AN ECONOMIC MODEL OF INTRANSITIVITY:

ITS APPLICATION TO PERSUASION

by

Nancy Wood Bliese

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Instructor in Charge

Redacted Signature
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INTRODUCTION

In the Rhetoric, Aristotle says, "The use of persuasive speech
is to lead to decisions. . . . This is so even if one is address-
ing a single person and urging him to do or not to do something. . . ."[1]
In other words, we must concern ourselves primarily with those acti-
vities which influence other people to make the decisions we advo-
cate in cases where a choice is to be made from two or more alter-
natives. But this statement merely describes the purpose of the
rhetorical act. Aristotle further defines his concept of rhetoric
thus:

> There are, then, . . . three means of effecting per-
> suasion. The man who is to be in command of them must,
> it is clear, be able (1) to reason logically, (2) to
> understand human character and goodness in their var-
> ious forms, and (3) to understand the emotions. . . .[2]

Such a concept of persuasion implies that we must know not only the
modes of argument, but also the ways in which people are influenced
by them and the ways in which people are predisposed to make their
decisions. Therefore, the study of rhetoric legitimately embraces
the study of many other disciplines, including inter-personal and
intra-personal psychology, sociology, economic decision-making
theories, and the theory of games.

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[1]Aristotle, Rhetoric, 2. 18. 1391^{b}8-10.

[2]Aristotle, Rhetoric, 1. 2. 1356^{a}21-26.

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These concepts have been invaluable aids in our delineations of choice-making behavior in the past and will undoubtedly continue to be widely used. Through them we have developed a body of theory surrounding communication and persuasion which helps us to understand which modes of persuasion will work best in a given situation, why dependence upon these modes is better than dependence upon others, what results we may predict, and how confidently we may predict them. This body of theory is by no means complete, however. It contains inconsistencies and imprecisions which stem from the nebulous qualities of the knowledge from which we hypothesize, incomplete justification of the assumptions underlying out hypotheses, errors in experimental method and interpretation of data, and the relative youth of the field of study. It is possible, therefore, to improve our understanding of the phenomena which surround communication and persuasion by consistently testing our theories against experience and by making well-conceived attempts to integrate our own theoretical conceptions with theoretical constructs derived from relevant disciplines.

Any scientific investigation operates on the premise that certain dispositional qualities govern action. Heider has defined these qualities as:

> . . . those properties that 'dispose' objects and events
> to manifest themselves in certain ways under certain
> conditions. Dispositional properties are the invari-
> ances that make possible a more or less stable, predict-
> able and controllable world. They refer to the relative-
> ly unchanging structures and processes that characterize
> or underlie phenomena.[3]

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[3]Fritz Heider, The Psychology of Interpersonal Relations, Science Editions, (New York: John Wiley & Sons, Inc., 1958), p. 80.

These properties do not make action predictable in the sense that their presence implies stability of a particular action, but rather in the sense that they are permanent qualities which affect all, or nearly all, of the responses of a person, object, or event. For example, both intelligence and "being scatter-brained" could be considered dispositional qualities of persons. While the former might lead to relative uniformity and predictability of action in a specific sense, the latter certainly would not.

The purpose of this paper will be to consider the dispositional qualities of choice-making. We shall be particularly interested in the untested assumptions upon which our predictions that choice-making will have the properties of consistency and transitivity have been based. This investigation is prompted by the fact that the realities of choice-making do not seem to coincide with the predictions we make on the basis of the attributed qualities of consistency and transitivity. Our goal will be to develop a theoretical explanation of choice-making which is a more accurate description of the observed phenomena. If we are successful, we will be able to come closer to defining the true dispositional qualities of choice-making; and we as communicators will be at least one step farther toward precise prediction of the results of our efforts.

In the course of our investigation we shall find it necessary to discuss the assumptions regarding consistency and transitivity, the observations which lead us to doubt their validity, a theoretical resolution of the contradictions between reality and theory,

and an experimental test of our explanation. Finally, we shall apply our findings about the general nature of choice-making to the field of rhetoric.

CHAPTER 1

THEORETICAL ASSUMPTIONS OF TRANSITIVITY

In the philosophic and economic literature of Western culture, the assumption has always been made that, unless he is forced to do otherwise, man will think and make his decisions more or less rationally and logically. And, although we see contradictions of this prediction every day, we still make this assumption the basis of all of our social scientific theories about choice-making. We shall attempt in this chapter to trace its use in current social scientific theories which are relevant to the field of communication. These theories are drawn, for the most part, from the disciplines of psychology, economics and mathematics (game theory).

Almost all of the theories we shall discuss were originally drawn from the economic theories of logical choice-making. Such theories suppose that man will choose, in an economic context, those things which will yield the greatest amount of utility; measured in terms of aesthetic, psychological and physical pleasure, economic usefulness, status and the like; for each unit of resources expended. They also assume that he will make his choices in a logically consistent manner, within the context of the system. This is an important qualification, because it points out two assumptions which are made regarding logical choice-making in an economic

system that do not carry over to other social scientific theories
of choice-making. These are the assumptions of perfect knowledge
of all of the alternatives; and ceteribus paribus or, other things
being equal. These two assumptions make the economic model valid
only so long as the system remains unchanged and in so far as the
person has perfect knowledge of his alternatives. To the degree
that either of these elements is missing, logical choice-making
behavior will be impaired. If prices change, or if some other fac-
tor varies, the person will operate in a new system; and his choices
between systems are assumed to be consistent only to a very limit-
ed degree. For example, it is not expected that an individual
will choose something he once abhored rather than an alternative
he once liked in a system where only prices have changed.[4] Since
we do not often operate in static situations and since we must of-
ten make decisions on the basis of partial evidence about the alter-
natives, we can readily see that there are limitations to the blan-
ket application of economic decision-making to other situations.
As a matter of fact, the model cannot be applied with any sort of
accuracy to everyday economic action. This is probably because its
intention is to describe what happens in a pure system which is
not subject to the ramifications which affect practical choice-mak-
ing. To make the theory empirically descriptive, and therefore
applicable to social decision-making, we must make additional as-
sumptions which are often neglected. This failure has made some

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[4]A good explanation of the basic economic theories underlying
consumer behavior may be found in H.H. Liebhafsky, The Nature of
Price Theory, (Homewood, Illinois: The Dorsey Press, Inc., 1963),
Chapters 4 and 5.

of our theories of social choice-making behavior less than accurate.

Gaming theory, which is of mathematical origin, is concerned with predicting the outcomes and decisions in situations which are essentially of an economic nature. That is to say, gaming situations involve situations of contest or conflict in which there are two or more possible outcomes, the players have definite preferences for these outcomes, and each player contrives to play so that his rewards will be maximal. It is presumed that the preferences will be consistent within the context of the game and that such preferences will be transitive and will be arranged on an interval scale which is invariant with respect to order-preserving linear transformations. "This means that a player given any three outcomes, A, B, and C, can say without ambivalence not only his order of preference but can also tell the ratio of the differences among the preferences. . . ."[5] It also makes the economic assumptions of perfect knowledge and ceteribus paribus within the context of an individual game. Gaming theory, then, is actually somewhat more rigid than economic theory in its prediction of logical, transitive choice since it assumes not only the consistency, transitivity, perfect knowledge and ceteribus paribus of economic theory, but it also assumes an interval scaling which is not assumed in economic theory. It is an extremely valuable construct, however, because it introduces the notion of bargaining or contingent reward. This allows us to discuss decision-making in a somewhat more realistic context.

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[5] Anatol Rapoport, Two-Person Game Theory: The Essential Ideas, Ann Arbor Science Library, (Ann Arbor, Michigan: The University of Michigan Press, 1966), p. 28.

The bargaining concept has been adapted to social choice-making primarily by Deutsch and Krauss (1960), Blau (1964), and Thibaut and Kelley (1959). All three of these adaptations also assume consistency and rationality of choice in the context of the bargaining situation with the goal of reward maximization. They do not, however, assume perfect knowledge or <u>ceteribus paribus</u>. In fact, they assume that if a player finds another situation in which his rewards are likely to be higher, he will break away from the original relationship to join the new one, providing that the costs of leaving do not negate the rewards that would derive from the new relationship. In this sense, these adaptations assume two kinds of choice--choices within a relationship and choices between relationships. In any case, they assume logical, consistent choice patterns in either situation after the manner of economic and gaming theory.

From these relatively precise theories, we turn to the psychological models. These theories, while they are less precise, often seem to conform better to reality than economic and gaming theories. This is possibly because psychologists are more interested in explaining human action as they observe it rather than as it would be in a pure system. This means that while human action can be predicted, it is only true in a probablistic sense; and means that our predictions cannot be made in frameworks as rigid as those we have already discussed.

Perhaps the greatest evidence of the theory of choice-making consistency and transitivity is represented in the body of consistency theories. All such theories imply that a person's choices,

at least those which he perceives to be related to one another, must be consistent and transitive. If they are not, these theories predict that the person will be compelled to make his actions consistent and transitive by his psychological need for consistency.[6] Abelson and Rosenberg (1958) in their theory of symbolic psycho-logic predict that individuals will follow certain psychological rules, which correspond very closely to the mathematical properties of transitivity, to determine the implications of past attitudes and actions (which are merely overtly expressed attitudes); and that they will use these considerations to make their choices consistent and transitive. This is undoubtedly the most extreme of these theories as it implies that people think and make decisions and choices according to a set of rules which are rigidly logical and conform very closely to syllogistic thinking. In later work, Rosenberg (1960a, 1960c, 1965a) further develops the concept that logical, transitive choices will be made about related issues and objects because of conscious realization of the implications of inconsistency contained in certain courses of action. McGuire's work with logical-affective consistency (1960a, 1960b, 1960c) implies very much the same thing about human choice-making behavior.

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[6]Such a need, in so far as it actually exists, may be culture bound rather than an a priori need inherent in human nature. Data are available to indicate that traditional patterns of thinking and child-rearing in a society will determine, at least partially, whether there is a need for consistency in action and thought. For example, see C.I. Hovland, A.A. Lumsdaine, and F.D. Sheffield, Experiments on Mass Communication, (Princeton, N.J.: Princeton University Press, 1949), for their comments on the differences between the consistency-oriented responses of American subjects and the complexity-oriented responses typical of Syrian subjects.

He posits and attempts to prove the hypothesis that if a person perceives that two actions or concepts are related, he will make logically consistent, transitive choices regarding them. Assimilation-contrast theory, developed by Sherif and Hovland (1961) and Hovland, Harvey, and Sherif (1957), in theorizing that choices in the realm of belief will be made consistent with certain "anchors", make the same sort of assumption about rational choice-making. The work in dissonance theory by Festinger (1957), and Brehm and Cohen (1962) implies that if logical transitive choices are not made, the person will suffer psychological discomfort and will attempt to make his decision consonant in some way. This last work, however, only implies that man is capable of making rational choices and that he will tend to do so, not that he will do so invariably.

On occasion, psychologists have become so mesmerized by mathematical and economic regularities that they fail to make allowances for the imprecisions which are inherent in human action. As we continue our investigation, we will find that such seems to be the case with the wholesale adoption of the assumption of consistency and transitivity in social choice-making. We shall find in the next chapter that there is much evidence from reality to indicate that people do not always make perfectly transitive, consistent choices, even in actions which are related to one another. In fact, there is some evidence to indicate that under certain conditions intransitivity will occur almost invariably.

CHAPTER 2

INDICATIONS OF THE EXISTENCE OF INTRANSITIVITY

There may, after all, be as much pressure toward intransitiv-

ity as in the other direction. McGuire says, when discussing the

origins of inconsistency:

> . . . the fault may lie in the stars and not in our-
> selves. The notion of a society free of inherent con-
> tradictions is going out of fashion. Cognitions that
> reflect an inconsistent social world . . . must be in-
> ternally contradictory. People are cast in conflict-
> ing roles. They are called upon to serve God and man
> when the two may be at odds. . . . And even if the
> universe is inherently consistent in the eyes of God,
> man sees only a sample of information and so, unaware
> of the higher synthesis, he may be left with a contra-
> diction in his partial and even biased sample.[7]

In such a universe, it might be more reasonable to assume that ir-

rationality and inconsistency would be the natural order rather

than the tendency toward consistency and transitivity which we have

always assumed. Philosophical speculations aside, however, we have

much objective information to suggest that intransitivity is a re-

latively common occurrence.

Even the consistency theorists, while indicating a need for

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[7]William J. McGuire, "The Current Status of Cognitive Consis-
tency Theories," in Martin Fishbein, ed., Readings in Attitude
Theory and Measurement, (New York: John Wiley & Sons, Inc., 1967),
p. 403.

consistency, indicate that there may be pressure in the opposite direction. Festinger, for instance, claims that when forced to choose among several appealing alternatives the individual will have post-decisional regret in many cases, even if he has chosen the alternative which is most consistent with his other cognitions.[8] If the person has post-decisional regret, or dissonance, in such a case, it would seem to indicate that he had at least some desire to choose another, less consistent, alternative. In fact, the whole dissonance theory, while it postulates consistency, logically implies that the tendency to choose inconsistently exists at least to some degree. Otherwise, there would be no occasions upon which a person would feel dissonance at all, and therefore be compelled to reduce it, except in cases of forced choice. The consistency theorists, however, do not consider whether or not consistency is the "natural" tendency. They merely contend that it is the choice tendency with which man is most psychologically comfortable.

Nor does transitivity follow by necessity from a mathematical definition of preference. If preference is defined as the greater probability of accurrence of one choice over another, then we may write xPy, xIy, or yPx according to whether $p(x) >, =,$ or $< p(y)$. We shall use the notation $p(x/x,y)$ to mean the probability that x is chosen from the set of x and y.[9]

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[8]Leon Festinger, <u>A Theory of Cognitive Dissonance</u>, (Stanford, Calif.: Stanford University Press, 1957), p. 22.

[9]In this context we shall use probability strictly in the sense of relative frequency.

From this definition we may attribute certain qualities to pre-
ference and indifference. The first of these is that a person
will either prefer x to y, prefer y to x, or remain indifferent to-
ward the two alternatives. The second is that a person will be in-
different between x and x. The third is that if a person is indif-
ferent toward the alternatives x and y he will also be indifferent
toward them when their order is reversed. The primary utility of
this statement is to permit mathematical manipulations which in-
volve reversing the indifference statement. The final statement
follows from the first. If a person prefers x to y it implies that
he does not prefer y to x. In other words we can say that our de-
finition of preference is such that the preference relation exhibits
the qualities of trichotomy, reflexivity and symmetry for I and
anti-symmetry for P.

It does not follow, however, from our definition that either
P or I is transitive. This means that we cannot say under all con-
ditions that if a person prefers x to y and prefers y to z that he
will of necessity prefer x to z. The same thing may be said of the
indifference relation. The transitivity for P and I only follow
when the choice is being made from elements of the same set.[10] A

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[10]A mathematical proof of this statement is as follows. From
the definition of preference above we may attribute the following
qualities to P and I.
(1) One and only one of xPy, xIy, and yPx holds. (Trichotomy).
(2) xIx. (Reflexivity for I).
(3) xIy implies yIx. (Symmetry for I).
(4) xPy implies not-(yPx). (Anti-symmetry for P).
However, it does not follow from a strict definition of preference
that either P or I is transitive, i.e. that:
(5) xPy and yPz imply xPz. Or,
(6) xIy and yIz imply xIz.
Such statements follow only when we attribute differential utility

brief example may serve to make this principle clearer. Saying

that a person will choose eternal damnation of his soul from the

set (eternal damnation of the soul, disgrace) and that he will

choose disgrace from the set (disgrace, stupidity) does not

necessarily imply that he will choose eternal damnation of his

soul from the set (eternal damnation of the soul, stupidity).

Such a relation assumes that each of the items has a constant uti-

lity which it assumes in all sets in which it appears. Such a pre-

sumption is valid only when all the alternatives are from the same

set and the set is ordered simultaneously. So, we must conclude

that while transitivity may follow with the addition of certain

conditions, it does not become a necessary conclusion of the defi-

nition of preference. Such a conclusion means that since transi-

tivity does not follow by necessity from the definition of prefer-

ence in some of the cases in which we are required to indicate our

preferences, intransitivity _may_ be exhibited without doing violence

to the mathematical definition of preference.

We certainly, it is pointed out by K.J. Arrow, cannot depend

upon transitivity in collective decision-making, although it may

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to the alternatives, which we shall see later is impossible in some
cases. The fact that transitivity is not a necessary conclusion
from our definition of preference becomes more readily obvious if
these statements are made in terms of probabilities.
(5') $p(x/x,y) > p(y/x,y)$ and $p(y/y,z) > p(z/y,z)$ imply $p(x/x,z) > p(z/x,z)$.
The above statement is not true because the probabilities are cal-
culated with respect to different fundamental probability sets.
The statement is true only for the trichotomous set.
(5'') $p(x/x,y,z) > p(y/x,y,z)$ and $p(y/x,y,z) > p(z/x,y,z)$ imply
$p(x/x,y,z) > p(z/x,y,z)$.
Therefore, we cannot say that transitivity follows from the defini-
tion of preference in all cases. Q.E.D.

occur. In fact, we quite often encounter the "voting paradox" in collective choice-making situations.

> Suppose there is a community consisting of three voters, and this community must choose among three alternative modes of social action. . . . In analogy with the usual utility analysis of the individual consumer under conditions of constant wants and variable price-income situations, rational behavior on the part of the community would mean that the community orders the three alternatives according to its collective preferences once for all, and then chooses in any given case that alternative among those actually available which stands highest on this list. . . . Let A, B, and C be the three alternatives, and 1, 2, and 3 be the three individuals. Suppose individual 1 prefers A to B and B to C (and therefore A to C), individual 2 prefers B to C and C to A (and therefore B to A), and individual 3 prefers C to A and A to B (and therefore C to B). Then a majority prefer A to B, and a majority prefer B to C. If the community is to be regarded as behaving rationally, we are forced to say that A is preferred to C. But in fact a majority of the community prefer C to A.[11]

Thus, in the literal sense, at least, we cannot expect transitivity in collective choice-making.

One of the earliest, and most often neglected, studies which indicates that intransitivity exists at the level of the individual was done by A.H. Martin in 1922. After having subjects indicate their preferences in situations where one alternative was definitely preferable to the others, where the alternatives were almost equally desirable, and where the choice was unimportant to the subjects, he found that intransitivity of preference patterns occurred at all levels. It was more often observed, however, in the last two conditions of the experiment, where the subjects had to indicate their preferences in cases where the alternatives were almost

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[11]Kenneth J. Arrow, Social Choice and Individual Values, (New York: John Wiley & Sons, Inc., 1951), pp. 2-3.

equally desirable and where the choice itself was relatively un-

important. In these cases, subjects showed far less confidence

in their choices and a significant tendency to change their rank-

ings of the alternatives when asked to rate them a second time.[12]

Another experimental effort which indicates that intransi-

tivity exists on the individual level was done by Kenneth May in

1954. Subjects were to make choices between pairs of hypothetical

marriage partners taken from a set of three such partners, x, y,

and z. The partners were described in terms of wealth (zxy),

looks (yzx), and intelligence (xyz). After having been confront-

ed with the alternatives in pairs and having indicated their pre-

ferences in that context, the subjects were asked to rank all

three. The results indicate that intransitivity was present.

> If group preferences be defined by majority vote, the
> results indicate a circular pattern, since x beat y
> 39 to 23, y beat z by 57 to 5 and z beat x by 33 to
> 29. The number of individuals having each of the pos-
> sible patterns was xyz: 21; xyzx: 17; yzx: 12; yxz:
> 7; xzy: 1; zyx: 4; zxy: 0; and xzyx: 0.[13]

It is impossible to tell from his results exactly how many of the

subjects showed intransitivity with respect to the paired choices,

but he does indicate that at least 30 of the 62 subjects showed

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[12]A.H. Martin, "An Experimental Study of the Factors and Types of Voluntary Choice," Archives of Psychology, 1922, No. 51.

[13]Kenneth O. May, "Intransitivity, Utility, and the Aggregation of Preference Patterns," Econometrica, V. 22, No. 1, January, 1954, p. 6.

some intransitivity.[14]

We have seen that the possibility of intransitivity is logically implied in both our current consistency theories and in the mathematical definition of preference; as well as that it does, in fact, exist both in the aggregate and at the individual level. Given the absence of force, economic theory would explain these intransitivities as either a change in one or more of the Marshallian utility parameters--i.e. tastes, income, prices, and so on--or in terms of indifference. It is probable that we can explain many of the intransitivities we have encountered in terms of the same sorts of indifferences.

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[14]Ibid., p. 7.

CHAPTER 3

INDIFFERENCE AS IT RELATES TO INTRANSITIVITY

Indifference may be described in terms of indifference curves. These curves are such that along any one of them the consumer will derive constant utility. In other words, he will be indifferent to any combination along a given curve. His total utility will change only if he moves to a higher or lower indifference curve. By definition he will operate at the highest level of utility, or on the highest indifference curve which his resources will allow.[15]
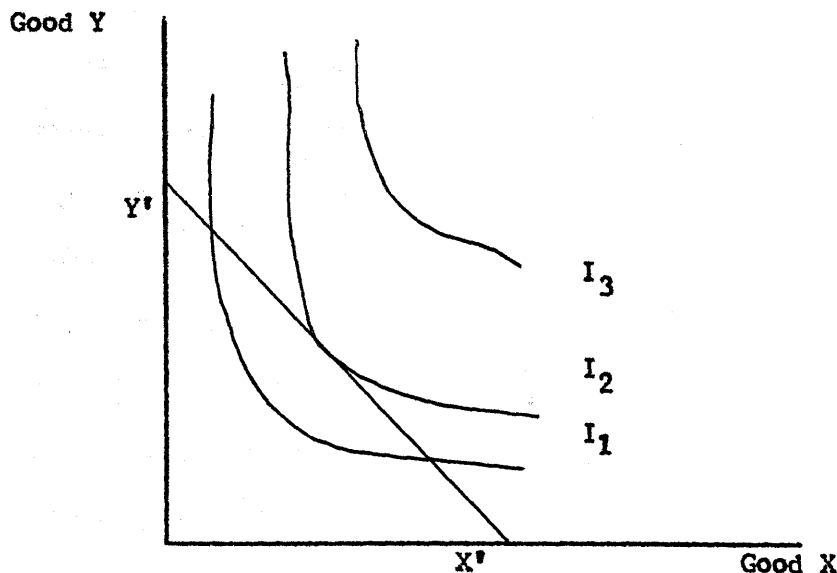

Figure 1
An Individual's Indifference Pattern

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[15]H.H. Liebhafsky, Price Theory, pp. 83-84.

Figure 1 depicts the situation in which a consumer has an income line represented by the budget line X'Y'. This line is drawn by finding the points X' and Y', which correspond to the amount of each of the goods the consumer could buy if he devoted all of his income to that good alone, and joining the two points. The curves I_1 to I_3 represent differing levels of utility, which we may define for our purposes as satisfaction. In reality, there are an infinite number of these curves, representing an infinite number of levels of utility or satisfaction. In practice, however, we draw only a few of these lines to represent the relative orderings of preference levels. In Figure 1, the consumer will choose to operate on curve I_2 because it is the highest level of satisfaction he can reach within the limits of his income.

We may explain social differentiation in terms of a similar indifference model. Arrow, Thibaut and Kelley, and Blau have already begun the translation of social action into economic terms. In fact, Blau has already used the indifference model to explain which of several bilateral monopoly bargaining relations will be chosen.[17] Thibaut and Kelley have theorized that the individual will act as an economic man in social situations to obtain the greatest social reward at the smallest cost.[18] Such suppositions will form the basis for our own model.

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[17]Peter M. Blau, Exchange and Power in Social Life, (New York: John Wiley & Sons, Inc., 1964), pp. 171-78.

[18]John W. Thibaut and Harold H. Kelley, The Social Psychology of Groups, (New York: John Wiley & Sons, Inc., 1959, pp. 9-30.

We shall operate from a few basic assumptions. Our previous

discussion indicates that people are capable of expressing defi-

nite preferences for some social relationships; and that such

preferences are based on the social utility or reward of these

relationships. In other words, an individual will find relation-

ships which yield equal amounts of satisfaction equally desirable.

A corollary to this assumption is that the individual will also

be indifferent to some relationships, i.e. they will give him

equal rewards or utilities. A second assumption is that he will

tend to become satiated by the rewards from an activity so that

his reward increment for each added increment of participation

will become smaller as his participation rate increases. In other

words, he will experience diminishing marginal utility as his

participation goes up. We shall also assume that, although an in-

dividual's indifference pattern contains all possible sets of out-

comes, he will be prevented from reaching his highest possible

indifference level by certain personal and social limitations.

Just as the individual in society must operate within a mone-

tary budget, he also must operate within a "social budget" which

reflects personal and social factors which prevent his reaching

his highest possible indifference level. We shall refer to this

sort of budget as the social parameter, SP. We shall assume that

just as one's financial parameters may change from time to time,

so may one's social parameter change, allowing him to reach a high-

er level of social satisfaction or forcing him to a lower one. The

SP, as a matter of fact, might be in a state of almost continual

flux because of its complexity and because of the changeable nature of personalities and social conditions. It includes such factors as inhibition, personal ability, level of aspiration, societal regulation or discrimination, geographical or other physical limitations, tastes, interpersonal pressure--in short, any factor which would increase or decrease one's possibility of attaining his highest possible indifference level.

This model will operate to explain choice-making on both the interpersonal and intrapersonal levels. Let us suppose that Foghorn Zilch has some choices to make. On a given Friday night he may choose either to go out with the boys or to go out with Jane or Mary. He prefers going out with Mary to going out with Jane and prefers going out with Jane to going out with the boys. But let us suppose that when he calls Mary she says that she already has a date with Hero the football player on Friday. This puts one of his choices above his social parameter since he does not wish to go out with Mary badly enough to suffer a cauliflower ear for the privilege. In other words, the marginal costs of a date with Mary are greater than the marginal rewards. He therefore calls Jane who says that she would love to go. However, she will not express a preference for going to a movie or going bowling, possibilities to which Foghorn himself is indifferent. He likes them equally well, they yield equal satisfaction or utility to him, and there is no other activity that will yield a higher utility. His choice in terms of the model will be:
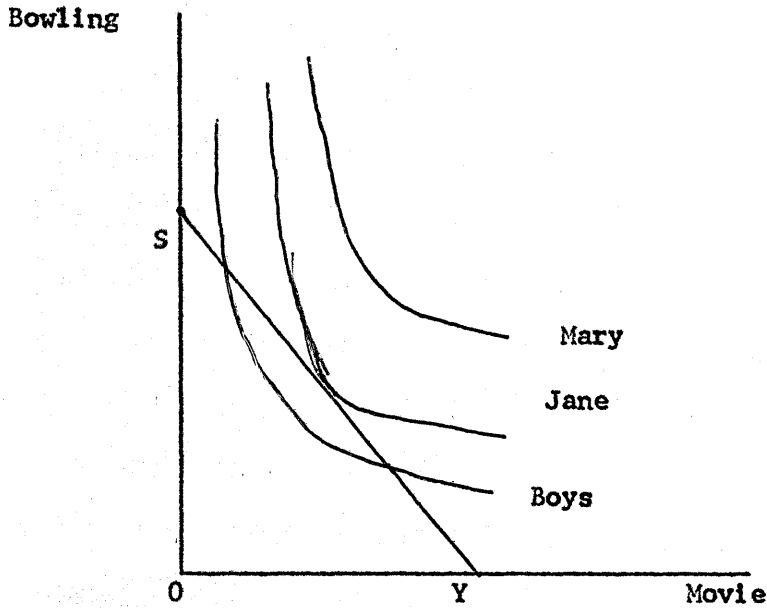
Bowling

Figure 2
Foghorn's Indifference Pattern

In this situation, he will probably make an arbitrary choice be-
tween a movie and bowling which are on the indifference curve mark-
ed Jane. If, however, he chooses a movie, the next time he goes
out he will probably choose bowling, because although the objective
utilities of bowling and movies are equal, the marginal utility of
a night of bowling will be greater after he has been to the mov-
ies once.

Such a model is far more interesting when we use it only to
consider choices among alternatives which have equal or nearly equal
desirability. Because of our assumption that preferences will
correspond to utilities, equal desirability implies equal utility.
In the case where there are two or more alternatives of equal
utility or desirability which fall on the optimal indifference
frontier, we may expect that choice among them will be more or
less arbitrary within the limits of diminishing marginal utility.

Therefore, we cannot expect choices or preference indications a-
mong them to be strictly transitive. In fact, we may expect a
great deal of intransitivity or refusal to choose at all in this
context.

The reader may object, and legitimately so, that the instance
in which alternatives are precisely equal in utility is a rare one.
This is probably true. However, it is not practical in the usual
case to differentiate between precise and approximate equality.
Since there are an infinite number of utility or satisfaction lev-
els in any individual's indifference pattern, the differences be-
tween equal and approximately equal utility are probably so imper-
ceptibly small that it is not necessary to distinguish between
them for our purposes. In either case, the alternatives will be
so close to equal desirability that it will be difficult for the
individual to delineate one clearly preferable alternative. In
Festinger's conceptualization, if the individual is forced to choose
among the alternatives in the case we have described, he will ex-
perience a great deal of post-decisional dissonance. From this
analysis we may generalize that the more nearly equally desirable
an individual perceives the alternatives in a situation to be, the
more arbitrary, and, therefore, the more intransitive his choices
will be.

Following this line of reasoning, we shall presume that such
equal utility may stem either from unimportance of the choice, in
which case intransitivity is of little moment, from the length of

time over which the choice is made, or from equality of the alternatives in terms of equal numbers of positively and negatively valued, equally salient characteristics. Thus, we may especially expect intransitivity to occur in situations where the individual must choose the best of several "good" alternatives, or the least evil from a set of "bad" ones. The more nearly any given situation conforms to this pattern, the more intransitivity we may expect the individual to exhibit.

Let us then, apply our model to one of the intransitivities we described in a previous chapter. In May's experiment, the marriage partners were described in such a way that none were superior on the basis of all three characteristics. Each was first on one dimension, second on another dimension and last on the third dimension. If we disregard the time dimension, which may have had some effect in this experiment, although it was probably not a major one; we find that the subjects were faced with the problem of ranking three marriage partners on the basis of descriptions which were more or less objectively equal. Furthermore, the characteristics described--wealth, looks, and intelligence--were probably equally salient characteristics of a marriage partner. In such a situation, it would be highly likely that the marriage partners would fall on the same indifference curve. Therefore, we would predict from our model that the subjects would tend to make arbitrary choices between the two partners in any given pair. This decision, because of its arbitrary nature and because of actual indifference--that is, precise equality of desirability--

would not be internalized by the subject. Therefore, when faced
with another pair, it is highly likely that the subject will make
an intransitive choice. The results of May's experiment support
this prediction. Almost half of his subjects, 30 of 62, exhibit-
ed such intransitivity.

The implication of this model is that if one were to formu-
late a choice situation such that the alternatives easily order
themselves in terms of preference, one would find more transitivity
of choice-making than in a situation where the alternatives are
nearly equal in desirability so that it is harder for a clearly
preferable alternative to emerge. This is the basis upon which
we formulated a design to test the applicability of our theory.

CHAPTER 4

EXPERIMENTAL DESIGN

The experiment was designed to test the hypothesis: A sub-
ject will tend to exhibit more intransitivity in choice-making
the more diverse, counter-balancing factors he is given about the
alternatives among which he must choose. A corollary of this hy-
pothesis is that in a situation where a subject is faced with di-
verse, counter-balancing information about the alternatives, he
will tend to exhibit less intransitivity if his attention is fo-
cused on one of the items. A choice in this context is considered
to be any indication of preference. Intransitivity may be defined
as having occurred when a subject's choices do not mutually agree.

The vehicle for the experiment was a paired-comparison pre-
ference scale with allowance for indifference. (See Appendix).
On this scale, the subject was asked to indicate his preference
for one of a pair of residence hall counselors taken from four de-
scriptions which he had read. There were six pairs in all, com-
prising the total possible combinations of the descriptions given.
Each subject rated all six pairs. Later, he was asked to rank
the counselors in the order he would prefer them, from first to
fourth, if he were allowed to choose among all four. These two
ratings were compared to determine the degree of transitivity which

was present. Perfect transitivity was indicated by a score of zero, and each occurrence of an intransitivity was scored as one.

The measure itself was three pages long. On the first page were descriptions of the four counselors, on the second was the paired-comparison rating scale, and on the third was the rank-order rating scale. There were four conditions in the experiment, denoting whether the descriptions of the counselors contained one, two, three, or four dimensions. In each of the last three conditions there were two treatments. In one of these, the subject's attention was deliberately focused on one of the dimensions (rule enforcement). The other treatment emphatically instructed the subject to take all the information given about the counselor into account when making his choices. We shall refer to these as the singular and diverse focus treatments, respectively. It was expected that in the singular focus treatment less intransitivity would be encountered in making the choices than in the diverse focus treatment. This prediction was made because the singular focus treatment would have the effect of raising the salience of the emphasized characteristic while reducing the salience of the others. This would make the alternatives less equally desirable than in the diverse focus condition.

The subjects were asked to make their choices on the basis of descriptions of four residence hall counselors. We chose to describe residence hall counselors because the counselor-counselee relationship is one which is familiar to most college students. In our case, especially, the supposition was a valid one. Slightly

more than seventy-five per cent of the sample population either
were living or had lived in a residence hall.

The descriptions were developed on the basis of a systema-
tic variation of one to four one-dimensional characteristics--
availability for counseling, severity of rule enforcement, age,
and encouragement of participation in extra-curricular activities.
The characteristics were first developed individually. Then a
sample of forty-seven Speech I students was asked to rank each of
the four groups of variations of an individual characteristic for
likability. They ranked the items in each group from one to four--
most liked to least liked. Each characteristic variation was then
assigned a rank of one, two, three, or four on the basis of the
sample rankings. Finally, in order to insure that the alternatives
were approximately equal in attractiveness, the combinations were
systematically varied so that in the fourth condition each descrip-
tion would contain one characteristic of each rank, and, therefore,
be approximately equal in desirability. Table 1 shows the varia-
tion system.

Table 1
Ranking Variation System for
Counselor Descriptions

	Availability	Rule Enforcement	Age	Activities
Counselor A	3	2	4	1
Counselor B	2	1	3	4
Counselor C	1	4	2	3
Counselor D	4	3	1	2

The same variation system was used for all four conditions to assure

uniformity.

The printed instructions which preceded the descriptions were

of two types. The instructions for the diverse focus condition were

as follows:

> Imagine that you are about to be assigned to a dormitory
> for a school year. You must choose which of the follow-
> ing counselors you wish to have as the counselor for your
> living group. You may assume that they are very similar
> in all but the described aspects. Be very careful to
> take every fact given about the counselor into account
> when making your choice.[19]

A slight variation of these instructions was used in the first con-

dition. The instructions for the singular focus condition were:

> Imagine that you are about to be assigned to a dormitory
> for a school year. You must choose which of the follow-
> ing counselors you wish to have as the counselor for your
> living group. You may assume that they are very similar
> in all but the described aspects. Research has shown
> that a student will be happiest in a group where the
> counselor shares his views on how strictly the rules
> should be enforced. Therefore, you may want to weight
> this factor more heavily than others in making your
> choice.

The descriptions followed these instructions. The counselors were

identified as A, B, C, and D.

The instructions for the paired-comparison rating scale were

the same in all conditions. They read:

> Please place a check by the letter of the counselor you
> would choose if forced to choose between the counselors
> in the pairs given. If you are indifferent to a pair,
> (you don't particularly prefer one to another), place
> a check in the space marked I. Consider each pair se-
> parately. Do not skip any pairs.

Verbal instructions were given which were designed to discourage

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[19]The complete measures may be found in the Appendix.

overuse of the indifference category.

The verbal instructions were uniform for all groups of sub-jects. The experimenter told the group that she represented the housing authorities on campus and that she was making a study in connection with the revision of the criteria for choosing resi-dence hall counselors. She then told the group that they could aid in this study by indicating on a questionaire what sorts of counselors they liked best. The following verbal instructions were then given:

1. When you get your questionaire be sure to read the instructions and descriptions very carefully before indicating your choices.

2. You should be careful to reflect your true preferences because other people will have to live with your choices.

3. Assume that the counselors described are of your own sex.

4. Do not turn to page three until you have completed everything up to that point.

The subjects were also asked to indicate their ages and whether they were living or had lived in a residence hall. The first and fourth instructions were given simply to reinforce the printed instructions. The second instruction was given as a mitigation against the over-use of the indifference category. The third instruction was given to eliminate the confusion that might have arisen for the young ladies in the sample due to the fact that all of the descriptions were written in the impersonal third person singular. The request for age and living group information was made to make the cover story more realistic and in the hope that possible aberrations might be explained on this basis.

The variations among the four conditions of the experiment perhaps bear explanation. The first condition was a choice based on a single dimension--availability for counseling. It was hypothesized that this method would allow the most clear-cut basis for choice. The descriptions in the second condition included two dimensions which were systematically varied according to a pre-arranged pattern, described in Table 1, which was the same for all of the conditions. The third condition descriptions contained the added variable of age. The fourth and final condition added the variable characteristic of encouragement of participation in rxtra-curricular activities. The general hypothesis was that the first condition would yield the smallest amount of intransitivity and that the number of people showing intransitivity would increase with each condition. It was further expected that there would be a progressively wider margin of difference between the singular and diverse focus conditions in each of the last three conditions.

After the data from the original experiment was gathered, a second experiment was done to test the influence of time and arrangement upon the amount of intransitivity shown by the subjects. The descriptions, scales, and instructions were the same ones which were used in the original experiment. The difference was that the descriptions were presented two at a time in booklet form. The last page of each packet was a rating sheet for the two counselors described in that booklet. The subjects were asked to fill this out without looking at the descriptions again. After

they had read both booklets and had rated the pairs, the subjects
were asked to fill out the paired-comparison scale and the rank-
order scale without looking back at the descriptions. In this
version of the experiment, only the descriptions from condition
four were used. It was predicted that the subjects would exhi-
bit more intransitivity than those in condition four of the origi-
nal experiment.

Our general prediction was that the number of persons show-
ing intransitivity would become progressively larger from the first
to the fourth conditions and that the margin of difference between
the singular and diverse focus treatments would follow the same
pattern.

CHAPTER 5

METHOD AND RESULTS

The subjects for the original experiment were sixty-eight

students who were taking the speech fundamentals course in the spring

semester. There were nine subjects in each of the two treatments

of conditions two, three, and four and twelve in the first condition.

Two subjects' responses were eliminated because they did not fol-

low instructions when giving their ratings.

The measures were administered to one class at a time. Five

classes were used. The various conditions were randomly distri-

buted so that every class had some subjects in each of the condi-

tions of the experiment. Each class was given the uniform verbal

orientation and instructions which are described earlier in this

paper. The questionaires were then distributed. The average sub-

ject completed the entire measure within fifteen minutes. The

experimenter was never questioned about any part of the questionaire,

although such questions were not prohibited, and no one appeared

to be having difficulty in responding. This, as well as the fact

that there were only two cases in which the responses were not made

correctly, indicates that the subjects probably understood the in-

structions and were not confused as to what they were to do. In

two cases, the teacher was given a brief written explanation of the

purposes of the experiment so that he could use the experiment
as a teaching device at his convenience. In the other three cases,
the experimenter returned to the class to discuss the experiment
and to answer questions.

The raw data were in two forms. For each subject, there was
a set of six responses to paired-comparison scales, indicating which
of the two counselors was preferred, and a ranking listing the coun-
selors in order of preference from first to fourth. The following
is a typical example of a subject's responses to the paired-com-
parison ratings. The notation, A P B, means that A is preferred
to B.

A P B	A P C
B P C	B P D
A P D	C P D

From this set of rankings it was relatively simple to derive the
order of preference for a given subject. In the case in the exam-
ple, the order is A B C D. This order was then checked against
both the ratings for each pair and the rank-ordering. The rank-
ordering was also checked for consistency with the paired-compari-
sons. An intransitivity was scored in any case where the paired
ratings did not agree with either the derived or the given rank-
order. In other words, two kinds of intransitivity were scored--
intransitivity among the paired-comparison rankings and intransi-
tivity between the paired-comparison rankings and the given ranking.
Either of these sorts of intransitivity indicates an inability to
make choices consistent with previously stated ones. In each con-

dition, two totals were recorded--the number of intransitivities and the number of subjects who exhibited them. Since it was possible for a single subject to exhibit intransitivity more than once, these totals sometimes differ. A table of the results follows.

Table 2
Raw Data From The Experiment

Condition	1	2S	2D	3S	3D	4S	4D	Totals
N in Condition	12	9	9	9	9	9	9	66
N intransitivities	6	0	1	3	3	4	3	20
N having intransitivity	5	0	1	2	2	3	3	16
% of total intransitivity	30	0	5	15	15	20	15	100
% of subjects showing intransitivity	41.7	0	11	22	22	33	33	24.2

Probably the most meaningful of these data is the percentage of subjects in a given condition who showed intransitivity. When charted on a graph, those data show the following pattern.
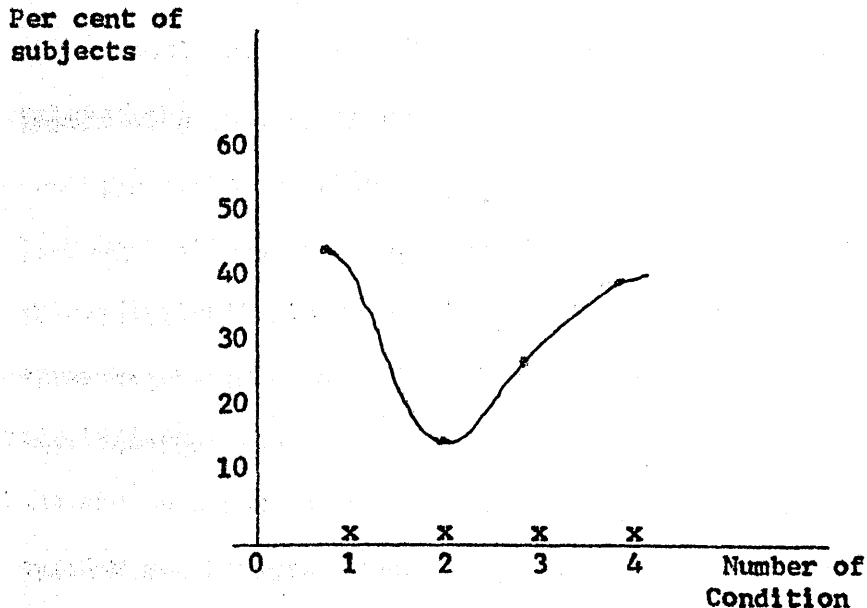

Figure 3
Per Cent of Subjects Showing Intransitivity

On the whole, the subjects exhibited a great deal more transitivity than was expected. From the results of May's experiment we would have expected close to half of them to have exhibited intransitivity in the fourth condition. In fact, only about thirty-three per cent did so. This was true in all but the first condition, in which the subjects exhibited more intransitivity than in any other, in direct contradiction of the predicted results. It is possible that these subjects were not challenged to make careful choices by the extreme simplicity of the descriptions in this condition. It is also possible that there is a lower limit to the number of variables required to remove the alternatives from their original condition of equal desirability. If this is true, the subjects would have just as difficult a time making a decision and in making consistent decisions when they are given too little information as in cases where they are given enough diverse, counterbalancing information to make the alternatives approach equal desirability.

In conditions two, three, and four, the results support the main hypothesis. With each addition of a variable to the description, the number of subjects who exhibit intransitivity increases. The results do not, however, confirm the corollary to our hypothesis. It may be that, in this experiment, focusing a subject's attention on one aspect of a description does not lessen the confusion caused by the other factors which are present.

In the second experiment, sixteen subjects in a single speech

class were used. The sample was divided equally between singular and diverse focus treatments. In the singular focus treatment there were three, or thirty-seven and one-half per cent, of the subjects who showed a total of ten intransitivities. In the diverse focus treatment, two subjects, or twenty-five per cent, showed six intransitivities. These results are reasonably consistent with our other results and seem to support the main hypothesis.

CHAPTER 6

PROBLEMS AND IMPLICATIONS

There were several problems in design that may have had an

effect on the results of the experiment. The first of these was

that the characteristics used to describe the counselors were not

tested for salience. Ideally, a number of different characteristics

should have been tested for salience, and the four most salient

characteristics used to describe the counselors. This would have

made certain that the alternatives were as nearly equally desirable

as possible. Such a precaution might have made the laboratory de-

cision more realistic. Had it been done, our sample would pro-

bably have shown greater intransitivity than it did. At any rate,

it is almost certain that the characteristics we did use were not

equally salient.

Another problem was that neither the written or the verbal

instructions made any attempt to hide the choice-making nature of

the experiment. Only the reasons for which the choice was being

made were camouflaged. It might be supposed that had the subjects

not been aware that they were to make a choice until after having

read the descriptions, the alternatives might have been more near-

ly equally desirable in their minds at the time of choice. Since

our results indicate that equally desirable alternatives probably

do lead to intransitivity in choice-making, it is entirely possible that more cleverly designed instructions might have mitigated in favor of our hypothesis.

A final problem was the arrangement of the measure. We chose to put all the descriptions on the same page and all of the paired-comparisons on the same page. It is not often that we find such a conveniently collected set of alternatives or such a closely related set of paired-comparisons in realistic experience. We would probably have more closely simulated reality if each description and each choice had been on a separate page. Had we used an arrangement which more nearly simulates reality we might have found greater support for our hypothesis.

The fact that our hypothesis was supported marginally despite errors in design which mitigated in favor of transitivity rather than intransitivity lends credence to our belief that indifference is an important factor in intransitivity. This conclusion has important implications for the practice of rhetoric.

We have always been concerned with the prior belief patterns of our audiences. The importance of indifference in the intransitivity of choice-making gives us an even greater cause to be concerned with the beliefs of our audiences. The precision with which we can predict the results of our efforts depends upon the precision with which we determine our audiences' prior beliefs. The indifference model implies that we must not only determine neutrality, favorability, or hostility, but as well we must determine the degree to which the audience is hostile or favorable.

Otherwise we run the risk of presenting only enough arguments to raise our alternative to the level of indifference with several other alternatives, rather than to the level of clear preferability to other alternatives. It also implies that we must consider only those alternatives which are within the social parameters of our audience.

Indifference theory, then, is a useful concept in helping us to analyze "how far" we must persuade an audience to be assured of success. We have always recognized that different audiences require different amounts of persuasive effort. We can apply the indifference model to our audiences to help us visualize where our alternative lies in the indifference patterns of our audience. We may then make attempts to raise our alternative to the optimal indifference frontier while preventing other alternatives from reaching or staying in that position.

APPENDIX

This appendix contains the descriptions from condition four of the experiment. To find the descriptions for conditions one, two, and three, read only the first one, two, or three of the characteristics respectively. The singular focus treatment was prefaced with the instructions below:

Imagine that you are about to be assigned to a dormitory for a school year. You must choose which of the following counselors you wish to have as the counselor for your living group. You may assume that they are very similar in all but the described aspects. Research has shown that a student will be happiest in a group where the counselor shares his views on how strictly the rules should be enforced. Therefore, you may want to weight this factor more heavily than others in making your choices.

The diverse focus treatments were prefaced with these instructions.

Imagine that you are about to be assigned to a dormitory for a school year. You must choose which of the following counselors you wish to have as the counselor for your living group. You may assume that they are very similar in all but the described aspects. Be very careful to take every fact given about the counselor into account when making your choice.

Condition one used these instructions:

Imagine that you are about to be assigned to a dormitory for a school year. You must choose which of the following counselors you wish to have as the counselor for your living group. You may assume that they are very similar in all but the described aspects.

Counselor A

This counselor feels that he isn't qualified to be of help with
personal problems. Whenever someone approaches him with a problem,
therefore, this counselor refers the person to the resident direc-
tor or someone in the Dean's office since he thinks these people
can be of more help than he. He does not enforce the rules very
strictly. He feels that most of them are unfair to the students
so he will not report any but the most serious offenders, and then
only if they have more than one infraction, if he has the choice.
He is a senior but is older than normal (26 years old) because he
dropped out of school to work for several years after completing
his sophomore year in college. He feels that students should be
interested in extra-curricular activities and regularly makes men-
tion of opportunities for such participation to people in his
group. He takes participation into account when making his reports
to the Dean's office; but such other things as grades, ability to
get along with others, and over-all adjustment also influence his
ratings. He makes no effort to discriminate in favor of those who
participate in extra-curricular activities although they often re-
ceive favorable reports because they are outstanding in other ways
as well.

Counselor B

This counselor enjoys having the people living in his group come
to him for help with their problems. In fact, he encourages them
to do so. His door is always open and he is more than willing to
listen to any problem, large or small, at all times. He feels
that rules should be strictly, but fairly, enforced. While he
does not search for infractions, if he sees someone breaking a
rule or if an offense is brought to his attention, he deals with
it promptly in the manner prescribed by the Dean's office. He is
a junior about 19 years old who has attended this school all three
years. He feels that extra-curricular activities are a waste of
the student's time and specifically discourages participation by
the students in his group. In making his reports to the Dean's
office he gives the most favorable reports to those who seem to be
the most serious about their studies and who seem to get along well
with other people in the living group. He usually gives the least
favorable reports to those who participate in extra-curricular ac-
tivities because he considers them to be "non-serious" students.

Counselor C

It has been this counselor's experience that it is more beneficial
to a person to work out his problems individually, on his own. He
is, however, willing to talk to a student about his problems if the
person can show evidence of having worked at solving the problem
by himself without success. He is sporadic in enforcing the rules.
At times he takes little or no action for even the most serious

infractions; but two or three times a year, when he thinks things
have "gotten out of hand," he begins to enforce the rules very
strictly. At these times he reports students to the judicial
council for even very minor infractions. He is a graduate student
about 23 years old who did his undergraduate work at another uni-
versity. He feels that no student can receive the full benefit
of his college education unless he participates in a number of ex-
tra-curricular activities during his college years. He therefore
encourages his students to participate in various activities and
recognizes those who do well by placing announcements of their
achievements on the floor bulletin board. In the reports he makes
to the Dean's office each semester for inclusion in student files
he always gives the most favorable reports to those who engage in
the greatest number of activities with the greatest success. He
gives an extremely unfavorable report concerning adjustment and
initiative to anyone who doesn't participate.

Counselor D

This counselor feels that he should not have to be bothered with
the problems of persons in his group. Most of the time he hangs
a Do Not Disturb sign on his door or is away from his room. If
someone does approach him with a problem he acts as though the per-
son has invaded his privacy and seeks to send him to someone else
or to put the counseling session off indefinitely. He is extreme-
ly zealous in his enforcement of the rules. He is constantly on
the look-out for infractions and investigates any situation where
he suspects someone of breaking a rule. He usually takes firm ac-
tion, espeically with first offenders. He figures that if he hands
out severe punishment the first time, the person will think twice
about breaking the rule again. He is 21 years old and a senior.
He has attended this school all four years. He feels that it is
not his business to either encourage or discourage participation
in extra-curricular activities. He seldom, if ever, takes parti-
cipation into account when making his evaluations of students. He
feels that students should not be pressured in this, or any other,
way to do things that take away from their study time. In fact,
one semester he gave the most unfavorable rating in the group to
the student body president because he felt that the student was a
disruptive influence and was making no effort to get along well
with his roommate or the others who lived around him.

PAIRED-COMPARISON RATING SCALE

Please place a check by the letter of the counselor you would
choose if forced to choose between the counselors in the pairs
given. If you are indifferent to a pair, (you don't particularly
prefer one to the other), place a check in the space marked I.
Consider each pair separately. Do not skip any pairs.

A_____ I_____ B_____   C_____ I_____ A_____

B_____ I_____ C_____   B_____ I_____ D_____

A_____ I_____ D_____   D_____ I_____ C_____

RANK-ORDER SCALE

List in the order you would prefer the counselors if you were able
to choose any one of the four given. Put the letter of the counse-
lor who is your first choice in the blank numbered "1" and so on.

1.   3.

2.   4.

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