constitutes a stimulus situation for X, X constitutes a stimulus situation for Yi. Just as Yi can elicit an initiation of exchange from X (i.e., an offer and a request) and either positively or negatively reinforce this initiation, X can elicit an initiation of exchange from Yi and either positively or negatively reinforce this initiation. This double Skinner box situation will be referred to as a joint operant conditioning situation.

5. **Perceived Worth.** The perceived worth of an amount of a resource is the subjective utility that the amount has for an individual.

6. **Net Perceived Gain for X in an Exchange Interaction with Yi.** The net perceived gain for X in an exchange with Yi is the perceived worth of what Yi gives him minus the perceived worth of what he has to give Yi in return.

7. **Cliqués.** A collectivity can be said to have split into cliques when the probabilities for the possible exchange interactions between all the different possible pairs of members of the collectivity are such that the
members of particular subsets of pairs are significantly more likely to enter into exchange interactions with one another than with other members of the collectivity. More precisely, a collectivity can be said to have split into cliques when the following conditions are evident:

(i) the probabilities for exchange interactions between all possible pairs of members in the collectivity are not equal and hence an unbiased, random, sociometric pattern does not prevail (see figure 1),

(ii) the highest probabilities define two or more discrete, sociometric patterns, and

(iii) the probabilities within any subset of pairs are, at least, approximately equal and the probabilities for interactions between members within any subset of pairs and members outside that subset are all significantly less than the probabilities for interactions between members within that subset. That is, each subset of pairs is closed (see figure 2).\(^3\)

Figure 1. A random, unbiased sociometric pattern for eight actors.

Where a line equals an exchange interaction and each line has an equal, non-zero probability of occurrence - i.e., A, B, C, D, E, F, G, or H are equally likely to interact with any one of the other seven because each line has the same probability of occurrence.
II. THE SCOPE CONDITIONS OF THE THEORY

The theory being presented is relevant to newly formed collectivities (i.e., collectivities in which there are no established patterns of interaction) for which the following seven statements are true:

1. There are four or more members (X + Y₁...Yₙ) so that, at least, two cliques of two can emerge.

2. The members all have the same reasons for valuing quantities of two resources that can be described in the following way:⁴

   (i) both are of a divisible, concrete or material nature, and

   (ii) successive amounts of both are cumulative or storable.⁵

3. The total amounts of both resources are fixed for the collectivity and (because of some environmental contingency or other factor) have been unequally distributed across the members of the collectivity in such a way that there are at least two members with, at least, roughly complementary
resource profiles on each of two or more net wealth levels (those with the greatest net wealth will be called 'highs' and those with the least net wealth will be called 'lows' – see figure 3). 6

Figure 3. 'High' and 'low' net wealth levels.

--- net wealth level

| resource 1 |
| resource 2 |

Member A Member B Lows

Member C Member D Highs

4. The resources that each member has are visible to the other members. 7

5. The collectivity has a number of occasions during which every member, who wants to, can try to initiate an exchange with one other member and those members who receive one or more initiations can accept either none or one as they wish. 8

6. The members enter into several exchange interactions before exchanges cease. 9

7. Within the scope of the last condition, the details of any exchanges that occur are agreed upon by the parties involved. In each case,
one party proposes how much of one resource will be exchanged for how much of
the other resource and the other party either accepts or rejects this proposal.

III. PSYCHOLOGICAL ASSUMPTIONS

The eight psychological principles listed in this section are assumed
to govern the behavior of the members of collectivities that are characterized
by the scope conditions listed in the last section. They are fundamental to
the theory being presented because they underpin the arguments that lead up to
the hypotheses that are the central concern of this dissertation.

Although exchange interactions are to be viewed in terms of the joint
operant paradigm, some of the assumptions listed refer to cognitive processes.
It is true that operant theorists usually avoid mentioning unobservable
factors and their findings have generally been phrased in terms of what effect
past patterns of reinforcement for an operant behavior have on the frequency
of future non-reinforced occurrences of that operant behavior. The view
taken here, however, is that behavior in a collectivity-joint-operant-paradigm
situation cannot be adequately explained without reference to analytic
psychological processes (which is not to say that these processes are
incompatible with operant principles).

Most situations that operant theorists deal with are characterized by
the fact that reinforcements are not experienced until the operant behaviors
have occurred. In such situations, the only way to obtain information about
the magnitude of reinforcements that will follow an operant behavior is
through trial. In such situations, propositions of the sort: the greater the
reinforcement that has followed an operant behavior in the past the greater
will be its frequency of occurrence, make sense. Yet in a collectivity-
joint-operant-paradigm situation defined by the scope conditions, the resources that each member has are visible to the other members and the possibility that the members might operate on this information and try to estimate the chance that an initiation would have of being accepted by each of the others taken in turn has to be admitted. The first assumption reflects this admission. In addition, since operant psychological statements regarding reinforcement are usually phrased in terms that seem to imply that organisms are governed by a principle of maximization of utility or least effort\(^{12}\), the first assumption will also imply the principle of the maximization of utility.

1. It is assumed that a member of a collectivity will be most likely to make initiations that he perceives will result in the greatest net perceived gains for himself.

Since the resources that the members of a collectivity have are the sources of reinforcements and since each member sets the magnitude of the reinforcement he receives when he decides what to ask for in return for what he decides to offer, it has to be shown that some members can be seen to be sources of greater reinforcements than other members. If a member of a collectivity can see the other members' resources and can apply the notion of diminishing marginal utility\(^{13}\) to assess the perceived worth that each of the others would assign to a given amount of one of his resources, he could, in fact, differentiate the others in terms of the amount of another resource that they could be induced to give him in return for the given amount of his resource. Assumptions 2, 3, and 4 reflect this argument.

2. It is assumed that, if each member of a collectivity has the same reasons for valuing a resource, each member will assign the same perceived worth to a given total amount of it.\(^{14}\)

3. It is assumed that each member of a collectivity will assign
less perceived worth to successive, equal amounts of the same resource.  

4. It is assumed that each member of a collectivity adopts each other member's point of view to gauge how much of one resource each could be induced to give him in return for a given amount of another resource.  

It has just been admitted that in collectivity-joint-operant paradigm situations in which each member's resources are visible to the others, X may be able to decide, in an a priori fashion, with which other member he could drive the hardest bargain. It also has to be admitted that X might be able to perceive the determinants of the schedule of reinforcement associated with each Y. There is, however, no reason to assume that the latter could be done in a completely a priori fashion. For one thing, X is not directly informed about how many other initiations Yi will receive at the same time as he chooses to make an initiation to Yi. Nor is X directly informed about the sort of initiations Yi will receive from the others. It is most likely to be the case that X would require at least some experience of Yi's behavior before he could accurately assess the probability that Yi will accept an initiation from him. Although the operant theorist would usually limit himself to making statements to the effect that the strength of an operant is a function of some aspect of the pattern of past reinforcements for that operant, the next two assumptions have been worded in such a way that the possibility, that: the members might try to estimate the chance that an offer would have of being accepted by each of the other members, is not denied.  

5. It is assumed that, during the first few opportunities for exchange, a member of a collectivity will have little basis to anticipate the number of initiations that each of the other members in his collectivity will receive.
6. It is assumed that the likelihood of a member of a collectivity initiating to a particular member in his collectivity is directly related to how likely he perceives it is that his initiation will be accepted by that particular member.\(^\text{19}\)

The notion of diminishing marginal utility (see assumption 3) implies that the members of a collectivity can increase the perceived worth of their resources by exchanging amounts of the resources of which they have most for amounts of the resources of which they have least. Since the members of a collectivity do not have to accept the initiations they receive and since the details of the initiations are set by the initiators, any exchange interactions that do occur will generally involve reciprocal perceived rewards or reinforcements.

7. It is assumed that:

(i) every time a member of a collectivity makes an initiation that is accepted, his tendency to repeat that initiation is positively reinforced, and

(ii) every time a member of a collectivity makes an initiation that is rejected, his tendency to repeat that initiation is negatively reinforced.

8. It is further assumed that:

(i) every time a member of a collectivity makes an initiation that is accepted, positive sentiments held by that member toward the member he initiated to are positively reinforced.

(ii) every time a member of a collectivity makes an initiation that is rejected, negative sentiments held by that member toward the member he initiated to are positively reinforced.
IV. DERIVATION OF HYPOTHESES

The hypotheses listed in this section apply to collectivities that meet the scope conditions listed in section II.

Given: assumption 5 (that: during the first few opportunities for exchange, the members have no basis to perceive how much competition their initiations will run into), assumption 2 (that: the members will equally value given total amounts of the same resource, if they have the same reasons for valuing it), assumption 3 (that: successive amounts of the same resource are assigned less perceived worth), and assumption 4 (that: the members adopt the points of view of the others), it follows that the members of a collectivity will initially perceive that they can get larger amounts of a given resource from those members who have most of it. Given this conclusion and assumption 1 (that: each member of a collectivity is most likely to make initiations that he perceives will result in the greatest perceived gains for himself), it is possible to formulate hypothesis 1.

Hypothesis 1. The members of a collectivity will be most likely to direct their first initiations to the members of high net wealth (see scope condition 3 for an explanation of the terms 'high' and 'low' net wealth levels).

Given the joint operant paradigm, Yi constitutes a stimulus situation for X and X constitutes a stimulus situation for Yi. Given a sequence of exchange interactions between X and Yi, Yi's acceptance of X's last initiation can be seen not only as an acceptance of X's last initiation but also as an initiation for X to respond to. Hence, after assumption 1 (that: the members of a collectivity are most likely to make initiations that they perceive will result in the greatest perceived gains for them), it can be argued that the
members will be most likely to accept initiatives that they perceive will result in the greatest perceived gains for them. In addition, it can be argued, after assumption 3 (that: successive amounts of the same resource are assigned less perceived worth), that (in objective terms) the lows will tend to ask the highs for more than they offer. If, during the first few opportunities for exchange, all the members tend to initiate to the highs (see hypothesis 1) but the lows tend to: (i) make smaller average offers (necessitated by scope condition 6), and (ii) ask for more than they offer, the highs will tend to accept one another's initiations and reject initiations from the lows. Given this conclusion and either assumption 7 (that: the acceptance of initiations positively reinforces them and the rejection of initiations negatively reinforces them) or the argument preceding assumption 6 (that: the members might develop an appreciation of the competition they face — in particular, that they will face most competition when initiating to highs) and assumption 6 (that: this appreciation influences their choice of members to initiate to), it can further be concluded that the highs will continue to initiate to the highs and that, over successive opportunities for exchange, more and more of the lows will initiate to lows. Thus over several opportunities for exchange, the rate of high to high initiations in a collectivity will remain fairly constant while the rate of low to low initiations in a collectivity will tend to increase. Hypothesis 2 is based on this argument.

Hypothesis 2  
A collectivity will split into cliques as the members, through successive initiations, learn with which other members they can enter into exchange interactions.

Before going on to the next hypothesis, two reservations concerning hypothesis
2 should be noted. The first reservation concerns the interaction between the perceived worth of an outcome and the subjective probability of the occurrence of that outcome. If the subjective probability of acceptance is looked upon as a risk factor, it can be hypothesized that the risk X will be prepared to take will be a function of the size of the net perceived gain that will accrue to him if his initiation is accepted. This hypothesis is of interest because it suggests that, in the case of extreme differences between the highs and the lows, the lows may never end up in interaction with one another because they persist in running a high risk for a high net perceived gain. The question of how extreme the difference between net wealth levels can be, before the theory will break down, is, of course, one that calls for empirical investigation. The second reservation concerns the role of competition in the collectivity. Competitive processes are likely to operate when members are deciding: (i) what to ask for in return for their offers, and (ii) with whom they would like to exchange. Since both parties in an exchange interaction usually increase the perceived worth of their resources, it might be assumed that the members of a collectivity will be concerned not only with their own net perceived gains but also with the net perceived gains that the others stand to make. After all, what is one member's relative gain is another member's relative loss. It may even be the case that concern with net relative perceived gains would cause members to compete most fiercely with those closest to them in terms of net perceived wealth. One might expect, however, that such competitive factors would only become important when the members have more to gain by haggling and haggling than by freely cooperating (i.e., when each member has almost equal amounts of both resources) but such situations do not fall within the purview of the theory being presented.

Returning to the general argument that hypothesis 2 was based on, it
follows that the number of rejected initiations will be greater for the lows than for the highs during the first few opportunities for exchange. Because rejected initiations will tend to delay the emergence of cliques and because the delay will be greater for cliques involving lows than for cliques involving highs, it is possible to formulate the next hypothesis.

Hypothesis 3 Clique of members of high net wealth will emerge within a collectivity before cliques of members of low net wealth. 24

It was assumed (assumption 8) that the acceptance of initiations reinforce positive sentiments toward the acceptor and rejection of initiations reinforce negative sentiments toward the rejector. It was also noted, in the argument that hypothesis 2 was based on, that Yi's acceptance of an initiation from X can be seen not only as a reinforcement for X's initiation but also as an initiation for X to respond to. If Yi's acceptance of an initiation from X is viewed as an initiation to X then an initiation to Yi from X during the next opportunity for exchange can be seen as an acceptance of Yi's acceptance of X's last initiation to Yi. It follows from assumption 8 and this line of reasoning that it can also be assumed that the receipt of an initiation that can be accepted reinforces positive sentiments toward the initiator and either the non receipt of initiations or the receipt of initiations that cannot be accepted reinforces negative sentiments toward the initiator. Given assumption 8 and its corollary and given the argument that the highs will tend to initiate only to fellow highs and will reject initiations from the lows and will not return the lows' initiations so that the lows will end up both initiating to one another and accepting one another's initiations we can conclude that: (1) positive sentiments between the highs will be reinforced,
(ii) negative sentiments between the highs and lows will be reinforced, and
(iii) positive sentiments between the lows will be reinforced. But it has already been hypothesized that cliques of highs and lows emerge in a collectivity. The final hypothesis to be derived follows.

Hypothesis 4 The members of each clique that emerges within a collectivity will approve of one another more than they will approve of the other members of the collectivity who are not members of their clique.

The theory has now been presented. In the next chapter, the research design that was formulated to test the hypotheses will be described.
The problem of defining resources is complicated by the fact that different resources appear to have different properties. For example, some resources can be transferred only (e.g., money) while others can be kept and transferred at the same time (e.g., knowledge). See: S. Rosen, the comparative roles of informational and material commodities in interpersonal transactions. Journal of Experimental Social Psychology 2 (1966), pp. 211-226, for a discussion of an investigation to test the thesis that owners of valuable information would engage in different pricing behavior than owners of valuable material commodities. Experimental support was found for the hypothesis that informants in a three person game would ask less for information than sellers would for material commodities but that lenders and confidants would set the same price.

2 It should be noted, as an empirical generalization, that exchanges usually occur when X: (i) notices Yi, (ii) sees that Yi is short of a resource that he has an excess of and that Yi has an excess of some other resource that he is short of, (iii) offers Yi some of the resource that Yi is short of for some of the resource that he is short of, and (iv) has this offer accepted by Yi.

3 It should be appreciated that a precise definition of "approximately equal" and "significantly less" are theoretical issues. Both terms must ultimately be defined in terms of theoretical predictions.

4 In the interest of keeping the theory as general as possible, neither the particular reasons for valuing the resources nor the actual resources are stipulated here.

5 Attention is limited to resources with these properties so that: (i) the limitations associated with the norm of reciprocity approach to social status systems and the problems that Leik et al encountered (see chapter 1) can be avoided, and (ii) the relevance of the psychological assumptions listed in the next section will be maximized.

6 What constitutes a sufficient degree of complementarity between individuals and how different the two or more levels of net wealth have to be are empirical issues. What is being claimed is that the theory will hold when the complementarities between subjects and the differences between net wealth levels are such that the subjects can notice them.

7 It may be the case that it would be enough to stipulate that human subjects only need a knowledge of the operant conditions but attention is nevertheless limited to situations in which each member's resources are visible to the other members to eliminate the problems that Leik et al ran into (see chapter 1, pp. 7-10) and because it might be argued that in naturally occurring situations people tend to advertise their wealth levels. See, for example:
- for a discussion of the Northwest Indian practice of potlatching.
(iii) P.M. Blau, A theory of social integration. American Journal of Sociology LXV (1960)n6, pp. 545-556. Blau begins with the assumption that persons interested in becoming integrated members in a group are under pressure to impress the other members that they would make attractive associates.

8 Cf. the Leik et al statement (cited in chapter 1) that their propositions assume, "transactions in any relation compete for available time with possible transactions in alternative relations".

9 Generally this will be when each member has managed to acquire more or less equal amounts of both resources. N.B., this condition is stipulated because we are interested in linking the notion of reciprocal reinforcement and learning effects to exchange theory (i.e., we want to look at extended sequences of exchange interactions.)


11 See: Burgess and Akers (1966), Ibid., p. 310. "The strength of an operant is a function of the amount of its reinforcement." Note that the authors do not formally define 'amount' but state that the strength of an operant is a function of both the frequency of past reinforcement and the ratio of past reinforcements to non reinforcements - in either case, however, the gross quantity of reinforcement received can be seen as a factor.

12 (i) See note 8 above. (ii) Cf.: P.T. Young, Motivation and Emotion: A survey of determinants of human and animal activity. (New York: John Wiley & Sons, Ltd., 1961). Chapter 6. Young reviews the literature on size of incentives and performance and concludes: "...in other words, the strength of a motive to approach may be, in part, determined by the perceived magnitude of the reward."


14 This assumption eliminates the problem of individual differences while allowing the next assumption regarding the principle of diminishing utility to hold. It also eliminates the difficulty of defining resources in a tautological fashion that Homans ran into (see chapter 1, p. 4 ).
16(i) The idea that social actors have to adopt the standpoint of the other is well entrenched in the literature. See, for example: K.H. Turner, Role-taking, role standpoint and reference-group behavior. American Journal of Sociology 61 (1956), pp. 316-328. The only empirical investigation (known to this author), however, is that reported by Cottrell and Dymond. See: L.S. Cottrell, Jr. and Rosalind F. Dymond, The empathic responses: A neglected field for research. Psychiatry XII (1949), pp. 355-359, and Rosalind F. Dymond, A scale for the measurement of empathic ability. Journal of Consulting Psychiatry XIII (1949), pp. 127-133. See also appendix V of this work.

(ii) Note. It is assumed that each member adopts the point of view of the others regarding himself. It is not assumed that they adopt the point of view of each of the others regarding all of the others. While it is a logical possibility that members could do the latter, it is assumed that this possibility will generally lie outside a member's psychological capacity.

17See: (i) R.D. Luce, Psychological studies of risky decision making - in: Social Science Approaches to Business Behavior. G.B. Strother (editor). R.D. Irwin Inc., (1962). Reprinted in: Decision Making. W. Edwards and A. Tversky (editors). Penguin, (1967). Luce looks at the literature on "choices that people make among alternatives that are risky" and concludes, "...Human beings appear to be both 'adaptive' and cognitive'; they sometimes adjust their behavior gradually to experience, and they sometimes 'understand' and analyze choice situations. Furthermore, both processes often seem to go on at the same time. The current learning theories are exclusively adaptive whereas, almost by definition, the static assumptions of the preference theories are cognitive." (p. 350, Edwards & Tversky). Luce goes on to point out that models which synthesize the two processes are required. (ii) appendix IX for coded comments elicited by post experimental question: If you received two or more similar offers at the same time what factors would you take into account in deciding which one to accept?

18See: note 16 (ii). Assumption 5 rests on a similar assessment of the psychological capacity of the members of a collectivity.

19See: Burgess and Akers (1966), op. cit. "2.a.9. Law of Differential Reinforcement: Given a number of available operants, all of which produce the same reinforcer, the operant which produces the reinforcer in the greatest amount, frequency and probability will have the greatest probability of occurrence."

20(i) See: S. Siegel, Levels of aspiration and decision making, chapter 8 in: Decision and Choice: Contributions of Sidney Siegel. S. Messick and A. H. Brayfield (editors). (New York: McGraw-Hill, 1964). "...It may be said that if various alternatives are available to an individual, he will choose from among the alternatives, toward each of which he has a subjective probability of attainment and a utility, so as to maximize subjective expected utility..." (p. 124). Also chapters 11, 13 and 17 by S. Siegel; S. Siegel and


22 See: I.C. Whittemore, The competitive consciousness. *Journal of Abnormal and Social Psychology* 20 (1925-26), pp. 17-33. Whittemore ran the same groups of 4 subjects for a number of sessions during each of which the subjects worked at a competitive task. He concluded that subjects tended to single out the fellow group member whose skill was most nearly the same as his own as his principal rival.

23 During pilot work with the research design described in the next chapter, it was observed that subjects did tend to begin haggling at this point and hence the experiments that were eventually run, and reported in chapter 4, were terminated before each subject had managed to get two similar sized piles of resources in front of him.

24 Hypotheses 2 and 3 were derived to see how well the theory advanced here handles the predictions that Leik et al (1968) were interested in making (see chapter 1, p. 6).
The research design, described in this chapter, was formulated to test the hypotheses derived from the theory that was presented in the last chapter. It was formulated to meet both the criticisms that were leveled against the research design used by Leik et al (see chapter 1) and the scope conditions listed at the beginning of the last chapter. It was the end result of pilot work in which over two hundred subjects were used in some forty different experiments (see appendix 1).

Basically, the research design centered on a type of game situation. Subjects who had been given supplies of both yellow and blue buttons sat in a circle and exchanged buttons of one colour for buttons of the other colour.

The theory, set out in the last chapter, deals with fixed amounts of two different resources that have been distributed across the members of a collectivity. A resource was defined as any effect that is both valued by another individual and can be transferred to him (definition 1, p.16). It was then specified that attention would be limited to only those resources that have the properties of: divisibility, concreteness and cumulativity (scope condition 2). It was further stipulated that each member of a collectivity would have the same reasons for valuing the resources (scope condition 2). To satisfy these requirements the two resources were operationalized as 2520, 7/8" diameter, blue buttons and 2520, 7/8" diameter, yellow buttons. Subjects listened to tape recorded instructions (see appendix III) from which they gained certain information concerning these buttons. First, subjects were told that they were going to play a game that would be run in two parts and that in
the second part of the game they would need quantities of both colours because
the two colours would be used for completely different purposes. Second, by
reference to a table of figures pinned in front of each subject (see appendix
II), it was demonstrated that the principle of diminishing marginal utility
applied to both resources. This table was provided because the results of
pilot work (see appendix I) had suggested that the principle of diminishing
marginal utility only operates in conjunction with knowledge about prospective
use (i.e., the size of the units that are used to measure amounts of the
resource is set in accordance with the use to which the resource gets put).
It had the advantage of standardizing the value of given numbers of the
different coloured buttons without necessitating further information about the
second part of the game. Buttons were employed since it was assumed that they
would be free from associations that would interfere with the information given
to the subjects.

Each experiment began with all the resources distributed across a
collectivity. No further resources entered the situation once an experiment
had begun.

The theory deals with situations in which the resources have been
distributed in such a way that at least two subjects have complementary resource
profiles on at least two perceivably different levels of net wealth (scope
condition 3). Pilot work (see appendix 1), however, indicated that the
situations should accommodate subjects' tendency to vary their responses
(perhaps to relieve boredom). Provision of two alternative potential exchange
partners on each net resource level permitted subjects to vary their responses
without necessarily violating the principle on which the theory is based.
Since it was felt that the problem of response variability might also be
related to the fact that, after the first opportunity for exchange, some
subjects had two piles of resources while others still had only one because they had failed to enter into an exchange, it was decided that subjects should begin with a small amount of their non-predominant resource. Thus subjects who failed to enter into an exchange during the first opportunity to do so were not conspicuous at the start of the next opportunity for exchange because they still had only one resource in front of them. The resources were initially distributed across collectivities of eight subjects in the manner illustrated in figure 4.

Figure 4. Distributions of resources for experiments.

........ net resource level

 resource 1

 resource 2

Four Lows
Note: each low has two possible partners on his own net wealth level.

Four Highs
Note: each high has two possible partners on his own net wealth level.

Each subject, then, began the experiment with predetermined amounts of both resources: a small amount of one and a much larger amount of the other. The different amounts were weighed out, before the subjects arrived, to an accuracy of better than 1%.²

Scope condition 4 states that the members of a collectivity can see
what resources each of the other members have. This requirement necessitated special screens or booths (see appendix II) to eliminate uncontrolled factors such as facial expressions, clothing differences, etc. that might be expected to affect choices of interaction partners. Booths were constructed that had windows covered with a semi-sheer gauze material and a 4" gap at the bottom. The gaps made it possible for the subjects to keep their buttons out in front of the booths and the windows allowed each subject to see what resources the each of the others had. The booths were arranged in a circle and a light in the center caused each subject to sit in the shadow of his booth. Each subject could identify the other members of his collectivity by letters printed at the top of the booths (G,H,...N to avoid alpha preference) and each subject's own letter was printed again inside his booth.

The copy of the table that was used to demonstrate that the principle of diminishing marginal utility applied to both resources was pinned to the inner left hand side of each booth. A card pinned just below the window inside each booth told each subject how many buttons of each colour he had to begin with (see appendix II) and he was provided with a pencil and paper so that he could keep track of how many buttons of both colours he had.

Scope condition 5 stipulates that the members of a collectivity are given a number of opportunities to interact with one another if they want to and that the details of any exchanges that take place are agreed upon by the parties involved (allowing for scope condition 6). These conditions were satisfied in the following way. Each subject was given a bowl and a pile of initiation forms (see figure 5). A second card pinned just below the window inside each booth told each subject that there were restrictions on the size of the offers he could make and the number of buttons he could give in return. This second set of cards informed the subjects that although they were free to
request whatever they thought the other subjects would be prepared to give them in return for their offers, they could neither make offers of more than 1/20 of the initial numbers of buttons in their largest piles nor accept any offers that required them to give more than 1/20 of the initial numbers of buttons in their largest piles in return (see appendix II). These restrictions were necessitated by scope condition 6 which states that every member of a collectivity enters into several exchange interactions with the other members of the collectivity. They were imposed so that each subject would have to enter into several exchange interactions. They can also be justified by appealing to the common sense notion that people with a lot tend to deal in larger units than people with a little. It might also be pointed out that it is unlikely that the limits would have anything to do with whether subjects asked for more or less than they offered.

Figure 5. An initiation form.

<table>
<thead>
<tr>
<th>Initiator's letter</th>
<th>Offer directed to: (letter)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(circle one)</td>
</tr>
<tr>
<td>Will give (No.)</td>
<td>yellow blue buttons</td>
</tr>
<tr>
<td>for (No.)</td>
<td>yellow blue buttons</td>
</tr>
<tr>
<td>accept</td>
<td>(circle one)</td>
</tr>
<tr>
<td>reject</td>
<td></td>
</tr>
</tbody>
</table>

The tape recorded instructions (see appendix III) informed the subjects that during the first part of the game they have a number of opportunities to exchange buttons with the other subjects and the procedure for entering into
exchanges was explained in detail. In line with scope condition 5, subjects were told that they neither had to make an offer of exchange nor had to accept any offer during an opportunity for exchange. They were also told that they could not accept more than one offer during each opportunity for exchange.

The subjects were told to look through their screens at the start of each opportunity for exchange to see what resources each of the other subjects had and decide whether they wanted to send an offer to one of them. If they wanted to send an offer, they were to fill in an initiation form and count out the buttons that they wanted to offer. Initiation forms and buttons were then to be put in the bowls and the experimenter would deliver each bowl to the booth to which it was addressed. Since each subject had only one bowl, each subject could send only one offer during each opportunity for exchange. The subjects did not talk to one another.

At the same time that a subject had sent his bowl around to one of the other booths he could receive more than one bowl, though as stated above, he could not accept more than one offer.

If a subject accepted an offer, he had to put a check on the initiation form that accompanied it, take the buttons sent to him and replace them with the buttons requested. If a subject rejected an offer, he had to put a cross on the initiation form that accompanied it. At the end of each opportunity for exchange the experimenter returned the bowls and initiation forms so that each subject could see the check or cross on the form he had just sent and then the forms were collected and put to one side. Once the used initiation forms had been collected, the next opportunity for exchange began. Subjects could not see how many offers the others received during each opportunity for exchange: nor could they see whether their offers had been accepted until their bowls had been returned.
The procedure used, then, met both the criticism made of Leik et al's experimental design, that the subjects could initiate to more than one person at a time (see chapter I), and the theoretical requirement, that transactions in any relation compete for available time with possible transactions in alternative relations.

It should also be noted that the subjects were told that the first part of the game would be competitive in the sense that each subject would be out for himself and that there would be plenty of time for each subject to make as many offers as he needed to make.

After the seventh opportunity for exchange, the subjects were asked to answer some questions before going on (see appendix V). Once these questions had been answered, the subjects were told that the experiment was actually over and that the experimenter would discuss it with them.

Finally, attention should be drawn to three general features of the research design. First, in every experiment run, the high blue, high yellow, low blue and low yellow subjects were always positioned around the circle according to the same pattern so that possible position effects would be kept constant. Second, the assignment of subjects to the booths can be assumed to be random in that the subjects met outside the laboratory before being shown in and were asked to sit at any vacant booth. Lastly, since the magnitude of the difference between the two levels of net wealth (i.e., x in figure 4) was the independent variable, experiments were run with this variable set at different values.

While much has been programmed into the experimental situation just described, for example, the reasons for needing quantities of buttons of both colours and the principle of diminishing marginal utility, the subjects were still free to choose with whom they wanted to initiate exchanges and, within
the limits imposed, whose offers they would accept. In other words, the experimental design should enable us to test whether the hypotheses derived on the basis of the assumptions regarding the way the buttons would be valued actually hold. It is true that experimental designs formulated in the future could profitably be focused on the assumptions that were programmed into the design advanced in this chapter. It is also taken to be true that no single experimental design would enable us to test every aspect of the theory set out in chapter II.

The results for experiments based on the design advanced, then, will be presented and evaluated in the next chapter.
FOOTNOTES


2A beam balance and carefully counted piles of buttons as standard weights were employed for this task.
1. View of experimental situation

2. View through a booth window
CHAPTER IV

RESULTS AND EVALUATION OF RESULTS

The results of the three sets of experiments that were carried out are reported and evaluated in this chapter. Subjects were first and second year, male-student volunteers. There were 6 experiments in the first set, 6 experiments in the second set and 8 experiments in the third set. There were no differences between the subjects' initial net wealth levels in the first set of experiments, moderate differences between the subjects' initial net wealth levels in the second set and extreme differences between the subjects' initial net wealth levels in the third set. The actual distribution of resources for the three sets of experiments are set out in Table 1.

Table 1. The Initial Distributions of Resources Across Collectivities for Each Experimental Condition

<table>
<thead>
<tr>
<th></th>
<th>No. Subjects</th>
<th>No. of yellow buttons</th>
<th>No. of blue buttons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Set:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No initial net resource differences between subjects</td>
<td>4</td>
<td>600 + 30 = 630 each</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>30 + 600 = 630 each</td>
<td></td>
</tr>
<tr>
<td><strong>Second Set:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate initial net resource differences between subjects</td>
<td>2</td>
<td>700 + 30 = 730 each</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>30 + 700 = 730 each</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>500 + 30 = 530 each</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>30 + 500 = 530 each</td>
<td></td>
</tr>
<tr>
<td><strong>Third Set:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extreme initial net resource differences between subjects</td>
<td>2</td>
<td>800 + 30 = 830 each</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>30 + 800 = 830 each</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>400 + 30 = 430 each</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>30 + 400 = 430 each</td>
<td></td>
</tr>
</tbody>
</table>
In all three sets of experiments, the booths were always placed in the same location vis à vis one another and the G,H,I and J subjects always began with a greater number of blue buttons than yellow buttons while the K,L,M and N subjects always began with a greater number of yellow buttons than blue buttons (see Figure 6).

Figure 6. Position of Booths vis à vis One Another, and the Colour of the Largest Pile of Buttons put in Front of Each Booth, in Every Experiment Run

Blue
H

Blue
J

Yellow
M

Yellow
L

Yellow
K

Yellow
N

Blue
I

Blue
G

In the second and third sets of experiments, the "high" distributions (i.e., 730 buttons in the case of the second set and 830 buttons in the case of the third set) were always placed in front of the I,J,M and N booths while the "low" distributions (i.e., 530 buttons in the case of the second set and 430 buttons in the case of the third set) were always placed in front of the G,H,K and L booths (see Figure 7).
Figure 7. Position of the High and Low Net Wealth Level Members in the Moderate and Extreme Differences Experiments

Low
H

High
J

Low
L

High
N

Low
G

High
M

Low
K

High
I

Thus the positions of the booths vis-à-vis one another were kept constant and the resources were distributed around the collectivities according to the same general pattern. In the moderate and extreme differences conditions, the highs were always the I, J, M and N subjects and the lows were always the G, H, K and L subjects. Consequently, the behavior of the I, J, M and N subjects and the G, H, K and L subjects can be compared both within each set of experiments and across sets of experiments.

Once again, there were no differences between the I, J, M and N subjects' initial net wealth levels and the G, H, K and L subjects' initial net wealth levels in the first set of experiments while there were moderate differences in the second set and extreme differences in the third set. In the second and third sets of experiments, the I, J, M and N subjects were "highs" and the G, H, K and L subjects were "lows". To facilitate comparisons between the results of
the three sets of experiments, the I,J,M and N subjects in the first set will be called "high-position" subjects and the G,H,K and L subjects in the first set of experiments will be called "low-position" subjects.

Given that the magnitude of the differences between the I,J,M and N subjects and the G,H,K and L subjects is the independent variable in the theory to be tested, the emergence of cliques should be evidenced only by the data for the second and third sets of experiments. Moreover, the emergence of cliques should be evidenced most strongly by the data for the third set because the independent variable was fixed at the highest level for the third set of experiments.

Because the independent variable was fixed at zero for the first set of experiments, any non random patterns of interaction among the high-position subjects and among the low-position subjects or between the high-position and low-position subjects have to be interpreted as a consequence of a factor that was common to all sets of experiments (e.g., the order in which the booths were set up vis a vis one another). It seems that such a factor did, in fact, operate. Twenty-three of the 47 initiations made by the first set of subjects during their first opportunity for exchange were directed to the most visible potential partners (i.e., the subjects with complementary resource profiles who were most directly in front of them). Thirteen of the 47 initiations were directed to the two side positions and 11 were directed to the immediately adjacent position (see Figure 8 and appendix IV). This result is statistically significant at the .001 probability level. Given this result and the fact that the most visible potential partner for an I,J,M or N (i.e., high-position) subject was a G,H,K or L (i.e., low-position) subject and vice versa, it must be concluded that the seating arrangement created a bias toward interactions between high-position subjects and low-position subjects in the no differences
condition. Moreover, because the positions of the booths vis à vis one another were kept constant and the resources were always distributed around collectivities according to the same general pattern, it must be concluded that the bias toward interactions between I,J,M and N and G,H,K and L subjects would have also operated in the moderate and extreme differences conditions.

Figure 8. An Example of the Visibility of Potential Exchange Partners

If it is assumed that a pressure to initiate to the most visible complementary profile position existed in each experimental condition it must also be assumed that the moderate and extreme difference experiments are more severe tests of the hypotheses derived in chapter II than would be the case if this pressure had not operated. That is, in the cases of the moderate and extreme difference experiments, the theory predicts the eventual emergence of patterns of interactions not between I,J,M and N subjects and G,H,K and L
subjects but among the I, J, M and N subjects and among the G, H, K and L subjects. Put another way, the theory predicts the eventual emergence of cliques composed of highs and composed of lows rather than the eventual emergence of cliques composed of both highs and lows.

The research design, described in the last chapter, produced two sources of data that can be used to test different aspects of the theory. The initiation forms that were collected at the end of each opportunity for exchange constitute the first source of data while the responses to the post experimental questions constitute the second. Each of the four hypotheses to be tested will be taken in turn and discussed in terms of: the kind of data called for, the sort of results that could be accepted as supporting the hypothesis in question, the actual results that were obtained and the conclusions regarding the validity of the hypothesis.

Hypothesis 1. The members of a collectivity will be most likely to direct their first initiations to the members of high net wealth.

If Hypothesis 1 is valid, significantly more of the highs and lows in the second and third sets of experiments should have directed their first initiation toward a high than toward a low. The hypothesis, moreover, should be more strongly supported by the results of the third set of experiments than by the results of the second set because the independent variable was set at a more extreme value for the third set of experiments. Table 2 indicates the actual results obtained.
Table 2. Initiations Directed Toward Highs During the First Opportunity for Exchange under Each Experimental Condition

<table>
<thead>
<tr>
<th>Imbalance in Distribution of Resources</th>
<th>Moderate initial net resource differences between subjects</th>
<th>Extreme initial net resource differences between subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>No initial net resource differences between subjects</td>
<td>17.4% (N23)**</td>
<td>90.3% (N31)**</td>
</tr>
<tr>
<td>Moderate initial net resource differences between subjects</td>
<td>45.8% (N24)</td>
<td>90.7% (N32)</td>
</tr>
<tr>
<td>Extreme initial net resource differences between subjects</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* High and low terms properly apply only to moderate and extreme differences conditions (i.e., in the no differences condition, the highs are high-position subjects and the lows are low-position subjects).

** one subject chose to not make an initiation during this opportunity for exchange.

Effect of resource imbalance

(i) $\chi^2$ for proportion of subjects in no difference experiments and proportion of subjects in moderate difference experiments that initiated to Highs = 3.08 d.f. 1 sig. between p .10 and p .05.

(ii) $\chi^2$ for proportion of subjects in no difference experiments and proportion of subjects in extreme difference experiments that initiated to Highs = 31.52 d.f. 1 sig. beyond p .001.

Effect of degree of imbalance

(1) $\chi^2$ for proportion of subjects in moderate difference experiments and proportion of subjects in extreme difference experiments that initiated to Highs = 14.63 d.f. 1 sig. beyond .001.

In spite of the pressure toward high to low and low to high initiations due to the way the booths were set up vis a vis one another, the results of the first opportunities for exchange clearly support Hypothesis 1. In the case of the highs, the introduction of moderate differences between subjects was associated with an increase of about 150% of the high-position subjects'
rate of initiating to fellow high-position subjects while the introduction of
extreme differences between subjects was associated with an increase of more
than 400% of this rate. In the case of the lows, the introduction of
moderate differences between subjects was associated with an increase of 12%
of the low-position subjects’ rate of initiating to high-position subjects
while the introduction of extreme differences between subjects was associated
with an increase of about 50% of this rate. The fact that the increases are
greater for the highs than for the lows is not surprising. As a consequence
of the pressure toward inter net wealth initiations due to the way the booths
were set up vis à vis one another, the high-position to high-position
initiation base rate is lower than the level that would be expected by chance
alone and the low-position to high-position initiation base rate is higher
than the level that would be expected by chance alone. Thus in the case of
the highs, there was a greater percentage range (i.e., gap between the base
rate for when the independent variable was set at zero and 100%) across which
the effect of the independent variable could be observed.

Hypothesis 2. A collectivity will split into cliques as the members,
through successive initiations, learn with which other
members they can enter into exchange interactions.

Hypothesis 3. Cliques of members of high net wealth will emerge within
a collectivity before cliques of members of low net
wealth.

Because the experimental paradigm deals with a fixed resource
situation, only a limited number of exchange transactions can occur before
the subjects end up with equal sized piles of buttons in front of them. For
this reason, subjects were only given seven opportunities for exchange. Since the number of opportunities for exchange was limited, however, hypotheses 2 and 3 could not be tested as fully as would be desired. Given that these hypotheses assume learning effects, it is appropriate to ask whether seven opportunities for exchange would allow learning principles to operate in the way argued. The position taken here is that, even if seven opportunities did not allow the probabilities for intra net wealth level initiations to reach asymptotic values, the sequence of opportunities for exchange is long enough to allow the arguments that the hypotheses are based on (see p. 25) to be tested. Hence, once the hypotheses have been directly tested, the arguments that the hypotheses are based on will be tested too.

If hypotheses 2 and 3 are valid, increases in the independent variable (i.e., the magnitude of the initial net resource differences between subjects) should be associated with significant increases in low to low initiation rates over the seven opportunities for exchange. The corresponding increases in the high to high initiation rates over the seven opportunities for exchange would not be expected to be as large since hypothesis 1 predicted that the high to high initiation rates would be high even during the first opportunity for exchange. Note that initiations rather than acceptances will be looked at because an initiation occurs temporally prior to an acceptance and the distribution of acceptances that occurred during each opportunity for exchange may have been as much the result of the restrictions on what could be offered or given in return\(^3\) as the assumed learning principles. Though the restrictions on what could be offered or given in return would influence the distribution of initiations too, this influence would only be apparent after several opportunities for exchange.

The different distributions of initiations for the first and seventh
opportunities for exchange are reported in Table 3.

Table 3. Intra Wealth Level Initiations During the First and Seventh Opportunities for Exchange under Each Experimental Condition

<table>
<thead>
<tr>
<th>High-to-High Initiations</th>
<th>First Opportunity For Exchange</th>
<th>Seventh Opportunity For Exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>No initial net resource differences between subjects 24*</td>
<td>17.4%**</td>
<td>39.1%**</td>
</tr>
<tr>
<td>Moderate initial net resource differences between subjects 24</td>
<td>45.8%</td>
<td>70.8%</td>
</tr>
<tr>
<td>Extreme initial net resource differences between subjects 32</td>
<td>90.3%</td>
<td>90.0%***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Low-to-Low Initiations</th>
<th>First Opportunity For Exchange</th>
<th>Seventh Opportunity For Exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>No initial net resource differences between subjects 24</td>
<td>37.5%</td>
<td>41.6%</td>
</tr>
<tr>
<td>Moderate initial net resource differences between subjects 24</td>
<td>30.4%**</td>
<td>52.2%**</td>
</tr>
<tr>
<td>Extreme initial net resource differences between subjects 32</td>
<td>9.4%</td>
<td>50.0%</td>
</tr>
</tbody>
</table>

"High to high" and "low to low" terms properly apply only to the moderate and extreme differences conditions (i.e., in the no differences condition, the high to high initiations are high-position to high-position initiations and the low to low initiations are low-position to low-position initiations.

* N's calculated on the basis of four subjects on particular net wealth level per experiment run.

** Base for % is 1 less than indicated N because 1 subject chose to not make an initiation during this opportunity for exchange.

*** Base for % is 2 less than indicated N because 2 subjects chose to not make initiations during this opportunity for exchange.

Although the changes in the no differences condition percentages, in Table 3, were not predicted, the percentages for the seventh opportunity for exchange were still below the fifty per cent level that would be expected by
chance alone. In the cases of the moderate and extreme differences conditions, all the changes are congruent with the hypotheses. The small changes in the high to high initiation rates in the extreme differences condition are presumably the consequence of very high first percentages (i.e., it can be argued that the emergence of cliques composed of highs was immediate in this condition). The fact that the moderate and extreme differences low to low initiation rates did not rise higher than around 50% is presumably a reflection of the limited number of opportunities for exchange. In all it would seem reasonable to conclude that hypotheses 2 and 3 are supported by the data reported in Table 3. Nevertheless, the arguments on which these hypotheses were based will be investigated.

In the last chapter, it was argued that all the members of collectivities which meet the scope conditions of the theory would tend to initiate to the high wealth members during the first opportunity for exchange, but that the low wealth members would be likely to make initiations that are less favourable to the high wealth members than the high wealth members when initiating to high wealth members. On the basis of these arguments it was then concluded that the high wealth members would positively reinforce initiations from one another by accepting them and negatively reinforce initiations from the low wealth members by rejecting them.

First we will investigate whether the lows did in fact make initiations that were less favourable to the high wealth members than the highs when initiating to highs. If the initiations recorded for the three experimental conditions are coded according to whether the initiator: "offered more than requested", "offered the same as requested" or "offered less than requested", the results for the lows should be skewed toward the "offered less than requested" category when compared with the results for the highs. Moreover,
the degree of skew should be greater for the extreme differences condition than for the moderate differences condition. The percentages of initiations against which this prediction can be checked are set out in Table 4.

Table 4. Initiations to Highs under Each Experimental Condition: Offers Relative to Requests*

<table>
<thead>
<tr>
<th>Low-to-High Initiations**</th>
<th>High-to-High Initiations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offered more than requested</td>
<td>Offered less than requested ***</td>
</tr>
<tr>
<td>Offered more than requested</td>
<td>Offered less than requested</td>
</tr>
</tbody>
</table>

- **No initial net resource differences**
  - Between subjects
    - No initial net resource differences
      - Offered more than requested: 15.1% (7/24Ss)**
      - Offered less than requested: 25.5% (14/24Ss)**
    - Between subjects
      - Moderate initial net resource differences
        - Offered more than requested: 13.6% (6/24Ss)**
        - Offered less than requested: 41.0% (16/24Ss)**
      - Between subjects
        - Extreme initial net resource differences
          - Offered more than requested: 5.0% (3/32Ss)**
          - Offered less than requested: 44.6% (23/32Ss)**

* The data for all seven opportunities for exchange have been pooled because there were no apparent trends over the seven opportunities for exchange.

** The terms "low to high" and "high to high" properly apply only to the moderate and extreme differences conditions (i.e., in the no differences condition, the low to high initiations are low-position to high-position initiations and the high to high initiations are high-position to high-position initiations).

*** The "offered the same as requested" percentages are omitted for the sake of clarity.

**** The numbers in brackets are the numbers of subjects who made 1 or more offers of this sort (i.e., they indicate the consistency of the occurrence, across the individuals observed, of the type of behavior under scrutiny.

It would seem reasonable to conclude that the data presented in Table 4 support the argument being investigated. On the one hand, the lows were indeed less likely than either the low-position subjects in the no differences
condition or the highs to offer more than they requested. On the other hand, the lows were more likely than either the high-position subjects in the no differences condition or the highs to offer less than they were requesting. Both of these observations indicate that the lows were, in fact, more likely to make initiations that were less favourable to the highs than the highs when initiating to the highs.

Since the lows did not have the resources to compete with the highs for any length of time by offering more than they requested, this possibility need not be seen as having any importance for our theory. The only factor that could have been important, in the long run, was the impact that acceptance and rejection had on the direction of initiations. This is the point of the second argument which underlies hypotheses 2 and 3 and requires investigation.

Hypotheses 2 and 3 were based on the argument that the highs would negatively reinforce initiations from the lows. This argument is equivalent to the one that there should be a stronger tendency to change the target of initiation after rejection than after acceptance. A change in the choice of net wealth level rather than a change in the choice of person is predicted because subjects on the same net wealth level with the same resource profiles are considered to be equivalent stimulus conditions (after the stimulus generalization principle in operant psychology). Both the highs and the lows should have changed net wealth levels initiated to more often after having had initiations rejected, than after having had initiations accepted. The data required to check this argument are set out in Table 5.
Table 5. Changes of Net Wealth Level Initiated to After Acceptance and After Rejection Under the Moderate and Extreme Differences Conditions

<table>
<thead>
<tr>
<th>Last initiation</th>
<th>Last initiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>accepted</td>
<td>rejected</td>
</tr>
<tr>
<td>Moderate initial net resource differences between subjects (N157)*</td>
<td>40.2%</td>
</tr>
<tr>
<td>Extreme initial net resource differences between subjects (N208)</td>
<td>27.0%</td>
</tr>
</tbody>
</table>

* Since the data pertain to what the subjects did after the outcome for the last opportunity for exchange, there are 7-1 = 6 observations per subject. Note that the data for each experimental condition have been pooled, since there were no apparent differences in the data for these opportunities for exchange.

Note. It is not possible to give a simple indication of the consistency of the data because when we evaluate both the notion of positive reinforcement and the notion of negative reinforcement both the stability and change of choice of net wealth level initiated to in relation to the outcomes for the immediately preceding operants has to be taken into account.

Again, it would seem reasonable to conclude that the data presented support the argument being checked out. Subjects in both the moderate and extreme differences conditions were more likely to change their choice of level initiated to if their last initiation was rejected than if it was accepted. The claim that the subjects were orienting to levels of net wealth and not other stimulus factors is supported by the observation that both the highs and the lows tended to direct their first initiations to the highs (see Table 2, p. 49).

Hypothesis 4. The members of each clique that emerges within a collectivity will approve of one another more than they will approve of the other members of the collectivity who are not members of their clique.
The argument that led to hypothesis 4 was based on a number of assumptions concerning the relationship between reinforcement effects and the generation of sentiments of approval and disapproval. It was assumed that the acceptance of initiations reinforces positive sentiments toward the acceptor and that rejection of initiations reinforces negative sentiments toward the rejector. In addition, it was assumed that the receipt of an initiation that can be accepted reinforces positive sentiments towards the initiator and that either the non receipt of initiations or the receipt of initiations that cannot be accepted reinforce negative sentiments toward the initiator. Furthermore, it was argued (on the basis of hypotheses 1, 2 and 3) that the highest rates of rejection (and, correspondingly, the lowest rates of acceptance) would be experienced by low wealth members when they are initiating to high wealth members and that the highest rates of acceptance (and, correspondingly, the lowest rates of rejection) would occur between members on the same net wealth levels. If all of these assumptions and arguments are sound, the post experimental approve/disapprove votes that subjects cast toward one another (see appendix V) in the second and third sets of experiments should have been distributed in the manner predicted by hypothesis 4.

The first step toward testing hypothesis 4, then, will be that of ascertaining whether the acceptance and rejection rates were as assumed. The data reported in Table 6 indicate the rates of inter and intra net wealth level acceptance rates (and, corresponding rejection rates).
Table 6. Inter and Intra Net Wealth Level Initiations Accepted under Each Experimental Condition

<table>
<thead>
<tr>
<th>Condition</th>
<th>% Acceptances*</th>
<th>N**</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Position-to-High-Position</td>
<td>69.2%</td>
<td>78</td>
</tr>
<tr>
<td>Initiations***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-Position-to-Low-Position</td>
<td>72.8</td>
<td>77</td>
</tr>
<tr>
<td>Initiations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Initial Net Resource Differences Between Subjects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-Position-to-Low-Position</td>
<td>54.3</td>
<td>83</td>
</tr>
<tr>
<td>Initiations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-Position-to-High-Position</td>
<td>50.0</td>
<td>86</td>
</tr>
<tr>
<td>Initiations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-to-High</td>
<td>59.6</td>
<td>109</td>
</tr>
<tr>
<td>Initiations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate Initial Net Resource Differences Between Subjects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-to-Low</td>
<td>67.5</td>
<td>77</td>
</tr>
<tr>
<td>Initiations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-to-Low</td>
<td>45.7</td>
<td>57</td>
</tr>
<tr>
<td>Initiations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-to-High</td>
<td>46.6</td>
<td>88</td>
</tr>
<tr>
<td>Initiations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-to-High</td>
<td>68.2</td>
<td>179</td>
</tr>
<tr>
<td>Initiations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extreme Initial Net Resource Differences Between Subjects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-to-Low</td>
<td>77.8</td>
<td>99</td>
</tr>
<tr>
<td>Initiations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-to-Low</td>
<td>31.7</td>
<td>41</td>
</tr>
<tr>
<td>Initiations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-to-High</td>
<td>31.4</td>
<td>121</td>
</tr>
<tr>
<td>Initiations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Complementary percentages equal the percentages of initiations rejected.

** Since subjects were free to decide to which subjects they would direct their initiations, the N's were free to vary.

*** High-position subjects are those subjects that sat at the same booths as the highs and low-position subjects are those subjects that sat at the same booths as the lows.
All the percentages for the moderate and extreme differences conditions appear to be in line with the assumptions concerning the relevant reinforcement effects that underly hypothesis 4. The percentages for the no differences condition, however, are not quite as expected. These percentages should, presumably, all be similar. The discrepancies are due to the results of three of the six experiments that were run under the no differences condition. For some non-obvious reason, cliques seemed to emerge among the I,J,M and N subjects and among the G,H,K and L subjects in these experiments. In contrast to this variability in the patterns of interaction in the no differences experiments, the variability in the patterns of interactions in the extreme differences experiments was minimal.

In spite of the anomalies in the data for the no differences experiments, it should be noted that the predicted pattern of percentages is stronger in the extreme difference data than in the moderate differences data.

The next step toward testing hypothesis 4 is that of ascertaining whether the distribution of approve/disapprove votes reflect the pattern of results in Table 6: that is, whether the highest rates of approval and the lowest rates of disapproval occurred between subjects on the same net wealth levels. The results obtained are set out in Table 7.
Table 7. Post Experimental "Approve" and "Disapprove" Votes Directed Toward Fellow Net Wealth Level Subjects

<table>
<thead>
<tr>
<th>No Initial Net Resource Differences between Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 High-Position subjects* directed 48.9% (N45) approve votes and 47.3% (N36) disapprove votes toward fellow High-Position subjects</td>
</tr>
<tr>
<td>20 Low-Position subjects directed 40.0% (N45) approve votes and 56.5% (N23) disapprove votes toward fellow Low-Position subjects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Moderate Initial Net Resource Differences between Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>23 Highs directed 52.4% (N42) approve votes and 42.8% (N28) disapprove votes toward fellow Highs</td>
</tr>
<tr>
<td>21 Lows directed 57.2% (N42) approve votes and 34.4% (N32) disapprove votes toward fellow Lows</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extreme Initial Net Resource Differences between Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>27 Highs directed 71.2% (N59) approve votes and 42.0% (N31) disapprove votes toward fellow Highs</td>
</tr>
<tr>
<td>27 Lows directed 75.6% (N45) approve votes and 21.0% (N43) disapprove votes toward fellow Lows</td>
</tr>
</tbody>
</table>

*(i) high-position subjects are those that sat at the same booths as the highs and low-position subjects are those that sat at the same booths as the lows.

(ii) 2/24 high-position and 4/24 low-position subjects in the no-initial-differences-between-subjects condition, 1/24 highs and 3/24 lows in the moderate-differences condition and 5/32 highs and 5/32 lows in the extreme-differences condition did not bother (or were not able) to indicate approval or disapproval for any of the other subjects in their collectivity. Those subjects that did indicate approval or disapproval toward other subjects generally limited themselves to 2 or 3 of the 7 other subjects in their collectivity.
The percentages in Table 7 appear to be much as predicted by Hypothesis 4. The only discrepancies would seem to be in the percentages for the low-position subjects where the figures are somewhat lower than the 50% level that would be expected on the basis of chance alone. The analysis, nevertheless, can be taken another step. Since the approve/disapprove votes are assumed to be generated through actual interaction or contact between subjects, the pattern of contacts associated with both approve and disapprove votes should be looked at. If the theory underlying hypothesis 4 is sound, subjects should have been most likely to direct votes toward subjects with whom they had had actual contact.

According to the theory, contact between subjects can be of two sorts. First there are the initiations that ego makes, and second there are the initiations that ego receives. Both sorts of contact involve acceptances and rejections. The theory does not include a rationale for weighting the importance of the two sorts of contact, and so ego is predicted to have been more likely to approve than disapprove of alter if the balance between all the initiations accepted and all the initiations rejected is in favour of the initiations accepted and vice versa. To test this part of the theory, all the pairs of subjects that had any contact at all will be looked at and the histories of interactions between them will be classified according to the percentage of initiations accepted and whether they were associated with an approve vote or a disapprove vote. The results are set out in Table 8. The vertical percentages indicate the way the votes that were actually cast were distributed across the different acceptance levels while the horizontal percentages indicate the likelihood of approval votes and disapproval being associated with histories of interaction which fall into the different categories of acceptance.
Table 8. Distribution of Approval and Disapproval Votes Across Different Levels of Acceptance*

<table>
<thead>
<tr>
<th>Approval Votes (N=274)</th>
<th>Disapproval Votes (N=197)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution according to percentage of initiations accepted in histories of all action histories characterized by acceptance level and associated with approval votes</td>
<td>Distribution according to percentage of initiations accepted in histories of all action histories characterized by acceptance level and associated with disapproval votes</td>
</tr>
<tr>
<td>% of all Initiations between rater and rated accepted</td>
<td>% of all Initiations between rater and rated accepted</td>
</tr>
<tr>
<td>50-100%</td>
<td>70.45%</td>
</tr>
<tr>
<td>0-49%</td>
<td>54.65%</td>
</tr>
<tr>
<td>17.15%</td>
<td>19.15%</td>
</tr>
<tr>
<td>12.40%</td>
<td>14.20%</td>
</tr>
<tr>
<td>No histories of interactions between rater and rated i.e., no initiations either accepted or rejected</td>
<td>4.70%</td>
</tr>
</tbody>
</table>

* The data for the no, moderate and extreme differences experiments were pooled because there were no apparent differences in the patterns of contact associated with either the approve or disapprove generated under the three conditions.

** The column of percentages for interaction sequences that were not associated with either an approve or a disapprove vote has been omitted for the sake of clarity.
The results set out in Table 8 appear to be in line with the theory. Looking at the vertical percentages, 70.45% of the approve votes fall in the 50-100% acceptance level and 51.80% of the disapprove votes fall in the 0-49% acceptance level. Only 12.40% of the approve votes and 14.20% of the disapprove votes are not associated with contact between the raters and rated.

Looking at the horizontal percentages, 54.65% of all the interaction sequences that fall on the 50-100% acceptance level are associated with an approve vote while 41.60% of all the histories of interaction that fall on the 0-49% acceptance level are associated with a disapprove vote.

The theory, presented in chapter II, predicts the generation of approval or disapproval on the basis of the outcomes of all the initiations that flow between ego and alter. That is, the theory takes into account both the initiations made by ego and the initiations made by alter. The significance of the element of the data concerning the initiations that alter makes might be questioned. It can be noted, however, that this element of the data did increase the theory's ability to predict approval and disapproval votes. If just the initiations that ego made are taken into account, only 65.25% of all the histories of interaction associated with approve votes fall into the 50-100% acceptance category and only 45.65% of all the histories of interaction associated with disapprove votes fall into the 0-49% acceptance category.7

Evaluation of Results

The data reported in the first section of this chapter were collected to test the theory advanced in chapter II. These data will now be evaluated in an overall sense. In the main, percentage differences have been relied upon because it can be argued that statistical tests of significance are not
applicable since up to seven observations of each subject were recorded. That is, it can be argued that the subjects' successive initiations would have been related so that the observations made are not independent. Interdependence among the data would, of course, lead to a less than conservative evaluation of results because the power of statistical tests of significance depends upon the number of observations made and interdependence among observations means that the latter observations do not contribute as much information as the first observations made.

The problem faced in this section is that of deciding whether or not the data are sufficiently reliable to permit conclusions concerning the general validity of the theory.

The data for the first opportunity (see Table 2, p. 49) are certainly well in line with the expectation that both highs and lows would begin by initiating to the highs. The strength of the remaining data, however, is more difficult to assess. The main difficulties would seem to stem from the limited number of opportunities for exchange. Although the data clearly indicate that a high rate of interaction between the highs quickly emerges, it has to be argued that the interaction sequences are hardly long enough for comparable rates to emerge between the lows (see Table 3, p. 52). Yet it can also be argued that the greater tendency for the lows to offer fewer buttons than they request when initiating to highs (see Table 4, p. 54) and the stronger tendency for subjects to change their target of initiation after rejection than after acceptance (see Table 5, p. 56), suggest that the prediction regarding the formation of cliques of lows would be correct in the long run.

The data that was advanced as being relevant to the predictions concerning sentiments of approval and disapproval are generally in line with
the predictions. Indeed, it might be felt that the data appear stronger than
might have been expected given that the histories of interaction were generated
by only seven opportunities for exchange (i.e., a possible of 14 exchanges
since the experimental paradigm allows ego to receive initiations at the same
time as he initiates to one of the other subjects): the fact that subjects
were not asked to indicate the intensity of their approval or disapproval may
account for this.

The fact that there are clearly detectable patterns throughout the data
for each set of experiments, coupled with the fact that the predicted
differences are greater between the no and extreme differences conditions than
between the no and moderate differences conditions would seem to justify a good
deal of confidence in the theory set out in chapter II. It might also be
claimed that this confidence would justify the belief that the theory advanced
constitutes an advance on the Leik et al formulation that was discussed in
chapter I. Despite this confidence, however, it has to be admitted that the
theory could stand more severe testing. The research design, for example,
could be modified to allow more extended interaction sequences. This might be
achieved either by giving the subjects more buttons at the start of the
experiment, or by imposing smaller limits on the size of offers that can be
made so that each subject has to enter into a greater number of exchanges
before he has two equal piles in front of him. It might also be achieved by
running the same collectivity through a series of sessions in which the members
begin each session with fresh sets of resources that are the same as they had
in the first session. The last possibility would, of course, imply continual
injection of new resources into the situation and would call for modification
of scope condition 3 in the theory.

One of the considerations underlying the formulation of the research
design described in chapter III was a desire to advance a paradigm that could be used as the basis for a series of investigations. The research design advanced meets this objective. Besides the suggestions made in the last paragraph, a number of different experiments could be run with profit. Future work to investigate the consequences of more extreme initial net resource difference between subjects would be worthwhile. There is reason to think that the theory will break down if the difference between the net wealth levels is too great. As was pointed out in chapter II when hypothesis 2 was advanced, at some point the lows may persist in running very high risk for high gain so that cliques of lows may never form. In addition, the hypotheses (especially hypothesis 3 about the order in which cliques emerge) should be retested by running experiments with distributions of resources that involve more than two net wealth levels.
Subjects were solicited from all first and second year, University of British Columbia, 1970/71 Chemistry classes. The experimenter attended a lecture session for each class and asked for volunteers. The students were told: "...The experiment that you are being asked to take part in involves a type of game situation. You will sit around a table with seven other volunteers and engage in a type of game. There are no nasty experiences - no electric shocks, etc. At the conclusion of the experiment, the experimenter will fully discuss the theory back of the experiment and the problems involved in running such experiments. The people who have taken part in these experiments have said that they enjoyed the experience. Each experiment takes less than one hour - that is, you will be asked to come to the Small Groups Laboratory for one one-hour session." Those students who indicated that they wanted to take part in an experiment (usually about 10% of the class) were given timetables so that they could indicate at which time they would be free to come to the Small Groups Laboratory. Volunteers were also asked to put their telephone numbers on the timetable so that the experimenter could let them know what time he would like them to come. For each experiment, nine volunteers were contacted and asked to come at an appointed time. Generally at least eight would remember to do so. Occasionally, however, only seven would show up in which case the experimenter would find a substitute volunteer in a lounge beside a lecture hall in the same building as that in which the Small Groups Laboratory is situated. In all some 240 volunteers were used in pilot experiments and 160 were used in the experiments reported here. The main difficulty encountered during the pilot stage concerned the problem of getting a set of instructions that were clear enough to be quickly assimilated by all the members in a collectivity.

There were not enough subjects to run 8 or more experiments in each set. Eight experiments were run in the third set because the third set of experiments focused on extreme differences in the distribution of resources and the experimenter felt that experiments in this condition might be the most interesting from a theoretical point of view.

See scope condition 6. Each subject's limit was set at 1/20th of the number of buttons that was in his largest pile to begin with. Hence, in the control experiments all the subjects had limits of 30, in set 2 the highs had limits of 35 and the lows had limits of 25 and in set 3 the highs had limits of 40 and the lows had limits of 20.

See R.L. Burgess and R.L. Akers, Are operant principles tautological? Psychological Record 16 (1966), pp. 305-312. P. 311, "2.b.2. Law of Generalization Type II: Whenever a stimulus acquires conditioned reinforcing properties, then other stimuli will take on reinforcing properties to the extent that they are similar to the original conditioned reinforcer."
See appendix X, A: Results for experiments 3, 4 and 5.

E.g., the numbers of acceptances in the high to low initiations for each of the eight experiments in the extreme differences condition were: 16, 16, 17, 14, 16, 16, 12, 17.

C.f. When just the initiations that alter made are taken into account, only 61.00% of all the histories of interaction associated with approve votes would fall in the 50-100% acceptance category and only 37.60% of all the histories of interaction associated with disapprove votes would fall in the 0-49% acceptance category.
CHAPTER V

A WIDER CONTEXT

Preceding chapters have been devoted to an investigation into the relationships between: the distribution of resources, the formation of cliques and the generation of sentiments of approval and disapproval in experimental collectivities. This final chapter will deal with the problem of placing the work reported into the broader context of the sociology of social stratification in general. But before this problem is broached, one point should be understood. There will be no attempt to generalize from the findings reported in chapter IV to naturally-occurring collectivities. The laboratory experiments described in chapter III were specifically designed to test the hypotheses set out in chapter II and the data that resulted are not relevant to anything but these hypotheses. What will be attempted is a comparison between these hypotheses and recorded observations of naturally-occurring collectivities. To the degree that these naturally-occurring collectivities can be seen as being characterized by the scope conditions of the theory presented in chapter II, these observations can be taken as further data against which the hypotheses can be tested. There is no intention, however, to push the claim that all the scope conditions are met by all the naturally-occurring collectivities that have been looked at. What is being suggested is that comparison between the hypotheses and the observations that have been made of these naturally-occurring collectivities may lead to a better understanding of the range of phenomena to which the theory either is, or could be made, relevant.

The strategy that will be adopted is that of first considering how
hypothetical collectivities would function if they met the scope conditions of
the theory and then comparing these conclusions with reported observations of
naturally-occurring collectivities also meeting these conditions.

The cliques predicted by the theory can be concisely described in the
following way: (i) the members in each clique have similar net wealth levels
(i.e., the cliques can be ordered in terms of the mean net wealth levels of
their members), and (ii) the members of each clique approve of one another
more than they approve of the members of other cliques in their collectivity.

It is a fact that naturally-occurring groups have been described in very
similar terms. For example, Sorokin has written about naturally-occurring
groups which he calls social classes that are:

"...(1) legally open but actually semi-closed;
(2) normal; (3) solidary; (4) antagonistic to
certain other groups (social classes) of the same
general nature, X; (5) partly organized but mainly
quasi-organized; (6) partly aware of its own unity
and existence and partly not; (7) characteristic
of the Western society of the eighteenth, nineteenth,
and twentieth centuries; (8) a multibonded group
bound together by two unibonded ties - occupational
and economic (both taken in their broad sense) and
one bond of social stratification in the sense of
the totality of its essential rights and duties as
contrasted with the essentially different rights
and duties of other groups (social classes) of the
same general nature, X...."2

And Mayer and Buckley have written about social classes in the following way:

"...in a class system, the social hierarchy is
based primarily upon differences in monetary
wealth and income. Social classes are not
sharply marked off from each other, nor are they
demarcated by tangible boundaries. Unlike estates,
they have no legal standing, individuals of all
classes being in principle equal before the law.
Consequently there are no legal restraints on the
movement of individuals and families from one class
to another. The same is true of intermarriage which,
while it may be frowned upon and informally
discouraged, is not usually prevented by law or
insuperable social pressures. Unlike castes,
social classes are not necessarily organized, closed social groups. Rather, they are aggregates of persons with similar amounts of wealth and property and similar sources of income. Nevertheless, they may be analytically separated into statistically significant subgroups or subcultures in terms of such criteria as interaction patterns, political attitudes, and life styles.

In societies marked by a class system the differences in wealth and income are expressed in different ways of life: patterns of consumption, types of education, speech, manners, dress, tastes and other cultural attributes. In turn, these differences give rise to the formation of status groups. These are informal social groups whose members view each other as equals because they share common understandings - as expressed in similar attitudes and similar modes of behavior - and who treat or regard outsiders as social superiors or inferiors. Thus in a class society there develops a hierarchy of status groups that is not identical with the hierarchy of economic classes.

There is a considerable amount of movement up and down the class and status hierarchies. Although the individual acquires his initial position at birth, ascription does not necessarily determine his later social rank, which can be changed through the acquisition or loss of wealth and other attainments. As a result, class societies are apt to be highly competitive and fluid, since individuals and families may compete for wealth and social position on the basis of personal qualities and achievements...."3

Obviously social classes are more complex than the cliques described here: for instance, both Sorokin and Mayer and Buckley talk about factors such as "rights" and "duties". Yet it would seem that the core criteria used to define social classes are the criteria that we have used to define cliques.

Because wealth dimensions are valued by all the members of a collectivity it can be assumed that every member of the collectivity would like to have a high net wealth level, which is not to say that those members of the collectivity who do not belong to cliques of high mean net wealth levels will like or approve of the members of the collectivity who do. In
fact, the theory suggests that respect for the possession of resources and sentiments of approval will be orthogonally related. It is interesting that an investigation of this issue in a naturally-occurring situation found that respect was a positive function of the occupational status of the stimulus person and a negative function of the occupational status of the respondent and that friendship was an inverse function of the difference in status between the person and the respondent.

According to the theory, the parties involved in exchange interactions, in a collectivity which meets the scope conditions, will tend to have:
(i) resource dimension level profiles that complement one another, and (ii) similar net wealth levels because sequences of exchanges will only occur when reciprocal benefits are realized during each exchange interaction. If the theory applies to naturally-occurring collectivities, only cliques that involve individuals of similar net wealth levels will be observed. The literature on 'choice of best friend', as it happens, strongly suggests that people choose people of similar economic status to themselves as friends. In fact, Kahl and Davis claim that:

"The evidence is clear, persons of similar prestige are likely to associate with one another in those recreational situations where free choice is available. The differential costs of the activities engaged in at the different status levels and the different educations, habits and values that characterize people at the separate prestige levels make people more comfortable with their own kind."
(Kahl and Davis, 1965, p. 153)

Although the theory was limited to situations in which one person gives amounts of one material commodity to another in return for amounts of another material commodity, scope condition 2 could be modified so that the theory encompassed situations involving certain non material resources such as
knowledge. It is an interesting fact that the results of a number of studies of communication patterns within groups reported in the literature have the same general gestalt that we would predict if the situations involved material resources. For example, Riley et al (1954) asked 9th and 10th grade girls whom, in their own grade, they would most likely talk with on each of a number of designated topics which ranged from issues concerning peer relations to problems of right and wrong, and found that the girls tended to choose others of either equal or higher social status. And Hurwitz et al (1960) in a study of communication in groups composed of mental hygiene workers of high and low occupational status found that both the highs and the lows were most likely to direct their communications to highs.

Finally, the basic assumption underlying the theory is that the members of a collectivity exchange amounts of resources with one another because they perceive that they will be better off with similar amounts of both resources than with a lot of one resource and a little of the other. It follows from this assumption that each member's levels on the two resources will equilibrate as a consequence of the exchange interactions in which he is involved. If resource dimensions are status dimensions, this argument is very similar to that advanced by Benoit-Smullyan who observed that the status levels exhibited by the members of naturally-occurring groups appear to equilibrate over time.

Conclusion

The aim of this chapter has been to suggest that a number of aspects of social stratification in naturally-occurring collectivities that have been studied might be explained by a theory similar to the theory presented in
chapter II. Out of need, the case has been sketched rather than demonstrated conclusively because attention has never been specifically directed toward the identification and tabulation of resources flowing via repeated exchange interactions between the members of naturally-occurring situation. Nevertheless, enough has been demonstrated to justify the claim that the theory presented merits further work.
FOOTNOTES


4 H.C. Triandis and V. Vassiliou, Social status as a determinant of respect and friendship acceptance. Sociometry 29 (1966), pp. 396-405. The researchers interviewed a representative sample of 400 residents in Athens (Greece).


<table>
<thead>
<tr>
<th>Average status of three best friends</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Status of Respondent</strong></td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>
Table 3.
Percentage of best friends in each occupational category by occupation of respondent:

<table>
<thead>
<tr>
<th>Occ. Category of Respondent</th>
<th>A. Males</th>
<th>B. Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I II III IV V</td>
<td>I II III IV V</td>
</tr>
<tr>
<td>I Professional &amp; managerial</td>
<td>73 20 6 1 -</td>
<td>76 16 4 2 2</td>
</tr>
<tr>
<td>II Clerical &amp; Sales</td>
<td>9 75 6 5 5</td>
<td>12 61 11 11 5</td>
</tr>
<tr>
<td>III Skilled manual</td>
<td>10 22 49 10 9</td>
<td>11 38 28 16 8</td>
</tr>
<tr>
<td>IV Semi skilled manual</td>
<td>4 19 20 35 23</td>
<td>7 25 17 37 15</td>
</tr>
<tr>
<td>V Unskilled manual</td>
<td>9 16 12 18 44</td>
<td>8 21 19 16 35</td>
</tr>
</tbody>
</table>

Note: figure in cells represent proportion of topics they would like to talk about (i.e., the desired amount of communication).
Frequency of communication between high and low status mental hygiene workers:

<table>
<thead>
<tr>
<th>Status of communicator</th>
<th>Status of recipient</th>
<th>Frequency of Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>high</td>
<td>high</td>
<td>4.89</td>
</tr>
<tr>
<td>high</td>
<td>low</td>
<td>3.66</td>
</tr>
<tr>
<td>low</td>
<td>high</td>
<td>3.61</td>
</tr>
<tr>
<td>low</td>
<td>low</td>
<td>2.71</td>
</tr>
</tbody>
</table>

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**Articles**


Deutsch, M. Homans in the Skinner box. Sociological Inquiry 34 (1964)n2, pp. 156-165.


Heath, A. MacIntyre on Blau. (Correspondence). *Sociology* 2 (1968)n1, pp. 93-96.


Unpublished Material


APPENDIX I

PILOT WORK

The first experiments carried out suggested that exchanges were almost random and on the basis of informal post experimental interviews it was decided that as a consequence of the instructions used the principle of diminishing marginal utility was not operating. The problem seemed to lie in the fact that the subjects did not know what the buttons would be used for and hence did not know how to value the buttons. Hence, subjects were asked to operate on the basis of a table that indicated how much different numbers of buttons would be worth during the second part of the game. The procedure of giving subjects a table to base their calculations on is preceded in a study by S.S. Siegel and L.E. Fouraker, Bargaining and Group Decision Making. (New York: McGraw-Hill, 1960). It had the advantage of standardizing the value of given numbers of the different coloured buttons without necessitating further information about the second part of the experiment. The provision of the tables resulted in a skewing of initiations toward the highs. Further experiments led first to the application of limits on what the subjects could offer and second to limits on what could be given in return.

The following data are the results of six experiments run using four subjects per experiment: 1 high 600 blue, 1 high 600 yellow, 1 low 300 blue, and 1 low 300 yellow. Highs could not offer more than 50 buttons at a time though there was no restriction on how many buttons they could ask for in return. Lows could not offer more than 25 at a time and again there was no restriction on how many buttons they could ask for in return. 11/12 highs and 10/12 lows initiated to a high during the first opportunity for exchange.
During the second opportunity for exchange, however, 8/12 highs and 7/12 lows initiated to lows. From opportunity 3 through to opportunity 6 the subjects returned to initiating predominantly to the highs. It seemed most likely that the odd results for opportunity 2 were caused by: (i) the fact that the lows' failure to enter into exchanges during the first opportunity had made them conspicuous in that they still had only one pile of buttons in front of them, and (ii) the utility of response variability (see S. Siegel in collaboration with Alberta Siegel and Julia M. Andrews, *Choice Strategy and Utility*, New York: McGraw-Hill, 1964). The fact that the lows did not give up initiating to the highs seemed to be a consequence of the fact that the odd large offers to the lows from the highs that were accepted by the lows (i.e., there were no restrictions on what subjects could give in return) mitigated the need for the lows to get together. Subsequent experiments were run giving subjects initial amounts of both resources and applying restrictions not only to what could be offered but also to what could be given in return.
APPENDIX II

LABORATORY SET-UP

A. The booths used were as illustrated in Figure 9.

Figure 9. A booth

1. Dacron polyester, semi sheer gauze with 1/16 inch sheer strips running vertically and horizontally 1/4 inch apart. When the room was illuminated from the center, subjects could see through the gauze window in front of them but not through both their window and the windows in front of the other subjects.

2. Card telling subject what resources he had to begin with.

3. Subject's letter (also on the front of the booth so that the other subjects could see it).

4. A 4 inch gap allowed subject to keep his buttons out in front of the booth so that the other subjects could see them.

5. Card telling subject that there are limits on the size of offers he can make and the size of amounts he can give in return.

6. Table indicating the worth of different numbers of buttons of a given colour for the second part of the game. The instructions drew attention to the fact that the table implies law of diminishing marginal utility.
B. The cards pinned to the lower bar of the booths were as illustrated in Figure 10.

Figure 10. Sample cards pinned to lower bar of each subject's booth.

G.

600 Blue
30 Yellow

LIMITS
You cannot offer more than 30 buttons at a time
You cannot accept any offer that requires you to give more than 30 buttons in return.

There are no restrictions on what you ask for in return for what you offer.

C. Figure 11 is a copy of the table pinned to the side of each subject's booth (note that the table is based on an exponent of .5 - see: p, 67 Decision Making. Edited by W. Edwards and A. Tversky. Edwards, discussing the utility of money, says, "...The most direct way of finding out how valuable $10 is to someone is to ask him. No one has done that but Stevens reports anecdotally the results of a semi experiment in which Galanter asked Ss how much money would be twice (or half) as desirable as $10, and other amounts. He found results consistent with Steven's general power law for psychophysics, with an experiment of 0.5, which implies decreasing marginal utility....")
Figure 11. Copy of the Table pinned to the side of each subject's booth (upper half)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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Total number of buttons of a given colour: 
(Notice that the increments on this side are all equal.)

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</table>

Net worth of total number of buttons of a given colour in value units for the second phase of the experiment. (Notice that the increments on this side are smaller at the top than at the bottom.)
Figure 11 (continued)

<table>
<thead>
<tr>
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Total number of buttons of a given colour:

<table>
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<tbody>
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<td>100</td>
<td>1000</td>
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Net worth of total number of buttons of a given colour in value units for the second phase of the experiment.

<table>
<thead>
<tr>
<th>90</th>
<th>949</th>
</tr>
</thead>
<tbody>
<tr>
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<td>547</td>
</tr>
<tr>
<td>20</td>
<td>446</td>
</tr>
<tr>
<td>10</td>
<td>316</td>
</tr>
</tbody>
</table>

Base line zero 0

Net worth of total number of buttons of a given colour in value units for the second phase of the experiment.

(Notice that the increments on this side are smaller at the top than at the bottom.)
APPENDIX III

INSTRUCTIONS

The instructions were given by means of a tape recorder - the same instructions were used for each experiment. The instructions were taped because it was noticed during pilot work that some subjects seemed to have trouble assimilating the instructions when they were given in written form. The instructions were given in as informal and relaxed a way as possible. The following is a transcript of the instructions employed.

"...Hi! Thanks for tuning up to take part in this experiment.

You are going to play a game called exchange and build and as the name suggests there are going to be two parts to it. The instructions, that I am going to give you now, only concern the first part and we are going to forget about the second part until later.

Exchange and build is the sort of game in which some of you will do better than others - in other words, you will be out for yourselves.

During this first part of the game, you are going to be exchanging or trading buttons with one another and the object of the first part of the game is to build up the small pile of buttons in front of you without losing too many buttons from the large pile in front of you. Let me put that another way. The object of the first part, then, is to increase the number of buttons of which you have least at the moment without losing too many buttons of which you have most.

You need to do this because in the next part of the game the two colours are used for completely different purposes. So you will need buttons of both colours in the next part of the game.

Now if you look at the table on the side of your screen you'll notice that there are two columns of figures there. The column of figures on the left refer to different sized piles of buttons of a given colour - the column on the right tells you how much these different sized piles of buttons of a given colour would be
worth in the next part of the game. Now if you look closely at the figures in the columns, you'll notice that the figures on the left increase ten at a time so they go ten, twenty, thirty, forty and so on right up to 800. However, the figures on the right increase in big jumps to begin with and the jumps get smaller and smaller as you go from the bottom up to the top. Because the figures in the two columns increase in different ways, the table tells us two very important things. The first thing it tells us is that if you have got a lot of buttons of a given colour ten more would be worth less to you than if you only had a few buttons of that colour...ahmm... let me show...let me demonstrate that. Say you had a pile of 790 blue buttons you see that they would be worth 2806 value units in the next part of the game...O.K. ...and if you got ten more of them it would put your pile up to 800 and a pile of 800 is worth 2826 so that you would have gained 20 value units. However, if you only had a pile of 100 blue buttons and you got ten more you find that 100 blue buttons would be worth 1000 value units for the next part of the game and a pile of 110 is worth 1049 - so whereas if you had 790 buttons ten extra are worth 20 value units, if you've only got 100, ten extra are worth 49. Once again the idea is that the more buttons you have of a given colour the less worth ten extra would be. This is the same thing as saying that $10 is worth less to a millionaire than say to a person on welfare. ....The second thing that the table tells you is that if you have a lot of buttons of one colour and only a few of the other colour you will actually increase the worth of your buttons every time you exchange some of the buttons of which you have most for some of the buttons of which you have least. Now let me show you how this works.....if you had...say 800 blue buttons you find that they are worth 2826 value units for the next part of the game ....O.K. ....and if that was all you had..... you decided that you had to...that you would exchange one half of your blue buttons for some yellow buttons so that you would end up with 400 blue buttons and 400 yellow buttons you'd find that a pile of 400 blue buttons would be worth - well see it from the table - 2000 value units and since you've also managed to get a pile of yellow buttons they would also be worth 2000 value units so two piles of
buttons are worth 2000 + 2000...4000 value units and you notice that whereas 800 blue buttons were only worth 2826 value units, two piles: one pile of blue and one pile of yellow - 400 each - would be worth 4000 value units. So you would have actually increased the value of your buttons by exchanging. Since big piles are of course better than small piles, you'll be even better off if you can pick up a few buttons while you are exchanging — that is, if you can get the others to give you a few more in return than you have to give them — though, of course, you may find this difficult to do because the others might not like the idea.

If you look through your screen, you'll notice that each of the other screens has a letter printed at the top of it — you'll notice that your screen has a letter printed on the lower bar just in front of you.

Now - I'm going to run through the steps involved in a single exchange opportunity so that you'll get a better idea of what you are going to do. Remember you are going to have a number of these exchange opportunities.

First of all you'll look through your screen to see what the others have and decide whether you want to send an offer to one of the others...ahmm...you do not have to send an offer unless you want to....so if you decide that you want to send an offer then you'll fill out one of the forms in front of you....now....you cannot send an offer of more than the limit that's written on the card pinned to the lower bar of your screen. However, you can ask for whatever number of buttons you like in return for the buttons you offer...so that although there is a limit on what you are allowed to offer, there is no restriction on what you are allowed to request in return for what you offer....ahmm... Once you've done this — once you've filled out a form and counted out the buttons that you are offering, put both the form and the buttons in the bowl in front of you. When everyone has done this, I'll deliver all the bowls to the people that they are addressed to.

Now - it is clear that while your bowl is round at someone else's booth either one or more bowls may come round to your booth and you can accept one — only one — providing it does not require you to give more than your limit in return. You cannot accept any offer that requires you to give more than your limit in return.

If you accept an offer, put a check mark on
the form that came with it and any offers that you reject put crosses on the forms that came with them. When everyone has done that, I'll ask those who have accepted an offer to take the buttons that were sent to them and to count out the buttons that they were requested to give in return. I'll then return all the bowls to their owners and, of course, we'll be ready to begin the next exchange opportunity.

I'd just like to be clear on one point that during each exchange opportunity two things are happening: somebody might be rejecting or accepting an offer from you at the same time as you are accepting or rejecting an offer from somebody else...O.K.

Now...throughout the course of this part of the game, try to keep your buttons out in front all the time so that the others can see what you've got and you can keep track of how many buttons you have on your scratch paper - the piece of yellow paper that you've been provided with...ahmm...the numbers that you're beginning with are written on the small card pinned to the lower bar of your screen.

This first part of the game will take us about 40 minutes and you'll find that once we get going you'll have plenty of time to make all the exchanges that you need to.

(slight laugh) Now I suppose I should say this...please do not cheat. Count out any buttons that you are offering accurately and observe the limits on...written on the card on the lower bar of your screen. That is, don't make any offers that are larger than your limit and don't accept any offers that require you to give more than your limit in return...O.K.

So if you'd just like to look through your screen now and decide whether you want to send an offer to one of the others during the first opportunity, we can begin."

(Time for tape: 12 minutes)

Notice that the instructions emphasize:

(1) that the two colours are needed because they will be used for different purposes in the second part of the game,

(11) that the situation is competitive in the sense that some subjects will supposedly do better than others,
(iii) that the principles of diminishing utility applies to the two colours, and

(iv) that there will be plenty of time for the subjects to complete all the exchanges that they want to.
APPENDIX IV

POSITION EFFECTS

Table 9 gives the results of the first initiation in Set 1. These results indicate that there is a tendency to initiate to the most visible person.

Table 9. Visibility of Positions and Initiations During the First Opportunities for Exchange Under the No Differences Condition

<table>
<thead>
<tr>
<th>Initiator:</th>
<th>To subject furthest away (i.e., most visible)</th>
<th>To subject on left side</th>
<th>To subject on right side</th>
<th>To subject immediately adjacent</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>I</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>K</td>
<td>3</td>
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<td>2</td>
<td>1</td>
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<td>7</td>
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</table>

\( \chi^2 \) for row of totals is significant \( p .001 \)
APPENDIX V

QUESTIONS ANSWERED BY SUBJECTS AFTER THE
SEVEN OPPORTUNITIES FOR EXCHANGE

SMALL GROUPS LABORATORY
DEPARTMENT OF ANTHROPOLOGY AND SOCIOLOGY
UNIVERSITY OF BRITISH COLUMBIA

Your letter ____________

1. Would you say that you have begun to approve ___ or disapprove ___ of (letter)
to approve ___ or disapprove ___ of (letter)
to approve ___ or disapprove ___ of (letter)
to approve ___ or disapprove ___ of (letter)
to approve ___ or disapprove ___ of (letter)
to approve ___ or disapprove ___ of (letter)
to approve ___ or disapprove ___ of (letter)

2. Would you say that you tried to see your offer from the other subject's
point of view whenever you were deciding what to offer another subject?

   yes ___  no ___

   Comments:

3. If you received two or more similar offers at the same time, what factors
would you take into account in deciding which one to accept?

   Comments:
APPENDIX VI

CHECK FOR ASSUMPTION 4

The data reported in Table 10 was collected at the conclusion of the experiments that were run to test the hypotheses derived from the theory presented in chapter II. Table 8 indicates the distribution of responses to the post experimental question: Would you say that you tried to see your offer from the other subject's point of view whenever you were deciding what to offer another subject? (see appendix VII for the comments the subjects made in conjunction with this question.)

Table 10. Yes/No Responses to the Post Experimental Question: Would you say that you tried to see your offer from the other subject's point of view whenever you were deciding what to offer another subject?

| Set 1: (No differences in experiments) | high position Ss | 16 | 8 | n24 |
| low position Ss | 19 | 5 | n24 |

| Set 2: (Moderate differences in experiments) | highs | 19 | 5 | n24 |
| lows | 19 | 5 | n24 |

| Set 3: (Extreme differences in experiments) | highs | 27 | 5 | n32 |
| lows | 30 | 2 | n32 |

\[ \chi^2 \] for column totals significant at \( p < .001 \)
APPENDIX VII

SAMPLE OF COMMENTS ELICITED BY POST EXPERIMENTAL QUESTION:

Would you say that you tried to see your offer from the other subject's point of view whenever you were deciding what to offer another subject?

A. Evidence for empathy process:

(i) Set 1 (No differences experiments) high-position subjects.
- I tried to take into consideration the points he was trying to accumulate by the size of his two piles.
- Several times I offered more chips than I wanted in order to ensure that the deal was accepted.

(ii) Set 1 (No differences experiments) low-position subjects.
- I tried to make my offers as attractive as possible but also to my benefit.
- Naturally - I wanted my offer accepted.
- I tried to figure out what his limit was and then tried to give him a deal that would benefit both.
- Assuming one is out to 'win' he must make the best deal and one he feels will be acceptable.
- yes but only to the extent of seeing, by the size of the other's two piles, whether the offer's reasonable.

(iii) Set 2 (Moderate differences experiments) highs.
- I didn't try to make offers which were unreasonable because I knew they would be rejected.
- By always offering more than I intended to receive I was appealing to his greedy nature.
- In order that he would be more likely to accept.
- I looked to see who could use the colour most.
- I look to see who has few of the colour he is trying to get and make him a big offer for a few more than I gave.
- I looked at the state of his pile to see if profit would work both ways.

(iv) Set 2 (Moderate differences experiments) lows.
- Only offer what you would accept yourself.
- I make offers where we will both optimal number of buttons (hence both gain).
- He has to like the deal.
- Generally trying to make it profitable for both.

(v) Set 3 (Extreme differences experiments) highs.
- Tried to make offer as good as possible to opponent while breaking even or making points.
- Definitely, you have to see what he wants and how badly he wants it.
- I tried to figure out just how much he needed blue buttons and
how far he would go.
- I try to get as much as I can taking into account what he should be willing to give.

(vi) Set 3 (Extreme differences experiments) lows.
- Yes I figured some guy was undercutting my offers so I put more down - However, I saw that he wasn't receiving any offers so I figured he was crazy.
- I wanted to trade down to the best possible number of chips and then try to trade for more than I offered, therefore the party must be desperate.
- I tried to see what terms they would accept.
- Would see what the other subject might require.
- Yes depending on the relative difference in his two piles of buttons.
- I've tried to make offers that help us both to an equal extent. It seems no one wants to lose any buttons.
- You have to see yourself behind his pile, estimate approximately ...and then find a mutually agreeable amount.

B. Evidence against empathy process:

(i) Set 1 (No differences experiments) high-position subjects.
- Everyone for himself.
- Size of respective piles biggest factor.

(ii) Set 1 (No differences experiments) low-position subjects.
- If you're strictly out for yourself; it is up to the other person to watch out for themselves.
- I tried to establish the most number of points possible by equal trading, then by offering less for more I tried to improve my position more.
- I only looked to see if I benefited.

(iii) Set 2 (Moderate differences experiments) highs.
- I was only using my own point of view to obtain my largest gain. If everyone has different totals the worth of one colour cannot be approximated.

(iv) Set 2 (Moderate differences experiments) lows.
- Did what meant more gain for myself.
- I can't say yes or no because in some cases I do and some cases I don't. One thing I am not going to do is let other people better themselves as a result of me.
- Since everyone for himself.
- Most of the time, I offered 1 : 1 deals but I experimented on deals that would be profitable for myself and found them lacking.

(v) Set 3 (Extreme differences experiments) highs.
- I treat this only as a game that I don't have to worry about my fellow players.
- Tried to get as many for myself as possible.
- I would only trade even up.
- I was in business merely to make money.

(vi) Set 3 (Extreme differences experiments) lows.
- I allowed my own situation to influence more than the situation of the other subject.
APPENDIX VIII

SAMPLE OF COMMENTS ELICITED BY POST EXPERIMENTAL QUESTION:

If you received two or more similar offers at the same time, what factors would you take into account in deciding which one to accept?

(i) Set 1 (No differences experiments) high-position subjects.
   - chance of another exchange with the same person.
   - Previous offers if bargains or not.
   - I accepted the one with which I was dealing, over the one that I was not making an exchange.
   - If I could conduct more exchanges with one of them which would finally prove profitable.
   - If I had traded with one of them before, I would accept his over the other's with a view to establishing a steady arrangement.
   - Whether the sender had agreed to my offers and if no experience with either would choose the order of the letter of alphabet sender.
   - How many times I've traded before.
   - I would not break off a profitable trade agreement for the sake of a few extra buttons.
   - Turn down the one that turned me down on a previous occasion.
   - Which one had offered before I would accept.

(ii) Set 1 (No differences experiments) low-position subjects.
   - Who gave me good offers before he would get my business.
   - I would accept the one who had the most chips of the colour I had to offer so that I could send my next offer to the one just refused.
   - what types of offers he made before.
   - I would look to see if one of the persons would be more likely to trade again in the future.
   - the offerer's reaction to previous offers of my own.
   - Whom I'd deal with before and the results.
   - The one that looks like he would be good to trade with in the future.
   - I would probably accept the one where the initiation benefited least.
   - The one which had done business with me.

(iii) Set 2 (Moderate differences experiments) highs.
   - First one.
   - Previous deals with other.
   - I would accept the most regular customer.
   - Previous trading 'record' with the others.
   - I'll trade with the one that needs it most.
   - which one has accepted me previously.
usually accepted the one who had less of what they wanted.
- If I am carrying on a good trade with the same person.
- If I could continue to get steady income of buttons from the
  person.

(iv) Set 2 (Moderate differences experiments) lows.
- Past trading.
- How much I had been dealing with each and would choose the most
  frequented.
- I would look at my trading record and accept the offer from
  the letter which I hadn't dealt with.
- I'd refuse the guy that was doing well.
- Whether they had rejected an offer of mine, depending on what
  kind of offer it was (if it was outrageous offer of mine, it
  would not affect my decision).
- a good offer might be turned down to retain good relation.
- If I had accepted one of them before I would probably do it
  with them.
- Previous offers.
- previous behavior of other players.

(v) Set 3 (Extreme differences experiments) highs.
- Take offer of opponent who had less to gain.
- If late in the game and you had been doing business with one
  man quite steadily I would take his offer, assuming the
  difference wasn't too much.
- Previous offers to the same booths and how effective they had
  been in bettering my position. Also, how many blue buttons
  they had - I would give to the one with the lesser pile.
- What deals had gone on before? Was he a worth while client?
  Did he have enough buttons to make trading worth while?
- Whether or not a good transaction had been made with the
  offering party in the past, I would probably accept his offer.
- Offers from that letter before and their acceptance of mine,
  size of pile (i.e., which one would gain less from the
  transaction).
- Previous dealings with the offerer.
- Previous trades, favourable or not.
- See how close to becoming even, one player was than another,
  if he was leading me and it would help him I would not trade.
- Which one had enough buttons to do more trading with.
- Who had already been trading with me satisfactorily.
- The kind of previous dealings I had had with the different
  offerers and whether it would be in my eventual interests to
  cultivate one or the other.
- I take the first one I come to.
- How the two people involved had dealt previously and the
  status of the piles at the present time.
- probably accept from the person to whom it would do least good.
- Previous offer - if offers were generally better or more
  frequent from one, would accept his.

(vi) Set 3 (Extreme differences experiments) lows.
- Who you had been dealing with well before.
- Decide who had sent in acceptable offer or accepted mine the
  most times.
- Strength of others and trade with weaker.
- One of the offers was from a previously friendly offerer whereas the other one had rejected my previous offer.
- Past business.
- Which person the offer would seem to aid most (i.e., not trade with him).
- If I had benefited from one I would decide to take that one or if I had not benefited I would choose the other.
- Size of the piles (decline letter with larger pile he is building), past trades if refused offer more than once.
- The guy with the greatest difference in the piles would get the accept.
- I would look at the two piles of the offerers to see who would gain least advantage by receiving my chips.
- If I had gotten a similar offer from one of the two before.
- Previous dealership.
- The one with whom I have dealt before.
Table 11. Coded Results of Comments Elicited by Post Experimental Question:
If you received two or more similar offers at the same time, what factors would you take into account in deciding which one to accept?

<table>
<thead>
<tr>
<th>Learning factors</th>
<th>Cognitive factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>(frequency of past events mentioned)</td>
<td>(benefits that would accrue to parties involved; sizes of piles; chance for future trades mentioned)</td>
</tr>
</tbody>
</table>

Set 1: (No differences experiments)
- high-position Ss: 8
- low-position Ss: 5

Set 2: (Moderate differences experiments)
- highs: 5
- lows: 5

Set 3: (Extreme differences experiments)
- highs: 11
- lows: 9

Total: 43

Total: 25
APPENDIX X

RAW DATA

A. Initiations and Transactions

Key to notation:

\[ 1 \] = set 1, experiment 1
\[ 0 \] = first opportunity for exchange
\[ i-k \] = I made an offer to K
\[ b \] = blue buttons
\[ y \] = yellow buttons
\[ a \] = offer was accepted
\[ r \] = offer was rejected

\[ 1101\text{-}k15b20ya \] = in experiment 1 during the first opportunity for exchange I made an offer to K of 15 blue buttons for 20 yellow buttons which was accepted by K.

Set 1: (No Initial Net Resource Imbalances Between Subjects)

\[ 1101\text{-}k15b20ya \] \[ 1101h\text{-}n30b28ya \] \[ 1101j\text{-}m30b30ya \] \[ 11011\text{-}130y30ba \n
\[ 1101n\text{-}h30y30ba \] \[ 1101g\text{-}m30b30yr \] \[ 1101m\text{-}j30y40br \] \[ 1101k\text{-}120y25br \n
\[ 1102n\text{-}h30y30ba \] \[ 1102h\text{-}k30b29ya \] \[ 11021\text{-}g10y20ba \] \[ 11021\text{-}j25y30br \n
\[ 11022\text{-}h15b20yr \] \[ 1102j\text{-}126b30yr \] \[ 1102m\text{-}i30y40br \] \[ 11022\text{-}j25y30br \n
\[ 1103k\text{-}g25y25ba \] \[ 1103n\text{-}h30y30ba \] \[ 1103j\text{-}n26b30ya \] \[ 1103n\text{-}j20y20ba \n
\[ 11031\text{-}h15b20yr \] \[ 11031\text{-}j10y20br \] \[ 1103h\text{-}130b29yr \] \[ 1103g\text{-}m10b20yr \n
\[ 11034k\text{-}130y30ba \] \[ 11034n\text{-}120y20br \] \[ 11034j\text{-}k25b25ya \] \[ 11034i\text{-}l27b30ya \n
\[ 11035n\text{-}h28y26ba \] \[ 11035j\text{-}j21y20ba \] \[ 11035g\text{-}k25y22ba \] \[ 11035m\text{-}k30b29ya \n
\[ 11035j\text{-}n39b30ya \] \[ 11035l\text{-}l31y21br \] \[ 11035i\text{-}l30b13yr \] \[ 11035g\text{-}k30b30yr \n
\[ 1106g\text{-}128b20ya \] \[ 1106n\text{-}l11y10ba \] \[ 1106h\text{-}n30b29ya \] \[ 1106j\text{-}k20b20ya \n
\[ 1106k\text{-}g21y20ba \] \[ 1106l\text{-}g20y30br \] \[ 1106m\text{-}l30y29br \] \[ 1106 ----- \n
\[ 1107h\text{-}n30b29ya \] \[ 1107j\text{-}l27b30ya \] \[ 1107g\text{-}g20y19ba \] \[ 1107 ----- \n
\[ 1107m\text{-}j30y30ba \] \[ 1107g\text{-}n21b20yr \] \[ 1107 ----- \]
| 1605k-g30y30ya | 1605m-h30y30ba | 1605l-n30b28ya | 1605g-k30b30ya |
| 1605n-g30y30br | 1605l-g30y30br | 1605j-130b30yr | 1605h-k30b30yr |
| 1606m-h30y30ba | 1606h-m30b30ya | 1606j-n30b30ya | 1606n-130y30ba |
| 1606g-k30b30ya | 1606k-j30y30ba | 1606l-130b28yr | 1606l-j30y30br |
| 1607j-130b30ya | 1607n-g30y30ba | 1607k-h20y20ba | 1607m-130y30ba |
| 1607i-k25b25yr  | 1607g-130b30yr | 1607l-m30y30br | 1607h-m30b30yr |
Set 2: (Moderate Initial Net Resource Imbalances Between Subjects)

| 21o1l|-125y25ba | 21o1j|-n35b35ya | 21o1k|-h25y25ba | 21o1l|-120b20ya |
| 21o1n|-h35y30br | 21o1n|-h25b25yr | 21o1m|-g20y30br | 21o1g|-n25b25yr |
| 21o2j|-m25b30ya | 21o2g|-120b20ya | 21o2k|-h25y25ba | 21o2h|-135y30br |
| 21o2m|-g30y30br | 21o21|-m20b25yr | 21o21|-i20y20br | 21o2h|-j25b25yr |
| 21o3j|-g20y30ba | 21o3h|-j35y30ba | 21o3j|-g25y25ba | 21o3k|-h25y25ba |
| 21o3m|-l25y25ba | 21o3h|-m25b25ya | 21o3g|-m25b25yr | 21o3j|-k25b35yr |
| 21o4j|-g20y20ba | 21o4n|-j35y30ba | 21o4j|-n30b35ya | 21o4g|-120b20ya |
| 21o4k|-h25y25ba | 21o4h|-125b25yr | 21o4m|-130y30br | 21o4i|-n10b15yr |
| 21o5j|-m30b35ya | 21o5h|-m20b20ya | 21o5h|-j35y30ba | 21o5i|-g20y25br |
| 21o6l|-g20y20ba | 21o6g|-120b20ya | 21o6k|-h25y25ba | 21o6h|-m25b25ya |
| 21o6m|-l30y30br | 21o6l|-m20b25yr | 21o6m|-g20y20br | 21o6f|-n20b20ya |
| 21o7h|-l20b25ya | 21o71|-g20y20ba | 21o71|-j35y30yr | 21o7j|-n25b20yr |
| 21o7m|-l20y25yr | 21o7k|-h25y25br | 21o71|-n20b35yr | 21o7j|-n15b20yr |
| 22o1g|-n25b25ya | 22o11|-120b20ya | 22o1m|-h20y15ba | 22o11|-k25y35br |
| 22o1l|-j25y15ba | 22o1n|-h30y30br | 22o11|-n15b18yr | 22o11|-k20y18br |
| 22o2j|-k25b20ya | 22o21|-m20b25yr | 22o21|-j20y18br | 22o3j|-k20y25ba |
| 22o2k|-g25y25ba | 22o3h|-m25b25ya | 22o3j|-n25b20ya | 22o3l|-125y20br |
| 22o3m|-h20y19ba | 22o3h|-m25b25ya | 22o3j|-k25b20ya | 22o4i|-h25y21ba |
| 22o4k|-l25y25ya | 22o4g|-l24b25ya | 22o4f|-k25b25ya | 22o4i|-n15b18yr |
| 22o5j|-k25b25ya | 22o4g|-l25b25ya | 22o4j|-l20y20br | 22o4n|-k25y25br |
| 22o5k|-j25y25ba | 22o5l|-m35b35yr | 22o5m|-m25b25yr | 22o5n|-l35y30ba |
| 22o6l|-n20b20ya | 22o6g|-m23b25ya | 22o6m|-g20y20br | 22o6l|-j25y24ba |
| 22o6m|-j35y32ba | 22o6k|-g20y25br | 22o6l|-j25y24ba | 22o7f|-120y25br |
| 22o71|-l20y25ba | 22o7f|-120b25ya | 22o7f|-m20b20ya | 22o7f|-g35y30br |
| 22o7k|-l10y25yr | 22o7f|-l10b10yr | 22o7f|-m20b25yr | 22o7f|-n10b20ya |
| 23o1j|-l35y35ba | 23o1j|-l15b25ya | 23o1l|-l15b35ba | 23o1l|-125y25br |
| 23o2j|-m35b35ya | 23o2j|-l25y25ba | 23o2m|-j35y35ba | 23o2m|-n10b40yr |
| 23o3m|-j35y35ba | 23o2k|-g20y50br | 23o3m|-j35y35ba | 23o2i|-n35b35ya |
| 23o3j|-m35b40yr | 23o3k|-l0y25br | 23o3j|-m25b25ya | 23o2h|-k10b20yr |
| 23o4j|-m35b35ya | 23o4j|-m35b35ya | 23o3g|-k20b30yr | 23o3i|-g20y25ba |
| 23o4l|-j20y25ba | 23o4n|-j10y15br | 23o4j|-m35b35ya | 23o3n|-g35y40br |
| 23o5j|-n35b35ya | 23o5m|-j10y15br | 23o4j|-l10b15yr | 23o4j|-k15b25ya |
| 23o5n|-h20y25ba | 23o5h|-l10y25br | 23o5h|-l10b10ya | 23o4j|-k10y20br |
| 23o6j|-j20y25ba | 23o5g|-k15b25yr | 23o5g|-l10b20yr | 23o5j|-n35b35ya |
| 23o6h|-m5b10yr | 23o6m|-g25y30br | 23o5m|-j35y35ya | 23o5k|-m15y25br |
| 23o7f|-l20y25ya | 23o6k|-j15y25br | 23o6k|-l15b25yr | 23o6j|-n35b35yr |
| 23o7g|-k25b25yr | 23o7k|-g25y25ba | 23o7k|-g25y25ba | 23o6g|-n25b25yr |
| 24o1i|-l120b20ya | 24o1j|-m10b10ya | 24o1j|-l10b15yr | 23o7f|-l35b35ya |
| 24o1m|-j32y30br | 24o1k|-l25y25br | 24o1k|-l10b15yr | 23o7f|-l35b35ya |
| 24o2h|-n25b25ya | 24o2i|-m30b25ya | 24o1l|-g25y25ba | 24o1l|-l10b20yr |
| 24o2j|-k20b25yr | 24o2i|-m25b25ya | 24o1g|-l10b15yr | 24o1n|-l15b30br |
| 24o3s|-n25b25ya | 24o3k|-g25y23ba | 24o1m|-l10b15yr | 24o2n|-j25y25br |
| 24o3n|-l20y15ba | 24o3l|-g25y23br | 24o1l|-l10b20yr | 24o2k|-j25y25br |
| 24o4j|-n25b25ya | 24o4l|-k23b25ya | 24o4k|-l24y23br | 24o3j|-n35b35ya |
| 24o4n|-l20y20br | 24o4i|-h20y25br | 24o4n|-m20b25yr | 24o4j|-n35b35ya |
Set 3: (Extreme Initial Net Resource Imbalances Between Subjects)

3101n-j30y35ba  310lg-n20b20ya  310lj-m40b40ya  310li-m30b40y
3101k-j10y15br  310lm-g40y40br  310lj-j20y25br  310hn-n20b40yr
3102n-j30b35ya  310lg-m20b25ya  310jk-g15y15ba  3102m-j40y40ba
3102l-n30b40yr  310hn-130y40ba  3102l-120y20br  3102h-m10b20yr
3103n-j40b40ya  3103g-120b20ya  31031-n30b40ya  3103k-h10y10ba
3103h-kl7b20ya  3103j-m40b40ya  3103m-130y30ba  31031-120y15br
3104j-n35b40ya  3104i-g20y20ba  3104m-j40y40ba  3104h-115b20ya
3104k-115y20br  3104j-n30b40yr  3104m-g15b20yr  3104n-j35y40br
3105j-m40b40ya  3105m-j40y40ba  3105k-h16y20ba  3105i-130b40ya
3105l-115y15br  3105h-k15b20yr  3105n-135y38ba  3105g-m20b20yr
3106n-140y40ba  3106g-k15b15ya  3106l-m35b40ya  3106n-h15b20ya
3106j-n10b15yr  3106i-120y20br  3106m-130y30br  3106k-g17y20br
3107n-135y38br  3107h-n30b20yr  3107k-j18y20br  3107l-120y25br
3107i-j20y25br  3107m-130y30br  3107n-125y10ba  3107h-120y20br
3108i-n40b40yr  3108j-n20b20ya  3108k-g20y20ba  3108h-20y20br
3108j-n40b40yr  3108k-g20y20ba  3108i-n20b20ya  3108h-20y20br
3108j-n40b40yr  3108k-g20y20ba  3108i-n20b20ya  3108h-20y20br
3108j-n40b40yr  3108k-g20y20ba  3108i-n20b20ya  3108h-20y20br
B. Approve and Disapprove Votes

Key:  
11 = set 1, experiment 1  
a = approved  
d = disapproved

eg. 11 l-i d = after experiment 1 in set 1, L indicated disapproval of I.

Set 1: (No Initial Net Resource Imbalances Between Subjects)

11 m-g a  
11 n-h a  
11 i-m d  
11 j-m d  
11 k-j a  
11 l-g d  
11 l-k a  
11 g-m a  
12 j-k d  
12 l-h d  
12 m-h d  
12 n-h a  
12 g-n a  
12 k-h d  
13 n-g a  
13 m-g a  
13 i-k a  
13 g-m a  
13 l-i a  
13 l-m d  
14 n-j a  
14 i-k d  
14 j-m d  
14 m-g a  
14 k-m a  
14 g-j a  
14 l-i d  
15 n-j a  
15 n-m d  
15 m-g a  
15 j-k d  
15 k-g a  
15 k-m a  
16 j-l a  
16 j-m d  
16 i-n a  
16 n-g a  
16 k-j a  
16 h-n a
Set 2: (Moderate Initial Net Resource Imbalances Between Subjects)

```
21 j-n a
21 j-m d
21 i-h a
21 i-g a
21 l-h d
21 g-n a
21 g-m d
22 m-i d
22 j-l a
22 n-k d
22 i-m d
22 k-h a
22 h-i a
22 m-j a
22 l-k a
22 n-j a
22 l-j a
22 g-k d
24 i-k a
24 m-j a
24 l-h a
24 k-h d
24 g-l a
25 m-g d
25 n-g d
25 j-n d
25 g-n a
25 k-g a
25 h-n d
25 l-i d
26 n-h a
26 n-j a
26 j-i d
26 m-j a
26 g-k a
26 n-h a
26 l-g a
26 l-m a
```
Set 3: (Extreme Initial Net Resource Imbalances Between Subjects)

| 31 n-h d | 31 i-j a | 31 n-i a | 31 i-n a |
| 31 i-m d | 31 i-l d | 31 m-l d | 31 j-m a |
| 31 j-k d | 31 j-n a | 31 l-i d | 31 l-g a |
| 31 l-m d | 31 l-k a | 31 l-g d | 31 l-n d |
| 31 l-h a | 31 h-k a | 31 h-l a | 31 h-n d |
| 31 h-m d | 31 h-i d | 31 g-n d | 31 g-l a |
| 31 g-k a | 31 g-m a | 31 k-j d | 31 k-g d |
| 31 k-h a | 32 i-n a | 32 i-l a | 32 j-n d |
| 32 j-m a | 32 j-k a | 32 k-j d | 32 k-l d |
| 32 h-l a | 32 h-n d | 32 h-m d | 32 l-j d |
| 32 l-i d | 32 l-h a | 32 l-g a | 32 g-m d |
| 32 g-n a | 33 j-m a | 33 j-n a | 33 j-h d |
| 33 j-g a | 33 j-l a | 33 j-k a | 33 n-g d |
| 33 n-i a | 33 n-j a | 33 n-h a | 33 i-m a |
| 33 i-n a | 33 i-l d | 33 i-k d | 33 m-j a |
| 33 m-i d | 33 h-m d | 33 h-n d | 33 h-l a |
| 33 g-k a | 33 g-l a | 33 g-m d | 33 g-n d |
| 33 k-g a | 33 k-g d | 33 k-h d | 33 k-i d |
| 34 j-n a | 34 j-m a | 34 j-k d | 34 j-l d |
| 34 n-j a | 34 n-h d | 34 m-n d | 34 i-n d |
| 34 i-k a | 34 i-l d | 34 i-m d | 34 m-j a |
| 34 m-i d | 34 h-k a | 34 h-l a | 34 h-m d |
| 34 g-l a | 34 g-n d | 34 g-h d | 34 k-h a |
| 34 k-j a | 34 k-g d | 34 k-l a | 35 l-m a |
| 35 m-i d | 35 m-j a | 35 i-k a | 35 j-m a |
| 35 j-n a | 35 j-l d | 35 n-j a | 35 g-m d |
| 35 n-i a | 35 n-j a | 35 n-h a | 35 h-m a |
| 35 j-k d | 35 k-h a | 35 k-l d | 35 h-n d |
| 35 g-l a | 35 k-g d | 35 l-h a | 35 l-i d |
| 35 h-l d | 35 l-g a | 36 n-j d | 36 n-h a |
| 36 j-n a | 36 j-m a | 36 i-n a | 36 i-l a |
| 36 i-g a | 36 n-l a | 36 i-m a | 36 i-k d |
| 36 i-j a | 36 h-i d | 36 h-n d | 36 h-k a |
| 36 h-m d | 36 h-l a | 36 h-j a | 36 l-h a |
| 36 g-a | 36 h-g d | 36 k-g a | 36 k-i a |
| 37 n-h d | 37 n-g d | 37 n-i a | 37 n-j a |
| 37 m-j a | 37 m-i d | 37 k-g d | 37 k-h a |
| 37 g-n d | 37 g-m a | 37 g-j d | 37 h-n d |
| 37 h-k a | 37 h-m a | 37 h-l d | 38 j-h a |
| 38 j-n a | 38 j-g a | 38 j-k a | 38 n-j a |
| 38 j-m a | 38 j-l a | 38 n-i d | 38 i-l d |
| 38 j-k a | 38 n-g a | 38 m-j a | 38 k-h a |
| 38 i-n a | 38 m-i a | 38 l-h a | 38 h-k a |