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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 Simmel¹, 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 Schwartz² 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 Whyte⁴, Blau⁵ and Belshaw⁶ 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.⁸ 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.⁹ 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.¹⁰ 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 Kelley¹¹, Kuhn¹², Longabough¹³, Blau¹⁴ and Boulding¹⁵ 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 theory¹⁶ 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.¹⁷ 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 other¹⁸ 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.¹⁹ Homans, unfortunately, ran into severe criticism for his efforts. He was criticized for ignoring the question of how amounts of different resources can be equated to one another.²⁰ He was accused of failing to give a set of correspondence rules for central concepts (e.g., cost, profit, etc.)²¹ and of defining these central terms tautologically.²² 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.²³ 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.²⁴

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 authority²⁵ 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_i and $a_{i'}$) 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_i repeatedly performs in the relation, and behavior j' which $a_{i'}$ performs. Assume further that j and j' are both operant behavior. If, in addition, j is a reinforcing stimulus (or mediates reinforcement) for $a_{i'}$, then we say that a_i 's ability to perform j is a resource of a_i in his relation with $a_{i'}$. The magnitude of this resource is a function of the value of j to $a_{i'}$, and the ability of a_i to provide it. This social relation can be symbolized as the exchange relation $a_i \text{---} a_{i'}, j, j'$, where j and j' are behavioral resources of a_i and $a_{i'}$, 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 $a_i \text{---} a_{i'}$, 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 $a_{i'}$ is 'accessible' to a_i at a given time, a_i is said to have an opportunity. Given an opportunity, if a_i performs (or symbolically 'promises to perform') j , then we say that a_i 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_i , if a_i 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_1 could associate a_1 , 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

¹See: (i) G. Simmel, The Sociology of Georg Simmel. Translated, edited and introduced by K.H. Wolff. (New York: Free Press, 1950). On page 387, Simmel discusses gratitude for gifts or service as a non legal form of honour. (ii) M. Maus, The Gift: Forms and Functions of Exchange in Archaic Societies. Translated by I. Cunnison and introduced by E.E. Evans-Pritchard. (New York: W.W. Norton & Co., 1967). (iii) C. Lévi-Strauss, Les Structures Élémentaires de la Parenté. Presses Universitaires de France, 1949. Chapter V: Le Principe de Réciprocité abridged and translated by Rose L. Coser and Grace Frazer and reprinted in Sociological Theory, edited by L.A. Coser and B. Rosenberg. (New York: MacMillan, 1957), pp. 84-94.

²B. Schwartz, The social psychology of the gift. American Journal of Sociology 73 (1967)nl, pp. 1-11.

³A.W. Gouldner, The norm of reciprocity: A preliminary statement. American Sociological Review 25 (1960)n2, pp. 161-178.

⁴W.F. Whyte, Street Corner Society. (Chicago: University of Chicago Press, 1943). On page 74, Whyte advances the idea of the gang leader establishing authority by maintaining a net-work of obligations.

⁵P.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...."

⁶C.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 tilia 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 entrepreneurial activity...."

⁷J.C. Harsanyi, A bargaining model for social status in informal groups and formal organizations. Behavioral Science VII (1966)n5, pp. 357-369.

⁸P.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...."

⁹See: G.C. Homans, Social Behavior: Its elementary forms. (New York: Harcourt, Brace & World, Inc., 1961). On pages 64-68, Homans discusses this possibility.

¹⁰See: 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.

¹¹J.W. Thibaut and H.H. Kelley, The Social Psychology of Groups. (New York: Wiley, 1959).

¹²A. Kuhn, The Study of Society: A unified approach. (Homewood, Ill.: Irwin-Dorsey, 1963).

¹³R. Longabough, A category system for coding interpersonal behavior as social exchange. Sociometry 26 (1963), pp. 319-345.

¹⁴P.M. Blau, Exchange and Power in Everyday Life. (John Wiley & Sons, 1964).

¹⁵K.E. Boulding, Economic Analysis: Vol. I, Microeconomics. (New York: Harper & Row, 1966), 4th edition.

¹⁶See: (i) H. Helson, Adaptation-level Theory: An experimental systematic approach to behavior. (New York: Harper & Row, 1964).
(ii) W. Bevan and R.E. Adamson, Internal referents and the concept of reinforcement. In Interdisciplinary Behavior Sciences Research Conference, University of New Mexico, Decisions, Values and Groups, Vol. I (New York: Pergamon, 1963).

¹⁷See: K.E. Boulding, op. cit., pp. 22-23.

¹⁸See: (i) K.E. Boulding, op. cit., chapter 27. (ii) S. Siegel and L.E. Fouraker, Bargaining and Group Decision Making. (New York: McGraw-Hill, 1960). (iii) H.H. Kelley, Interaction process and the attainment of maximum joint profit. Chapter 16 in: Decisions and Choice: Contributions of Sidney Siegel. Edited by S. Messick and A.H. Brayfield. (New York: McGraw-Hill, 1965).

¹⁹See: (i) G.C. Homans, Social behavior as exchange. American Journal of Sociology 63 (1957-1958)n6, pp. 597-606. (ii) G.C. Homans, Social Behavior: Its elementary forms. (New York: Harcourt, Brace & Co., 1961).

²⁰J.A. Davis, Two critiques of Homans' Social Behavior: Its elementary forms, A sociologist's view. American Journal of Sociology 67 (1961-1962)n4, pp. 454-458.

²¹J.A. Davis, Ibid.

²²B. Abramson, Homans on exchange: Hedonism revived. American Journal of Sociology 76 (1970)n2, pp. 273-283.

²³M. Deutsch, Homans in the Skinner box. Sociological Inquiry 34 (1964)n2, pp. 156-165.

²⁴See: (i) J.A. Davis, op. cit. (ii) K.C. Land and R.C. Rockwell, A critical and programatic examination of exchange theory. Proceedings Southwest Sociological Association 16 (1966), pp. 183-187. (iii) R. Maris, The logical adequacy of Homans' social theory. American Sociological Review 35 (1970)n6, pp. 1069-1081.

²⁵See Homans, op. cit., (1961), chapter 14.

²⁶R.K. Leik, R.M. Emerson and R.L. Burgess, The Emergence of Stratification in Exchange Networks: An experimental demonstration. Paper presented at the West Coast Conference for Small Group Research, San Diego, March 1968. Institute for Sociological Research, University of Washington, Seattle, Washington. Mimeographed.

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

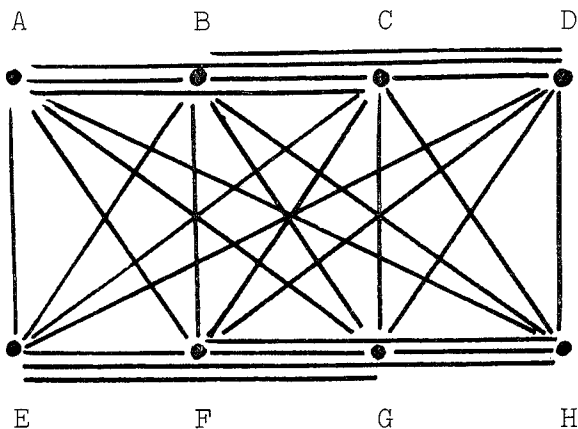
Seven concepts will be defined, here, because they are basic to the theoretical statements that will be made in succeeding sections.

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. Cliques. 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:

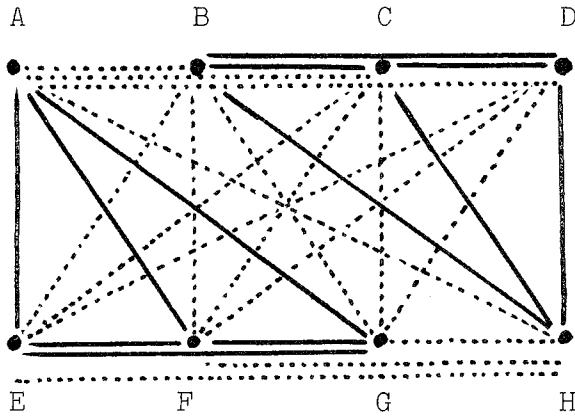
- (i) the probabilities for exchange interactions between all possible pairs of members in the collectivity are not equal and hence an unbiased, random, sociometric pattern does not prevail (see figure 1),
- (ii) the highest probabilities define two or more discrete, sociometric patterns, and
- (iii) 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.

Figure 2. An example of a non-random, biased sociometric pattern for eight actors.



Where A,E,F, and G are equally likely to interact with one another and are more likely to interact with one another than with B,C,D, or H and B,C,D and H are equally likely to interact with one another and more likely to interact with one another than with A,E,F or G.

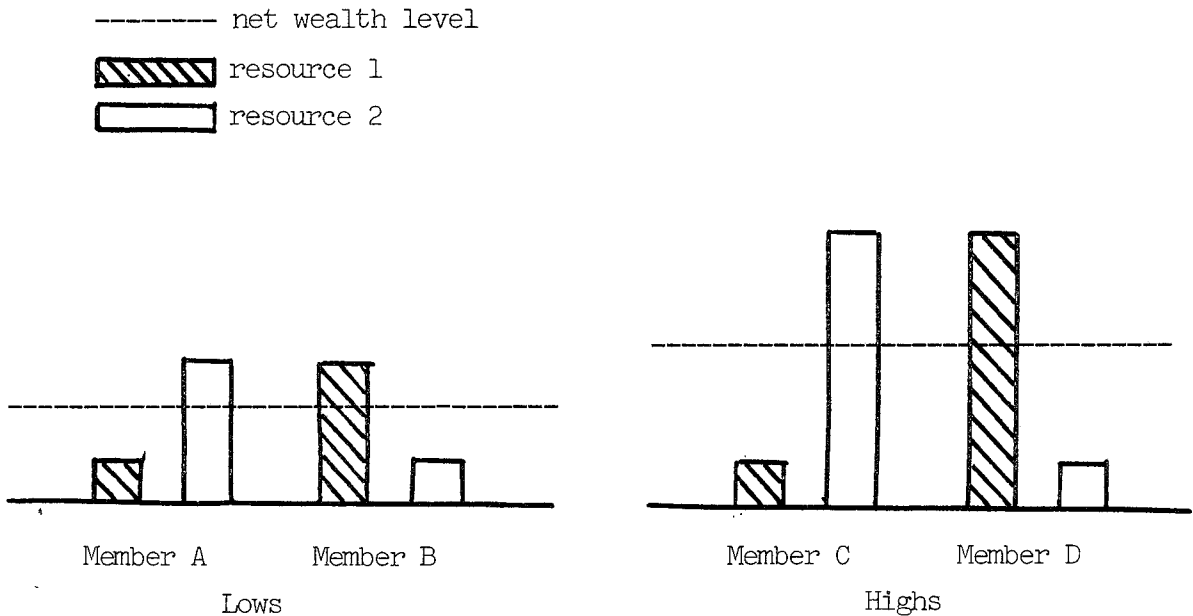
II. THE SCOPE CONDITIONS OF THE THEORY

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 ($X + Y_1 \dots Y_n$) 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.



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.¹⁰ 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 occurrence¹¹, 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 effort¹², 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 utility¹³ 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.¹⁵

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.¹⁶

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 Y_i will receive at the same time as he chooses to make an initiation to Y_i . Nor is X directly informed about the sort of initiations Y_i will receive from the others. It is most likely to be the case that X would require at least some experience of Y_i 's behavior before he could accurately assess the probability that Y_i 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.¹⁷

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.¹⁸

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.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 initiations 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.²⁰ 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.²¹ 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.²² One might expect, however, that such competitive factors would only become important when the members have more to gain by higgling and haggling than by freely cooperating (i.e., when each member has almost equal amounts of both resources)²³ 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 Cliques 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: (i) 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.

FOOTNOTES

¹The 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 confiders would set the same price.

²It 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.

³It 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.

⁴In 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.

⁵Attention 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.

⁶What 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.

⁷It 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 advertize their wealth levels. See, for example:

(i) T. Veblen, The Theory of the Leisure Class. (Viking Press Inc. Copyright: 1899 and 1912 by MacMillan Co.), pp. 60-70 on conspicuous consumption. Reprinted in: Sociological Theory: A book of readings. Edited by L.A. Coser and B. Rosenberg. (N.Y. MacMillan Co., 1957), pp. 281-391. (ii) Ruth Benedict, Patterns of Culture. (Boston: Houghton Mifflin and Co., 1959). Chapter IV: The Northwest Coast of America.
- 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.

⁸Cf. 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".

⁹Generally 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.)

¹⁰See: R.L. Burgess and R.L. Akers, Are operant principles tautological? Psychological Record 16 (1966), pp. 305-312. The authors list the operant psychological findings.

¹¹See: 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."

¹³See: K.E. Boulding, Economic Analysis: Vol.I, Microeconomics. (New York: Harper and Row, 1966), 4th edition. Chapter 24. Boulding discusses the principle of diminishing utility.

¹⁴This 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).

¹⁵See note 10.

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

Julia M. Andrews; and Julia M. Andrews, respectively. Also S. Siegel in collaboration with Alberta E. Siegel and Julia M. Andrews, Choice Strategy and Utility. (New York: McGraw-Hill, 1964), for reports of experimental investigations of Siegel's subjective expected utility hypothesis. (ii) Cf. the operant psychological finding that intermittent reinforcement leads to more enduring response rates than continuous reinforcement - see: Burgess and Akers (1966), op. cit., p. 310, 2.a.3. and 2.a.4.

²¹See: D.M. Messick and W.B. Thorngate, Relative gain maximization in experimental games, Journal of Experimental Social Psychology 3 (1967), pp. 85-101. The authors advance evidence for the hypothesis that relative gain is an important goal in experimental games.

²²See: I.C. Whittemore, The competitive consciousness. Journal of Abnormal and Social Psychology 20 (1925-26)nl, 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.

²³During pilot work with the research design described in the next chapter, it was observed that subjects did tend to begin higgling and 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.

²⁴Hypotheses 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).

CHAPTER III

RESEARCH DESIGN

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).¹ 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

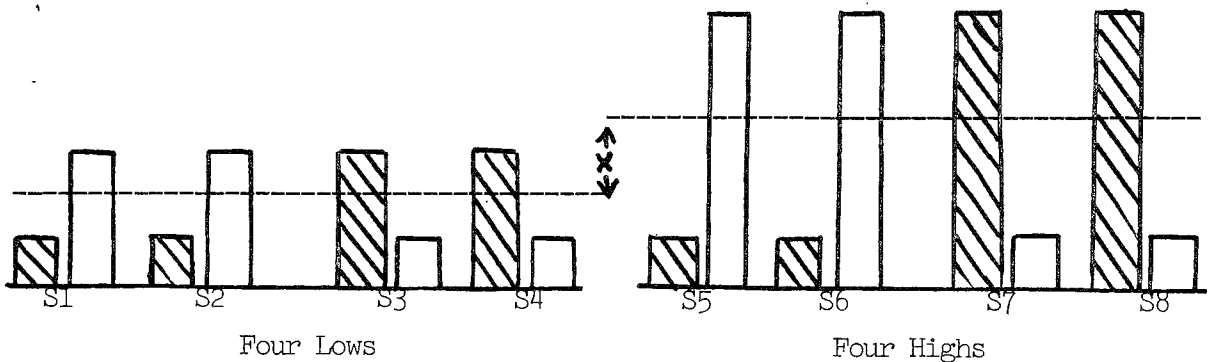
subjects had two piles of resources while others still had only one because they had failed to enter into an exchange, it was decided that subjects should begin with a small amount of their non-predominant resource. Thus subjects who failed to enter into an exchange during the first opportunity to do 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



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

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.

Initiator's letter ____	Offer directed to: ____ (letter)
	(circle one)
Will give (No.) ____ yellow	blue buttons
for (No.) ____ yellow	blue buttons
	(circle one)
	accept ____
	reject ____

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.

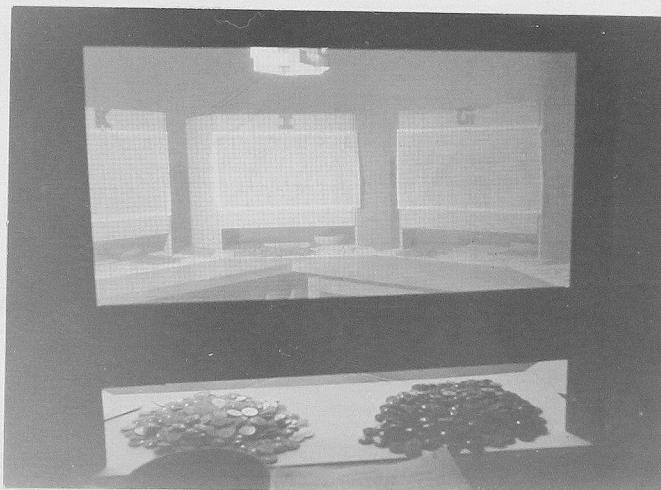
FOOTNOTES

¹Siegal et al postulates that the choice of a response in probabilistic situations is determined by the utility of a correct response and the utility of varying choices to escape boredom. See: e.g., Decisions and Choice: Contributions of Sidney Siegel. Edited by S. Messick and A.H. Brayfield. (New York: McGraw-Hill, 1964).

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

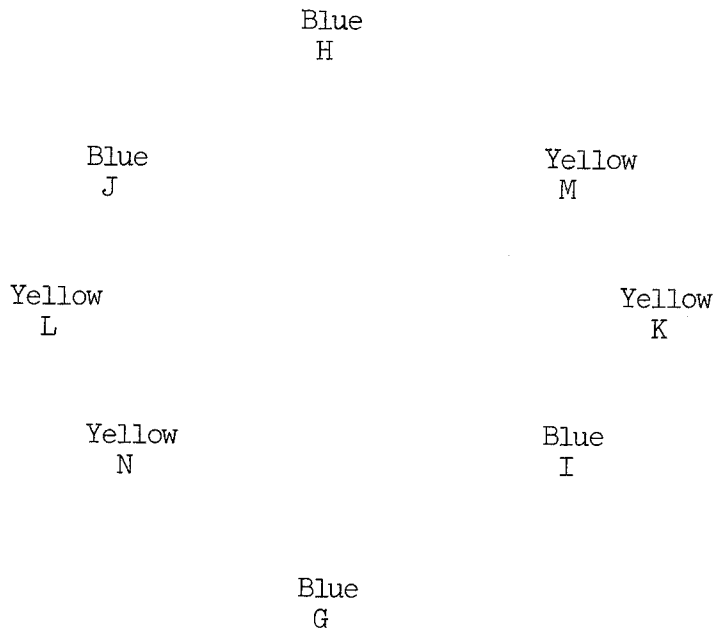
The results of the three sets of experiments that were carried out are reported and evaluated in this chapter. Subjects were first and second year, male-student volunteers.¹ There were 6 experiments in the first set, 6 experiments in the second set and 8 experiments in the third set.² There were no differences 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

	No. Subjects	No. of yellow buttons		No. of blue buttons	
First Set:					
No initial net resource differences between subjects	4	600	+	30	= 630 each
	4	30	+	600	= 630 each
Second Set:					
Moderate initial net resource differences between subjects	2	700	+	30	= 730 each
	2	30	+	700	= 730 each
	2	500	+	30	= 530 each
	2	30	+	500	= 530 each
Third Set:					
Extreme initial net resource differences between subjects	2	800	+	30	= 830 each
	2	30	+	800	= 830 each
	2	400	+	30	= 430 each
	2	30	+	400	= 430 each

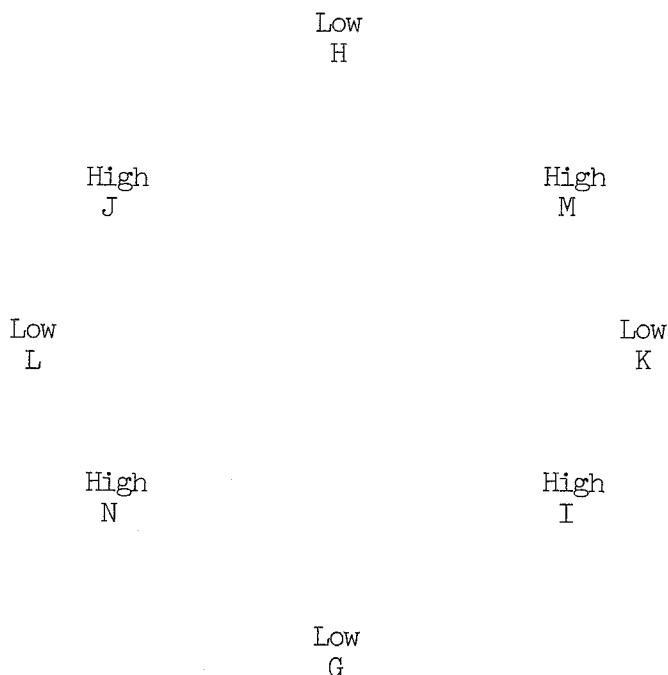
In all three sets of experiments, the booths were always placed in the same location vis à vis one another and the G,H,I and J subjects always began with a greater number of blue buttons than yellow buttons while the K,L,M and N subjects always began with a greater number of yellow buttons than blue 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



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



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

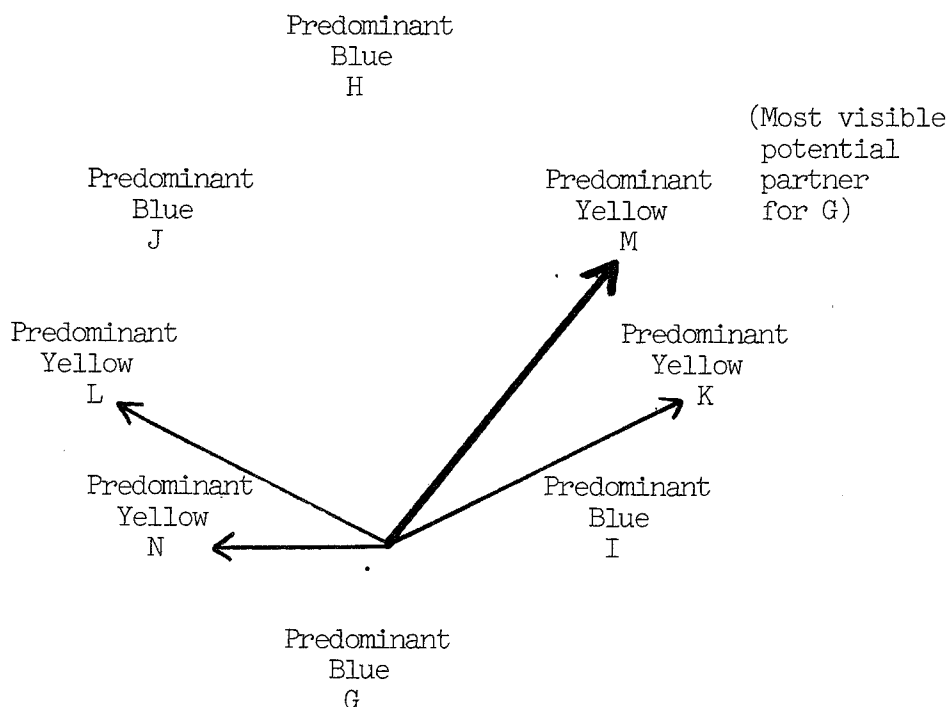
the three sets of experiments, the I,J,M and N subjects in the first set will be called "high-position" subjects and the G,H,K and L subjects in the first set of experiments will be called "low-position" subjects.

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

Imbalance in Distribution of Resources

	No initial net resource differences between subjects	Moderate initial net resource differences between subjects	Extreme initial net resource differences between subjects
Initiations made by Highs towards Highs*	17.4% (N23)**	45.8% (N24)	90.3% (N31)**
Initiations made by Lows towards Highs	62.5% (N24)	70.8% (N24)	90.7% (N32)

* 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) χ^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) χ^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

(i) χ^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 return³ 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

		N	First Opportunity For Exchange	Seventh Opportunity For Exchange
.....				
	No initial net resource differences between subjects	24*	17.4%**	39.1%**
<u>High-to-High Initiations</u>	Moderate initial net resource differences between subjects	24	45.8%	70.8%
	Extreme initial net resource differences between subjects	32	90.3%	90.0%***
			
	No initial net resource differences between subjects	24	37.5%	41.6%
<u>Low-to-Low Initiations</u>	Moderate initial net resource differences between subjects	24	30.4%**	52.2%**
	Extreme initial net resource differences between subjects	32	9.4%	50.0%
			

"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*

	Low-to-High Initiations**		High-to-High Initiations	
	Offered more than requested	Offered less than requested***	Offered more than requested	Offered less than requested
No initial net resource differences between subjects	15.1% (7/24Ss)****	25.5% (14/24Ss) N86	23.1% (9/24Ss)	20.5% (7/24Ss) N78
Moderate initial net resource differences between subjects	13.6% (6/24Ss)	41.0% (16/24Ss) N88	23.0% (11/24Ss)	18.7% (9/24Ss) N109
Extreme initial net resource differences between subjects	5.0% (3/32Ss)	44.6% (23/32Ss) N121	17.9% (6/32Ss)	20.5% (8/32Ss) N179

* 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 psychology⁴). 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

	Last initiation accepted	Last initiation rejected
Moderate initial net resource differences between subjects	40.2% (N157)*	56.6% (N122)
Extreme initial net resource differences between subjects	27.0% (N208)	42.6% (N165)

* 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

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

* 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.⁵ 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.⁶

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

.....
No Initial Net Resource
Differences between Subjects

22 High-Position subjects* directed	48.9% (N45)	approve votes and
	47.3% (N36)	disapprove votes toward fellow High-Position subjects
20 Low-Position subjects directed	40.0% (N45)	approve votes and
	56.5% (N23)	disapprove votes toward fellow Low-Position subjects

.....

Moderate Initial Net Resource
Differences between Subjects

23 Highs directed	52.4% (N42)	approve votes and
	42.8% (N28)	disapprove votes toward fellow Highs
21 Lows directed	57.2% (N42)	approve votes and
	34.4% (N32)	disapprove votes toward fellow Lows

.....

Extreme Initial Net Resource
Differences between Subjects

27 Highs directed	71.2% (N59)	approve votes and
	42.0% (N31)	disapprove votes toward fellow Highs
27 Lows directed	75.6% (N45)	approve votes and
	21.0% (N43)	disapprove votes toward fellow Lows

.....

- * (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 or 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*

		<u>Approval Votes (N274)</u>		<u>Disapproval Votes (N197)</u>	
		Distribution according to percentage of initiations accepted in histories of interaction		Distribution according to percentage of initiations accepted in histories of interaction	
		% of all histories of interaction characterized by acceptance level and associated with approval votes		% of all histories of interaction characterized by acceptance level and associated with disapproval votes	
.....		
% of all	50-100%	70.45%		34.00%	
Initiations		54.65%		18.45%	N 363**
between rater and		17.15%		51.80%	
rated accepted	0-49%	19.15%		41.60%	N 245
.....		
No histories of interactions between rater and rated i.e., no initiations either accepted or rejected		12.40%		14.20%	
		4.70%		3.92%	N 7140
.....		

* 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.

FOOTNOTES

¹Subjects 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.

²There 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.

³See 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.

⁴See 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."

⁵See appendix X, A: Results for experiments 3, 4 and 5.

⁶E.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.

⁷C.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.¹ 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 unbonded 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 situation⁴ 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'⁵, as it happens, strongly suggests that people choose people of similar economic status to themselves as friends. In fact, Kahl and Davis⁶ 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.⁷ 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.⁸

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-Smullyan⁹ 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

¹See: M. Webster Jr. and J. Kervin, The Problem of Artificiality in Experimental Sociology. Paper delivered at Canadian Sociology and Anthropology Association annual meetings held at York University, 1969. John Hopkins University. Mimeographed. To be published in the Canadian Review of Sociology and Anthropology (November, 1971).

²P.A. Sorokin, What is a social class? Journal of Legal and Political Science (1947), pp. 21-28. Reprinted in: Class, Status and Power: A reader in social stratification. R. Bendix and S.M. Lipset (editors). (Free Press of Glencoe, 1953), pp. 87-92.

³K.B. Mayer and W. Buckley, Class and Society. (New York: Random House, 1969), third edition.

⁴H.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).

⁵See, for example: (i) J.A. Kahl with an introduction by K. Davis, The American Class Structure. (New York: Holt, Rinehart and Winston, 1965). On pp. 137-138 Kahl reports a study done by Davis and Kahl in Cambridge, Massachusetts in 1953. They asked 199 men between 30 and 49 years of age to give the occupation of their 3 best friends. The occupation of the respondents and their best friends were coded according to North & Hatt prestige scores (0 = 1-23, 1 = 24-36, 2 = 37-60, 3 = 61-77 and 4 = 78-90). Table 3, p. 138 (previously unpublished) Cambridge: Percentage Distribution of status of best friends.

Average status of three best friends

Status of Respondent	n	0-0.9	1-1.9	2-2.9	3+	Has none	
0	19	74	16	-	-	10	100%
1	34	32	38	15	3	12	100%
2	82	10	15	50	12	13	100%
3	47	-	9	38	30	23	100%
4	17	-	-	35	35	30	100%
	199						

(ii) D.W.G. Timms, Occupational stratification and friendship nomination: A study in Brisbane. Australia and New Zealand Journal of Sociology 3 (1967)nl, pp. 32-43, p. 38 Table 3. Percentage of best friends in each occupational category by occupation of respondent:

Occ. Category of Respondent		Percentage of Best Friends in each occ. category					No. of respondents	No. of Friends
		I	II	III	IV	V		
<u>A. Males</u>								
I	Professional & managerial	73	20	6	1	-	48	132
II	Clerical & Sales	9	75	6	5	5	51	110
III	Skilled manual	10	22	49	10	9	41	87
IV	Semi skilled manual	4	19	20	35	23	45	88
V	Unskilled manual	9	16	12	18	44	55	92
<u>B. Females</u>								
I	Professional & managerial	76	16	4	2	2	50	147
II	Clerical & Sales	12	61	11	11	5	62	142
III	Skilled manual	11	38	28	16	8	41	120
IV	Semi skilled manual	7	25	17	37	15	37	86
V	Unskilled manual	8	21	19	16	35	58	85

⁶J.A. Kahl, op. cit., p. 153.

⁷Matilda W. Riley et al, Interpersonal orientations in small groups: A consideration of the questionnaire approach. American Sociological Review 19 (1954), pp. 715-724.

Each respondent's status was defined in terms of questionnaire data that were assumed to indicate the deference elicited by the respondent from all the others.

Extent of Dyadic "Talking" (by the status of both partners)

Status of subject		Status of object					
		Low ₀	1	2	3	4	High ₅
low	0	.07	.26	.22	.26	.41	.49
	1	.11	.26	.26	.34	.47	.60
	2	.07	.20	.38	.42	.54	.69
	3	.07	.18	.36	.62	.76	.81
	4	.05	.19	.33	.52	.81	.88
high	5	.04	.16	.25	.39	.66	1.36

Note: figure in cells represent proportion of topics they would like to talk about (i.e., the desired amount of communication).

⁸J.I. Hurwitz et al, Some effects of power in the relations among group members, in Group Dynamics: Research and Theory. Edited by D. Cartwright and A. Zander. (New York: Harper and Row, 1960), 2nd edition.

Frequency of communication between high
and low status mental hygiene workers:

Status of communicator	Status of recipient	Frequency of Communication
high	high	4.89
high	low	3.66
low	high	3.61
low	low	2.71

⁹E. Benoit-Smullyan, Status types, status interrelations. American Sociological Review 9 (1944), pp. 151-161.

BIBLIOGRAPHY

Books

- Bevan, W. and R.E. Adamson. Internal referents and the concept of reinforcement. In: Interdisciplinary Behavior Sciences Research Conference, University of New Mexico, Decisions, Values and Groups, proceedings, vol. 2. New York: Pergamon, 1963.
- Bevan W. The pooling mechanism and the phenomena of reinforcement. Chapter 2 in: Motivation and Social Interaction. Edited by O.J. Harvey. New York: Ronald, 1963.
- Blau, P.M. The Dynamics of Bureaucracy: A study in interpersonal relations in two governmental agencies. Chicago: University of Chicago Press, 1955.
- _____. Bureaucracy in Modern Society. New York: Random House, 1956.
- _____. Exchange and Power in Social Life. John Wiley and Sons, 1964.
- Boulding, K.E. Economic Analysis: Vol. I, Microeconomics. New York: Harper Row, 1966. 4th edition.
- Dahrendorf, R. On the origin of inequality among men. In: Essays in the Theory of Society. Stanford University Press, 1968. Reprinted in: The Logic of Social Hierarchies. Edited by E.O. Laumann et al. Chicago: Markham, 1970.
- Decision Making: selected readings. Edited by W. Edwards and A. Tversky. Penguin Books, 1967.
- Decisions and Choice: Contributions of Sidney Siegel. Edited by S. Messick and A.H. Brayfield. New York: McGraw-Hill, 1964.
- Emerson, R.M. Operant psychology and exchange theory. In: Behavioral Sociology. Edited by R.L. Burgess and D. Bushell. New York: Columbia University Press, 1969.
- _____. Exchange theory Part I: A psychological basis for social exchange, and Part II: Exchange Relations, exchange networks and groups as exchange systems. In: Sociological Theories in Progress, Vol. II. Edited by J. Berger et al. Boston: Houghton-Mifflin (forthcoming).
- Gouldner, A.W. Organizational analysis. In: Sociology Today. Edited by R.K. Merton et al. New York: Basic Books, 1959.

- Helson, H. Adaptation-level theory: An experimental systematic approach to behavior. New York: Harper and Row, 1964.
- Homans, G.C. Social Behavior: Its elementary forms. New York: Harcourt, Brace and Co., 1961.
- Hurwitz, J.I., A.F. Zander and B. Hymovitch. Some effects of power on the relations among group members. Chapter 42 in: Group Dynamics: Research and theory. Edited by D. Cartwright and A. Zander. New York: Harper and Row, 1960. 2nd edition.
- Kelley, H.H. Interaction process and the attainment of maximum joint profit. Chapter 16 in: Decision and Choice: Contributions of Sidney Siegel. Edited by S. Messick and A.H. Brayfield. New York: McGraw-Hill, 1964.
- Kuhn, A. The Study of Society: A unified approach. Homewood, Ill.: Irwin-Dorsey, 1963.
- Lévi-Strauss, C. Les Structures Élémentaires de la Parenté. Presses Universitaires de France, 1949. Chapter V: Le principe de réciprocité, abridged and translated by Rose L. Coser and Grace Frazer and printed in: Sociological Theory: A book of readings, edited by L.A. Coser and B. Rosenberg. New York: MacMillan, 1957.
- Luce, R.D. Psychological Studies of risky decision making. In: Social Science Approaches to Business Behavior. Edited by G.B. Strother. R.D. Irwin Inc., 1962. Reprinted in: Decision Making. Edited by W. Edwards and A. Tversky. Penguin, 1967.
- Mauss, M. The Gift. Translated by I. Cunnison. New York: W.W. Norton and Co., 1967.
- Mayer, K.B. and W. Buckley. Class and Society. New York: Random House, 1969. 3rd edition.
- Sahlins, M.D. On the sociology of Primitive exchange. In: The Relevance of Models for Social Anthropology. (American Sociological Association monograph, No. 1). Editor: M. Banton. London: Tavistock Publications, 1965.
- Siegel, S. and L.E. Fouraker. Bargaining and Group-decision Making. New York: McGraw-Hill, 1960.
- Siegel, S. in collaboration with Alberta E. Siegel and Julia M. Andrews. Choice Strategy and Utility. New York: McGraw-Hill, 1964.
- Simmel, G. The Sociology of Georg Simmel. Translated, edited and introduced by K.H. Wolff. New York: Free Press, 1950.
- Sorokin, P.A. What is a social class? Journal of Legal and Political Science 1947, pp. 21-28. Reprinted in: Class, Status and Power: A reader in social stratification. Edited by R. Bendix and S.M. Lipset. Free Press of Glencoe, 1953.

- Thibaut, J.W. and H.H. Kelley. The Social Psychology of Groups. New York: Wiley, 1959.
- Whyte, W.F. Street Corner Society. Chicago: University of Chicago Press, 1943.
- Young, P.T. Motivation and Emotion: A survey of determinants of human and animal activity. New York: John Wiley and Sons Ltd., 1961.

Articles

- Abrahamson, B. Homans on exchange: Hedonism revived. *American Journal of Sociology* 76 (1970)n2, pp. 273-285.
- Barnett, H.G. The nature of the potlatch. *American Anthropologist* 40 (1938).
- Benoit-Smullyan, E. Status types, Status interrelations. *American Sociological Review* 9 (1944), pp. 151-161.
- Blau, P.M. Social integration, social rank and processes of interaction. *Human Organization* XVIII (1959-60), pp. 152-157.
- _____. A theory of social integration. *American Journal of Sociology* 65 (1960), pp. 550-553.
- Boulding, K.E. Two critique of Homans' Social Behavior: Its elementary forms. An Economist's view. *American Journal of Sociology* 67 (1961-62)n4, pp. 458-461.
- Burgess, R.L. and R.L. Akers. Are operant principles tautological? *Psychological Record* 16 (1966), pp. 305-312.
- Cohn, W. Social status and the ambivalence hypothesis: Some critical notes and a suggestion. *American Sociological Review* 25 (1960)n4, pp. 508-513.
- Cottrel, L.S., Jr. and Rosalind F. Dymond. The empathic responses: A neglected field for research. *Psychiatry* XII (1949), pp. 355-359.
- Davis, J.A. Two critique of Homans' Social Behavior: Its elementary forms. A sociologist's view. *American Journal of Sociology* 67 (1961-62)n4, pp. 454-458.
- Deutsch, M. Homans in the Skinner box. *Sociological Inquiry* 34 (1964)n2, pp. 156-165.
- Dymond, Rosalind. A scale for the measurement of empathic ability. *Journal of Consulting Psychiatry* XIII (1949), pp. 127-133.

- Flament, C. and E. Apfelbaum. Elementary processes of communication and structuration in a small group. *Journal of Experimental and Social Psychology* 2 (1966), pp. 376-386.
- Franklin, C.W., Jr. Operant concepts and social interaction. *Pacific Sociological Review* 14 (1971)n1, pp. 5-19.
- Gouldner, A.W. The norm of reciprocity: A preliminary statement. *American Sociological Review* 25 (1960)n2, pp. 161-178.
- Harsanyi, J.C. A bargaining model for social status in informal groups and formal organizations. *Behavioral Science* VII (1966)n5, pp. 357-369.
- Heath, A. MacIntyre on Blau. (Correspondence). *Sociology* 2 (1968)n1, pp. 93-96.
- Homans, G.C. Social behavior as exchange. *American Journal of Sociology* 63 (1957-58), pp. 597-606.
- Kelley, H.H. Communication in experimentally created hierarchies. *Human Relations* VIV (1951), pp. 39-56.
- Land, K.C. and R.C. Rockwell. (University of Texas Austin). A Critical and Programatic Examination of Exchange Theory. *Proceedings of the Southwest Sociological Association* 16 (1966), pp. 183-187.
- Longabough, R. A category system for coding interpersonal behavior as social exchange. *Sociometry* 26 (1963), pp. 319-345.
- MacIntyre, A. P.M. Blau: Exchange and Power in Social Life. (Book review). *Sociology* 1 (1967)n2, pp. 199-201.
- Maris, R. The logical adequacy of Homans' social theory. *American Sociological Review* 35 (1970)n6, pp. 1069-1081.
- Messick, D.M. and W.B. Thorngate. Relative gain maximization in experimental games. *Journal of Experimental and Social Psychology* 3 (1967), pp. 85-101.
- Muir, D.E. and E.A. Weinstein. Norms of social obligation. *American Sociological Review* 27 (1962), pp. 532-539.
- Riley, Matilda W. et al. Interpersonal orientations in small groups: A questionnaire approach. *American Sociological Review* 19 (1954), pp. 715-724.
- Rosen, S. The comparative roles of informational and material commodities in interpersonal transactions. *Journal of Experimental and Social Psychology* 2 (1966), pp. 211-226.
- Schwartz, B. The social psychology of the gift. *American Journal of Sociology* 73 (1967)n1, pp. 1-11.

- Schwartz, M. The reciprocities multiplier: An empirical evaluation. *Administrative Science Quarterly* 9 (1964), pp. 264-277.
- Timms, D.W.G. Occupational stratification and friendship nomination: A study in Brisbane. *Australia and New Zealand Journal of Sociology* 3 (1971)n1, pp. 32-43.
- Triadis, H.C. and V. Vassiliou. Social status as a determinant of respect and friendship acceptance. *Sociometry* 29 (1966), pp. 396-405.
- Turner, K.H. Role-taking, role standpoint and reference-group behavior. *American Journal of Sociology* 61 (1956), pp. 316-328.
- Weinstein, E.A. and P. Deutschberger. Tasks, bargains and identities in social interaction. *Social Forces* 42 (1964)n4, pp. 451-456.

Unpublished Material

- Kriesberg, L. "Non-normative reciprocity: Critique of Gouldner's: The norm of reciprocity: A preliminary statement." Microfiche 66-10. C.F.S.L., University of Wisconsin. Milwaukee. Paper presented to General Session of the Midwest Sociological Society, Annual Meetings, 1960.
- Leik, R.K., R.M. Emerson and R.L. Burgess. "The Emergence of Stratification in Exchange Networks: An experimental demonstration." Paper presented at the West Coast Conference for Small Group Research. San Diego, 1968. Institute for Sociological Research: University of Washington, Seattle. (Mimeographed)

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 precededented 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.

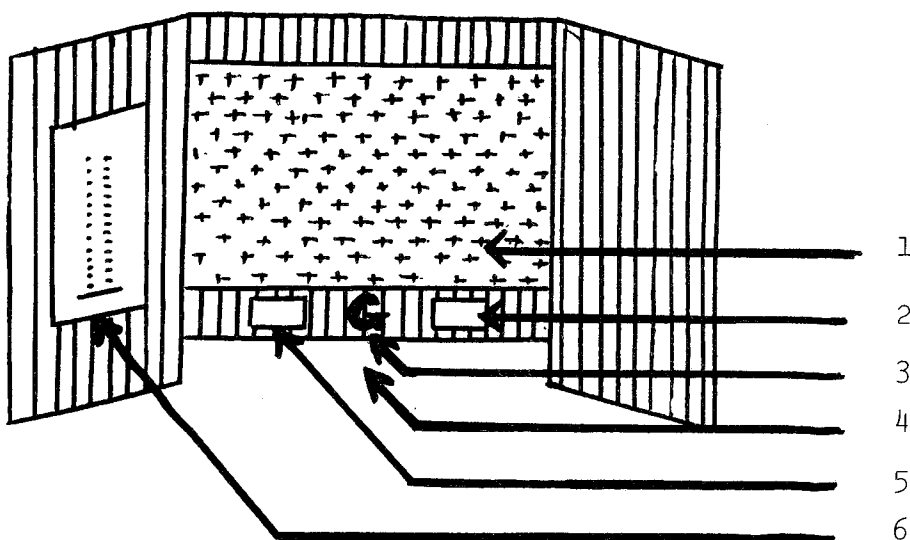
During the second opportunity for exchange, however, 8/12 highs and 7/12 lows initiated to lows. From opportunity 3 through to opportunity 6 the subjects returned to initiating predominantly to the highs. It seemed most likely that the odd results for opportunity 2 were caused by: (i) the fact that the 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)

800	2826
790	2806
780	2786
770	2766
760	2746
750	2726
740	2706
730	2686
720	2666
710	2646
700	2626
690	2606
680	2586
670	2566
660	2546
650	2526
640	2496
630	2476
620	2456
610	2436
600	2416
590	2396
580	2376
570	2356
560	2336
550	2316
540	2296
530	2276
520	2256
510	2236
500	2216
490	2196
480	2176
470	2156
460	2136
450	2116
440	2096
430	2072
420	2048
410	2024
400	2000
390	1975
380	1949
370	1923
360	1897
350	1871
340	1843
330	1815
320	1787
310	1759
300	1731

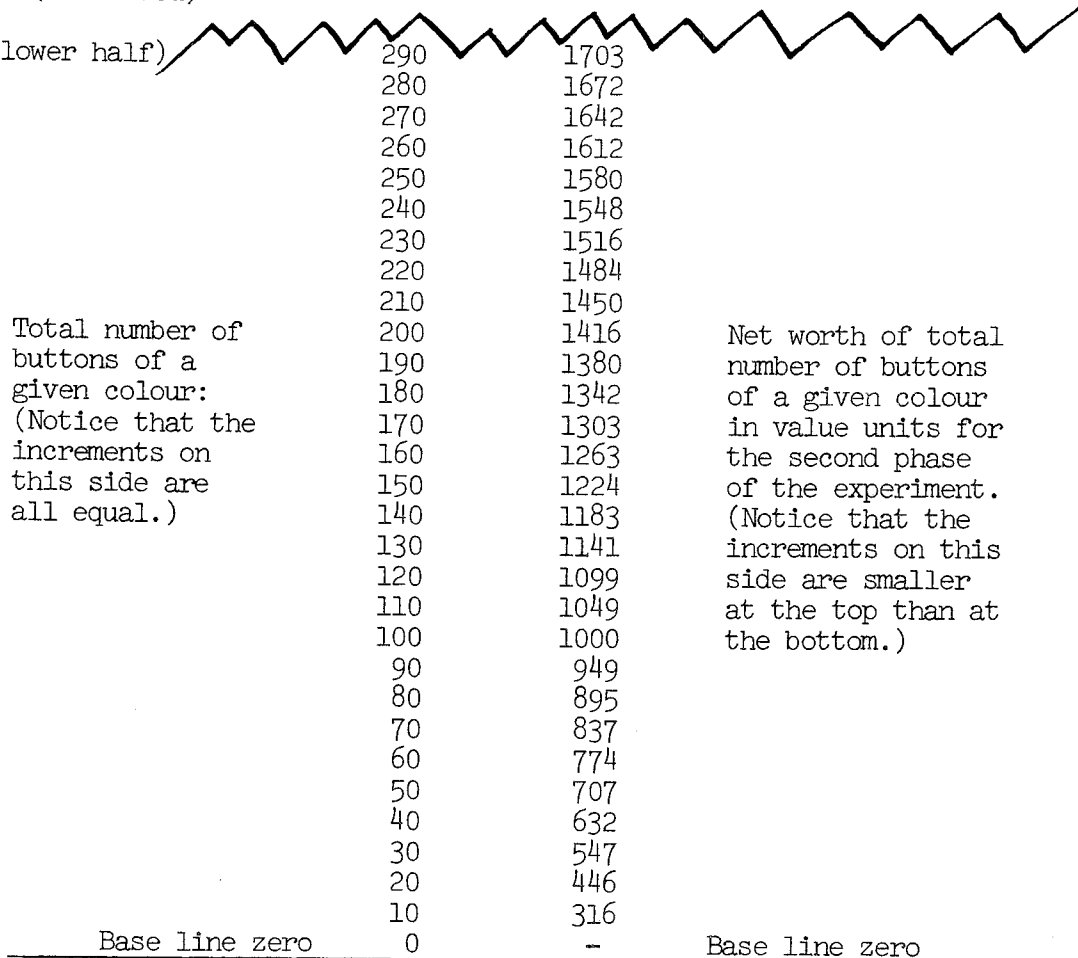
Total number of
buttons of a
given colour:
(Notice that the
increments on
this side are
all equal.)

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)

(lower half)



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 gameO.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:

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

	To subject furthest away (i.e., most visible)	To subject on left side	To subject on right side	To subject immediately adjacent	
Initiator:	G	4	1	0	1
	I	4	0	0	2
	K	3	0	2	1
	M	2	1	1	2
	H	2	1	1	2
	J	3	1	1	1
	L	2	2	2	0
	N	3	0	0	2
	23	6	7	11	n47

χ^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	high position Ss	16	8	n24
- experiments)	low position Ss	19	5	n24
Set 2:				
(Moderate	highs	19	5	n24
differences	lows	19	5	n24
experiments)				
Set 3:				
(Extreme	highs	27	5	n32
differences	lows	30	2	n32
experiments)		<hr/>	<hr/>	<hr/>
		130	30	160

χ^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 experiment) 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 dealt 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.

APPENDIX IX

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?

		Learning factors (frequency of past events mentioned)	Cognitive factors (benefits that would accrue to parties involved; sizes of piles; chance for future trades mentioned)
Set 1: (No differences experiments)	high-position Ss	8	2
	low-position Ss	5	4
Set 2: (Moderate differences experiments)	highs	5	3
	lows	5	2
Set 3: (Extreme differences experiments)	highs	11	8
	lows	9	6
		43	25

APPENDIX X

RAW DATA

A. Initiations and Transactions

Key to notation:

e.g. 11 = set 1, experiment 1
01 = 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

11o1i-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)

11o1i-k15b20ya	11o1h-n30b28ya	11o1j-m30b30ya	11o1l-i30y30ba
11o1n-h30y30ba	11o1g-m30b30yr	11o1m-j30y40br	11o1k-i20y25br
11o2n-i30y29ba	11o2h-k30b29ya	11o2l-g10y20ba	11o2g-l30b15ya
11o2i-h15b20yr	11o2j-l26b30yr	11o2m-i30y40br	11o2k-j25y30br
11o3k-g25y25ba	11o3m-h30y30ba	11o3j-n26b30ya	11o3n-j20y20ba
11o3i-h15b20yr	11o3l-j10y20br	11o3h-l30b29yr	11o3g-m10b20yr
11o4k-i30y30ba	11o4h-m30b29ya	11o4g-k25b25ya	11o4i-l27b30ya
11o4n-i20y20br	11o4l-h13y21br	11o4j-k26y30br	11o4m-j10y15br
11o5n-h28y26ba	11o5k-j21y20ba	11o5m-g25y22ba	11o5h-k30b29ya
11o5j-n29b30ya	11o5l-i13y21br	11o5i-n10b13yr	11o5g-k30b30yr
11o6g-l28b20ya	11o6n-i11y10ba	11o6h-n30b29ya	11o6j-k20b20ya
11o6k-g21y20ba	11o6l-g20y30br	11o6m-i30y29br	11o6 -----
11o7h-n30b29ya	11o7j-l27b30ya	11o7n-g20y19ba	11o7k-i20y20ba
11o7m-j30y30ba	11o7g-n21b20yr	11o7l-h20y28br	11o7 -----
12o1n-h30y25ba	12o1g-l30b30ya	12o1j-n30b30ya	12o1h-n30b50yr
12o1m-g30y30br	12o1k-h30y30br	12o1i-l20b20yr	12o1l-m27y30br
12o2i-k30b30ya	12o2n-i30y25ba	12o2j-n30b30ya	12o2m-j25y25ba
12o2k-j30y30ba	12o2h-k30b100yr	12o2l-i30b28yr	12o2g-m25b30yr
12o3i-k30b30ya	12o3m-h30y30ba	12o3j-l30b30ya	12o3l-i30b30ya
12o3n-g30y30ba	12o3g-l25b30yr	12o3h-l30b50yr	12o3k-g30y30br
12o4i-k30b30ya	12o4k-i30y30ba	12o4n-h30y30ba	12o4g-m30b30ya
12o4l-i30b30yr	12o4j-k30b30yr	12o4h-m30b50yr	12o4m-i30y30br
12o5k-j20y30ba	12o5m-g30y30ba	12o5h-n30b30ya	12o5j-l30b30ya
12o5n-i30y30ba	12o5i-k30b30ya	12o5g-l30b30yr	12o5l-g30b30yr
12o6n-j30y30ba	12o6g-m30b30ya	12o6i-k30b30ya	12o6k-i30y30ba
12o6m-g30y30ba	12o6h-m30b30ya	12o6j-l30b30ya	12o6l-j30b30yr

12o7l-130y30ba	12o7n-g30y30ba	12o7g-130b30ya	12o7m-g30y30br
12o7i-k30b30yr	12o7k-120y30br	12o7j-125b30yr	12o7h-k15b15yr
13o1n-g25y25ba	13o1g-m30b30ya	13o1h-130b30ya	13o1l-h30y10ba
13o1j-125b20yr	13o1m-g30y35br	13o1k-j20y30br	13o1i-130b30yr
13o2h-k30b30ya	13o2n-i30y30ba	13o2m-j10y11ba	13o2l-g30y30ba
13o2g-140b30ya	13o2k-g20y25br	13o2i-k30b30yr	13o2j-k20b20yr
13o3h-130b30ya	13o3k-h30y30ba	13o3i-n30b30ya	13o3n-j30y30ba
13o3j-m10b11ya	13o3g-130b40yr	13o3m-j20y20br	13o3l-j20y30br
13o4k-i30y30ba	13o4h-n30b30ya	13o4n-h30y30ba	13o4l-i20y20br
13o4j-n30b30yr	13o4m-i20y20br	13o4i-130b30yr	13o4g-m30b20yr
13o5n-j30y30ba	13o5j-k30b25ya	13o5i-m30b30ya	13o5m-g25y28ba
13o5h-n30b30ya	13o5k-j29y30br	13o5l-j30y30br	13o5j-m30b30yr
13o6l-h20y20ba	13o6n-g25y25ba	13o6g-k30b20ya	13o6h-m30b30ya
13o6k-i29y30br	13o6j-k30b30yr	13o6m-g30y31br	13o6i-m30b30yr
13o7h-m20b20ya	13o7j-n30b30ya	13o7l-i10y10ba	13o7i-k30b30ya
13o7k-j30y30ba	13o7m-n 8y 7br	13o7g-n25b30yr	13o7n-h30y30br
14o1k-j30y30ba	14o1m-h30y30ba	14o1h-k30b30ya	14o1n-g20y10ba
14o1i-k30b30yr	14o1g-n30b30yr	14o1l-h30y20br	14o1j-k20b20yr
14o2l-g30y30ba	14o2k-h30y30ba	14o2h-n30b30ya	14o2j-m30b30ya
14o2g-k30b25ya	14o2m-h30y30br	14o2i-k30b28yr	14o2n-g25y15br
14o3m-j30y30ba	14o3h-130b30ya	14o3g-k20b20ya	14o3n-i30y10ba
14o3k-g25y30ba	14o3j-n29b30ya	14o3l-130b25yr	14o3i-130y50br
14o4j-130b30ya	14o4l-h30y30ba	14o4n-j30y20ba	14o4h-k30b30ya
14o4g-130b30yr	14o4m-j30y30br	14o4k-g20y23br	14o4i-130b20yr
14o5m-130y30ba	14o5n-j30b21ya	14o5g-m30b25ya	14o5i-130b20ya
14o5k-i25y30br	14o5l-130y30br	14o5j-m25b30yr	14o5h-125b30yr
14o6h-k30b30ya	14o6j-130b30ya	14o6n-i20y15ba	14o6i-n30b20ya
14o6m-g25y30ba	14o6k-i30y30br	14o6g-n25b20yr	14o6l-i30y30br
14o7g-m25b20ya	14o7k-j30y30ba	14o7h-k30b30ya	14o7l-g20y20ba
14o7m-g25y30br	14o7j-m24b30yr	14o7i-m30b30yr	14o7h-130y25ba
15o1g-m30b30ya	15o1i-130b30ya	15o1k-h30y30ba	15o1j-k30b25ya
15o1l-g30y30ba	15o1h-m15b18yr	15o1m-h25y25br	15o1 -----
15o2g-m30b30ya	15o2j-n30b35ya	15o2n-g30y30ba	15o2h-n22b25yr
15o2m-g30y30br	15o2k-g30y35br	15o2i-m30b30yr	15o2 -----
15o3k-g30y30ba	15o3m-i30y30ba	15o3l-h30y30ba	15o3g-n30b30ya
15o3i-k30b29ya	15o3n-h30y33br	15o3j-n25b35yr	15o3h-m29b30yr
15o4g-m30b30ya	15o4i-n30b29ya	15o4k-h30y30ba	15o4m-i30y30ba
15o4h-130b30ya	15o4l-g30y30ba	15o4j-m25b35yr	15o4n-i29y30br
15o5h-k30b30ya	15o5n-j30y25ba	15o5l-g30y30ba	15o5g-130b30ya
15o5i-m30b30ya	15o5m-130y30ba	15o5k-j30y35br	15o5j-g25b35yr
15o6m-i30y30ba	15o6h-130b30ya	15o6l-g10y10ba	15o6n-j30y26ba
15o6g-h28y30ba	15o6i-m30b30ya	15o6j-m20b25yr	15o6k-130y32br
15o7l-g10y10ba	15o7n-j30y26ba	15o7g-k28b30yr	15o7k-130y30br
15o7i-g 6y 6br	15o7j-k20b25yr	15o7h-k20b30yr	15o7m-i15y15br
16o1i-130b26ya	16o1k-j30y30ba	16o1m-i30y30ba	16o1l-g30y30ba
16o1n-h20y20ba	16o1j-k20b20ya	16o1h-m39b39ya	16o1g-m30b25yr
16o2k-j30y30ba	16o2h-m30b30ya	16o2l-g30y30ba	16o2n-j30y30ba
16o2i-n30b27ya	16o2g-n30b30yr	16o2j-n30b30yr	16o2m-g30y30br
16o3i-m30b28ya	16o3k-i30y30ba	16o3m-h30y30ba	16o3j-n30b30ya
16o3l-g30y30ba	16o3h-n30b30yr	16o3g-k30b28yr	16o3n-130y30br
16o4j-m30b30ya	16o4l-g30y30ba	16o4g-n30b28ya	16o4k-j30y30ba
16o4m-i30y30ba	16o4h-m30b30yr	16o4i-k30b28yr	16o4n-j30y30br

16o5k-g30y30ba
16o5n-g30y30br
16o6m-h30y30ba
16o6g-k30b30ya
16o7j-l30b30ya
16o7i-k25b25yr

16o5m-h30y30ba
16o5l-g30y30br
16o6h-m30b30ya
16o6k-j30y30ba
16o7n-g30y30ba
16o7g-l30b30yr

16o5i-n30b28ya
16o5j-l30b30yr
16o6j-n30b30ya
16o6i-l30b28yr
16o7k-h20y20ba
16o7l-m30y30br

16o5g-k30b30ya
16o5h-k30b30yr
16o6n-i30y30ba
16o6l-j30y30br
16o7m-i30y30ba
16o7h-m30b30yr

Set 2: (Moderate Initial Net Resource Imbalances Between Subjects)

21o1l-i25y25ba	21o1j-n35b35ya	21o1k-h25y25ba	21o1i-120b20ya
21o1n-h35y30br	21o1h-n25b25yr	21o1m-g20y30br	21o1g-n25b25yr
21o2j-m25b30ya	21o2g-120b20ya	21o2k-h25y25ba	21o2h-i35y30br
21o2m-g30y30br	21o2i-m20b25yr	21o2l-i20y20br	21o2h-j25b25yr
21o3l-g20y20ba	21o3h-j35y30ba	21o3i-n20b25ya	21o3k-h25y25ba
21o3m-125y20ba	21o3h-m25b25ya	21o3g-m25b25yr	21o3j-k25b35yr
21o4l-g20y20ba	21o4n-j35y30ba	21o4j-n30b35ya	21o4g-120b20ya
21o4k-h25y25ba	21o4h-125b25yr	21o4m-i30y30br	21o4i-n10b15yr
21o5k-h25y25ba	21o5g-n20b20ya	21o5h-j35y30ba	21o5l-g20y20ba
21o5j-m30b35ya	21o5h-k25b25ya	21o5m-g20y25br	21o5i-120b27yr
21o6l-g20y20ba	21o6g-120b20ya	21o6k-h25y25ba	21o6h-m25b25ya
21o6m-i30y30br	21o6i-m20b25yr	21o6n-g20y20br	21o6j-m15b20yr
21o7h-120b25ya	21o7l-g20y20ba	21o7h-j35y30ba	21o7g-n20b20ya
21o7m-i20y25br	21o7k-h25y25br	21o7i-n20b25yr	21o7j-n15b20yr
22o1g-n25b25ya	22o1i-120b20ya	22o1m-h20y15ba	22o1j-k25b20ya
22o1l-j25y15ba	22o1n-h30y30br	22o1h-n15b18yr	22o1k-i20y35br
22o2h-m19b20ya	22o2j-k25b20ya	22o2n-j25y25ba	22o2g-125b25ya
22o2k-g25y25ba	22o2i-m20b25yr	22o2l-j20y18br	22o2m-j20y20br
22o3h-g25y25ba	22o3g-m25b25ya	22o3i-n25b20ya	22o3k-j20y25ba
22o3m-h20y19ba	22o3h-123b24ya	22o3j-k25b20ya	22o3l-i25y20br
22o4k-i25y25ba	22o4h-n24b25ya	22o4j-k25b25ya	22o4l-h25y21ba
22o4g-125b25ya	22o4m-i20y20br	22o4i-n15b18yr	22o4n-k25y25br
22o5j-k25b25ya	22o5l-g25y24ba	22o5n-i35y30ba	22o5g-n25b25ya
22o5k-j25y25ba	22o5i-m35b35yr	22o5h-m25b25yr	22o5m-i35y32br
22o6i-n20b20ya	22o6g-m23b25ya	22o6n-i30y30ba	22o6h-k25b25ya
22o6m-j35y32ba	22o6k-g20y25br	22o6l-j25y24ba	22o6j-130b30yr
22o7l-i25y23ba	22o7j-125b25ya	22o7h-m20b20ya	22o7m-i20y25br
22o7k-120y25br	22o7i-110b10yr	22o7g-m20b25yr	22o7n-g35y30br
23o1m-i35y35ba	23o1g-125b25ya	23o1n-j35y35ba	23o1h-n10b20ya
23o1k-h10y37br	23o1i-135b30yr	23o1l-i25y25br	23o1j-n20b40yr
23o2j-m35b35ya	23o2l-h25y25ba	23o2n-i35y35ba	23o2i-n35b35ya
23o2m-j35y35ba	23o2k-g20y50br	23o2g-m25b25yr	23o2h-k10b20yr
23o3i-n35b35ya	23o3m-j35y35ba	23o3h-m25b25ya	23o3l-g20y25ba
23o3j-m35b40yr	23o3k-h10y25br	23o3g-k20b30yr	23o3n-g35y40br
23o4i-n35b35ya	23o4m-i35y35ba	23o4j-m35b35ya	23o4g-k15b25ya
23o4l-j20y25ba	23o4n-j10y15br	23o4h-n10b15yr	23o4k-i10y20br
23o5i-n35b35ya	23o5m-i35y35ba	23o5h-110b10ya	23o5j-m35b35ya
23o5n-h20y25ba	23o5l-g25y20ba	23o5g-k15b25yr	23o5k-m15y25br
23o6i-n35b35ya	23o6l-j20y25ba	23o6n-j20y25br	23o6j-n35b35yr
23o6h-m5b10yr	23o6m-g25y30br	23o6k-j15y25br	23o6g-n25b25yr
23o7l-h20y25ba	23o7h-k15b15ya	23o7k-g25y25ba	23o7i-n35b35ya
23o7g-k25y25yr	23o7m-g25y25br	23o7j-m35b35yr	23o7n-g5y10br
24o1i-120b20ya	24o1h-m10b10ya	24o1l-g25y25ba	24o1j-110b15yr
24o1m-j32y30br	24o1k-j25y25br	24o1g-m10b15yr	24o1n-i25y30br
24o2h-n25b25ya	24o2i-m30b25ya	24o2g-125b25ya	24o2n-j25y25br
24o2j-k20b25yr	24o2l-m25y52br	24o2m-i20y20br	24o2k-i25y25br
24o3g-n25b25ya	24o3k-g25y23ba	24o3m-h25y20ba	24o3j-m35b35ya
24o3n-i20y15ba	24o3j-115b20yr	24o3l-g25y25br	24o3h-k20b25yr
24o4j-n25b25ya	24o4g-k23b25ya	24o4k-i24y23br	24o4l-k20b25yr
24o4n-i20y20br	24o4l-h20y25br	24o4h-m20b25yr	24o4m-h35y35br

24o5l-i24y25ba
24o5h-n25b25ya
24o6k-i14y14ba
24o6j-k30b30yr
24o7m-j30y30ba
24o7h-n25b25yr
25o1h-n10b10ya
25o1g-m50b50yr
25o2n-j30y25ba
25o2l-h20y20br
25o3j-l35b25ya
25o3h-m15b25ya
25o4n-j35y27ba
25o4h-k15b25yr
25o5k-i25y15ba
25o5l-g25y25br
25o6m-h30y20ba
25o6i-k25b25yr
25o7k-i25y24ba
25o7g-n25b24ya
26o1l-g20y25ba
26o1n-h15y13ba
26o2i-n35b35ya
26o2g-n20b30yr
26o3g-k20b25ya
26o3h-k10b13yr
26o4m-j35y35ba
26o4n-j35y35br
26o5n-h25y20ba
26o5k-i25y30br
26o6j-m35b35ya
26o6m-j35y35ba
26o7j-m35b35ya
26o7i-n35b35yr

24o5g-n23b25ya
24o5j-m20b22yr
24o6l-g25y30ba
24o6n-g30y32br
24o7l-h15y15ba
24o7i-l30b33yr
25o1k-g20y18ba
25o1n-g15y10br
25o2h-m10b15ya
25o2j-m35b30yr
25o3n-g30y25ba
25o3k-g22y21br
25o4i-m35b35ya
25o4m-h20y15br
25o5g-k25b24ya
25o5i-l35b35yr
25o6j-m35b25ya
25o6g-k25b23yr
25o7m-j35y25ba
25o7i-m35b35yr
26o1j-n35b35ya
26o1i-l35b35yr
26o2h-m25b23ya
26o2j-n35b35yr
26o3i-n35b33ya
26o3l-j15y25br
26o4i-n35b35ya
26o4l-i20y25br
26o5g-k20b25ya
26o5l-h25y25br
26o6n-i35y35ba
26o6k-gl3y15ba
26o7l-g20y20ba
26o7n-j35y32br

24o5k-h15y15ba
24o5n-j30y31br
24o6h-m25b25ya
24o6g-k25b30yr
24o7k-i18y17ba
24o7g-n25b30yr
25o1m-g30y30br
25o1l-g25y25br
25o2k-g20y18ba
25o2m-j20y20br
25o3i-k25b25ya
25o3g-l11b10yr
25o4k-i25y24ba
25o4g-n25b26yr
25o5n-g33y26ba
25o5m-g25y20br
25o6n-j35y28ba
25o6l-i25y25br
25o7h-l20b20ya
25o7n-i33y26br
26o1m-j35y35ba
26o1k-i25y45br
26o2h-i20y18ba
26o2m-h35y35br
26o3k-h25y15ba
26o3n-j30y27br
26o4k-h25y15br
26o4j-i35b35yr
26o5i-n35b35ya
26o5j-i35b35yr
26o6g-l20b25ya
26o6l-j25y25br
26o7m-j35y35ba
26o7g-m15b20yr

24o5m-g30y25ba
24o5 -----
24o6m-g20y20br
24o6i-k10b13yr
24o7j-n25b25ya
24o7n-h30y32br
25o1i-n35b35yr
25o1j-n35b35yr
25o2i-n35b35ya
25o2g-k25b26yr
25o3m-i30y20ba
25o3l-i25y25br
25o4j-l35b25ya
24o4l-j25y25br
25o5j-n35b25ya
25o5h-n15b25yr
25o6k-i25y24ba
25o6h-m20b25yr
25o7j-m35b25ya
25o7l-j25y25br
26o1g-m25b25ya
26o1h-n25b25yr
26o2l-h20y25ba
26o2k-j20y30br
26o3m-j35y35ba
26o3j-n35b35yr
26o4g-n20b25yr
26o4h-j13y18br
26o5m-j35y35ba
26o5 -----
26o6i-n35b35ya
26o6h-m 2b 2yr
26o7k-gl3y15br
26o7 -----

Set 3: (Extreme Initial Net Resource Imbalances Between Subjects)

31o1n-j30y35ba	31o1g-n20b20ya	31o1j-m40b40ya	31o1i-m30b40yr
31o1k-j10y15br	31o1m-g40y40br	31o1l-j20y25br	31o1h-n20b40yr
31o2j-n30b35ya	31o2g-m20b25ya	31o2k-g15y15ba	31o2m-j40y40ba
31o2i-n30b40yr	31o2h-i30y40ba	31o2l-i20y20br	31o2h-m10b20yr
31o3n-j40b40ya	31o3g-l20b20ya	31o3i-n30b40ya	31o3k-h10y10ba
31o3h-k17b20ya	31o3j-m40b40ya	31o3m-i30y30ba	31o3l-i20y15br
31o4j-n35b40ya	31o4l-g20y20ba	31o4m-j40y40ba	31o4h-l15b20ya
31o4k-i15y20br	31o4i-n30b40yr	31o4g-n15b20yr	31o4n-j35y40br
31o5j-m40b40ya	31o5m-j40y40ba	31o5k-h16y20ba	31o5i-l30b40ya
31o5l-i15y15br	31o5h-k15b20yr	31o5n-i35y38ba	31o5g-m20b20yr
31o6n-i40y40ba	31o6g-k15b15ya	31o6i-m35b40ya	31o6h-n15b20ya
31o6j-n10b15yr	31o6l-i20y20br	31o6m-i30y30br	31o6k-g17y20br
31o7i-n40b40ya	31o7n-j35y38br	31o7g-n20b20yr	31o7l-i20y25br
31o7j-m10b15yr	31o7h-n18b20yr	31o7k-j18y20br	31o7m-i30y30br
32o1g-m15b18ya	32o1h-n20b20ya	32o1n-i25y10ba	32o1l-i20y20br
32o1j-n40b40yr	32o1m-j40y100br	32o1k-i20y20br	32o1i-n40b40yr
32o2m-i30y40ba	32o2j-m40b40ya	32o2l-g20y20ba	32o2i-n20b20ya
32o2k-j20y20ba	32o2n-j20y25br	32o2g-m15b17yr	32o2h-m20b20yr
32o3l-h19y20ba	32o3n-g20y20ba	32o3g-n15b18ya	32o3i-m30b30ya
32o3k-j20y19ba	32o3h-k20b20ya	32o3m-i35y40br	32o3j-m30b25yr
32o4m-i40y40ba	32o4k-j20y20ba	32o4h-l20b20ya	32o4i-n20b20ya
32o4g-m10b15yr	32o4n-i30y37br	32o4l-j16y19br	32o4j-k40b40yr
32o5i-m40b40ya	32o5m-i40y40ba	32o5n-j30y30ba	32o5l-i20y20br
32o5j-m60b40yr	32o5h-m20b20yr	32o5k-j20y20br	32o5g-n15b20yr
32o6m-i40y40ba	32o6i-m40b40ya	32o6h-n20b20ya	32o6l-h20y20ba
32o6n-j40y38ba	32o6g-n 5b 4yr	32o6j-n60b40yr	32o6k-j20y18br
32o7h-l20b20ya	32o7j-m40b30ya	32o7l-g20y20ba	32o7i-n40b40ya
32o7m-i40y40ba	32o7k-i20y17br	32o7g-m20b14yr	32o7h-j40y43br
33o1j-m30b30ya	33o1h-i40y40ba	33o1k-j15y20br	33o1i-m25b25yr
33o1g-m20b20yr	33o1l-i15y15br	33o1h-n15b20yr	33o1m-i30y30br
33o2j-n40b40ya	33o2l-h20y10ba	33o2n-j40y40ba	33o2g-l20b19ya
33o2i-m40b40ya	33o2m-j20y20ba	33o2k-h20y20br	33o2h-m20b20yr
33o3h-n20b20ya	33o3m-i40y40ba	33o3g-k20b20ya	33o3l-j10y10ba
33o3j-m40b40ya	33o3k-j15y20br	33o3i-k15b25yr	33o3n-i40y40br
33o4k-g20y20ba	33o4m-j40y40ba	33o4j-n40b40ya	33o4g-l20b20ya
33o4h-j40y40br	33o4l-g10y10br	33o4h-m10b20yr	33o4i-l20b25yr
33o5g-k20b20ya	33o5i-m40b40ya	33o5m-j30y30ba	33o5j-n40b40ya
33o5l-j10y10br	33o5h-k20b20yr	33o5k-i15y20br	33o5h-g40y40br
33o6k-g20y20ba	33o6m-i40y40ba	33o6j-l10b10ya	33o6n-h20y20ba
33o6i-n40b40ya	33o6g-k20b20ya	33o6l-h10y10br	33o6h-n20b20yr
33o7h-l10b15ya	33o7i-n40b40ya	33o7g-k20b20ya	33o7n-i40y40ba
33o7m-i25y25br	33o7k-i15y20br	33o7l-l10y10br	33o7j-m20b20yr
34o1k-i17y20ba	34o1i-n25b20ya	34o1n-j40y40ba	34o1g-n20b20yr
34o1m-h40y39br	34o1h-k15b20yr	34o1j-n20b25yr	34o1l-j20y20br
34o2m-i40y38ba	34o2l-g20y20ba	34o2h-j40y40ba	34o2g-m20b20ya
34o2i-n25b25ya	34o2j-m20b20yr	34o2h-n20b20yr	34o2k-g17y20br
34o3j-k20b20ya	34o3l-h20y20ba	34o3g-l20b20ya	34o3i-n30b30ya
34o3k-i20y20ba	34o3m-j40y38ba	34o3h-l20b20yr	34o3n-j40y40br
34o4l-h20y20ba	34o4h-k20b15ya	34o4m-j40y39ba	34o4n-h30y30br
34o4g-k20b20yr	34o4i-k30b30yr	34o4k-h18y20br	34o4j-k20b20yr

34o5h-k19b20ya	34o5j-n20b20ya	34o5l-g20y20ba	34o5g-120b20ya
34o5i-m25b25ya	34o5k-i18y20ba	34o5h-g30y30br	34o5m-n20y20br
34o6i-k17b20ya	34o6j-m20b19ya	34o6l-h20y20ba	34o6g-120b20ya
34o6h-i20y25br	34o6h-n20b25yr	34o6k-j19y20br	34o6m-i20y20ba
34o7k-h20y20ba	34o7h-j40y40ba	34o7j-n20b20ya	34o7l-i20y20br
34o7h-m20b22yr	34o7g-m20b25yr	34o7i-125b25yr	34o7 -----
35o1i-m30b30ya	35o1k-j10y12ba	35o1j-n30b30ya	35o1l-i20y20ba
35o1g-m15b15yr	35o1h-j30y40br	35o1h-m20b30yr	35o1m-j39y25br
35o2m-i40y20ba	35o2l-j20y20ba	35o2g-120b20ya	35o2i-m35b35y
35o2h-120b20yr	35o2k-g10y15br	35o2j-m35b35yr	35o2n-i30y30br
35o3h-k20b15ya	35o3k-h20y25ba	35o3i-m40b40ya	35o3g-n20b20ya
35o3h-i40y40ba	35o3l-j19y20br	35o3m-j35y35br	35o3j-k32b35yr
35o4h-120b20ya	35o4j-n40b40ya	35o4h-i40y40ba	35o4g-k20b20ya
35o4l-i20y20br	35o4m-h40y35br	35o4k-i10y13br	35o4i-k10b15yr
35o5m-h40y30ba	35o5h-m20b20ya	35o5j-n40b40ya	35o5n-i40y40ba
35o5i-k8b10ya	35o5g-m20b20yr	35o5l-h20y20br	35o5 -----
35o6g-120b20ya	35o6k-g20y20ba	35o6i-k8b10ya	35o6m-j20y20ba
35o6j-n40b40ya	35o6n-i40y40ba	35o6l-m20y20br	35o6h-m15b20yr
35o7h-120b20ya	35o7j-n40b40ya	35o7m-j25y25ba	35o7k-i8y10br
35o7i-k5b10yr	35o7g-n20b20yr	35o7n-i40y40br	35o7l-h20y20br
36o1m-j40y15ba	36o1i-m40b40ya	36o1h-n20b20ya	36o1k-i20y20ba
36o1h-j40y40br	36o1g-m10b10yr	36o1l-j15y20br	36o1j-m20b20yr
36o2i-n40b40ya	36o2k-i20y20ba	36o2m-j35y40ba	36o2h-m20b20ya
36o2n-h20y20ba	36o2g-h10b10yr	36o2l-h20y20br	36o2j-n30b25yr
36o3j-125b15ya	36o3h-k20b20ya	36o3k-j20y20ba	36o3i-n40b40ya
36o3h-i40y40ba	36o3l-g20y15ba	36o3m-i35y40br	36o3g-120b10yr
36o4g-k20b15ya	36o4i-m40b40ya	36o4m-j35y40ba	36o4h-l10b10ya
36o4h-i40y40ba	36o4l-g20y20ba	36o4j-m20b20yr	36o4k-j18y20br
36o5l-g20y15ba	36o5h-i40y40ba	36o5i-n40b40ya	36o5k-j20y20ba
36o5h-m20b20ya	36o5m-j35y40br	36o5j-n20b15yr	36o5 -----
36o6j-m30b25ya	36o6g-k20b20ya	36o6i-n15b15ya	36o6m-j40y35ba
36o6k-g20y20ba	36o6h-i40y40br	36o6l-g20y20br	36o6h-m20b20yr
36o7g-l10b15ya	36o7i-m10b10ya	36o7k-j20y20ba	36o7j-n25b20ya
36o7l-h20y15ba	36o7h-j15y20br	36o7h-k20b20yr	36o7m-j40y40br
37o1l-j20y20ba	37o1j-m40b40ya	37o1h-n5b40yr	37o1k-h10y10br
37o1m-j40y50br	37o1g-m20y20br	37o1n-g40y40br	37o1 -----
37o2h-i40y38ba	37o2g-n20b20ya	37o2j-m40b40ya	37o2l-g20y20ba
37o2h-m10b20yr	37o2m-i40y30br	37o2k-g10y11br	37o2 -----
37o3m-j40y30ba	37o3h-k10b12ya	37o3j-n40b40ya	37o3n-h37y39ba
37o3l-i15y20br	37o3k-i20y20br	37o3g-l10b11yr	37o3 -----
37o4h-j10y10ba	37o4n-i37y39ba	37o4g-m20b20ya	37o4i-k32b32yr
37o4l-g15y16br	37o4j-k40b40yr	37o4m-h40y30br	37o4h-n30b32yr
37o5j-m40b40ya	37o5l-h20y20ba	37o5g-n20b20ya	37o5n-g37y39br
37o5h-m14b20yr	37o5m-g40y25br	37o5k-i8y10br	37o5i-l2b3yr
37o6i-k14b15ya	37o6g-m20b30ya	37o6k-g10y10ba	37o6m-j40y40ba
37o6j-n40b40ya	37o6l-i19y20br	37o6h-n19b20yr	37o6n-j40y40br
37o7m-j40y40ba	37o7h-k20b20ya	37o7j-n40b40ya	37o7l-g20y20ba
37o7h-i40y40ba	37o7g-l10b10ya	37o7k-g10y10br	37o7 -----
38o1l-i10y20ba	38o1j-m40b35ya	38o1h-n20b20ya	38o1m-j40y40ba
38o1h-j40y40br	38o1g-m10b15yr	38o1l-n10b40yr	38o1k-j20y20br
38o2k-g20y20ba	38o2m-j30y30ba	38o2j-n35b40ya	38o2h-i20y20ba
38o2g-k15b15ya	38o2l-i10y20br	38o2h-l15b15yr	38o2i-k10b30yr

38o3k-h20y20ba	38o3m-i40y40ba	38o3h-110b10ya	38o3j-m35b40ya
38o3n-j23y20ba	38o3l-j10y10br	38o3i-120b40yr	38o3g-115b15yr
38o4n-i30y25ba	38o4k-h20y20ba	38o4h-k20b20ya	38o4j-n35b40ya
38o4l-g10y10ba	38o4m-i40b40yr	38o4i-120b30yr	38o4g-k15b15yr
38o5m-i35y30ba	38o5h-110b10ya	38o5j-m40b40ya	38o5i-n25b30ya
38o5k-g15y20br	38o5g-m15b15yr	38o5n-i20y20br	38o5l-i20y20br
38o6g-n15b15ya	38o6k-h20y20ba	38o6m-i30y25ba	38o6h-k20b20ya
38o6h-i30y25br	38o6l-i10y10br	38o6j-k40b35yr	38o6i-135b40yr
38o7m-i25y20ba	38o7h-110b10ya	38o7g-m20b20ya	38o7n-j30y25ba
38o7l-g10y10ba	38o7j-n40b35ya	38o7k-j20y25br	38o7i-130b40yr

B. Approve and Disapprove Votes

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

eg. 11 1-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 d	11 m-j a	11 m-h a	11 m-i d
11 n-h a	11 n-i d	11 n-j d	11 n-g a
11 i-m d	11 i-l d	11 i-n d	11 i-k a
11 j-m d	11 k-g a	11 k-h a	11 k-i a
11 k-j a	11 h-n a	11 h-l d	11 h-m a
11 l-g d	11 l-h d	11 l-i d	11 l-j d
11 l-k a	11 l-n a	11 l-m a	11 g-l d
11 g-m a	11 g-k a	11 g-n a	
12 j-k d	12 j-l a	12 j-n a	12 i-k a
12 i-h d	12 m-l d	12 m-g a	12 m-i a
12 m-h d	12 n-g a	12 n-j a	12 n-i d
12 n-h a	12 l-i a	12 g-m a	12 g-l a
12 g n a	12 k-i a	12 k-g d	12 k-g a
12 k-h d	12 h-m a	12 h-n a	12 h-k d
13 n-g a	13 n-h a	13 n-j a	13 n-h a
13 m-g a	13 m-j d	13 m-i a	13 m-h a
13 i-k a	13 i-l d	13 i-m a	13 i-n a
13 g-m a	13 g-k a	13 g-n a	13 l-j d
13 l-i a	13 l-g a	13 l-h a	13 l-n a
13 l-m d	13 l-k d	13 k-j a	
14 n-j a	14 n-i a	14 n-g a	14 i-n a
14 i-k d	14 i-j d	14 i-h d	14 i-l a
14 j-m d	14 j-n a	14 j-l a	14 m-j d
14 m-g a	14 m-i a	14 k-h d	14 k-i d
14 k-m a	14 g-l a	14 g-m d	14 g-n d
14 g-j a	14 g-h d	14 g-k a	14 g-i a
14 l-i d	14 h-k a	14 h-l d	
15 n-j a	15 n-g a	15 n-l d	15 n-h d
15 n-m d	15 n-k d	15 n-i d	15 m-i a
15 m-g a	15 m-j d	15 m-h d	15 j-n a
15 j-k d	15 j-m d	15 i-m d	15 l-g a
15 k-g a	15 k-i d	15 k-h a	15 k-j d
15 k-m a	15 k-l a	15 k-n a	
16 j-l a	16 j-n a	16 j-g d	16 j-k d
16 j-m d	16 j-h d	16 j-i d	16 i-k d
16 i-n a	16 i-m a	16 n-i a	16 n-j a
16 n-g a	16 n-h d	16 l-g d	16 k-i d
16 k-j a	16 k-g a	16 k-h a	16 k-m a
16 h-n a			

Set 2: (Moderate Initial Net Resource Imbalances Between Subjects)

21 j-n a	21 m-j d	21 m-g a	21 n-j a
21 j-m d	21 n-g a	21 i-m d	21 i-n a
21 i-h a	21 i-l a	21 i-j a	21 i-k a
21 i-g a	21 h-k d	21 h-m a	21 h-n d
21 l-h d	21 l-g d	21 l-i d	21 g-l a
21 g-n a	21 g-m d		
22 m-i d	22 m-j a	22 j-k a	22 j-m a
22 j-l a	22 n-i a	22 n-j a	22 n-g a
22 n-k d	22 n-h a	22 n-l a	22 i-n a
22 i-m d	22 g-l d	22 l-j a	22 k-i d
22 k-g a	22 k-n a	22 k-l a	22 k-j a
22 k-h a	22 k-m d	22 h-m a	22 h-k a
22 h-i a	22 h-n a	22 h-l a	
23 m-j a	23 m-i a	23 m-g d	23 i-n d
23 i-k a	23 j-n d	23 j-l d	23 n-i a
23 n-j a	23 n-g d	23 n-i a	23 l-h a
23 l-j a	23 l-k d	23 g-m a	23 j-n d
23 g-k d			
24 i-k a	24 i-l d	24 i-g a	24 i-n a
24 m-j a	24 m-h d	24 n-g d	24 l-g a
24 l-h a	24 l-j d	24 l-i a	24 k-j d
24 k-h d	24 k-g d	24 h-m a	24 h-n d
24 g-l a	24 g-n a	24 g-k a	24 g-m d
25 m-g d	25 m-g a	25 m-h a	25 m-j a
25 n-g d	25 n-h d	25 j-m a	25 j-k d
25 j-n d	25 j-l a	25 i-k a	25 i-m d
25 g-n a	25 g-k a	25 g-h a	25 k-i a
25 k-g a	25 k-h d	25 h-m a	25 h-k d
25 h-n d	25 h-l a	25 l-j d	25 l-h a
25 l-i d	25 l-g d		
26 n-h a	26 n-k d	26 n-m d	26 n-i a
26 n-j a	26 n-l a	26 n-g a	26 j-m a
26 j-i d	26 j-l d	26 j-n d	26 i-k d
26 m-j a	26 m-h d	26 m-g d	26 g-n d
26 g-k a	26 h-m d	26 m-l a	26 h-i d
26 h-j d	26 h-g a	26 h-n a	26 h-k a
26 l-g a	26 l-i d	26 l-j d	26 l-h a
26 l-m a	26 l-n a	26 l-k d	

Set 3: (Extreme Initial Net Resource Imbalances Between Subjects)

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