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ABSTRACT

The purpose of this paper is to describe an intuitively appealing continuum along which motives relevant to situations of social interdependence may be located. Aditionally, it is argued that individuals differ in terms of their positions on this continuum, and that such differences are important to a general theory of bargaining. The argument is based on: (a) the demonstration of a number of simple (and internally consistent) measurement techniques which describe a subject's social motivation, and (b) some empirical results demonstrating the relationship of such motivational measures to actual bargaining behavior. The present paper discusses several general approaches to the measurement of social motives in the individual subject. As it discusses the first two approaches, data is cited which indicates the relation of the motivational measures to actual bargaining behavior. Such a relation seems quite desirable, given the assumption of motivation's influence on bargaining behavior. The approaches have in common the underlying notion that in the dyad, subject's utility function over outcomes is determined by a weighted sum of the outcome subject receives for him/herself and the outcome received by the other. It is in terms of these weights that subjects' orientations can be described. (Author)

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The Measurement of Social Motivation in

Mixed Motive Settings

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Running Head: Social Motives

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The Measurement of Social Motivation in

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Introductory Remarks: The purpose of this paper is to describe an intuitively appealing continuum along which motives relevant to situations of social interdependence may be located. Additionally, it will be argued that individuals differ in terms of their positions on this continuum, and that such differences are important to a general theory of bargaining. The argument is based on: (a) The demonstration of a number of simple (and internally consistent) measurement techniques which describe a subject's social motivation, and (b) Some empirical results demonstrating the relationship of such motivational measures to actual bargaining behavior.

A mixed motive setting of social interdependence possesses a range of outcomes, each outcome producing a payoff to self (Sf) and to the other (Ot). The specific outcome that obtains is determined jointly by the actions of each participant. (Hence, the interdependence.) Now, we assume that each participant has a preference ordering over the set of possible outcomes, which ordering reflects his/her social motivation. We also assume that variation in social motivation of bargainers is systematically related to variation in actual bargaining sessicns.

In a classic study, Deutsch (1960) demonstrated the impact of three motivational orientations on choice behavior in Prisoner's Dilemma. The motives studied by Deutsch were as follows: (a) Cooperation, the orientation to maximize the joint gain accruing to both self and the other person. (b) Individualism, the orientation to maximize one's own gain with no concern for the gains or losses of the other, and, (c) Competition, the orientation to maximize one's gains relative to that of the other.

The Deutsch study induced the three orientations by means of explicit experimental instructions. More recently Messick and McClintock (1968) have shown these three orientations (or, social motives) exist in the absence of any explicit motivational instructions. Hence, the motives can be viewed as "naturally occurring" psychological states.

The present paper discusses several general approaches to the measurement of such social motives in the individual subject. As we discuss the first two approaches, data will be cited which indicates the relation of the motivational measures to actual bargaining behavior. Such a relation seems quite desirable, given our assumption of motivation's influence on bargaining behavior. The approaches have in common the underlying notion that in the dyad, subject's utility function over outcomes is determined by a weighted sum of the outcome subject receives for him/herself (Sf) and the outcome received by the other (Ot). It is in terms of these weights that subjects' orientations can be described. Table 1 indicates sets of weights to Sf and to Ot associated with the three motives currently under discussion, and two other social motives to be considered later. This table may prove helpful as the first two techniques are discussed.

Insert Table 1 about here

Simple Categorization

With this procedure, two subjects are asked to make a series of choices across a variety of decision stimuli called decomposed games. Each subject is assigned to a single motivational category based on which social motive (of the total set being considered) accounts for most of his/her choice behavior across the series of decomposed games. Table 2 gives examples of four types of decomposed game we have used in measuring social motives. For example, an individualistically motivated subject would choose Alternative B in game type 1, B in game type 2, and Alternative A in game types 3 and 4. It should be pointed out that in both the present procedure and the remaining two as well, each subject makes all of his/her decomposed game choices in total ignorance of the other's actions.

A number of studies have used this technique (McNeel, 1973; Kuhlman & Marshello, 1975(a); Kuhlman & Marshello, 1975(b)), all of them reporting that the great majority of undergraduate subjects consistently display cooperative, individualistic, or competitive motivation in the decomposed task. A doctoral dissertation (Kotkov, 1976) provides striking support for the assumption that these social motives relate to actual bargaining behavior. After completing the decomposed game task, pairs of subjects played nine trials of the Deutsch and Krauss trucking game, in which each player possessed: (a) A gate, (b) A fine card, which could be used to fine the other at any time, as many times as desired, and (c) A threat card, which was playable at any time, and the meaning of which was (intentionally) ambiguous. Half of Kotkov's dyads played the game with no communication, and the other half were allowed to speak before each trial. A 2 (communication, no communication) by 6 (motivational composition of dyad) analysis of variance was computed, taking total dyadic profit over the nine trials as the dependent variable. The analysis yielded two significant effects: For motivational composition of dyad, $F=4.207$, $df=5,61$, $p<.0024$; for the interaction between motive of dyad and

and communication, $F=2.242$, $df=5,61$, $p<.0614$. The means associated with this interaction appear in Figure 1. This figure shows profit across each of the six possible dyads (six are possible because three motives were considered). The dyads are ordered on the X axis in terms of their

Insert Figure 1 about here

"Cooperative Potential"; this ordering is suggested by previous work on these motives (Kuhlman & Marshello, 1975(b)). Clearly, in the absence of communication, conflict resolution in the trucking came is related to the dyad's cooperative potential. The only dyad to achieve a profit in this condition was made up of two cooperators. In the presence of communication, most dyads (save the individualist individualist one) show a lessening of conflict. It is interesting to note that of the three dyads achieving a profit in this condition, all contain at least one cooperative member.

It would appear then, that motivational assessment as simple and as gross (i.e., subjects are assigned to a single motivational category) as the present one is quite helpful to the experimenter in accounting for considerable variability in laboratory measures of conflict resolution. While such a technique does possess the virtue of simplicity, it nonetheless runs the risk of yielding an incomplete description of a subject's motivational system.

Specifically, subjects are assigned to discrete motivational categories (Cooperative, Competitive or Individualistic) based on which type choice they make most often in the no-feedback decomposed game task. While it is true that most subjects show a preference for a single type of gain, it is not the case that each subject manifests the same orientation on every trial. Such data indicate the desirability of a measurement scheme which indicates the relative strengths of all three motivational orientations within a given subject. Kuhlman and Marshello (1975c) have shown that Messick and McClintock's stochastic choice model can provide such description.

Measurement by the Stochastic Choice Model

The stochastic choice model assumes that at any given time the subject is in one of four motivational states (Individualistic, Competitive, Cooperative, and Indifferent) with some fixed probability (w, x, y, and z, respectively, where $w+x+y+z=1.0$). If the subject is in one of the first three states, s(he) chooses the game alternative which maximizes the type of gain appropriate to the state; if the subject is in the Indifference state, s(he) chooses between the alternatives randomly. Hence, the probability that a given alternative will be chosen is simply a sum of the probabilities associated with the goals maximized by that alternative, plus z/n, where n is the total number of alternatives in the game.

For example, consider Alternative B in decomposed game type 2 (see Table 2). This alternative maximizes both individualistic and competitive gain. The probability of this choice being made is w (the probability of being in the individualistic state) + x (probability of the competitive state) + $z/3$ (one third the probability of being in the indifference state). It is possible then to express the probabilities of each alternative shown in Table 2 as a linear combination of the model's four motivational parameters. (E.g., for the alternative just described, the combination is: $1(w)+1(x)+0(y)+1/3(z)$). This yields an overdetermined system of equations in four unknowns, the solution of which would provide an estimate of the four motivational parameters within a given subject.

Kuhlman and Marshello (1975c) estimated these parameters for 205 subjects using a least squares technique. Correlations between actual choice behavior in decomposed game type 1 (which was not used in the estimation of the parameters) and predictions based on estimated parameters were quite high; (a) For Own gain choices $r=.81$ (Males) and .83 (Females), (b) For Relative gain choices $r=.89$ and .90 (Males, Females) and (c) For Joint gain choices $r=.92$ and .90 (Males, Females). Such data indicate the model provides a consistent description of choice behavior within the decomposed task itself, which it might be remembered, involves no feedback between the two subjects. This leaves a question then, as to the ability of measures provided by this technique to account for behavior in an actual laboratory interaction.

To this end, a study was run (Kuhlman, 1976) in which subjects (92 Males and 92 Females) responded in twelve no feedback decomposed game trials, and then played ninety trials of the Prisoner's Dilemma Game with feedback after every trial. The purpose of this study was to assess the relationship between the dyad's motivational makeup and the frequency of the two most commonly occurring outcomes in Prisoner's Dilemma; bilateral cooperation (the "CC" state) and bilateral defection (the "DD" state).

The stochastic choice model was used to estimate five motives (Altruism, Cooperation, Individualism, Competition, and Indifference) for each subject. Next, a cooperative index was computed for each subject by: (1) Summing the probabilities of Altruism and Cooperation, (2) Summing the probabilities of Individualism and Competition, and (3) Taking the difference between terms 1 and 2. Then, subject one's cooperative index (C1), subject two's cooperative index (C2), and the product of these two terms (C1*C2) were used as predictor variables in two multiple regression analyses; one analysis took bilateral cooperation in Prisoner's Dilemma as the criterion variable, and the other took bilateral defection. The predictor variables were entered into the regression equation according to a forward selection procedure, (Draper & Smith, 1966). Table 3 shows the results of each step of both analyses. Clearly, for both Prisoner's Dilemma states, motivational measures achieved via the stochastic model account for nontrivial amounts of variability.

Insert Table 3 about here

To this point then, we have seen that a small number of discrete motivational states are first, measurable, and second, quite helpful in accounting for what goes on in bargaining sessions. As mentioned previously, the motives differ in terms of the weighting one gives to his/her own and to the other's outcomes. The stochastic choice model, currently under discussion, essentially portrays the individual subject as hopping from one set of weights to the other and back again. Such a portrayal suggests but by no means requires a subject who is motivationally unstable, who, from a theoretical point of view is not so desirable as a subject whose orientation is more constant. Some recent theoretical work on social motivation by Griesinger and Livingston (1973) provides a framework for viewing subjects as possessing stable social motivation. Interestingly enough, data which (successfully) evaluates the stochastic choice model (Kuhlman & Marshello, 1973c) is quite consistent with Griesinger and Livingston's system. The following paragraphs describe Griesinger and Livingston's model.

The Geometric Choice Model

Griesinger and Livingston (1973) show that any decomposed game alternative can be represented as a point in two dimensional space, in which gains to self are on the x axis and gains to other are on the y axis. Figure 2 represents the three alternatives in decomposed game type 1 (see Table 2) in this fashion. A subject chooses between the

Insert Figure 2 about here

alternatives presented on the basis of which has the largest projection on his/her "motivational vector." Figure 2 indicates five motive vectors, ranging from Altruism (90°) to Cooperation (45°) to Individualism (0°) to Competition (-45°) to Aggression (-90°). For a subject whose vector is -45° we see he/she would choose alternative C, since its projection onto this vector is largest. An Altruistic subject (Vector = 90°) would choose alternative A.

Of course, a particular subject's vector may be anywhere in this space, such as 27.5°, representing a motive somewhere between Individualism and Cooperation. The feature of this model important to the present discussion is that it suggests a specific ordering of motives which the previous two approaches do not. Specifically, we see Cooperation lying "closer" to Individualism than to Competition;

Completion is "closer" to Individualism than Cooperation, and Individualism is somewhere in "between" Cooperation and Competition.

As was mentioned previously, some data from a stochastic choice model study (Kuhlman & Marshello, 1975c) is consistent with this ordering. Specifically, it was found that of those subjects having joint gain as their strongest parameter, 81% of them had own gain as their second strongest parameter. Eighty percent of subjects with relative gain as the strongest parameter had own gain as their second strongest. Finally, subjects whose strongest parameter was own gain were essentially divided equally as to whether their second strongest motive was Cooperation or Competition. While the stochastic choice model in no way specifies dependencies of this type among its parameters, it is clear they fit well with Griesinger and Livingston's scheme.

In their article, Griesinger and Livingston describe a measurement procedure to determine the angle of a subject's motivational vector. Unlike the two previous procedures, Griesinger and Livingston's technique generates the decomposed stimulus on trial n based on the subject's choices in the preceding trials. Subjects are asked to choose between pairs of decomposed game alternatives, all of which fall on a single circle around the origin.

Initially, the alternatives are far apart, but with trials they come closer together. Trials continue until the subject is indifferent between the alternatives offered, and at this point, the angle of the subject's motivational vector is known.

The present author is unaware of research relating "vector measures" to actual bargaining behavior. However, the consistency of parameter measures from the stochastic model with the continuum of the geometric model suggests such research would be successful. Hence it appears reasonable to conclude that motive assessment via any of the three techniques described here is likely to yield comparable results as far as locating the subject in some "motivational neighborhood." Also, it seems appropriate to label these neighborhoods as Altruistic, Cooperative, Individualistic, Competitive, and Aggressive in that order. Finally, results from studies using the first two measurement techniques are sufficiently encouraging (to this author at least) to warrant the sugges- tion that individual gaming orientation be included in any theory of mixed motive bargaining that strives to be complete.

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Table 1

Weightings for Outcomes to Self (Sf) and to the Other (Ot) Associated with Five Different Social Motivations

Motivation	Weight to Self	Weight to Other
Altruism	0	1
Cooperation	1	1
Individualism	1	0
Competition	1	-1
Aggression	0	-1

Table 2

Examples of Four Types of Decomposed Game

Used to Assess Social Motivation

Type 1

	Alternative A	Alternative B	Alternative C
Outcome to Self	70	80	60
Outcome to Other	50	30	0
Motive(s) Leading to Choice of this Alternative	Altruism Cooperation	Individualism	Competition Aggression

Type 2

	Alternative A	Alternative B	Alternative C
Outcome to Self	60	70	40
Outcome to Other	50	30	20
Motive(s) Leading to Choice of this Alternative	Altruism Cooperation	Individualism Competition	Aggression

Type 3

	Alternative A	Alternative B	Alternative C
Outcome to Self	70	60	40
Outcome to Other	60	40	30
Motive(s) Leading to Choice of this Alternative	Altruism Cooperation Individualism	Competition	Aggression

Table 2 (continued)

Examples of Four Types of Decomposed Game

Used to Assess Social Motivation

Type 4

	Alternative A	Alternative B	Alternative C
Outcome to Self	60	20	40
Outcome to Other	0	20	10
Motive(s) Leading to Choice of this Alternative	Cooperation Individualism Aggression Competition	Altruism	

Table 3

Multiple Regression Analyses of CC and DD States in Prisoner's Dilemma, Taking Each Subject's Cooperation Index as Predictor Variables

	Variable Entered		Multiple R		R Squared	
	CC	DD	CC	DD	CC	DD
Step One	C1[a]	C1C2	.48	.66	.23	.44
Step Two	C2	C1	.54	.68	.29	.46
Step Three	C1C2	C2	.58	.68	.34	.47

a: C1 is subject one's cooperation index, C2 is subject two's, and C1C2 is the product of these two indices.

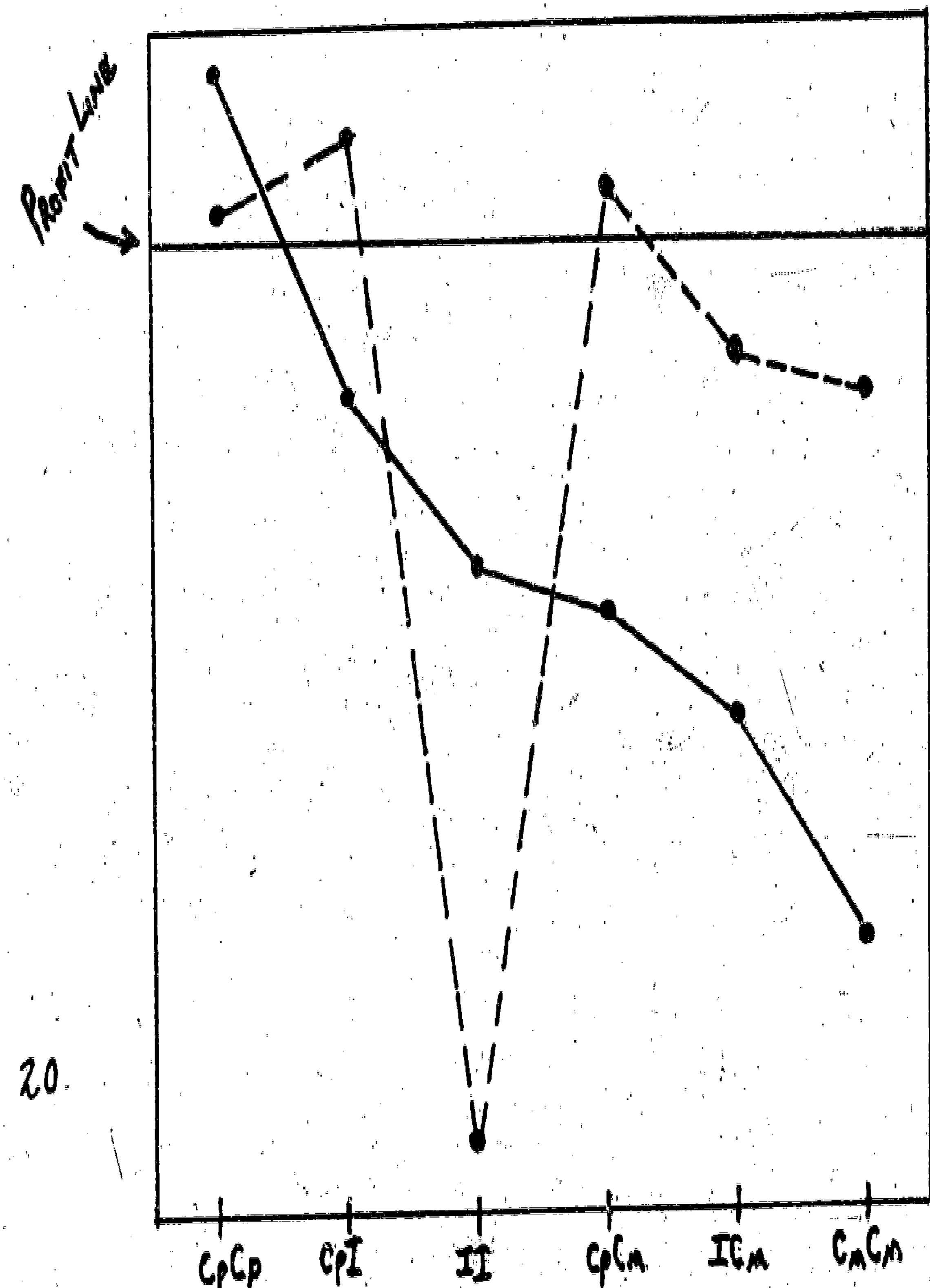
Figure Captions

Figure 1. Total dyadic profit as a function of motivational makeup of dyad, and the presence or absence of communication.

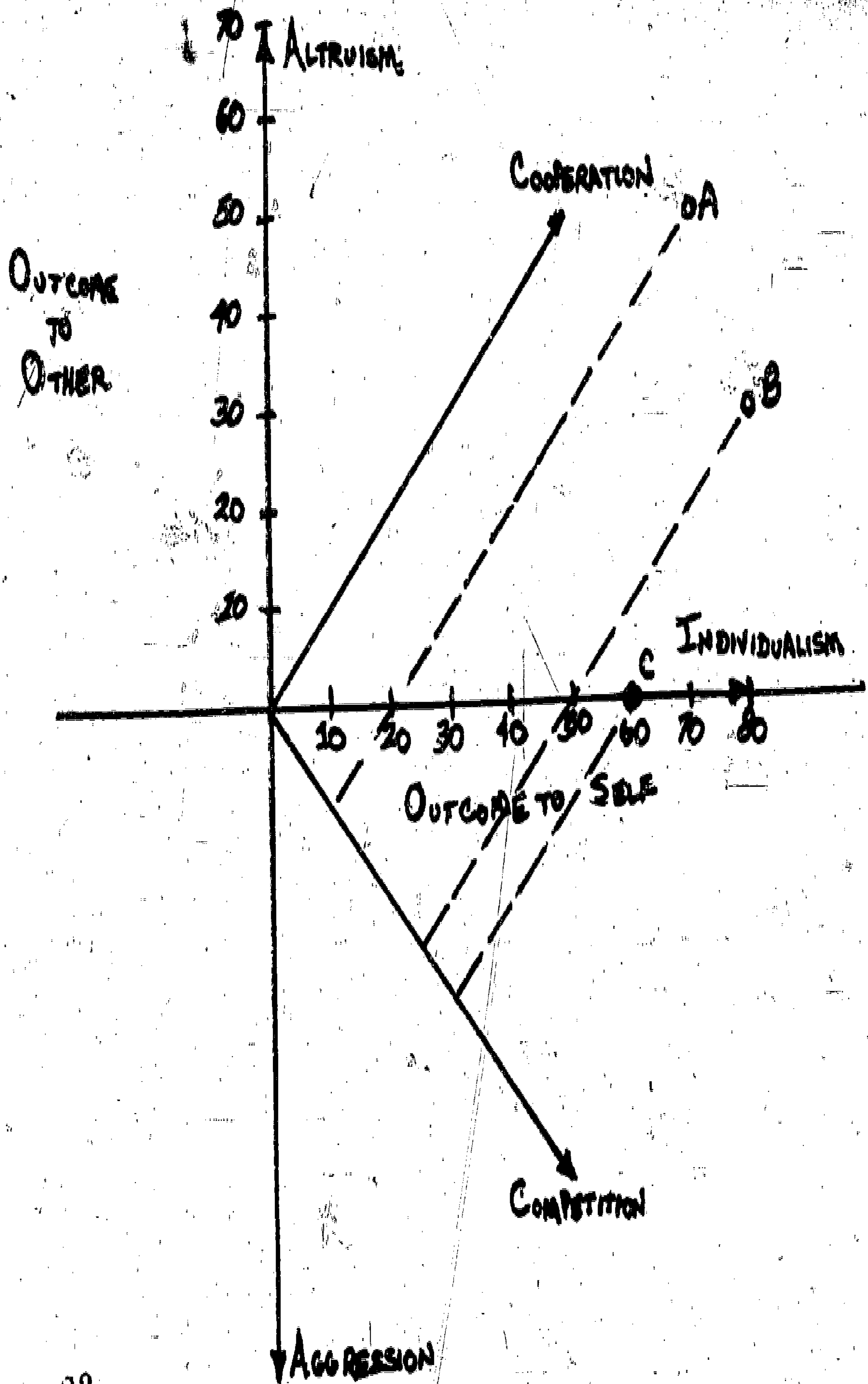
NOTE: CP indicates a Cooperator, I an Individualist, and CM a Competitor. Hence, CpI indicates a dyad composed of a Cooperator and an Individualist. No communication is a solid line, communication is a broken line.

Figure 2. Diagram of Griesinger and Livingston's geometric choice model.

NOTE: The three dots represent Alternatives A, B, and C in decomposed game type 1. The five arrows represent five motivational vectors. The projection of each point (Alternative) onto the Competitive Vector is shown.



PROFIT LINE
CpCp
CpI
II
CpCm
ICm
CmCm



ALTRUISM
COOPERATION
A
B
C
OUTCOME TO OTHER
INDIVIDUALISM
70
60
50
40
30
20
10
10
20
30
40
50
60
70
80
OUTCOME TO SELF
COMPETITION
AGGRESSION

22