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Running Head: CORRESPONDENCE INFERENCES AND CHOICE BEHAVIOR

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Abstract

An experiment employing 38 intro-psychology students was performed in order to a) observe the outcome-biased correspondent inference, b) investigate whether this inference may be manifested in social dilemma behavior, and c) investigate the role of social values in reactions to feedback, investment behaviors, and sensitivity to the correspondent inference. The experiment consisted of two parts. The first part categorized subjects as either cooperators or defectors using the Ring Measure of Social Values. In the second part, subjects completed a booklet with the aid of taped instructions. The booklet contained a questionnaire, a bogus scenario, and three investment situations. Results showed a) the correspondent inference to be present for the attributes of effectiveness, communication skill, and experience, b) this inference to be linked to behavior in only one situation (eight quota), and c) cooperators' and defectors' to not differ in reference to feedback or investment behaviors, but in reference to a feedback interaction for the investment situations and two inference questions. Discussion suggests more thorough investigation to improve this novel study.

Outcome-Biased Correspondent Inferences and Choice Behavior in Social Dilemmas: "Acting on Inference"

Social dilemmas may be thought of as situations in which individuals must decide whether to act in accordance with their self-interest, others' interests, or some combination of both. Furthermore, behaving in a self-interested manner, in lieu of a collective-interested manner, usually means that both the individual and the group will ultimately be in in a worse position (Messick and Brewer, 1983). The classic example of a social dilemma is that of Hardin's Tragedy of the Commons (1968) in which a number of herdsman, sharing a common pasture, must each decide how many animals they are going to graze on the commons. It is in the herdsmens' self-interest to increase the number of their respective herds and thus increase their profit; however for all to do so would be disastrous since it would mean the ruin of the commons. Thus by making a self-interested decision, the herdsmen may sacrifice long term gain. On the other hand, if they restrain from increasing their respective herd sizes, a collective interest decision, they accrue the long term gain of retaining the commons.

Although Hardin was addressing population growth, social psychologists viewed his metaphor as an n-person Prisoners' Dilemma (PD). This is a situation of social interdependence in which there is a disjunction between individual and group interests. This disjunction is such that neither the groups' nor the individuals' outcomes are maximized when all individuals choose to maximize their outcomes. The term social dilemma was born out of the assimilation of Hardin's metaphor into PD theory (Messick, Wilke, Brewer, Kramer, Zemke, & Lui, 1983). Social dilemmas have been applied to population control (Kahan, 1974), use of commonly owned resources (Hamburger, 1979), provision of public goods (Brubaker, 1975; Marwell & Ames, 1979), political organizations (Orbell & Wilson, 1978; Ostrom & Ostrom, 1977), pollution control management (Dawes et al., 1974), and arrangement of reinforcement contigencies (Platt, 1973).

In attempting to solve social dilemma situations in the most optimal way - that is, to promote cooperative choices (collective interest) and reduce defecting choices (self-interest) - social psychologists have identified two types of solutions. One type is structural

and the other is individual.

Structural solutions to social dilemmas address the pattern of incentives that characterize social dilemmas (Messick & Brewer, 1983). An example of a structural solution might be a city government either charging consumers more for extra water used, or limiting the number of subscribers, during a water shortage. These actions change the incentive structure of the individuals using the water. Structural solutions have been investigated in relation to altering payoff structures for users of an existing or needed resource (Kelley & Grzelak, 1972; Bonacich, Shure, Kahan, & Meeker, 1976), privatizing the resource(s) in question (Cass & Edney, 1978; Messick and McClelland, 1983), reducing group size (Komorita, 1976), establishing a superordinate authority (Samuelson, Messick, Rutte & Wilke, 1984), and establishing minimum contributing sets (Van de Kragt, Orbell & Dawes, 1982).

Individual solutions to social dilemmas involve independent changes in a person's behavior (Messick & Brewer, 1983). These may be derived from alterations of perception, and may or may not be influenced by structural changes. Sources of individual solutions to social dilemmas

have been identified and researched in regard to increased communication (Brechner, 1977; Edney & Harper, 1978), information about others' choices (Dawes, McTavish & Shaklee, 1977), trust in other group members (Kelley & Stahelski, 1970; Brewer, 1981), ingroup identity (Kramer & Brewer, 1983; Edney, 1980), increased experience (Allison & Messick, 1985a), and social values and responsibility (Liebrand, 1982; Sweeney, 1973).

Information about others' behaviors has an especially interesting influence on choice behavior in social dilemmas. This information may take the form of performance feedback and may indicate that others are making defective or cooperative choices. How, specifically, this defecting or cooperative feedback about others' behaviors affects different individuals, depends largely on how much importance those individuals place on their gain relative to others' gains; this is social value theory. However, it is generally observed that when individuals are made aware of the defecting choices that others are making, the tendency is to increase their own defecting choices (Liebrand, Wilke, Vogel & Wolters, 1986; see also Dawes et al., 1977). Relevant to this understanding is the

idea of expectations and the perceptions of others which influence those expectations. Expectations about how others will act allow individuals insight into their chances of obtaining that outcome which has been deemed as most rewarding. Perceptions of others, in the presence or absence of positive or negative information, guide these expectations. Thus, in understanding the effect of feedback on behavior within social dilemmas, perceptions and expectations must be analyzed. Research has suggested that in social dilemmas, individuals generally expect others to be and act like them (Dawes et al, 1977; Kuhlman & Wimberly, 1976). Thus, whatever behavior one engages in, others are expected to act in a reciprocating manner (Messick & Brewer, 1983). When feedback is given, however, these perceptions and expectations regarding others may change, depending on the individual (Liebrand, 1984).

Although many have documented the importance of expectations in determining choice behavior, little attention has been given to how these perceptions are actually formed. Researchers have consistently observed that individuals with differing beliefs about others' value

orientations, likewise expect different patterns of exchange within social dilemma situations (Dawes et al, 1977). These beliefs and expectations may have their roots within social development and varying cues of comparison. For example, in the absence of knowledge about other's social choice patterns, an individual may rely on the only model of social choice pattern available, his or her own, to predict how others will act (Ross et al., 1977; Kuhlman & Wimberly, 1976). Researchers have also noted that past behavior and knowledge of others' past behavior influences choice decisions (Liebrand 1984). These researchers have not addressed, however, the specific question of how these beliefs and expectations may be formed through the attribution processes of the individual. That is, when an individual observes his or her social environment, how does he or she attribute characteristics to entities and objects within that environment?

This inferential process may involve error, since people tend to assume that a correspondence exists between behaviors and underlying characteristics, even when evidence is available that indicates the absence of any such correspondence (Allison & Messick, 1987). This

tendency to erroneously infer correspondence between individual actions and individual attitudes has been called the fundamental attribution error (Ross, 1977). This error is defined by a situation in which inferences are made primarily on the basis of behavior, with situational influences on behavior given little consideration.

Another form of erroneous attribution may be observed at the group level as the group attribution error (Allison & Messick, 1985b), also called the outcome-biased correspondent inference (Mackie & Allison, 1987). This is defined as a situation in which social perceivers, when inferring the attitudes of group members, place an inordinate amount of weight on the outcome of a group decision. At the same time, they may place too little weight on situational factors. As in the case of the fundamental attribution error, it is a relatively automatic (Winter, Uleman & Cunniff, 1984; Allison & Messick, 1987) tendency to infer a simplistic agreement between behaviors and characteristics. People tend to ignore the complexities of the group decision making process, and assume that a group decision or choice is an accurate indicant of the preferences or desires of the group

members. This may be an error because decisions are based not only on members' attitudes, but also on structural constraints such as decision rules. These constraints guide the ways in which members' inputs will contribute to the group output (decision). Clearly, an optimal decision would involve taking into account the noncorrespondences between individual inputs and group outputs. This would be optimal because it would take into account personal change and the nature of group interdependence within group situations. However, in many cases an optimal decision is not made and "assumptions of correspondence" are made (Allison & Messick, 1987).

An example of the outcome-biased correspondent inference may be found in the attacking of Libya by the United States a few years ago. The shortest route to Libya would have been to fly over France. However, Premier Francois Mitterand would not allow this and the United States Air Force was forced to double the length of its route by passing over Great Britain. When, surveys were taken, it was found that this event angered Americans toward French people and improved perceptions of the British. Americans saw the British as backing

U.S. intentions and the French as not backing U.S. intentions. Thus, based on the decisions made by the heads of the governments involved, Americans made assumptions about the attitudes of members of the particular countries. The irony is that when surveys were taken on French and British peoples' attitudes, it was found that the reverse of Americans' perceptions was actually true. Their was actually a larger percentage of French people who wanted the planes to fly over their country than there were British people who wanted the planes to be flown over England.

In this example, it can be seen how individuals focused their attention on the decision that the heads of government made, and failed to "account properly" for the complexity of the decision making structure that would have been involved in the formulation of the final decision. This type of "perceptual mistake" has been observed in studies which have varied both the type of group making the decision (eg. city, state, jury, nation), and the attributional measure (typical member, a randomly selected member, the group in general). Also, the error has been committed by individuals outside of the group in question

(out-group) and within the group in question (in-group) (Allison & Messick, 1985). Results suggest that in-outcome-biased correspondent inference is less severe than out-group error. In alignment with actor/observer theory, this may be because individuals are more likely to attribute their own behavior or their own group's behavior to situational factors than to do the same for others or other groups (Allison & Messick, 1985b).

The reason why the outcome-biased correspondent inference occurs is not perfectly clear. One possibility is that groups are often perceived as single entities (Wilder, 1977; Knowles, Bassett, Haas, Hyde & Schuchart, 1976). People may then use the representativeness heuristics (Kahneman & Tversky, 1972) to infer that a group's decision is representative of its members' preferences. The use of this heuristic usually leads to veridical perceptions of groups. However, when groups decisions are constrained by group decision rules, people may infer representativeness where none exists.

Besides taking into account formed inferences via the group correspondent inference, it might be worthy to examine the strength of the created or modified inference.

Social psychologists have long essayed to formulate a connection between experience of the external environment and the internal attitudes which individuals, may develop. These attitudes involve three components, affective (emotional), cognitive (belief), and behavioral (action) (Organ, Bateman, 1986), and to understand the strength of a formed inference, one must understand the relationship between the three components. Not only this, but one must take into account the specificity of the situations where attitudes may be formed or expressed; that is, the relationship between the components of attitude are not equitable in all situations. In regard to measuring the strength of an inference by a call to action, this caveat may be understood with study done by Richard LaPiere (LaPiere, 1934). While traveling across the country with a young chinese couple, he took the task of observing the reactions of American hotel and restaurant clerks to this couple. Later, he questioned the Americans' true attitudes toward the traveling foreigners. What he found was an amazing incongruity between American attitudes toward the Chinese, and the actual observed behavior in regard to them (La Piere in Organ & Bateman, 1986). The

answer to this dilemma lies at the heart of the understanding of attitudinal formulation and expression. This rule of thumb may be that of functionality. Stated simply, affective, cognitive and behavioral aspects of attitudes will be molded for consistency (see Heider, 1946; Festinger, 1957) where the freedom provides and where it is most functional to the global or ecumenical concerns of the individual. For example, in LaPiere's observations, the fact that Americans did not express their opinions behaviorally could have been due to rules of social etiquette, need for customers, personal realization that opinions may not be well founded, avoidance of an argument, or other competing attitudinal aspects (Organ, Bateman 1986; Mann, 1969). These are what Mann (1969) calls external influences of the environment. He also notes that attitudes toward the situation as well as the object, and also the fact that intellectualized beliefs are more "bark than bite," both may explain the incongruity between attitudes and action. What is being said is that to understand the linkage between internal components (emotions, beliefs) and external behavior, the totality of attitudes and concerns specific to the situation must

be considered. In this considering, hierarchical, networking, and competing attitudinal entities may be uncovered and analyzed so to understand why some are expressed as action, and others some are not. This consideration may be important in interpreting the results of an outcome-biased correspondent inference.

The goal of the present research was to determine whether the outcome-biased correspondent inference influences people's behavior in a social dilemma. This study differs from previous studies measuring the outcome-biased correspondent inference (Allison & Messick, 1985;1987) in that it will not only measure whether heuristic inferences are made, but to what extent those inferences are involved in subsequent choice behavior. That is, we wish to see how, after a group is given feedback about their previous decision, individuals will use inferences, produced via the outcome-biased correspondent inference, to formulate perceptions and expectations and ultimately, to decide their behavior. The design of this experiment is also quite different from previous studies. The decision situation used in this experiment is an investment situation, a social

fence (Messick & Brewer, 1983), whereas the decision situations used in previous studies were basically survey situations.

In addition to feedback information, another important personal influence on social choice behavior is social values. Within outcome interdependent situations, in which a person's decisions may affect not only his own outcome but also other's outcomes, social values may be defined as varying individual preferences for the weighting of own and other's outcomes (Kramer, McClintock & Messick, 1986; McClintock & Allison, 1986; Knight & Dubro, 1984). Social values have been identified by other such labels as "interpersonal tendencies" or "motivational orientations" (Kuhlman & Marshello, 1975), "interpersonal dispositions" (Kelley, 1983), and "social motives" (Liebrand, 1984; Messick & McClintock, 1968). Social values are often conceptualized as vectors existing within a two dimensional own/other outcome space (Griesinger & Livingston, 1973). In this space, the x-axis denotes payoffs given to self(own) while the y-axis denotes payoffs given to other (see Figure 1). All possible combinations of own/other payoff

insert Figure 1 here

choices may be seen as potential coordinates within this outcome space. Actual units on the axes are arbitrary weights but usually represent money. As many as eight of these social values have been identified (Mcclintock & Avermaet, 1983; Radzicki, 1976), however, there are three which seem to be most commonly addressed in research. These values are cooperation, defined as the tendency to maximize own and other's gain; competition, defined as the tendency to maximize the difference between own and other's gain; and individualism, defined as the tendency to maximize one's own gain (Bem and Lord, 1979).

Procedures employing decomposed games (Messick & McClintock, 1968; Pruitt, 1967) have generally been used to assess an individual's dominant vector (Griesinger & Livingston, 1968; Kuhlman & Marshello, 1975). In the decomposed games methodology, individuals are asked to indicate preferences among various combinations of own/other distributions. It is seen as much more comprehensive than the traditional two-choice, two-person

matrix games. Furthermore, it minimizes confounding of strategy and motive choices, a major problem of earlier matrix games (McClintock & Avermaet, 1982). This measurement of social values has demonstrated reliability (Liebrand, 1987; Liebrand & Van Run), convergent, predictive and ecological validity (Liebrand, 1982; Liebrand, 1984; Liebrand, 1985; Liebrand & Van Run, 1985; Knight & Dubro, 1984; Kramer, McClintock & Messick, 1986; Bem, 1979), and construct validity (Liebrand & McClintock, 1987).

Social values have been studied extensively within n-person social dilemma situations (Kramer, Mcclintock & Messick, 1986; Liebrand, 1984; Liebrand & Van Run, 1985; Liebrand, Wilke, Vogel & Wolters, 1986). The basic finding is that cooperators are generally more aligned with collective interests, and willing to make self sacrifices, while competitors are more likely to exploit others and act in a self interested way (Allison, 1987; Kramer, McClintock & Messick, 1986; Liebrand, Wilke, Vogel & Wolters, 1986)).

It has been observed that individuals with different social values differ in their perceptions of others with whom they are interdependent. These perceptions are

related to expectations of others' behaviors. One of the most cited theories pertaining to this is Kelley and Stahelski's (1970) triangle hypothesis. This suggests that competitors perceive and expect others to be competitive, while cooperators perceive and expect others to be either competitive or cooperative. Furthermore, cooperators are assumed to assimilate more to the behaviors of others and thus respond cooperatively to cooperating others and competitively to competing others. The triangle hypothesis has been reproduced in a number of studies (Maki & McClintock, 1983; Liebrand, Jansen, Rijken & Suhre, 1985; Beggan, Messick & Allison, 1987). A study by Liebrand, Wilke, Vogel and Wolter (1986) found an opposite effect to Kelley and Stahelski's theory. They observed competitors seeming to be more assimilating and sensitive to feedback. Related to Kelley and Stahelski's research, is the egocentric attribution perspective which states that players in choice games expect others to choose in a similar way that they themselves choose (Ross, Greene, & House, 1977; Dawes et al., 1977). This idea that individuals expect others to have the same social values as they do,

has been supported with research (Kuhlman and Wimberley, 1976; Liebrand, 1984; Kramer, McClintock, & Messick, 1986; Dawes, McTavish & Shaklee, 1977).

Individuals with different social values have also been observed to react differently to feedback about others' behaviors. Both Dawes, McTavish and Shaklee (1977) and Kramer and Brewer (1985) observed cooperators to be irate with noncooperators after feedback about defecting behavior was given. Others (Kramer, McClintock & Messick, 1986) have found that cooperators would still show self restraint even after feedback indicating that others were making defecting choices. Liebrand, Wilke, Vogel and Wolters (1986) reported that there were more overall defecting choices made after defecting feedback was given, and that defectors were more sensitive to the type of feedback (defecting or cooperating) that they received.

It has been argued and observed that cooperators and competitors view their tendencies in different ways. A recent study (Liebrand, Jansen, Rijken & Suhre, 1986) suggests that while cooperators view cooperative behaviors along an evaluative "good-bad" dimension (Osgood, Suci &

Tannenbaum, 1957), competitors may view the same behaviors as existing along a "strong-weak" dimension (Beggan, Messick & Allison, 1987).

In this study, we are interested in how cooperators and competitors might act differently according to which type of feedback they are exposed. In looking at this, we hope to assess how differentially susceptible cooperators and competitors are to the outcome-biased correspondent inference. This study differs from previous studies investigating social values in that it utilizes an investment situation which is a social fence, whereas most previous studies investigated decisions made within n-person prisoner dilemmas, which are social traps. Also, the type of feedback given in this experiment is different from previous studies in that it is not direct information about other group members' behaviors but information about what the group decided. Therefore, any information about individuals' choices must be inferred through attribution methods.

METHOD

Subjects

Subjects were 38 undergraduates of the University of

Richmond, Virginia, who participated in partial fulfillment of a course requirement. Subjects were run in groups of three and were randomly assigned to one of two experimental conditions.

Design

The experiment employed a 2x2 between subjects design. The independent variables included type of feedback about the group's past performance (success or failure) and subject's social value orientation (cooperator or competitor).

Procedure

The experiment consisted of two parts. The sole purpose of the first part was to classify subjects into one of two social value categories, cooperation or competition. In order to do this, subjects completed a computerized version of the Ring Measure of Social Values (Liebrand, 1986).

Subjects were informed that the first and second parts of this experiment were actually two unrelated experiments run together due to an "overabundance of research projects" and a "dire need for subjects." To promote this scenario, separate consent and debrief forms

were given for each part of the experiment. Also, different experimenters conducted the two different parts of the experiment.

Social Values Measurement: In a decomposed game, a subject is given an n-number of oucome choices from which to choose. Each choice yields a certain distribution of payoffs to the chooser and one other person, who is anonymous. Each one of the possible choices (distributions) may be represented as a point within a common own/other matrix space, with others' payoffs represented by the y-axis and payoffs to self (own) represented by the x-axis (Liebrand & Van Run, 1985). Griesinger and Livingston (1973) proposed a geometric taxonomy for defining social values based on the idea that social values may be represented linearly as utility functions within this space. In reference to their model, social values can be represented by vectors that extend from the origin of the own/other matrix. Players in choice situations are assumed to choose those points which lie the farthest out on their motivational vector (Liebrand, 1984).

For the first part of this experiment, subjects made 24 choices between two own/other outcome combinations

which were displayed on the screen of a computer. Subjects were run three at a time in an open room and were seated at least one cubicle away from each other. Insructions and examples were displayed to orient the subject to the task, however, neither the instructions nor the examples directed subjects as to what decisions they should make. The 24 pairs of combinations were represented on a circle within the own/other outcome space. The center of the circle coincides with the origin of the matrix and has an abitrary radius. In this case the origin represents $0 for self and $0 for other, and the radius is $15.00. Subjects were assumed to choose those combinations on the circle which lay closest to their preferred vector. An example of a pair of combinations lying on the circle is a) -$3.90 for self and $14.50 for other, and b) $0.00 for self and $15.00 for other. Adding up the chosen amounts for self and for other yields an estimate of the slope of the person's motivational vector (see Liebrand, 1984). Once this was determined, subjects were classified only if they exhibited at least a 60% consistency rate in making choices aligned with a single social motive. If classifiable, subjects were

then labeled cooperative if their vector lay between 67.5 and 22.5 degrees and competitive if their vector lay between 337.5 and 292.5 degrees (Leibrand, 1984). For a more thorough description of this procedure see Liebrand (1984).

Investment Decision: The second part of the experiment was designed to measure basically two events (a) subjects' decisions whether to invest or not in certain investment situations, and (b) inferences about other group members made on the basis of feedback (success or failure).

After subjects'social values were assessed during the first part of the experiment, they were then instructed to go to another building to take place in a "second unrelated experiment." Thus, subjects were led to believe that the first part of the experiment was not related to the second part. This was done to prevent against confounding of results. Subjects completed thes second part of the experiment alone and in separate rooms. Subjects were given a booklet which they would complete with the aid of taped instructions. Subjects were told that they were taking part in the second half of an experiment which took place a few weeks ago, and that some others

who were participating now had participated before. In reality, there were no other subjects and no one had participated before. Subjects were then informed that they would be grouped into experienced or inexperienced groups and that one inexperienced person from each of the inexperienced groups would switch places with one experienced person from each of the experienced groups. In this way, on half of the groups contained only one experienced person and one half the groups contained only one inexperienced person. Subjects were then told that feedback about the past performance of the experienced person(s) in their group would randomly be given to the minority or majority of experienced or inexperienced persons in the group. Subjects were told that they belonged to one of these conditions. This information was, however, false since all subjects were told that they were the only inexperienced member of a group and the only person to receive feedback about the group's previous performance.

Within the booklet, subjects were presented with three investments situations in which they had to choose either to invest or not to invest. In investment situations,

subjects were to imagine that they were given an initial sum of money, for example $10, and that the experimenter would give every member of the group $20 if a certain number of the group members invested their start-up amount of $10. Subjects would then be asked whether they would invest or not. To provide incentive, subjects were told that after the experiment, one person would be randomly chosen to recieve an amount of money proportional to money earned within the hypothetical investment situations. An example of the type of investment situation presented to subjects is displayed in appendix A.

The employed investment situation is a type of social dilemma known as a social fence. Here, whether individuals decide to act in a self-interested or collective-interested manner will determine the creation of a new resource ($20 in our example). A certain number (quota) or more must invest ($10) to create the resource. The individually rational choice, not to invest, may or may not result in the creation of the resource, depending on how many others invest and the investment quota. However, if all choose to act in this way, no one will receive the benefits of the resource and all will be worse off than

if all had invested; if all or the quota amount invest, the lowest end-up amount if $20, whereas if none or below the quota amount invest, the lowest end-up amount is $0.

To get subjects acquainted to the task, examples of investment situations were presented and thoroughly explained to subjects. Next, subjects were asked to fill out a short quiz testing understanding of the task. Subjects were then told that they were the only inexperienced member of their group. Subjects received feedback that the group succeeded in meeting the quota in a previuos investment situation, or that the group failed to meet the quota in a previous investment situation. Whether the feedback information was of a success or failure type, all subjects in received the same information about how many members of their group previously decided to invest; what varied was the quota constraint put on the group. Thus, although in both the failure and success outcomes, the same action took place, whether it was a success or failure depended solely on the investment quota.

After feedback was given, subjects were asked to rate the "typical" member of the group on a number of

different dimensions as expressed on adjective scales. Also found within the booklet was bogus information about subject groups and other members of the group.

Dependent Variables: There were two major dependent variables. These were 1) subjects' decisions whether to invest or not invest in the investment situation, and 2) inferences made by subjects in relation to their group members (e.g. how cooperative, how trustworthy, etc.).

Results

Inferences

Analysis of data from this experiment did offer some support for the idea that perceptions formed via the outcome-biased correspondence inference may indeed be strong enough to influence behavior. In addition, some support for current social value theory was provided.

To test for the correspondence inference and how it related to social values, an 2x2 ANOVA (inference question x social value x feedback) was performed for each of the ten inference questions. A significant feedback effect was found for questions three, $F(1,28) = 11.90$, $p < .05$, four, $F(1,28) = 8.32$, $p < .05$, and seven, $F(1,28) = 5.12$, $p < .05$. This suggested that effectiveness, communicative

skills, and experience, were attributions especially sensitive to feedback about group behavior. In addition, significant interaction effects between feedback and social value were found for communication, $F(1,28) = 9.640$, $p < .05$, and ability to get along, $F(1,28) = 4.634$, $p < .05$. This indicates that feedback may influence individuals' attribution behavior in relation to the inferred qualities, but that this influence may depend on held social motives. Specifically, defectors infer more with failure feedback than do cooperators, and cooperators infer more with success feedback than do defectors (see Figure 2).

Insert Figure 2

To see if subject inferences depended on whether they completed the inference questions and then the investment situations, or vice versa, the independent variable of "task order" was added to the design above to make a 2x2x2 design (inference question x feedback x social value x task order). The results of this were identical to those not taking task order into account:

Effectiveness $F(1,28) = 14.295$, $p < .05$; communication skills, $F(1,28) = 7.02$, $p < .05$; and experience, $F(1,28) = 4.85$. In addition, significant interaction effects between social value and feedback were found for communication skills, $F(1,28) = 5.42$, $p < .05$, and experience, $F(1,28) = 7.84$, $p < .05$.

Investment Decisions

To see if individual's decisions to invest would be affected by information about the group's previous behavior a 3x2x2 ANOVA (Quota 6,8,10 x social value x feedback) was done for the three investment situations. Across the three situations, there was no significant main effect for feedback, indicating that the decision to invest was not directly dependent upon which type of feedback was received. There was, however, a significant interaction effect for feedback and investment situations, $F(1,28) = 7.0$, $p < .05$. This interaction, however, is an enigma. Inspection of the means suggests that, in general, individuals invested more when success feedback was given (although this was not significant); however, a sizeable reversal of this trend was seen in the 10 quota situation, and it is this which may be primarily

responsible for the interaction effect. See Appendix A for these and other means.

When task order was taken into account to produce a 3x2x2x2 design, there were again no significant main effects. However, a significant feedback by situation effect was found, $F(1,28) = 4.05$, $p < .05$.

To investigate the strange pattern of means found in the previous ANOVAs, the 3x2x2x2 design was broken down. First, the same design was rerun for just the six and eight quota situations. This yielded no main effect, indicating that even if the perplexing ten quota situation had not been considered, the desired trend would not have been seen. There was, however, a feedback by social value interaction, $F(1,28) = 5.93$, $p < .05$. This suggests that cooperators invest less with failure feedback and more with success feedback than defectors, and that defectors invest more with failure and less with success feedback than cooperators. Next, the design was run for the six and ten quota situations; there were no significant effects (see Figure 3)

Insert Figure 3

To investigate the behavior of only those who received success or failure feedback a 3x2x2 ANOVA (investment situation x social value x task order) was done on each group. For those received failure feedback, there were no within subjects main effects. For those who received success feedback, there was no effect either, however there was a significant feedback by social value effect, $F(1,28) = 3.44$, $p < .05$. showing cooperators to be much more sensitive than defectors to feedback.

In an even further breakdown of the design, several ONEWAY analyses showed no difference in individuals investment behavior as influenced by feedback, just looking at the six, eight or ten quota situations. Also, a T-TEST showed there to be no significant difference in investment behavior for individuals receiving success feedback, across the six and eight quota situations. The same result was found for those individuals receiving failure feedback, in regard to the six and eight quota situations.

Social Values

A second endeavor of this experiment was to study the

inference and investment behaviors of individuals with differing value orientations. ANOVA results indicate there to be no significant difference in decisions made by cooperators and defectors, and no significant difference in inferences made, as measured by the inference scales. There was, however, as mentioned above, a significant interaction effect for feedback and social value for questions four (communication skills) and nine (ability to get along). General inspection of the means suggests cooperators to infer more communication skills and "ability to get along with others' with success feedback, while defectors inferred less of these qualities with success.

There were significant social value by feedback interaction effects for several of the investment decision analyses, as noted earlier in this paper. Also, in investigating the behavior of just cooperators or noncooperators across the three investment situations, it appeared that neither groups varied their investment patterns significantly. In other words, there were no within subjects main effects. There was, however, a significant situation by feedback effect for the cooperating group.

This suggests that cooperators may invest differently in different situations according to feedback received. However, these results do not show cooperators to be significantly different from noncooperators in this characteristic. If anything, noncooperators might be more sensitive to feedback, if one looks at table means. See Appendix for these and other means.

Inference Manifestation

The relationship between feedback and inferences was looked at to observe an attribution behavior at work. Then, the relationship between feedback and investment behavior was looked at to see if the behavior in question was influenced by given information. The next step involved the goal of the study, and was aimed at getting an idea of exactly how feedback is connected to investment behavior. To do this, the relationship between inferences made (inference questions) and investment decisions (quota situations) was investigated using a Chi Square analysis. Unfortunately, the only significant effect was found for question four in the eight quota situation, $\chi^2(5) = 16.59$, $p < .05$. This suggests that those who perceived more communication skills on the

part of experienced group members tended to invest more within the eight quota situation. Question four, as annotated earlier, was significantly influenced by the type of feedback received. A common, but nonstatistical, deduction might encourage us to hypothesize that individuals do indeed act on their inferences about the communication skills of individuals, however this would be speculation.

Within the booklet subjects completed, there were questions with each quota situation asking subjects a) what they thought the group's chances were in attempting to reach the quota (as expressed by a probability), and b) how much of a difference they thought they could make (as expressed by a probability). As an area of interest, and perhaps enlightenment, the responses to these questions were reviewed with ANOVAs to see their relation to the independent and dependent variables previously investigated. Of the two 2x2x2 ANOVAs (feedback x social value x task order) generated, one for question a, (termed collective efficacy), and one for question b (termed self efficacy), only one, the self efficacy ANOVA, showed any significance in main or interaction effects. This ANOVA showed a significant main effect for social

value, $F(1,28) = 5.03$, $p < .05$, indicating that individuals with differing social motives differed in their perception of how much contribution their unique effort would make. For a summary of these results and the research questions they pertained to, see Appendix B.

Discussion

The goal of this study was to observe an outcome-biased correspondent inference, and while looking at the effects of feedback on investment decisions, to determine the strength of this inference as expressed in a decision making investment situation. The effect of social value orientation was also considered.

The results only mildly support the notion of a correspondent inference taking place. Effectiveness, communication skills, and experience all seemed to be sensitive to attribution tendencies; if a succesful decision was made, subjects inferred more of these to be present in the average group member. Yet other qualities within the inference questions, and ones which one might think to be attributionally sensitive, were not subject to the same inference process -- there were mean trends, however these were not significant. Why is this and

does it conflict with past research on the outcome-biased correspondent inference?

In addressing the latter question, one must look at the novelty of the concept known as outcome-biased correspondent inference, or, group attribution error (see Allison & Messick, 1985b). Although attributional perceptions of individuals have enjoyed a wide array of attention in the literature (eg. Ross, 1977; Jones & Harris, 1967), and past research has considered the phenomenon of group perceptions (eg. Allison, 1971; Wolfers, 1959; Knowles & Bassett, 1976; Wilders, 1977; Kahneman & Tversky, 1972)), only recently has the corralling of the concept of outcome-biased correspondent inference, or group attribution error, taken place. One must also look at the type of inference studied in previous research. In the few studies addressing the correspondent inference, dependent variables focused on agreement or diagreement with a decision outcome (e.g. Allison & Messick, 1985b, Experiments 1 to 5), not personal qualities or abilities, as this study does. Subjects simply inferred how representative the outcome decision was of the typical group members decision.

Thus, in the little research there would be to conflict, emphasis is on inferences of decision tendencies (agreement) (which are based on individual decision making processes) rather than on inferences about specific personal abilities and qualities (communication skills, ability too get along, etc..) of group members. So then, in relation to the outcome-biased correspondent inference, past research offers no real baseline for comparison, but instead offers a basis for contrast.

This difference in research emphasis brings up an important point for attribution research. It is important since decision making situations involve not only task orientation, or decision making strategies, but personal and social orientations and conflict as well. To understand behavior within a decision making setting, as this study does, one must inspect closely those more fundamental and unique aspects of participating individuals and how those qualities are perceived. In previous studies, where surveys were used, it was not pertinent to investigate abilities and personal qualities of participating individuals; it was irrevelant. However, real life decision making is not a "one time" process and because

of peoples' use of complex, accumulating inferences and the way they use these in their far from isolated functioning, it behooves one to investigate the most sensitive and familiar inferences of individuals. To look at the more personal inferrable qualities of individuals is to get more at the heart of their global and true orientation toward those around them, an orientation that may guide their thought or behavior throughout their group decision making experiences.

As to the question of why some qualities were more sensitive to inference than others, one must not be too presumptious. Since the inferred qualities are more personal, inferences about them are easily influenced by a number of factors. In other words, we may be wrong in assuming that trust, cooperation, cohesiveness, sacrifice, competition, ability to get along, easiness to work with, are qualities inferred to be associated with decision making. To subjects, these personal qualities may have subjective meanings, connections, or influences which may or may not cause them to associate these qualities with a certain type of decision making outcome or process. Thus, although one might think intuitively

that there would be a connection, perhaps it is not so clear.

Keeping in mind this warning, although one cannot, out of the immense myriad of possibilities, explain the lacking of our results, one may exercise theories on why communication, effectiveness, or experience were qualities sensitive to the inference process of subjects.

An interesting perspective involves the notion of psycho-historical saliency. Perhaps communication, since it is such a significant issue within the public eye due to society woven psycho-historical trends on relationship enhancement (eg. Gordon, 1985), organizational improvement (eg. Young, 1986) and international interaction (eg. Black & Marchand, 1982), is more saliently associated with successful experiences. Experience, even more so than communication, enjoys a salient association with success; most individuals are at least subtely aware of learning curves and how performance in task situations improves with experience. Effectiveness, while possibly enjoying a psycho-historical association with experience and communication, may also enjoy a saliency of psychological linking with successful experiences. In short, all

these qualities are more familiarly associated with success experiences, due to trends of thought within the society. This saliency of course, may be mediated by television, literature, radio, or colloquium, and may be responsible for seeming personality differences and decision making processes.

These speculations as related to societal psychological trends and associations are, of course, only intuitive conjectures. To gain significance, they would need to be thoroughly researched under the auspices of a sound experimental design.

Besides looking at inferences made on the basis of feedback information, choices made, as based on feedback information, were also investigated. This is inherently related to inference and attributional tendencies, yet simply focuses on to what extent feedback influences investment decisions. Results showed there to be no significant difference in the investment behaviors of those who received success feedback and those who received failure feedback. This is in contrast to previous research suggesting main effects for feedback (eg. Liebrand et al., 1986; Messick et al., 1983). There was

however, a significant interaction effect suggesting feedback to be differentially effective depending on the constraints of the investment situation. This effect, however, may be more due to serendipity than social truth, since, in looking at the configuration of investment in the ten quota situation, one may not explain why more people would invest in the failure feedback condition than in the success feedback condition. This is certainly perplexing and may be due to a faulty design, some hidden social/cognitive process being enacted, or a combination of both. For example, there is an organismic propensity for individuals to maintain stability, or consistency (Rogers, 1961 ; Festinger, 1957). This tendency may be seen especially within choice behavior since it involves concentrated weighting of alternatives and imagined scenarios of potential paths of action. In relation to this study, subjects may have fallen victim to a form of this tendency in responding to the six, eight, and ten quota situation all in a row. It might be that even if they were not normally in favor of investing in a stricter situation, they may do so to be, or to appear to be, consistent with immediately preceding investment

behavior. This is a circumstance that may be rampant within many research studies, and one which may be hard to assess. More extensive research would need to be done to asses whether, in this type of design, this circumstance might be taking place.

To better understand cerebration and performance within social dilemmas, one should take into account personality variables of the participants. One such personality variable is social value orientation. The investigation of social values within this study was somewhat disheartening. There were no significant primary differences in the way cooperators or defectors inferred group members qualities. This is in contrast to previous studies suggesting sharp differences in the inferencing processes of cooperators and defectors (eg. Kelley and Stahelski, 1970b; Maki & McClintock, 1983; Maki et al, 1979). There was, however, an interesting interaction effect for the communication and "ability to get along" questions. This indicated that for success feedback, cooperators gave individuals more credit for these qualities than defectors, and for the failure feedback the reverse was true. This is reminiscent of

Kelley and Stahelski's (1970b) triangle hypothesis which suggests cooperators to be more generous in their perception of the population. There was also no significant difference in the way that feedback affected cooperators or defectors. This is contrast with a plethora of studies (eg. Liebrand, Wilke, Vogel & Wolters, 1986; Dawes et al, 1977; Liebrand, 1984; Kuhlman & Wimberly 1976).

Once again, it should be cautioned that these research conflicts should be viewed within the context of different foci. That is, past research on social values has focused more on perceptions of cooperative tendencies (eg. Kelley & Stalhelski, 1970b), power vs. goodness (eg. Liebrand, Jansen, Ryken & Suhre, 1986; Osgood, Suci, Tannenbaum, 1957), and sensitiviey to information (eg. Liebrand, 1984), than on perceptions of specific qualities and abilities of others. Thus to obtain a firm and more global hold on how cooperators and defectors perceive and infer on others, further research needs to focus on more specific personal qualites. This may seem to be an attempt to marry cognitive theory with social theory, but perhaps the two have been ignoring

each other for too long.

In this same lane of thought, and in regard to the main purpose of this study, investigation was done to see how strong formed inferences/attitudes were as displayed by action. Results did not support this investigation. That is, those inferences seemingly being made (ie. effectiveness, communication, experience) were not related to actual investment behavior. One might have thought that if subjects took these inferences as their attitudes then their willingness to participate with the group members would increase. However, one may need to refer to the idea of attitudinal functionality discussed earlier in this paper. Within this concept one may see that other attitudes and tendencies to act are competing within the individual as he or she is weighing costs and benefits and deciding whether to cooperate with the othergroup members. Perhaps, the observed inferences themselves are strong, but more of them are needed to pass a sort of "action threshold" whereby a line of action congruent with that set of attitudes is more functional than any other line of action of any other set of attitudes. The speculation

of what other clusters of attitudes could be competing to prevent action from occurring, is total conjectue; to rise above this label, it would need precise research. However, it is significant to understand this concept.

For inferences made on given information, individuals will not just form preferences or agreements; they will also form more fundamental and personal ideas about other peoples' natures - it should be kept in mind that this inference process will be different for different inferences (eg. group, individual). Thus, as the result of information, there will be many formed attitudes, each with their own valence (negative, positive) and intensity (weak, strong, etc.). Now, if one views these attitudes as a group, a marble, then the group may have a total valence and intensity of its own, which are the sums of the individual valences and intensities of the attitudes. Adding these two totals may give us a competitive factor. Every marble has its own competitive factor and thus its own unique characteristics. When, at a later time, individuals must choose in a social dilemma situation, they will weigh the created marble against marbles of previous experiences and memory, and even perhaps marbles of the

future. That is, competitive factors will be consciously or subconsciously compared and chosen for optimal functionality. That marble which "wins" should have the highest potentiality for action. For a representation of this model, see Figure 4. It should be kept in mind that the influence within social dilemmas that we are talking about is that of knowledge of others (actually formed knowledge). There are many other influences such as risk, time, actual communication, and others that must be kept in mind when referencing to social dilemmas.

Although the results of this study were not as expected, there are some important implications. Some of these involve an improved design which could reduce the shortcomings, and induce the advantages, of the design used in this study: A larger sample would have to be used, and it should be more heterogenous for generalizability; the tendency for consistency on the subject's part should be tested somehow; the directions of the procedure should be more straightforward and less confusing for subjects; investigation on why subjects answered in certain ways should be incorporated into the design - this could involve questionnaires and could

allow subjects to answer many of the researcher's questions for him or her. In regard to future paths of research, this study points to a novel area of investigation: The notion of how strong different kinds of inferences are (eg. outcome-biased correspondent inference) seems to be a worthy path of research and one which needs to be homogenized; the importance of looking at fundamental personal inferences seems to point to pragmatic generalizability within the research arena; the concept of investigating decision making and social value theory under different types of dilemmas may aid in a fuller understanding of what those theories are revealing; and finally, the study of cognition and behavior as being accumulating and interinfluencing aspects of individuals through time, seems a common sense and worthy emphasis - decisions are not "one time deals."

Taking into account these and other implications, one may design a better study, and one which pursues the novelty intiated by this experiment. Then, hopefully, it may be found out why the correspondent inference works, when it works, who it works for, and how strong this group oriented inference really is.

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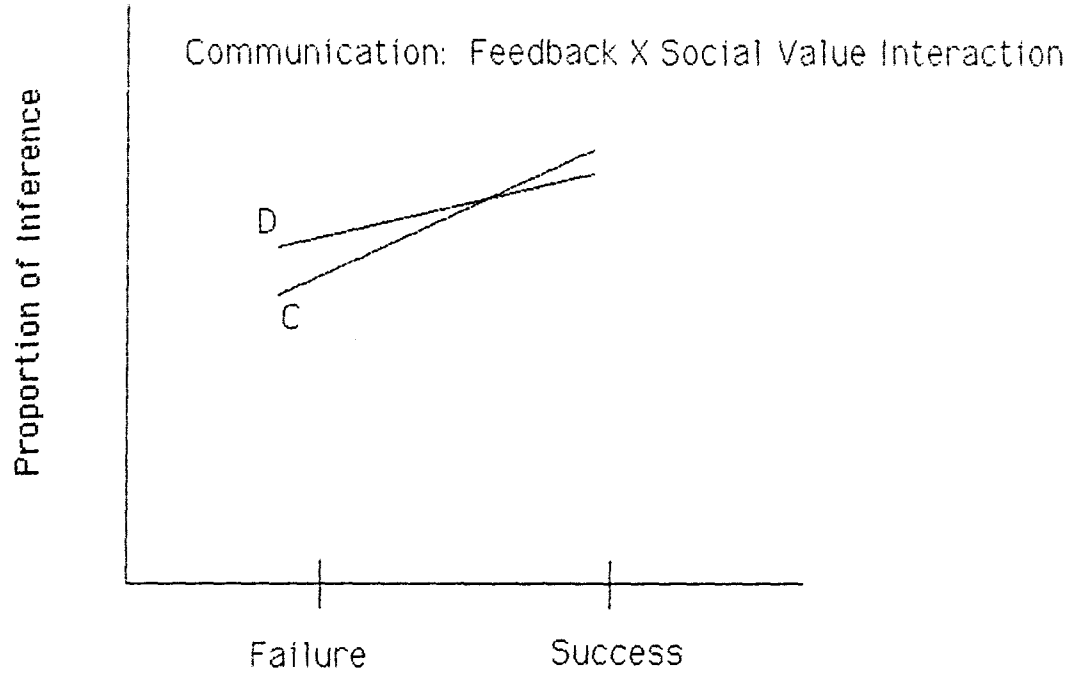
Figure 2


Communication: Feedback X Social Value Interaction
Proportion of Inference
D
C
Failure
Success

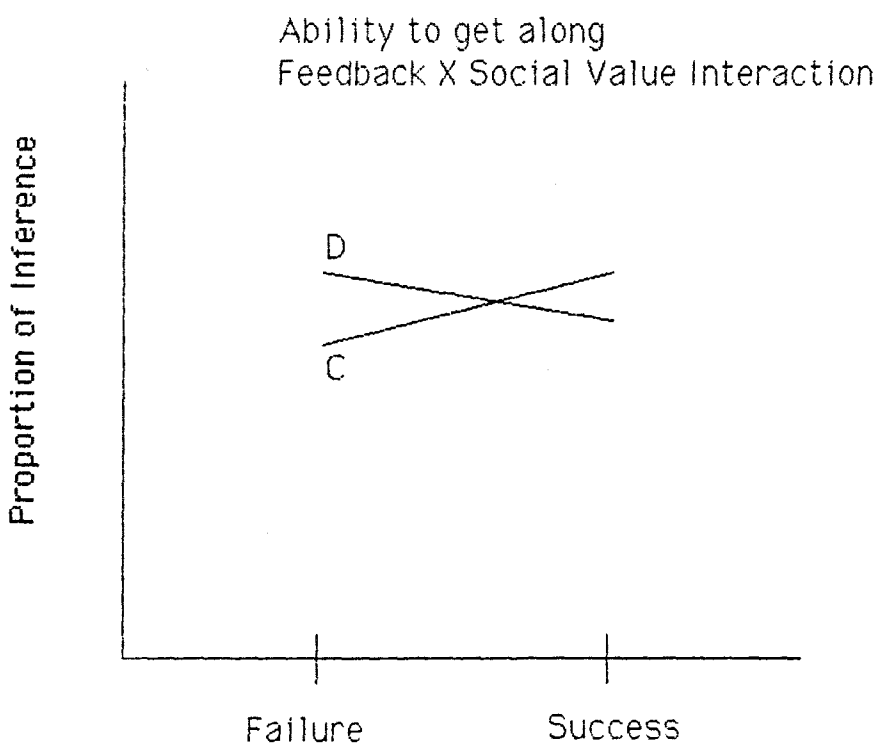

Ability to get along
Feedback X Social Value Interaction
Proportion of Inference
D
C
Failure
Success

Figure 3

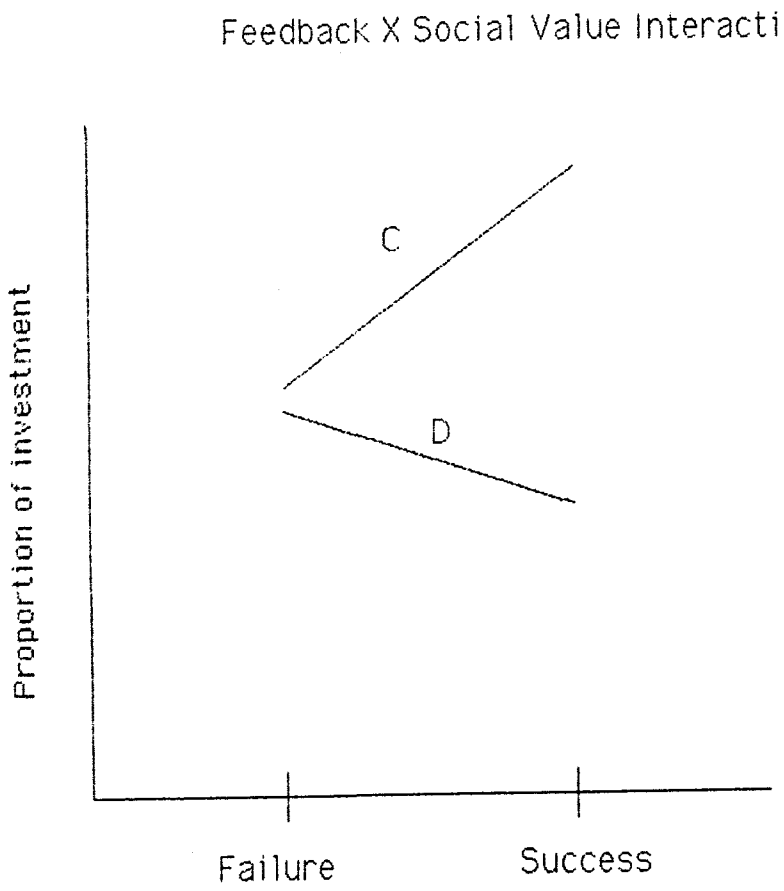
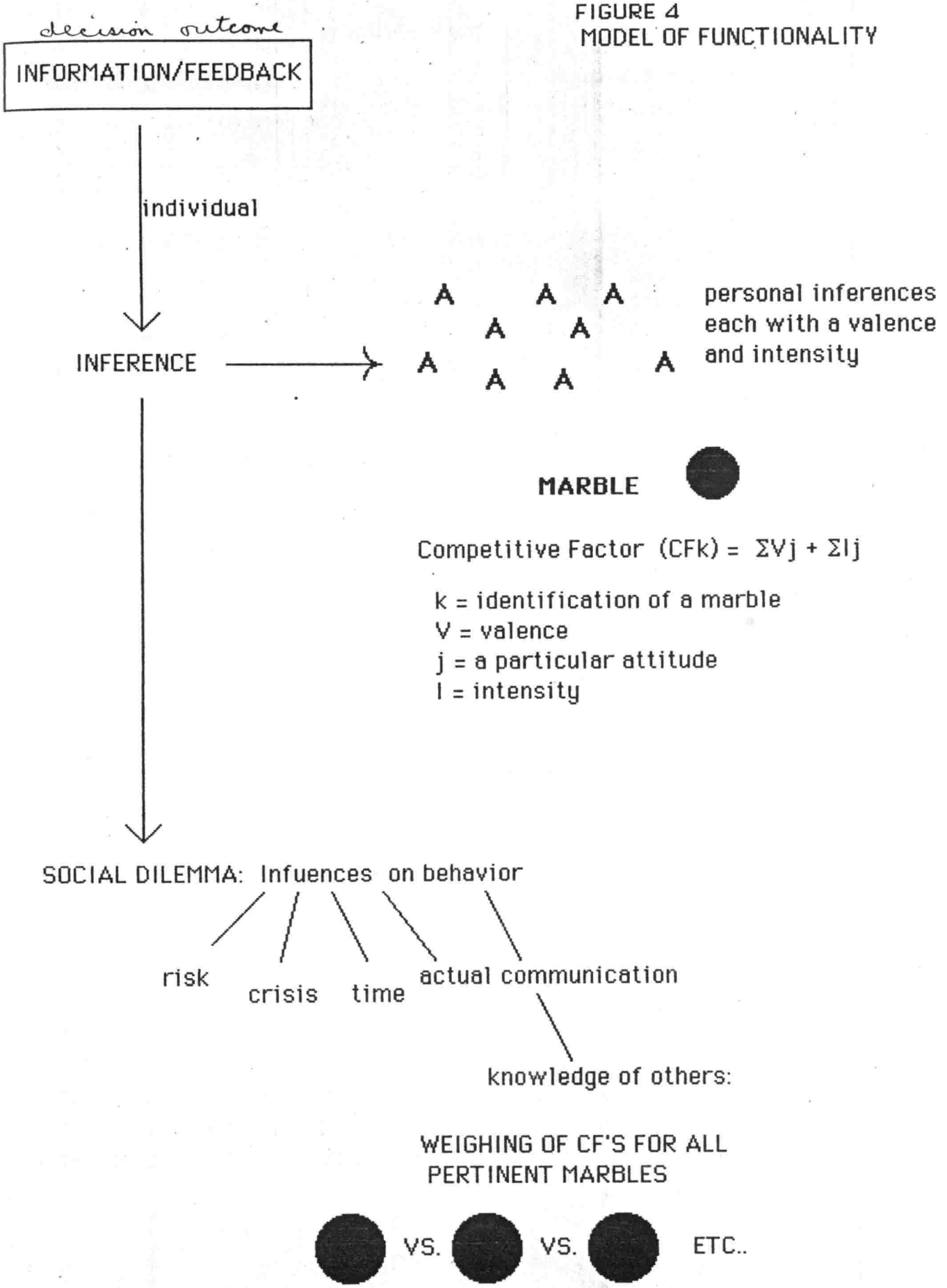

Feedback X Social Value Interaction
Proportion of investment
C
D
Failure
Success

FIGURE 4
MODEL OF FUNCTIONALITY



Research questions: **Appendix A**

A)

Do individuals make attributions about others based primarily on group outcomes or decisions? Yes, they make inferences about

	F	S
effectiveness	3.13	4.33
communication skills	3.00	4.17
experience	3.38	4.17

B)

Do cooperators and defectors differ in their investment behaviors? No, not in a main effect way, but they may differ depending on which type of feedback is given.

Do cooperators and defectors differ in the extent to which they are subject to the outcome-biased correspondent inference? Yes, in relation to inferences made on communication and ability to get along.

	(communication)		(ability to get along)	
	F	S	F	S
C	3.00	4.50	3.29	4.00
D	3.22	4.20	4.00	3.50

C)

Do those individuals who commit the outcome-biased correspondent inference differ in their investment behavior form those who do not? Generally, no, however individuals inferring good communication skills invest more in 8 quota situations than those who do not infer this, $X^2 - 16.59$, $p < .05$.

cooperators
defectors

	6		8		10	
	c	d	c	d	c	d
success	.87	.50	.75	.20	.25	.20
failure	.43	.33	.43	.33	.43	.55

C	D
.62	.30
.43	.41

	invest
C	.53
D	.34

6	8	10
.375	.375	.499
.66	.44	.23

	invest
S	.44
F	.42