



RETURNING MATERIALS:

Place in book drop to  
remove this checkout from  
your record. FINES will  
be charged if book is  
returned after the date  
stamped below.

JAN 08 2008

SOLVING SOCIAL DILEMMAS: ROLE OF INDIVIDUAL  
MOTIVES IN SOLUTION EFFECTIVENESS

By

David Nathan Sattler

A THESIS

Submitted to  
Michigan State University  
in partial fulfillment of the requirements  
for the degree of

MASTER OF ARTS

Department of Psychology

1988

## ABSTRACT

### SOLVING SOCIAL DILEMMAS: ROLE OF INDIVIDUAL MOTIVES IN SOLUTION EFFECTIVENESS

By

David Nathan Sattler

An experiment investigated the interaction between an individual's social motive (cooperator, individualist), information (moralizing, exploitation, control), and feedback (overuse, tit-for-tat) on behavior in two-person simulated social dilemma. Schema priming predicts that messages congruent with an individual's social motive primes a schema and increases the likelihood that environmental cues would be encoded via the schema and influence behavior. Cooperators (preferring to maximize joint gain) and individualists (preferring to maximize own gain) heard either a message congruent with the concerns of cooperators (e.g., moral issues), individualists (e.g., risk of exploitation), or a control message. Subjects harvested lumber from a simulated community forest and shared equal responsibility for fines levied for overzealous resource consumption. The primary hypothesis was supported for cooperators. For individualists, there was no such interactive effect. However, in the key condition for individualists (viz. exploitative partner and exploitation message), ceiling effects may have masked the effect.

To my family

## ACKNOWLEDGEMENTS

I was very fortunate to have had three outstanding members on the thesis committee. I wish to thank Dr. Norbert L. Kerr for his continual encouragement and guidance throughout this project and my graduate education. His enthusiasm for psychological research has been contagious. I appreciate the many hours Norb spend writing the computer program for this study. I wish to thank Dr. Lawrence A. Messe' for his advise and many insightful comments on this and other projects. Larry's feedback in both the design and analysis of this study was indispensable. I also wish to thank Joel Aronoff. Joel's counsel helped me to view cooperation and competition in a new light.

I would also like to thank my fellow graduate students for their contribution to this project and for providing necessary distractions from this project! Thank you Rick Harnish, Linda Sullivan, Geoff Kramer, and Jan Hymes. In addition, a special thanks goes to those two Psychology 817 group members for being so "nutty!"

It is with my deepest love that I thank my family for their never-ending support and encouragement. Your love truly is my greatest treasure.

## TABLE OF CONTENTS

LIST OF TABLES . . . . .	v
CHAPTER I: INTRODUCTION . . . . .	1
Research Paradigms . . . . .	3
Individual versus Collective Interests Paradigms . . . . .	3
Social and Temporal Traps . . . . .	4
Strategies to Induce Collectively-Interested Behavior. . . . .	6
Social Motives . . . . .	6
Information . . . . .	11
Feedback . . . . .	15
Persuasive Communication Processes: The Message by	
Person Match . . . . .	18
Functional Theory Approach . . . . .	19
Elaboration Likelihood Model . . . . .	22
Schema Priming . . . . .	25
The Current Experiment . . . . .	26
Hypotheses . . . . .	28
CHAPTER II: METHOD . . . . .	33
Pilot Study . . . . .	33
Design . . . . .	33
Subjects . . . . .	34
Measurement of Social Motive . . . . .	34
Experimental Task . . . . .	35

# TABLE OF CONTENTS (cont'd)

Procedure . . . . .	37
Information Manipulations . . . . .	39
Feedback Procedures . . . . .	41
CHAPTER III: RESULTS . . . . .	44
Subjects' Harvesting Behavior . . . . .	44
Construction of Evaluation and Potency Scale . . . . .	50
Social Values and Interpretation of Others' Behavior . . . . .	51
Additional Findings . . . . .	60
CHAPTER IV: DISCUSSION . . . . .	62
Social Values and Interpretation of Others' Behavior . . . . .	68
Conclusion . . . . .	72
REFERENCES . . . . .	73
APPENDIX A: Pilot Study . . . . .	83
Pilot Study . . . . .	84
Subjects and Procedure . . . . .	84
Results . . . . .	87
APPENDIX B: Experimental Materials . . . . .	89
Departmental Research Consent Form . . . . .	90
Social Motive Measure . . . . .	91
Original Message Text . . . . .	93
Message Text "Interpreted" by Reader . . . . .	100
Post-Experimental Questionnaire . . . . .	105
APPENDIX C: Experimental Instructions . . . . .	110
Instructions . . . . .	111

## LIST OF TABLES

1.	Analysis of Variance: Social Motive x Message on No-Feedback Trials . . . . .	45
2.	Means for Non-Significant Social Motive x Message Interaction on No-Feedback Trials . . . . .	45
3.	Analysis of Variance: Social Motive x Message x Feedback on Feedback Trials . . . . .	47
4.	ANOVA Means for Social Motive x Message x Feedback Interaction on Feedback Trials . . . . .	47
5.	Analysis of Covariance: Social Motive x Message x Feedback with Last Two No-Feedback Trials on Feedback Trials . . . . .	49
6.	Adjusted ANCOVA Means for Non-Significant Social Motive x Message x Feedback Interaction on Feedback Trials . . . . .	49
7.	Factor Loadings for Group Member Impressions . . . .	52
8.	Social Motive x Message x Feedback Interaction on Evaluation Factor . . . . .	54
9.	Social Motive x Message x Feedback Interaction on Potency Factor . . . . .	54
10.	Social Motive x Feedback Interaction for Control Message on Evaluation Factor . . . . .	58
11.	Social Motive x Feedback Interaction for Control Message on Potency Factor . . . . .	58



## INTRODUCTION

An important feature of social interaction is the conflict between personal interests and collective interests. One interesting class of such conflicts are social dilemmas. Social dilemmas are characterized by two properties: (a) each individual receives a higher payoff for selecting an individually-beneficial option than for selecting a collectively-beneficial option, no matter which options the other individuals in the group select, and (b) all individuals in the group receive higher payoffs if they select the collectively-beneficial option than if they select the individually-interested option (Dawes, 1980). This conflict was characterized by Garrett Hardin (1968) in his classic article "The Tragedy of the Commons." Hardin explored the situation in which a number of herdsmen, sharing use of a common pasturage, must decide on how many cattle to graze on the commons. Each herdsman reasoned that it is in his best interest to keep adding animals to his herd, for the personal gain from adding animals outweighs his proportionate share of the damage done to the commons, which is shared equally by all. Since the commons is finite, the day must come when the total number of cattle

will cause the pasturage to deteriorate and eventually destroy the resource on which the herdsmen depend. And therein lies the tragedy: the logic of the commons dictates that the collective consequences of self-interested behavior result in an undesirable outcome for everyone.

Other real world social dilemma examples abound. A social dilemma exists in labor organizations, where individuals can gain the benefits of a union without paying dues, on sinking ships, where individual rationality dictates that people rush to save themselves while risking the lives of everyone, and in resource use (e.g., petroleum), where individuals can gain from using as much of the resource as possible even though this action leads to pollution and elimination of the resource. The paradox facing the individual is that the self-interested choice is "rational" from his or her perspective, but the collective consequence, if everyone makes the self-interested choice, is a less desirable outcome than if all had made the collectively-interested choice.

Several types of variables have been shown to reduce collectively-interested behavior in social dilemmas. The present study investigates the interactive effects of several such variables on behavior in a two-person simulated social dilemma. The main focus of the present research is the way in which variables shown to influence behavior in a social dilemma interact. Specifically, are there conditions

in which the interaction of purported social dilemma remedies is differentially effective depending on individual personality characteristics?

### Research Paradigms

#### Individual versus Collective Interests Paradigms

The major research paradigms used to study the conflict between individual and collective interests are the prisoner's dilemma (Luce & Raiffa, 1957) and the N-person dilemma (or social dilemma). The paradigms have the following similarities. First, an individual must choose either a self-interested or a collectively-interested option. Second, group member outcomes are interdependent; an individual's outcome depends not only on his or her behavior but also on others' behavior (Kelley & Grzelak, 1972). Third, it is assumed that an individual attempts to maximize his or her individual interests. This is assumed to be the rational or optimal choice. Fourth, the main dependent variable is usually whether an individual makes a cooperative or self-interested choice (Dawes, 1980; Messick & Brewer, 1983). The prisoner's dilemma and the N-person dilemma differ in the following ways. In the prisoner's dilemma, any negative consequences that result when an individual selects an individually-beneficial option are focused on one other player, decisions are not anonymous, and each player has some degree of influence over the other individual. In contrast, in the N-person dilemma paradigm,

negative consequences are focused on at least two other players, and as the number of individuals who choose the cooperative choice increase, the outcomes for both the cooperative and the competitive choice increase monotonically. The self-interested option yields a higher outcome than the cooperative choice, but if every individual selects the cooperative choice the outcome is greater than if every individual selects the self-interested option. Finally, one individual has little fate control over another individual (Thibaut & Kelley, 1959). That is, it is difficult, if not impossible, for one individual to influence another's behavior in the N-person dilemma (Dawes, 1980; Komorita, 1976).

#### Social and Temporal Traps

Many real world social dilemmas include both social trap and temporal trap components. The conflict between individual and collective interests is a social trap (Platt, 1973). The conflict between short-term and long-term interests is a temporal trap (Messick & McClelland, 1983). Messick and McClelland (1983) investigated the effects of social and temporal traps on behavior in a social dilemma. Social traps were manipulated by varying the number of individuals who shared use of a resource. Subjects in the one-person condition experienced the temporal trap. Since there was no group or collective in the one-person condition, a social trap did not exist. Subjects in the

three- and six-person group experienced both temporal and social traps. Fifty-six introductory psychology students were told that their task was to withdraw as many points as possible over a series of trials without depleting a regenerating resource pool. The regenerating resource pool was replenished at the end of each trial by one-third the number of points withdrawn on the proceeding trial. The results indicated that subjects in the one-person condition maintained the resource pool longer than those in the group condition. Subjects who experienced a temporal trap were more successful at maintaining the resource pool than those who experienced a temporal and a social trap. This study demonstrated that both social and temporal traps have differing effects on behavior and may occur concurrently or in isolation in a social dilemma.

Schelling (1971) discussed several situations in which the pursuit of short-term self-interested goals resulted in long-range collective outcomes that were in almost no individual's self-interest. As an example, Schelling described the decay of rail service when individuals began to use their own automobiles. The decay of rail service was self-accelerating--as more individuals choose automobiles, the quality of the railroad and the number of patrons decreased. Traffic congestion resulted from the growing number of automobiles and it appeared that the efficient railroad of the past was preferred to the automobile.

### Strategies to Induce Collectively-Interested Behavior

Messick and Brewer (1983) described two strategies to resolve the conflict between individual and collective interests. Both are designed to induce individuals to include collective interests in their decision-making. Structural solutions make either the self-interested option more costly than the collectively-interested option or make the collectively-interested option more attractive than the self-interested option by eliminating or altering the incentive structure. For example, high cost for electricity use is a structural solution since it quantitatively changes the incentives for use. Likewise, increasing the cost of water should reduce consumption (Pope, Stepp, & Lytle, 1975). Another example is when a group collectively agrees to establish a strong central authority to use external control to constrain individual choices in the collective interest. Hardin's (1968) "mutual coercion, mutually agreed upon" solution, reflects this type of structural solution.

Individual solutions involve influencing individuals to voluntarily restrain their use of a common resource. The present study focuses on three individual solution variables: social motives, information, and feedback.

#### Social Motives

Edney (1980) suggested social dilemmas should be viewed as situations where there is "a conflict of human values" (p. 141) rather than as a problem of rationality in which

individuals attempt to maximize their individual interests. In outcome interdependent situations such as social dilemmas, individuals differ in preference for their own outcome and others' outcomes. These differences have been found to influence behavior in both 2-person experimental games (e.g., Kuhlman & Marshello, 1975a; 1975b) and in n-person experimental games (Knight & Dubro, 1984; Liebrand, 1984; Messick & McClintock, 1968), and influence an individual's interpretation of others' behavior (Liebrand, Jansen, Rijken, & Shure, 1986). Preference for various outcome distributions has been called social motives (McClintock, 1972), interpersonal motivations (Griesinger & Livingston, 1973), motivational orientations (Kuhlman & Marshello, 1975a, 1975b), and value orientations (Liebrand, 1983). Social motives are "more or less consistent complexes of cognitive, motivational, and moral orientations to a given situation that serves to guide one's behavior and responses in that situation" (Deutsch, 1982, p. 15).

McClintock, Messick, Kuhlman, and Campos (1973) suggested that "much of the choice behavior occurring in situations of social interdependence is in the service of...three major social motives: (a) maximizing own gain, (b) maximizing joint gain, and (c) maximizing outcomes relative to the outcomes of others (relative gain)" (p. 572). These social motives can be labeled as "individualism," "cooperation," and "competition,"

respectively. Kuhlman and Marshello (1975a) suggested a fourth social motive, namely, maximizing others' gain ("altruism"). These four social motives can be operationally defined by the choices (i.e., outcome distributions) individuals make in dilemma situations. It is assumed that each social motive has its own utility function as determined by the linear combination of own and others' outcomes (Griesingler & Livingston, 1973; Wyer, 1969). The differential weighing of own and others' outcome distributions have various utility functions, namely, to maximize own gain, joint gain, relative gain, or others' gain. For example, consider a situation in which an individual must select one of two outcome distributions. In one distribution the individual and the partner both receive \$6.00. In the other the individual receives \$10.60 and the partner receives \$5.50. If the individual selects the outcome distribution where the individual and the partner receive \$6.00, the utility function of this selection would be to maximize joint gain. This would be a cooperative selection. If the individual selects the outcome distribution where he or she receives \$10.60 and his or her partner receives \$5.50, the utility function of this choice would be to maximize relative gain or own gain. This would be a competitive or an individualistic selection.

Liebrand (1984) investigated the effects of social motives, communication, and group size on behavior in a



social dilemma. The four classes of social motives (competitive, cooperative, individualistic, and altruistic) were assessed prior to a decision-making task. Subjects were presented with a series of choices involving various forms of transportation, such as private versus public transportation. Connected with each choice was a monetary amount. An example of an outcome distribution selection was using a private car (yielding an outcome of \$3.00) versus public transport (yielding an outcome of \$.50). Consistent differences in the selections were found. Compared to the selections made by the average other player, competitive subjects made more self-interested selections than individualistic subjects, and altruistic subjects made more cooperative selections than cooperators. Each of the four types of social motives were related to an individual's choices.

Liebrand et al. (1986) investigated the influence of social motives on interpretation of others' behavior. Subjects were classified as either cooperative, border line, or individualistic. Subjects completed 16 self/other outcome distributions in each of four sessions in which a simulated player consistently made either altruistic, cooperative, competitive, or individualistic selections. After each session, subjects rated the "other" player on 39 personality adjectives. The results showed cooperators rated others' behavior more extremely on the evaluation

dimension (good versus bad) than individualists. Cooperators perceived a cooperative partner as more favorable and an exploiting partner as less favorable than did individualists. Conversely, individualists rated others' behavior more extremely on the potency dimension (strong versus weak) than did cooperators. Individualists perceived an exploiting partner as stronger and a cooperative partner as weaker than did cooperators. In addition, cooperators assimilated to the behavior of their partner, whereas individualists persisted in their behavior (cf. Kelley & Stahelski, 1971). Social motives influenced both perceptions of others' behavior and behavior. In perceiving others' behavior, cooperators were more sensitive to evaluation concerns (good versus bad) and individualists were more sensitive to the potency concerns (strong versus weak).

More recently, McClintock and Liebrand (in press) investigated the effect of task structure, social value, and feedback on choice behavior. Subjects participated in each of four outcome interdependent games. Three games, the Chicken, Leader, and Hero games, created a conflict between the strategy that minimizes an individual's losses and the strategy that has higher risks but results in higher outcomes to both the individual and his or her partner. The fourth game was the Prisoner's Dilemma game. McClintock and Liebrand (in press) discuss each game in detail. Subjects

completed Liebrand's (1984) social motive measure and played three 30-trial games with a 100% cooperative partner, a 100% competitive partner, and a partner responding in kind (tit-for-tat feedback) on each of the four games. The finding most relevant to the present study is that McClintock and Liebrand replicated Liebrand et al.'s (1986) finding that individualists perceive others' behavior more extremely than cooperators on the potency dimension was replicated. Cooperators did not perceive others' behavior as more favorable than individualists on the evaluation dimension. McClintock and Liebrand (in press) speculated the null finding for cooperators was due to a "floor" effect--cooperators did not rate their partner lower than the neutral point on the evaluation dimension rating scale.

#### Information

Certain types of information have been shown to induce cooperative behavior in situations where individual and collective interests are in conflict. Descriptive information describes the situation and allows participants to understand the characteristics of the situation. For example, the choices available or group member interdependence may be explained. Prescriptive information appeals to an individual's motivations, needs, or goals. For example, an individual attempting to maximize his or her relative gain may be told the best way to do so is through cooperation rather than competition.

Stern (1976) studied the effects of incentives (high or low gasoline cost), descriptive information (short spot messages that did not completely inform subjects about the consequences of self-interested behavior or detailed information about the long-term consequences of self-interested behavior), and a control condition on carpool membership and gasoline supply. Forty-eight undergraduate subjects participated in groups of four, and choose either to drive alone (considered the self-interested option) or to join a carpool (considered the collectively-interested option). The results showed that detailed information about the long-term consequences, but not spot messages, influenced individuals to join the carpool. In addition, incentives influenced individuals to join the carpool, and extended the life of the gasoline supply. Stern (1976) concluded that "information should increase conservation even when incentives are too weak to induce group-oriented behavior" (p. 1291).

Messe', Bolt, and Sawyer (1971) investigated the effects of understanding of the game (low understanding information, high understanding information), reward level (low payoff, high payoff), and motivation for participating (money, research credit) on cooperation in a prisoner's dilemma. One hundred and sixty male introductory psychology students were given two sets of instructions. One described the choices available (low understanding information), while

the other highlighted the interdependency inherent in the game (high understanding information). Reward was manipulated by two sets of matrix values, with one set having payoffs that were 10 times as great as the other. Both high-understanding information and participation for money promoted cooperation, while reward level had no significant effect. These researchers concluded that subjects may not understand or be motivated to play the game. Descriptive information increased cooperative behavior in this study.

Mack and Knight (1972) investigated the effects of descriptive information on competitive behavior in a prisoner's dilemma. Subjects received either no information or information clarifying the matrix. The results indicated information allowing subjects to understand the outcomes of their choices increased competitive behavior. While information has been found to increase cooperative behavior (e.g., Orwant & Orwant, 1970), Mack and Knight (1972) suggested their finding may indicate clarifying information increases competitive (self-interested) behavior whereas situational information that subjects can relate to "real-life" situations increases cooperative behavior.

Deutsch (1960) investigated the effects of motivational orientation (manipulated by prescriptive information) on trustworthy behavior in a prisoner's dilemma. Subjects were given one of three motivational orientations: (a)

cooperative: the welfare of both the subject and the other person was of concern to the subject and the other person, (b) individualistic: the subject was interested in doing well for himself, regardless of the other person, and the other person felt the same way, or (c) competitive: the subject should do as well as he could for himself and defeat the other person, and the other person felt the same way. The results indicated the cooperative orientation increased trusting and cooperative behavior, the competitive orientation increased self-interested behavior, and the individualistic orientation increased both cooperative and competitive behavior. This study indicates that behavior in situations where individual and collective interests are in conflict can be influenced by prescriptive information. However, an alternative explanation for the results is that the information manipulated the goal of the task. If so, the information manipulations would have been descriptive rather than prescriptive.

Individuals may be influenced to make cooperative choices by appeals to their values and sense of fairness. Orbell and Dawes (1981) briefly discuss a study by Dawes et al. (an unpublished manuscript) that investigated the effects of prescriptive information on cooperative behavior in a social dilemma. The information was presented by a "sermon" that portrayed the dilemma in terms of moral issues involving ethics, group benefit, and exploitation. The

sermon yielded rates of cooperation comparable to those found in discussion groups in other experiments.

### Feedback

Feedback concerning others' behavior has been found to influence an individual's behavior. Feedback may indicate either an individual's behavior (e.g., cooperative or competitive) or a group's behavior (e.g., cooperative or competitive). Messick, Wilke, Brewer, Kramer, Zemke, and Lui (1983) investigated the effects of feedback on behavior in a social dilemma. Subjects, in groups of six, were given false feedback indicating (a) group members were either overusing, underusing, or optimally using a resource pool and (b) the number of points withdrawn on each trial by the group members differed greatly (high variance) or were relatively similar (low variance). The task was to accumulate as many points as possible and to make the resource pool last as long as possible. The resource pool contained a maximum of 300 points and was replenished by multiplying the amount remaining at the end of each trial by 1.1. The results indicated that subjects receiving underuse feedback increased their withdrawal rates across trials, whereas subjects receiving overuse, high variance feedback decreased their withdrawal rates (compared to subjects receiving overuse, low variance feedback). The study demonstrated feedback can moderate behavior in a social dilemma.

Schroeder, Jensen, Reed, Sullivan, and Schwab (1982) investigated the effects of feedback and goal setting on behavior in a social trap. Subjects were instructed to earn as many points as possible by requesting colored chips worth one, three, or five points from a common resource pool on each trial. In addition, subjects were told that the number of points remaining in the resource pool after the last trial would be equally divided between the group members. Subjects received either actual feedback (each group member's selection was shown), conserving false feedback (one or three point chips were shown), consuming false feedback (three or five point chips were shown), or no feedback (chip selections were not shown). Subjects needed 360 points for early dismissal in the high-goal condition and 306 points in the low-goal condition. The results indicated subjects receiving conservation feedback took fewer points from the resource pool than subjects receiving no feedback, actual feedback, and consuming feedback. In addition, high goal groups conserved the resource pool marginally better than low goal groups. This study found subjects incorporated feedback in their decision-making and quickly conformed to the behavior of the other group members.

Feedback may influence behavior for several reasons. Feedback may introduce pressure to conform (Messick et al., 1983). Feedback indicating others are behaving



cooperatively may introduce pressures to behave cooperatively. Paradoxically, feedback indicating others are behaving cooperatively may decrease cooperative behavior. This is so because if others are behaving cooperatively, an individual's own cooperative behavior may be less essential to the collective welfare. Thus, the temptation to free ride (Olson, 1965) may come into play. An individual may choose not to act in the collective-interest if the group can succeed without his or her efforts. Likewise, discovering that other group members are making selfish choices may lead to conformity in favor of self-interest. This may introduce a desire to avoid the sucker role. Rather than maintaining this inequity, a group member may make more self-interested choices or reduce his or her efforts. Kerr (1983) suggested individual's consider it inequitable to do the group's work while other capable members do not contribute.

Messick (1982) suggested three distinct forces influence an individual's decisions in situations where individual and collective interests are in conflict. They are a desire to (a) accumulate as many points as possible, (b) use the resource intelligently, and (c) not deviate too markedly from the group norm (i.e., a modeling effect). Feedback may create a conflict between these forces. For example, when told other group members are overusing the resource pool, individuals in a social dilemma may want to

make small withdrawals to keep the pool from being depleted. Making small withdrawals is incongruous with the desire to make large withdrawals and violates conformity pressures. Messick et al. (1983) suggested that individual withdrawal decisions reflect the resolution between the conflicting pressures. A modeling effect was found when subjects were presented with feedback. Subjects given feedback that other group members were underusing the resource pool and could increase their harvest rate without depleting the pool did so only when there was another group member was taking a large amount.

#### Persuasive Communication Processes:

##### The Message by Person Match

The main focus of the present study is investigating the effect of information congruent with an individual's social motive on behavior in a social dilemma. The basic question addressed is the following: Do social motives effect the ability of certain types of messages to influence behavior in a social dilemma? Both theory and research indicate information congruent with either an individual's motivational orientation and personality needs or an individual's cognitive orientation is more effective than noncongruent information in influencing behavior. The current author found no prisoner's dilemma or social dilemma research matching information to the recipient's motivational orientation or cognitive orientation.

The match between information and the recipient is addressed by both Functional Theory (Katz, 1960; Smith, Bruner, & White, 1956) and schema priming (Higgins, King, & Mavin, 1982; Wyer & Srull, 1980). Functional Theory is concerned with information matching an individual's goals or motivational orientation and places a prescriptive emphasis on congruent information. Schema priming is concerned with information matching an individual's cognitive orientation and places a priming or sensitizing emphasis on congruent information. Both are relevant in the present study, for social motives may be viewed as reflecting either an individual's motivational orientation or cognitive orientation (Deutsch, 1982).

Functional Theory (Katz, 1960; Smith et al., 1956) emphasizes the relationship between a persuasive communication (information) and a person's underlying motivational and personality needs. Functional Theory assumes attitudes serve certain individualistic needs; attitudes allow an individual to successfully execute plans and achieve goals (DeBono, 1985). Functional Theory proposes four functions of attitudes. First, ego-defensive attitudes help protect the individual from accepting undesirable or threatening truths. Second, knowledge attitudes are formed to give meaning to objects. Third, value expressive attitudes allow the individual to express his or her underlying values and dispositions. Fourth,

social adjustive attitudes are formed on the basis of how well they allow individuals to fit into important social situations and behave appropriately in various reference groups. From the Functional Theory perspective, the function served by an individual's social motives (viz., cooperator, individualist)--or by either cooperative or self-interested behavior--may be value expressive. An individual's preference for own-other outcomes may allow expression of his or her underlying values and motivational orientation in outcome interdependent situations in an attempt to satisfy his or her goal (i.e., maximize joint gain for cooperators and maximize own gain for individualists).

Theoretically, attitude change should occur only if a message informs an individual the attitude is no longer serving its function (Katz, 1960). For example, if an attitude is serving a value expressive function, a message informing an individual that the particular attitude is not appropriate in a given situation should result in an attitude change. If a congruent message indicates a goal (e.g., to maximize joint gain and act in a virtuous and moral manner) can be realized by engaging in the prescribed behavior, then the individual's attitude toward the prescribed behavior (e.g., cooperation) should be enhanced. Other factors, including environmental factors such as others' behavior, should be minimally influential on the

individual's attitude, since the implications for the attitude from others' behavior is not as clear as the implications from the prescriptive message. Unlike information, feedback does not contain special information about the way in which an individual's goals can be achieved. Finally, a message addressing a motivational basis different than the one on which the attitude is based should not be persuasive (Petty, Ostrom, & Brock, 1981).

Snyder and DeBono (1985) investigated the effects of information matching an individual's interpersonal orientation on behavior. Subjects were identified as either a high self-monitoring individual or a low self-monitoring individual by scores on the Self-Monitoring Scale (Snyder, 1974). High self-monitors consider appropriate social and interpersonal behavior in each situation in which they find themselves and alter their behavior to in an attempt to be the type of person called for by the situation (Lippa, 1976; Snyder & DeBono, 1985). Low self-monitors do not attempt to alter their behavior to fit the situation (Snyder & Monson, 1975). Rather, behavior is influenced by attitudes, feelings, and dispositions (Snyder & Tanke, 1976). DeBono (1987) speculated "the social attitudes of high self-monitoring individuals may be serving a social-adjustive function" (p. 280), whereas the "social attitudes of low self-monitoring individuals may be serving a value-expressive function" (p. 281). Subjects were

contacted by telephone by an alleged market researcher investigating public receptiveness to a new shampoo. Subjects heard a message stressing either the enhanced image (i.e., good looking hair) resulting from the shampoo, or a message stressing the product's quality (i.e., effectively cleans hair). Results indicated high self-monitors were more willing than low self-monitors to try the "image enhancing" shampoo, and low self-monitors were more willing than high self-monitors to try the "quality" shampoo. High self-monitoring individuals were more influenced by the congruent message matching their image concerns, whereas low self-monitoring individuals were more influenced by the congruent message matching their quality concerns. This study lends support for the Functional Theory approach by indicating information congruent with an individual's orientations or predispositions that indicates the way in which a goal can be achieved is more effective in influencing behavior than noncongruent information.

#### Elaboration Likelihood Model

Petty and Cacioppo's (1981) Elaboration Likelihood Model provides a framework for understanding persuasion processes and the way in which individuals attempt to ascertain the validity of persuasive messages. The model proposes information may be processed in one of two routes. One is the central processing route, where persuasion is due to extensive thinking about issue-relevant arguments in the

communication. The other is the peripheral processing route, where persuasion is mediated by non-message factors, such as source factors (e.g., "Experts are usually correct") or non-content message factors (e.g., Longer messages are usually more valid"). These processing routes are similar to Chaiken's (1980) "systematic" and "peripheral" processing approach. Petty and Cacioppo's (1981) model goes further than Chaiken's (1980) approach by suggesting that to process a communication systematically, an individual must have the ability to analyze the message and be motivated to process the message. When either motivation or ability to process the message is absent, persuasion should result from non-message factors. Information may be more thoroughly evaluated in the central processing route than in the peripheral processing route.

Harkness, DeBono, and Borgida (1985) investigated the relation between degree of task involvement and the complexity of subjects' information processing strategy on problem solving. Female students participated in a study that allegedly studied dating relationships. There were three conditions: (a) dating condition-person information (high-involvement) where subjects believed that they would be examining information about a person they would be dating; (b) nondating condition-person information (low-involvement) where subjects believed they were examining information about a person but did not believe

they would be dating this person; and (c) nondating-abstract information (low-involvement) where subjects believed that the information they were examining was part of an abstract judgment task and not related to dating anyone. The results indicated that high-involvement subjects used more complex strategies to process the information than low-involvement subjects. When information had an impact on subjects plans, goals, and needs, complex and systematic processing strategies were used. Low-involvement subjects were more susceptible to non-message perceptual factors (e.g., visual information) than high-involvement subjects. This finding appears to support the Elaboration Likelihood Model. Message content may be more persuasive than non-message factors when an individual is motivated to attend to the message.

It is possible the effect of a message congruent with the motives of a cooperator or an individualist may not be to simply influence an individual to engage in the prescribed behavior, as Functional Theory would predict. Rather, the congruent message may prime or activate an individual's cognitive orientation and increase sensitivity to the central features of the schema. Relevant environmental cues (e.g., others' behavior) may be processed via the schema, thereby increasing the likelihood that the individual will behave in a schema consistent manner. This process fits the notion of schema priming.



### Schema Priming

Schema priming (Higgins, King, & Mavin, 1982; Wyer & Srull, 1980) emphasizes the relationship between information and an individual's cognitive orientation. A schema is an organized, structured set of cognitions that aids in encoding, interpreting, and remembering social information. Schemas are conceptual categories that contain information about persons, social roles, and events (Taylor & Crocker, 1981). Social motives may be viewed as a structured set of cognitions or a schema. An individual's preference for own-other outcomes may reflect his or her outcome interdependent situation schema. Information consistent with a schema has a greater chance of being selectively attended to (Johnston & Dark, 1986), encoded (Howard & Rothbart, 1980; Wyer, Srull, Gordon, & Hartwick, 1982), and recalled (Snyder & Uranowitz, 1978; Taylor & Crocker, 1981) than schema-inconsistent information.

A schema is primed or activated when schema-consistent information is presented. Priming causes the schema to be more accessible. A primed schema is more likely to be used when relevant environmental cues are present (Bargh & Thein, 1985; Higgins, King, & Mavin, 1982) to encode incoming information than an unprimed schema (Fazio, Sanbonmatsu, Powel, & Kardes, 1986; Hastie, Park, & Weber, 1984). In the absence of relevant environmental cues, the effect of schema priming on behavior may be null. For schema priming, unlike

Functional Theory, the effect of a congruent message is to prime or sensitize an individual to relevant environmental cues, not to directly influence the individual to engage in the prescribed behavior.

#### The Current Experiment

The present study investigated the effect of information congruent with an individual's social motive on behavior in a social dilemma. The study focused on individuals with cooperative and individualistic social motives and presented three messages: a moralizing message stressing evaluation issues, a exploitation message stressing potency issues, and a neutral control message presenting neutral information. Message content for the evaluation and potency messages was based on several assumptions from Liebrand et al.'s (1986) finding that cooperators perceive others more extremely than individualists on issues of fairness and virtue (the evaluation dimension--good versus bad), but individualists perceive others more extremely than cooperators on issues of strength (the potency dimension--strong versus weak). The present study assumed that the way in which cooperators and individualists perceive others' behavior may have implications concerning the way in which they view their own behavior. First, it was assumed the goals or orientations of cooperators and individualists may be more complex than previously assumed such that cooperators were more concerned

than individualists with issues of fairness and virtue, whereas individualists were more concerned than cooperators with issues of strength and power. Second, cooperators may engage in cooperative behavior because they view behavior in outcome interdependent situations as an ethical judgment such that it's morally right to cooperate. Individualists may engage in self-interested behavior because they view behavior in outcome interdependent situations as a means to be perceived as strong, dominant, and in control.

The moralizing message emphasized evaluation dimension issues (i.e., good versus bad). The message indicated cooperation is a good, moral, and socially-approved behavior and highlighted the mutual obligations, rights, and entitlements of group members. An ought, should, and obligatory quality to cooperative behavior in groups was stressed. Based on Liebrand et al.'s (1986) finding that cooperators are more sensitive to the evaluation dimension than individualists, the moralizing message should be more congruent with the concerns of cooperators than individualists in outcome interdependent situations. Second, the exploitation message emphasized potency dimension issues (i.e., strong versus weak). The message indicated self-interested behavior can lead to power, control, and domination of the situation. It discussed the risks involved in exploitation, including possible group member retaliation when an individual consistently acts in a

self-interested manner. Based on Liebrand et al.'s (1986) finding that individualists are more sensitive to the potency dimension than cooperators, the exploitation message should be more congruent with the concerns of individualists than cooperators in outcome interdependent situations. Third, the neutral control message presented information that did not emphasize either evaluation or potency issues. The control message should not be congruent with the concerns of either cooperators or individualists.

Feedback indicated whether the subject's partner was acting in either a competitively or a "fair" manner (viz., tit-for-tat). Tit-for-tat feedback (i.e., matching) indicated the group member was responding in kind by making approximately the same choices as the subject. Overuse feedback indicated the subject's partner was exploiting the situation by always making self-interested choices.

#### Hypotheses

It was first hypothesized that the present study would replicate past research findings that there is a main effect for social motive, information, and feedback. Cooperators should be more cooperative than individualists (cf. Kuhlman & Marshello, 1975a). Individuals hearing the moralizing message should be more cooperative than those hearing the exploitative message (cf. Dawes et al., 1977). Individuals with partners responding in kind (tit-for-tat feedback) should be more cooperative than those with exploitative

partners (overuse feedback) (cf. Kuhlman & Marshello, 1975a; Liebrand et al., 1986).

Functional Theory (Katz, 1960; Smith et al., 1956) predicts there should be a two-way (social motive x information) interaction. The moralizing message should be more effective for cooperators than individualists, and the exploitation message should be more effective for individualists than cooperators. If the goal of cooperators is to equally maximize all group members' outcomes and behave in a good and moral manner, then the message indicating this goal can be achieved by cooperation should increase cooperative behavior. If the goal of individualists is to maximize their own outcome and control and dominate the game, then the message indicating this goal can be achieved by exploitation should increase self-interested behavior. In essence, the congruent message prescribes behavior that may result in goal attainment.

Based on Kelley and Stahelski's (1970) triangle hypothesis, a two-way (social motive x feedback) interaction was also expected, although the specific effects were unclear. Briefly, the triangle hypothesis predicts that cooperators will cooperate when their partner is cooperative, but will assimilate to competitive behavior. In contrast, competitors will compete regardless of group member behavior. Specific predictions were not made in the present study due to several differences between the Kelley

and Stahelski's (1970) study and the present study that make the effects unclear. First, subjects in the present study were classified as either individualists or cooperators, not as either competitors or cooperators. It is not clear how individualists will act when their group member acts either cooperatively or competitively. Second, subjects in the present study played with a partner either responding in kind (tit-for-tat feedback) or competing (overuse feedback), rather than a purely cooperative and competitive partner as in Kelley and Stahelski's (1970) study. Third, unlike subjects in Kelley and Stashlski's (1970) study, subjects in the present study heard messages. Generally, it was expected that individualists may desire to avoid being perceived as weak and attempt to avoid the sucker role more than cooperators. Cooperators should be concerned with the "goodness" of their behavior and be more willing to "carry" exploitative partners than individualists.

Schema priming (Higgins et al., 1982; Wyer & Srull, 1980) predicts there should be a three-way (social motive x information x feedback) interaction. Information congruent with an individual's social motive should prime or activate an individual's cognitive category or schema. The moralizing message should be more effective for cooperators and the exploitation message should be more effective for individualists. When relevant environmental cues (i.e., others' behavior) are present, the likelihood that the

primed or activated schema will be used to encode incoming information increases. When others' behavior is consistent with the schema, it is likely that the individual will engage in schema consistent behavior.

The evaluation message should prime or activate the evaluation features of cooperators more than either the noncongruent or neutral message. This should increase the likelihood that cooperators will perceive others' behavior more evaluatively than individualists and will react to behavior in a schema consistent manner. The exploitation message should prime or activate the potency features of individualists more than either the noncongruent or neutral message. This should increase the likelihood that individualists will perceive others' behavior more in terms of the potency dimension than cooperators and react to behavior in a schema consistent manner.

Finally, it was hypothesized that cooperators would perceive others' behavior more extremely than individualists on the evaluation dimension (i.e., good versus bad), and individualists would perceive others' behavior more extremely than cooperators on the potency dimension (i.e., strong versus weak) (cf. Liebrand et al., 1986). Based on Liebrand et al.'s (1986) finding, cooperators should perceive a responding in kind partner more favorably and an exploiting partner less favorably than individualists. Individualists should perceive a responding in kind partner

as weaker and an exploiting partner as stronger than cooperators.



## CHAPTER II

## METHOD

Pilot Study

A pilot study was conducted to investigate (a) whether after hearing the messages individuals could make clear distinctions between the evaluation dimension and the potency dimension, (b) whether it was possible to convince individuals that an individual can be either (1) powerful and in control if he or she acts in either the collective-interest or his or her self-interest, or (2) moral and good if he or she acts in either his or her self-interest or the collective-interest, and (c) whether an individual's self-perceptions about his or her potential behavior influences his or her behavior. Examples of the messages, the procedure, and results are presented in Appendix A. The main finding was that subjects believed the message indicating collectively-interested behavior was good, moral, and socially-approved and the message indicating self-interested behavior can lead to control, power, and domination of the game. These two messages were therefore chosen for the study.

Design

The design was a 2 (Social Motive: Cooperator, Individualist) x 3 (Message: Moralizing, Exploitative, Control) x 2 (Feedback: Overuse, Tit-For-Tat) between

subjects factorial. The dependent measure was the number of acres withdrawn from a 200 acre community forest.

### Subjects

Six hundred male and female introductory psychology students at Michigan State University participated in a preliminary testing session in which a social motive measure was administered. Seventy-two males and 80 females were recruited from this pool. Seventy were classified as cooperators and 81 were classified as individualists. One subject was dropped from the analysis due to suspicion of the experimental cover story. Subjects received one hour of experimental credit for their participation in the session.

### Measurement of Social Motive

Subjects completed a social motive measure developed by Liebrand (1984) and adapted by Liebrand, Jansen, Rijken, and Shure (1986). The original measure (Liebrand, 1984) classified individuals as either competitive (preferring to maximize relative gain), individualistic (preferring to maximize own gain), cooperative (preferring to maximize joint gain), or altruistic (preferring to maximize other's gain). The measure in the present research was used to classify individuals as either cooperative or individualistic (Liebrand et al. 1986). The instructions presented an example and explained how the experimental game was played. Player interdependence was stressed to illustrate that outcomes were determined by the combined

choices of both players. The measure consists of making 24 choices between two own/other outcome distributions, and subjects were told to select the outcome distribution most preferable to them. An example is the choice between \$3.30 for self and \$7.90 for the other versus \$6.00 for self and \$6.00 for the other. Adding the amounts chosen for self and other across trials provides an estimate of an individual's social motive. The present study used Liebrand et al.'s (1986) classification criterion for cooperators and individualists, namely, 30 to 67.5 degrees for cooperators and 337.5 to 15 degrees for individualists. The classification procedure is discussed in detail in Liebrand (1984). To be classified into either cooperative or individualist category, selections had to be at least 60% consistent with the social motive. Individuals who did not meet the 60% consistency rule did not participate in the present study. Liebrand et al. (1986) were able to classify 131 out of 143 subjects. Using a similar classification method, Liebrand, Wilke, Vogel, and Wolters (1986) found that subjects' choices were 88% consistent with the cooperative and individualist categories. Appendix B1 presents the social motive measure.

#### Experimental Task

Subjects were told that they were a member of a two-person group and that the group shared use of a resource pool (i.e., a 200 acre forest). Group member

interdependence was stressed to illustrate the effect of one group member's actions on the other. Subjects were told that their goal was to accumulate as many acres of lumber as possible by harvesting (i.e., withdrawing) acres of lumber from the forest on each trial. Trials were independent such that making a decision on one trial did not effect the resource pool on the following trial. This eliminated temporal trap (short-term versus long-term) considerations. The size of the resource pool was constant across trials. There were 10 no feedback trials followed by 10 feedback trials. Functionally, there were 11 no feedback trials and nine feedback trials, since subjects did not receive feedback prior to making a decision on the first feedback trial. Subjects were not told the number of trials.

The harvesting task created a conflict between self-interested and collectively-interested outcomes through a fine system penalizing overzealous resource consumption. The fine was based on the group harvest and increased as the total number of acres withdrawn by the group increased. For example, a fine of 200 acres would be levied if both group members harvested 100 acres of lumber (the maximum harvest allowed) and no fine would be levied if both harvested 20 acres of lumber. Responsibility for the fine was shared equally by group members. For example, if a fine of 60 acres was imposed on a given trial, each member of the two

person group would be fined 30 acres. The task instructions are presented in Appendix C.

The harvesting task met the defining characteristics of a social dilemma (Dawes, 1980). The payoff for individual defection (i.e., self-interested behavior) was larger than the payoff for cooperation, but all group members received higher payoffs for cooperative behavior. The task also fit the definition of a take-some game (Orbell & Dawes, 1981). A take-some game is an experimental game used to study the conflict between individual and collective interests in which all group members are penalized (e.g., fined) if one or more of the group members select(s) the self-interested option. For example, take-some games capture the dilemma involved in polluting behavior (Dawes et al., 1977). Individuals may realize economic gain by polluting (less costly disposal), but society suffers the consequences (e.g., water pollution).

#### Procedure

Subjects were randomly assigned to condition. A maximum of four subjects participated in each session. On arrival to the laboratory, subjects were seated in a booth containing a computer video monitor, a game paddle used to transmit subjects' harvests to the computer, a chair, a desk, and a headset. Subjects were identified throughout the experiment by color code, with color names associated with each booth. Each subject was asked to give his or her

written consent to participate in the study. Appendix B2 presents the consent form.

The experiment began with prerecorded instructions delivered to the subjects through headsets. The experiment was introduced as a project investigating conditions that affect the decisions people make.

Subjects were advised that a lottery would be held at the completion of the entire study. One subject was selected to receive the amount of money he or she earned in the study in return for the acres of lumber he or she received. The rationale behind the lottery was to increase experimental realism and subjects' interest in the experiment.

All harvest decisions were anonymous, subjects did not know their partner's booth, and subjects left the experiment individually. These measures attempted to provide anonymity to avoid any effects resulting from subjects knowing or seeing other subjects. Identifiability has been found to influence an individual's decisions in group situations. Bixentine, Levitt, and Wilson (1966), Jerdee and Rosen (1974), and Fox and Guyer (1978), found higher rates of cooperation when choices were public. To avoid the influence of group member attributions made during the no feedback trials on behavior during the feedback trials, subjects were told that they were playing with a different

group member during the no feedback trials and the feedback trials.

Following the initial instructions, subjects were shown four example screens to familiarize them with the task. The screens presented example harvests, example fines, and example outcomes. The information manipulations were then presented, followed by the no feedback and feedback trials.

#### Information Manipulations

The moralizing message and the exploitative message presented subjects' discussing their impressions of a similar experiment allegedly conducted the previous year. The descriptive and prescriptive audiotape moralizing message attempted to induce cooperative behavior by indicating that cooperation is considered a good, moral, and socially-approved behavior. The message also highlighted the mutual obligations, rights, and entitlements of group members and stressed an ought, should, and obligatory quality to cooperative behavior in groups. An example of a subject on the tape is the following. "Some people tried to take as much as possible so that they would get a lot of money. I really didn't like that. I don't think those people could have very much respect for themselves. After all, we were all part of a group and I think it's better that everyone in the group end up with something than one person getting it all. Maybe I could have gotten more if I was greedy, but I just couldn't do it. If I'm in a group,

I'm going to try to do what helps the group, not just myself. I don't see how those people who were selfish could have a lot of respect for themselves. They're real sleazy."

The descriptive and prescriptive audiotape exploitative message attempted to induce individualistic behavior by indicating self-interested behavior can lead to power, control, and domination of the game. Also discussed were the risks involved in exploitation, including possible group member retaliation when an individual consistently acts in a self-interested manner. An example of a subject on the tape is the following. "You've got to be strategic in this game. Because if you show that you're weak, the other guys might start to take more than you, and then you've lost it. Then they pretty much can dictate what happens to you by the amount they take. I wasn't about to let that happen, so that's why I usually took a little bit more than them. I don't like anybody telling me what to do."

The third message was used as a control and presented students discussing the importance of recreational sports and physical activity in their lives. An example of a subject in the tape is the following. "I think it's important to be active. I always feel better after I work out. I've been doing aerobics for the last two years, and I notice that I have more energy than I used to. Sometimes it's a drag going to work out, but then I force myself to



remember how good I feel afterwards. I think it's important for everyone to do something."

Each message was of approximately equal length and included an equal number of males and females. Subjects were asked to listen to the messages while the experimenter purportedly prepared a task in the study. The original text for the messages is presented in Appendix B3. The text "interpreted" by the confederates read on tape is presented in Appendix B4.

#### Feedback Procedures

On trials 1-10, subjects received no feedback concerning the group member's harvest, the combined harvest, the fine, or the number of acres both group members received. On trials 11-20, the subject's harvest was presented, and false feedback indicated the group member's harvest, the combined harvest, the fine, and the number of acres both group members received. Tit-for-tat (i.e., matching) feedback indicated the group member was responding in kind by making approximately the same harvest (within five acres of lumber) as the subject. Overuse feedback indicated the group member was exploiting the situation by consistently making large harvests (between 70-100 acres of lumber). The computer's random number generator provided the feedback, thereby introducing a change element in receiving feedback.

After the experimental trials, subjects completed a

post-experimental questionnaire. First, the questionnaire checked both subject suspiciousness concerning the experiment and effectiveness of the manipulations. Second, the questionnaire attempted to replicate Liebrand et al.'s (1986) finding that cooperators perceive others' behavior more extremely than individualists on the evaluation dimension, and individualists perceive others' behavior more extremely than cooperators on the potency dimension. Subjects were asked to provide impressions of their group member on a 16-item evaluation on potency scale. Eight items were believed to tap the evaluation dimension and eight items were believed to tap the potency dimension. For both evaluation and potency, four items were positively worded (e.g. helpful or powerful) and four items were negatively worded (e.g. unjust or wimpy). The measure was a 7-point scale, anchored at 1 (definitely not applicable) and 7 (fully applicable). Finally, the questionnaire attempted to extend Liebrand et al. (1986) by investigating subjects' beliefs about the way in which their behavior was perceived by the other group member. That is, do cooperators believe others perceive their behavior on the evaluation dimension and individualists believe others perceive their behavior on the potency dimension? Subjects were asked to provide impressions of how their partner would perceive them if they selected collectively-interested and self-interested choices on the same evaluation and potency scale discussed above.

Appendix B5 presents the post-experimental questionnaire. After completing the questionnaire, subjects were debriefed, thanked, and excused.

A post-experimental session during the first 10 sessions of the experiment checked subjects' understanding of the task requirements, task clarity, suspiciousness, and impressions. Subjects indicated the procedure and task were clear. There was no suspicion, and subjects found the harvesting task to be involving.

## CHAPTER III

## RESULTS

Subjects' Harvesting Behavior

To explore the prediction based on Functional Theory, a 2 (Social Motive: Cooperator, Individualist) x 3 (Message: Moralizing, Exploitative, Control) analysis of variance (ANOVA) was performed on subjects' harvests on the 11 no-feedback trials. The ANOVA table is presented in Table 1. The main effect for message was significant,  $F(2,146) = 14.28$ ,  $p < .0001$ . Post hoc contrasts (Winer, 1971) indicated that compared to subjects in the control message condition, subjects hearing the moralizing message were more cooperative,  $F(1,147) = 11.75$ ,  $p < .001$ , whereas subjects hearing the potency message were less cooperative,  $F(1,147) = 3.34$ ,  $p < .05$ . The main effect for social motive was not significant,  $F(1,146) = .62$ ,  $p > .25$ . Both cooperators and individualists made similar harvests. The predicted two-way (social motive x message) interaction was also not significant,  $F(2,146) = .10$ ,  $p > .25$ . Each message influenced harvesting, regardless of subjects' social motive. The means underlying this non-significant social motive x message interaction are presented in Table 2.

To assess if either the moralizing message or the exploitation message masked the influence of social motives

Table 1

Analysis of Variance: Social Motive x  
Message on No-Feedback Trials

Source of Significance Variation	df	Mean Square	F	of F
Social Motive	1	148.78	0.62	.43
Message	2	3441.86	14.28	.001
SM x M	2	23.15	0.10	.91
Error	146	240.96		

Table 2

Means for Non-Significant Social Motive x Message  
Interaction on No-Feedback Trails

	Message Condition			-
	Moralizing	Control	Exploitative	X
Social Motive				
Cooperator	46.13	55.72	60.84	54.23
Individualist	46.71	57.96	64.09	56.25
-				
X	46.42	56.84	62.47	

on behavior during the no-feedback trials, a one-way (Social Motive: Cooperator, Individualist) ANOVA was performed on the harvests of subjects hearing the neutral message. Both types of subjects made similar harvests,  $F(1,48) = .26$ ,  $p > .25$ . Thus, social motives did not influence behavior on the no-feedback trials.

To explore the prediction based on schema priming, a 2 (Social Motive: Cooperator, Individualist) x 3 (Message:

Moralizing, Exploitative, Control) x 2 (Feedback: Overuse, Tit-For-Tat) ANOVA was performed on subjects' harvests on the nine feedback trials. The ANOVA table is presented in Table 3. There was a significant main effect for message,  $F(2,140) = 8.03$ ,  $p < .0001$ , and for feedback,  $F(1,140) = 45.07$ ,  $p < .0001$ . Post hoc contrasts (Winer, 1971) indicated subjects hearing the moralizing message were more cooperative than subjects hearing the neutral control message,  $F(1,146) = 6.48$ ,  $p < .01$ , but subjects hearing the exploitation message did not make more self-interested choices than subjects hearing the neutral control message,  $F(1,146) = 1.31$ ,  $p > .10$ . Subjects were generally more cooperative when their partner responding in kind (tit-for-tat feedback) than when their partner was exploitative. The social motive x message interaction on the feedback trials was not significant,  $F(2, 140) = .17$ ,  $p > .25$ .

The three-way (social motive x message x feedback) interaction was significant,  $F(2,140) = 3.19$ ,  $p < .05$ . The means underlying the three-way interaction are shown in Table 4. Two additional ANOVA's were conducted to explore the simple effects that were the bases for this interaction. First, a 3 (Message: Moralizing, Exploitative, Control) x 2 (Feedback: (Overuse, Tit-for-tat) ANOVA was conducted on the harvest decisions of cooperators. The simple two-way (message x feedback) interaction was significant,  $F(2,64) =$

Table 3

Analysis of Variance: Social Motive x Message  
x Feedback on Feedback Trials

Source of Significance Variation	df	Mean Square	F	of F
Social Motive	1	837.82	2.94	.09
Message	2	2293.44	8.03	.001
Feedback	1	12866.49	45.07	.001
SM x M	2	47.66	0.17	.85
SM x F	1	167.46	0.59	.46
M x F	2	732.76	2.57	.08
SM x M x F	2	909.60	3.19	.04
Error	140	285.50		

Table 4

ANOVA Means for Social Motive X Message X Feedback  
Interaction on Feedback Trials

-----				
Message Condition				
Social Motive				
	Moralizing	Control	Exploitative	- X
-----				
<u>Feedback</u>				
Overuse	77.66	70.00	79.70	75.78
<b>Cooperator</b>				
Tit-For-Tat	43.56	67.56	69.16	60.09
Overuse	74.67	85.18	87.94	82.59
<b>Individualist</b>				
Tit-For-Tat	55.11	65.56	66.11	62.26
-				
X	62.75	72.07	75.72	

6.73,  $p < .01$ . Post hoc contrasts (Winer, 1971) indicated that cooperators hearing the moralizing message were more cooperative when their partner responded in kind than when their partner was exploitative, but made similar harvests when their group member either responded in kind or was exploitative,  $F(1,140) = 11.72$ ,  $p < .05$ . Cooperators hearing the exploitation message made similar harvests regardless of their partner's behavior,  $F(1,140) = .70$ ,  $p > .25$ . Thus, the moralizing message appeared to sensitize cooperators to their partner's behavior.

Second, a 3 (Message: Moralizing, Exploitative, Control) x 2 (Feedback: Tit-for-tat, Overuse) ANOVA was conducted on the harvest decisions of individualists. The simple two-way (message x feedback) interaction was not significant,  $F(2,76) = .04$ ,  $p > .25$ . Contrary to the prediction, the exploitation message did not sensitize individualists to their partner's behavior. Instead, individualists were influenced by their partner's behavior, regardless of message. Across all three message conditions, individualists were more cooperative when their partner responded in kind than when their partner was exploitative,  $F(1,76) = 26.03$ ,  $p < .001$ .

The next analysis covaried the last two no-feedback trials to control differences in harvesting behavior across message treatments. Thus, a 2 (Social Motive: Cooperator,



Table 5

Analysis of Covariance: Social Motive x Message  
x Feedback with Last Two No-Feedback Trials on Feedback Trials

Source of Variation	df	Mean Square	F	Significance of F
Covariate	1	11034.51	47.28	.001
Social Motive	1	322.93	1.38	.24
Message	2	491.89	2.10	.13
Feedback	1	14856.60	63.66	.001
SM x M	2	54.02	0.20	.79
SM x F	1	10.05	0.04	.84
M x F	2	546.42	2.34	.10
SM x M x F	2	260.30	1.11	.33
Error	139	233.35		

Table 6

Adjusted ANCOVA Means for Non-Significant Social  
Motive x Message x Feedback Interaction on Feedback Trials

----- Message Condition -----				
Social Motive				-
	Moralizing	Control	Exploitative	X
-----				
<u>Feedback</u>				
Overuse	80.66	74.31	79.29	78.09
Cooperator				
Tit-For-Tat	48.58	65.12	64.81	59.50
Overuse	78.30	83.18	82.59	81.36
Individualist				
Tit-For-Tat	55.15	65.69	62.84	61.23
-				
X	65.67	72.08	72.38	

Individualist) x 3 (Message: Moralizing, Exploitative, Control) x 2 (Feedback: Overuse, Tit-For-Tat) analysis of covariance (ANCOVA) with the last two no-feedback trials as the covariate was conducted on subjects' harvests on the feedback trials. The ANCOVA table is shown in Table 5. The main effect for feedback was significant,  $F(1,139) = 63.66$ ,  $p < .001$ . Subjects with a partner responding in kind were more cooperative than subjects with an exploitative partner.

The predicted two-way (message x feedback) interaction was marginally significant,  $F(2,139) = 2.34$ ,  $p < .10$ . Simple effects tests (Winer, 1971) indicated that as predicted, subjects hearing the moralizing message were more cooperative than those hearing the neutral control message when their partner responded in kind,  $F(1,139) = 16.69$ ,  $p < .001$ . Although not significant, the prediction that subjects hearing the exploitation message would be less cooperative than those hearing the neutral control message when their partner was exploitative was in the predicted direction,  $F(1,139) = 2.24$ ,  $p < .25$ . No other interaction was significant. The means underlying the non-significant three-way (social motive x message x feedback) interaction are shown in Table 6.

#### Construction of the Evaluation and Potency Scale

Principle Component Factor Analyses (PCA) (Harman, 1967) were conducted on the subjects' impression ratings of

their group member. Varimax rotation was selected to maximize the variance of the factor loadings for each factor (Tabachnick & Fidel, 1983). Three factors with eigenvalues greater than one were extracted. The highest absolute factor loadings for the first factor were for the adjectives powerful, forceful, mean, dominant, aggressive, unjust, unfair, and dishonest. This factor appears to be similar to Osgood, Suci, and Tannenbaum's (1957) potency factor, although its meaning is unclear. The highest absolute loadings for the second factor were for the adjectives helpful, good, kind, pliable, and sincere. This factor appears to be an evaluation factor (cf. Osgood et al., 1957; Liebrand et al. 1986). The highest absolute loadings for the third factor were for the adjectives wimp, weak, and timid. This factor resembles a potency factor (cf. Osgood et al., 1957; Liebrand et al., 1986). An evaluation factor consisting of the items helpful, good kind, pliable, and sincere was constructed, and a potency factor consisting of the items wimp, weak, and timid was constructed. The item loadings for each factor are shown in Table 7.

#### Social Values and Interpretation of Others' Behavior

A 2 (Social Motive: Cooperator, Individualist) x 3 (Message: Moralizing, Exploitative, Control) x 2 (Feedback: Overuse, Tit-For-Tat) ANOVA was performed on the evaluation group member impression rating factor. Each item in the factor was weighted by multiplying the item by the item

Table 7

## Factor Loadings for Group Member Impressions

-----			
Factors			
-----			
Traits	Potency (?)	Evaluation	Potency
-----			
<b>Potency (?)</b>			
powerful	-.82	.06	.19
forceful	-.76	-.22	.09
mean	.76	.37	.21
dominant	-.76	-.24	.23
aggressive	-.74	-.33	.23
unjust	.70	.49	.09
unfair	.61	.58	.06
dishonest	.53	.45	.14
<b>Evaluation</b>			
helpful	.21	.77	-.01
good	.33	.73	.02
kind	.37	.73	-.08
pliable	.06	-.72	.23
sincere	.36	.60	-.07
<b>Potency</b>			
wimp	-.13	-.05	.80
weak	.10	.07	.73
timid	-.29	-.32	.64

loading. The means are presented in Table 8. The main effect for feedback was significant,  $F(1,137) = 88.56$ ,  $p < .001$ . A responding in kind partner was given a more favorable rating than was an exploitative partner. The social motive x feedback interaction was significant,  $F(1,137) = 11.58$ ,  $p < .001$ . Simple effects tests (Winer, 1971) showed cooperators perceived their partner more extremely than did individualists. Cooperators perceived a partner responding in kind as more favorable than did

individualists,  $F(1,133) = 5.21$ ,  $p < .05$ . Cooperators perceived an exploitative partner as less favorable than did individualists,  $F(1,133) = 9.34$ ,  $p < .01$ . The message  $\times$  feedback interaction was significant,  $F(1,137) = 3.68$ ,  $p < .05$ . Subjects hearing the moralizing message tended to perceive a partner responding in kind as more favorable than subjects hearing the control message,  $F(1,137) = 2.25$ ,  $p < .25$ , and an exploitative partner as less favorable,  $F(1,137) = 2.65$ ,  $p < .25$ .

A 2 (Social Motive: Cooperator, Individualist)  $\times$  3 (Message: Moralizing, Exploitative, Control)  $\times$  2 (Feedback: Overuse, Tit-For-Tat) ANOVA was performed on the potency group member impression rating factor. Each item in the factor was weighted by multiplying the item by the item loading. The means are presented in Table 9. The main effect for feedback was significant,  $F(1,139) = 17.49$ ,  $p < .001$ . An exploitative partner was perceived as stronger than a partner responding in kind. The main effect for social motive was significant,  $F(1,139) = 5.76$ ,  $p < .05$ . Cooperators perceived their group member as stronger than did individualists. There was a marginally significant main effect for message,  $F(2,139) = 2.79$ ,  $p < .07$ . Post hoc comparisons (Winer, 1971) indicated individuals hearing the moralizing message perceived their partner as stronger than did individuals hearing the exploitative message,  $F(2,139) = 6.06$ ,  $p < .01$ . The two-way and three-way interactions were

Table 8

Social Motive X Message X Feedback Interaction on Evaluation Factor				
-----				
Social Motive		Message Condition		
		Moralizing	Control	Exploitative
				- X
-----				
<u>Feedback</u>				
<b>Cooperator</b>	Overuse	1.22	1.36	1.45
	Tit-For-Tat	2.81	2.74	2.43
<b>Individualist</b>	Overuse	1.56	1.96	1.68
	Tit-For-Tat	2.65	2.26	2.23
-				
X		2.06	2.08	1.95

Table 9

Social Motive X Message X Feedback Interaction on Potency Factor				
-----				
Social Motive		Message Condition		
		Moralizing	Control	Exploitative
				- X
-----				
<u>Feedback</u>				
<b>Cooperator</b>	Overuse	4.19	4.05	3.83
	Tit-For-Tat	3.45	3.66	3.33
<b>Individualist</b>	Overuse	3.91	3.81	3.32
	Tit-For-Tat	3.53	3.00	3.22
-				
X		3.77	3.63	3.43

not significant. Thus, individualists did not perceive their group member more extremely than cooperators on the potency dimension, although the means were in the predicted pattern.

Two additional ANOVA's were conducted on the evaluation factor and the potency factor for subjects hearing the neutral control message. These analyses were performed to more closely approximate the conditions in the Liebrand et al. (1986) study and to help assess whether the messages presented in the present study disrupted the significance individualists attach to the potency dimension. A 2 (Social Motive: Cooperator, Individualist) x 2 (Feedback: Overuse, Tit-For-Tat) ANOVA was potency dimension, although the means were in the predicted pattern.

Two additional ANOVA's were conducted on the evaluation factor and the potency factor for subjects hearing the neutral control message. These analyses were performed to more closely approximate the conditions in the Liebrand et al. (1986) study and to help assess whether the messages presented in the present study disrupted the significance individualists attach to the potency dimension. A 2 (Social Motive: Cooperator, Individualist) x 2 (Feedback: Overuse, Tit-For-Tat) ANOVA was conducted on the evaluation group member impression rating factor for subjects hearing the neutral control message. The means are presented in Table 10. The main effect for feedback was significant,  $F(1,45) =$

22.88,  $p < .0001$ . Partners responding in kind were given more favorable ratings than exploiting partners. The social motive x feedback interaction was significant,  $F(1,45) = 11.28$ ,  $p < .01$ . Post hoc contrasts (Winer, 1971) indicated cooperators perceived partners responding in kind as more favorable and exploiting partners as less favorable than individualists,  $F(1,45) = 15.18$ ,  $p < .001$ .

A 2 (Social Motive: Cooperator, Individualist) x 2 (Feedback: Overuse, Tit-For-Tat) ANOVA was conducted on the potency group member impression rating factor for subjects hearing the neutral control message. The means are presented in Table 11. The main effect for feedback was significant,  $F(1,46) = 9.67$ ,  $p < .01$ . Exploiting partners were perceived as stronger than partners responding in kind. The main effect for social motive was significant,  $F(1,46) = 5.30$ ,  $p < .05$ . Cooperators perceived their group member as stronger than did individualists. The two-way (social motive x feedback) interaction was not significant,  $F(1,46) = 1.18$ ,  $p > .25$ ; although the pattern of means was as predicted. Post hoc contrasts (Winer, 1971) indicated individualists did not perceive an exploitative partner as stronger and a partner responding in kind as weaker than cooperators,  $F(1,46) = 1.13$ ,  $p > .25$ .

Since the means on the potency dimension showed the predicted pattern such that the difference between individualists' perceptions of their partner was greater



than the difference between cooperators' perceptions of their partner, the next analysis was conducted to determine whether this effect could be brought out if the evaluation and potency dimensions were treated as repeated measures. A 2 (Social Motive: Cooperator, Individualist) x 3 (Message: Moralizing, Exploitative, Control) x 2 (Feedback: Overuse, Tit-For-Tat) analysis of variance with repeated measures on the evaluation and potency scales was conducted.

Unfortunately, the two-way (social motive x feedback) interaction was marginally significant,  $F(1,136) = 3.11$ ,  $p < .10$ . This finding clearly confirmed the finding reported above that cooperators perceived their partner's behavior more extremely than individualists on the evaluation dimension. This finding did not clearly support the prediction that individualists perceive their group member more extremely than cooperators on the potency dimension.

Finally, responses to two questions investigating subjects' beliefs about the way in which their behavior would be perceived by the partner if he or she made either cooperative or self-interested selections. The evaluation and potency scales discussed above were used in the following analyses. The first two ANOVA's investigated subjects responses to the question asking how the group member would perceive them if subjects made small harvests. First, a 2 (Social Motive: Cooperator, Individualist) x 3

Table 10

Social Motive X Feedback Interaction  
for Control Message on Evaluation Factor

	Social Motive		-
	Cooperator	Individualist	X
Feedback			
Tit-for-tat	2.74	2.26	2.50
Overuse	1.36	1.96	1.66
-			
X	2.05	2.11	

Table 11

Social Motive X Feedback Interaction  
for Control Message on Potency Factor

	Social Motive		-
	Cooperator	Individualist	X
Feedback			
Tit-for-tat	3.66	3.00	3.33
Overuse	4.05	3.81	3.93
-			
X	3.86	3.41	

evaluation factor. The main effect for message was significant,  $F(2,133) = 4.59$ ,  $p < .05$ . Post hoc comparisons (Winer, 1971) indicated subjects hearing the moralizing message believed cooperative behavior would be perceived by their partner as more favorable than subjects hearing either the control message,  $F(1,133) = 9.16$ ,  $p < .01$ , or the exploitative message,  $F(1,133) = 4.04$ ,  $p < .05$ . No other interaction was significant. Second, a 2 (Social Motive:

Cooperator, Individualist) x 3 (Message: Moralizing, Exploitative, Control) x 2 (Feedback: Overuse, Tit-For-Tat) ANOVA was conducted on the potency factor. The main effect for feedback was significant,  $F(1,133) = 4.05$ ,  $p < .05$ . Subjects with partners responding in kind believed the group member would perceive cooperative behavior as more favorable than subjects with exploiting partners. No other main effects or interactions were significant.

The second two ANOVAs investigated subjects responses to the question asking how the group member would perceive them if subjects made large harvests. First, a 2 (Social Motive: Cooperator, Individualist) x 3 (Message: Moralizing, Exploitative, Control) x 2 (Feedback: Overuse, Tit-For-Tat) ANOVA was conducted on the evaluation factor. The main effect for message was significant,  $F(2,134) = 3.78$ ,  $p < .05$ . Post hoc comparisons (Winer, 1971) indicated subjects hearing the moralizing message believed self-interested behavior would be perceived by their partner as less favorable than subjects hearing either the control message,  $F(1,134) = 18.80$ ,  $p < .001$ , or the exploitative message,  $F(1,134) = 5.20$ ,  $p < .05$ . The main effect for feedback was significant,  $F(1,134) = 4.00$ ,  $p < .05$ . Subjects with partners responding in kind believed the group member would perceive self-interested behavior as less favorable than subjects with exploiting partners. No other main effects or interactions were significant. A 2 (Social Motive:

Cooperator, Individualist) x 3 (Message: Moralizing, Exploitative, Control) x 2 (Feedback: Overuse, Tit-For-Tat) ANOVA was conducted on the potency factor. No main effects or interactions were significant.

#### Additional Findings

Subjects provided their impressions of the experiment at the completion of the feedback trials. In response to the question asking whether the subject believed he or she made cooperative or competitive decisions, cooperators believed they made more cooperative decisions and individualists believed they made more competitive decisions,  $F(1,140) = 7.13$ ,  $p < .01$ . Compared to cooperators, individualists believed they were more responsible for the final group outcome,  $F(1,150) = 4.06$ ,  $p < .05$ , but both cooperators and individualists tended to see the other group member as more responsible for the group outcome,  $F(1,150) = 1.43$ ,  $p > .10$ , since the means were above the mid-point. Cooperators wanted to avoid the fine more than individualists,  $F(1,150) = 5.54$ ,  $p < .05$ . Individualists and cooperators did not differ in their belief that the other group member would act cooperatively if they acted cooperatively,  $F(1,150) = .48$ ,  $p > .25$ , or that the other group member would act competitively if they acted competitively,  $F(1,150) = 1.19$ ,  $p > .25$ . Both individualists and cooperators did not differ in their belief that their group member wanted to be selected to win

the money,  $F(1,150) = .64$ ,  $p > .25$ . Cooperators believed their group member found the task difficult marginally more than did individualists,  $F(1,149) = 2.65$ ,  $p < .10$ .

## CHAPTER IV

## DISCUSSION

The primary hypothesis that a message congruent with an individual's social motive is more influential than a noncongruent message on behavior in a social dilemma was partially supported. The moralizing message indicating cooperation is a good, moral, and socially-approved behavior that was congruent with the concerns of cooperators increased cooperation for cooperators. This effect occurred only on the feedback trials when the partner responded in kind. In fact, when the partner was exploiting the situation by over-harvesting, cooperators tended to be less cooperative. For individualists, the exploitation message indicating self-interested behavior leads to power and dominance that was thought to be congruent with the concerns of individualists did not influence individualists' behavior. Individualists were influenced only by their group members' behavior such that cooperation increased when the group member responded in kind but self-interested behavior increased when the group member was over-harvesting.

The non-significant two-way (social motive x message) interaction on the no-feedback trials suggests that the message did not serve a prescriptive role, as Functional Theory predicts. Neither cooperators nor individualists

hearing the congruent message engaged more in their prescribed behavior during the no-feedback trials. The present results suggest a message congruent with an individual's cognitive orientation serves to prime or activate his or her cognitive category or schema, as schema priming predicts. As schema priming predicts, in the absence of relevant environmental cues--such as others' behavior in the present study during the no-feedback trials--the congruent message did not influence behavior. When relevant environmental cues were present, cooperators were more likely to perceive the situation in terms of the activated schema. This finding illustrates that the combination of social dilemma "solution" variables can be more effective than variables in isolation. Of equal importance is that the present findings suggest the interaction of individual solution variables may actually discourage collectively-interested behavior in other situations. Cooperators hearing the moralizing message stressing cooperative behavior were more cooperative when their partner responded in kind, but tended to assimilate to the behavior of a competitive partner. A message highlighting issues of virtue and moral behavior appears to have made cooperators somewhat less tolerant of others' self-interested behavior. This finding highlights the importance of matching a social dilemma remedy to a given situation and audience. Future research should investigate

the interaction of social dilemma solution variables to determine the conditions in which they are either enhance or decrease collectively-interested behavior.

The results of both the present study and past research suggest that the schema or cognitive category of cooperators that was activated by the moralizing message consists of several components. First, cooperators attempt to maximize joint gain in outcome interdependent situations (cf. Kuhlman & Marshello, 1975). Second, cooperators perceive others' behavior in terms of the evaluation dimension (i.e., good versus bad) (e.g., Liebrand et al., 1986). That is, when perceiving another's behavior, cooperators view cooperative behavior as more favorable than self-interested behavior. Third, the assumption made in the present study based on Liebrand et al. (1986) that the evaluation dimension is an important component of cooperators' schema such that cooperators not only perceive others' behavior on the evaluation dimension but also attempt to behave in a good and moral way themselves received indirect support. Support is derived from the effectiveness of the moralizing message. If cooperators did not have evaluation concerns, then it is likely that the moralizing message--compared to the neutral control message--would not have primed their schema and increased cooperative behavior when their partner responded in kind. This finding raises an issue for future research. Do cooperators perceive all environmental stimuli--ranging



from interpersonal situations to abstract stimuli--in terms of the evaluation dimension? If so, then is cooperators' collectively-interested behavior driven by a desire to act in a good and moral way?

The exploitation message discussing power and control that was thought to be congruent with the concerns of individualists did not increase self-interested behavior. Individualists hearing the exploitation message made harvests similar to individualists hearing the neutral control message when their partner responded in kind and when their partner was exploiting the situation by over-harvesting. There are several possibilities why the exploitation message was ineffective. First, ceiling effects may have occurred. The harvest task allowed a maximum of 100 acres on each trial. In the neutral control message condition, individualists with exploitative partners made large harvests ( $M = 85.18$ ). Since the harvest size was large in this condition, it is possible that individualists hearing the exploitation message with an exploitative partner may have desired to make harvests larger than 100 acres but task constraints did not permit them to do so. Ceiling effects could mask the effectiveness of the exploitation message. Thus, the results might not establish the invalidity of the hypothesis. To determine whether the present findings were due to ceiling effects, it is suggested that a follow-up study be conducted that minimizes

the possibility of ceiling effects by altering the task harvesting constraints.

A second possibility is that the exploitation message was not congruent with the concerns of individualists. If so, a follow-up study should be conducted to construct a message that is more congruent with the schema of individualists. A third possibility is that individualists do not hold potency concerns. Individualists may not be concerned with issues of power, dominance, and control. The present study made the assumption that individualists hold potency concerns based on Liebrand et al.'s (1986) finding that individualists perceive other's behavior on the potency dimension. This assumption may have been incorrect. Future research should investigate the cognitive category or schema of individualists. Finally, individualists may be insensitive to certain types of information about group member behavior, including congruent messages. Perhaps the schema of individualists is not sensitized by information messages. Future research might explore this possibility.

The present study suggests that future theorizing examining the interaction between an individual's social motives (i.e., cooperator, individualist, competitor) and the situation (i.e., restricted versus unrestricted response options) is warranted. In response to Kelley and Stahelski's (1970) triangle hypothesis, Miller and Holmes (1975) conducted a study that allowed subjects to make more

than two choices (viz., three choices; a cooperative choice, a competitive choice, and a defensive choice that allowed cooperators the option of avoiding both assimilation to competitors behavior and exploitation when faced with a competitive player). Miller and Holmes (1975) called this the extended prisoner's dilemma. These researchers found that competitors did not uniformly compete as the triangle hypothesis predicts, but rather assimilated to the behavior of the cooperative group member. Further, cooperators did not choose the competitive alternative, but rather opted for the defensive choice. Miller and Holmes (1975) suggested that the triangle hypothesis was situation specific; it was valid only when subjects were allowed two choices. The present study appears to stir up this debate. Subjects in the present study were allowed a wide range of choices; in fact, subjects were allowed a wider range of choices than subjects in the Miller and Holmes (1975) study. However, cooperators in the present study behaved as the triangle hypothesis would predict, and individualists behaved like Miller and Holmes' (1975) competitors. Taken together, the results of the present study, the results of Kelley and Stahelski (1970), and the results of Miller and Holmes (1975) suggest that behavior is outcome interdependent situations is the result of an individual's social motive--including an individual's perception and interpretation of others' behavior--and the situation. It

appears that future theorizing examining the conditions in which an individual's social motive interacts with the situation to influence an individual's perception of, interpretation of, and response to others' behavior is warranted.

#### Social Values and Interpretation of Others' Behavior

The prediction that social motives influence interpretation of others' behavior such that cooperators attach more significance to the evaluation dimension (good-bad) and individualists attach more significance to the potency dimension (strong-weak) was supported only for cooperators. Cooperators perceived their partner more extremely than did individualists on the evaluation dimension. Cooperators perceived a group member responding in kind as more favorable than did individualists, and a partner exploiting the situation by over-harvesting as less favorable than did individualists. This finding is consistent with Liebrand et al. (1986) and suggests individual differences in behavior in the same situation may be influenced by an individual's perceptions of others' behavior (e.g., Endler & Magnusson, 1975; King & Sorrentino, 1983). It should be noted that the non-significant three-way (social motive x message x feedback) interaction on the evaluation factor is not fatal to the schema priming argument. It is possible that the schema of cooperators was

primed when subjects completed the adjective list containing many evaluation items.

Individualists did not attach more significance to the potency dimension than cooperators. Individualists did not perceive their partner more extremely (i.e., stronger or weaker) than cooperators on the potency dimension. There are several possibilities for this finding. First, the items loading on both the evaluation and potency factors in the present study were different than the items in Liebrand et al.'s (1986) evaluation and potency factors. The present study omitted a few of Liebrand et al.'s (1986) adjectives and added other adjectives. Items from Liebrand et al.'s (1986) study were omitted because it was believed that adjectives like "goody-goody" were not appropriate. New adjectives with clearer meaning were added to replace omitted adjectives. Although a potency factor was formed in the present study, slightly different item content between the two studies may have influenced the factor's meaning. Second, situational variables may have modified the degree to which individualists hold potency concerns. The harvest task in the present study may have influenced group member perceptions such that individualists may have perceived large harvests as both strong and good. Likewise, small harvests may have been perceived as weak and bad.

Third, the present study presented subjects with either an exploiting partner making large harvests or a partner

responding in kind. Individualists making large harvests were playing with a partner also making large harvests. Liebrand et al. (1986) presented subjects with either an exploiting partner or a cooperative partner. It is quite possible that since individualists were playing with only "strong" partners, they did not distinguish between "strong" and "weak" behavior.

Fourth, although the present study used an instrument similar to Liebrand et al. (1986) to assess social motives, the administration of the instrument was considerably different. Subjects in Liebrand et al.'s (1986) study were individually tested through an interactive computer program. Subjects were given ample time to comprehend the instructions and the own/other outcome distributions were presented individually. In contrast, subjects in the present study completed a paper and pencil version of the instrument and were tested in a large group (200-500 individuals). It is possible that subjects (a) did not thoroughly read and understand the instructions, (b) did not take the task seriously and randomly selected options, and (c) consulted fellow classmates concerning responses. The administration of the social motive instrument in the present study may have jeopardized its' reliability and validity to some degree. As a result, individuals may have been incorrectly assigned to a social motive category.

A final possibility is a difference in subject population. Participants in Liebrand et al.'s (1986) study were Dutch citizens responding to a newspaper advertisement whereas participants in the present study were undergraduates receiving course credit. It is possible that both cross-cultural differences and subject demographics may account for the different findings. Dutch individualists may have different concerns than midwestern undergraduate individualists. A follow-up study using a cooperative partner seems appropriate.

Further insight into the social motive construct may be gained by examining an individual's perceptions of his or her behavior on the evaluation and potency dimension. Do cooperators view their behavior more extremely on the evaluation dimension than individualists, and do individualists view their behavior more extremely on the potency dimension than cooperators? If so, in what way do these perceptions influence their behavior?

The failure of the present study to detect differences between the way in which cooperators and individualists believe others' perceive their behavior may have been due to the structure of the questions themselves. The hypothetical examples in the two questions posed extreme behavior (i.e., either very cooperative or self-interested); in fact, the behavior was more extreme than the feedback presented in the present study. Subjects therefore may have believed such

behavior to be unrealistic. A future study investigating these possible differences using less extreme examples is warranted.

### Conclusion

Effective social dilemma strategies must take into account both individual and structural solution variables (e.g., an individual's social motive, the type of information presented, and others' behavior) and the way in which these variables interact. These variables influence an individual's perception of a situation, and interpretation of and reaction to others' behavior. Future social dilemma research should investigate the interactive effects of individual and structural variables. It is important to understand the way in which "solution" variables interact to both encourage and discourage group rational behavior and in which circumstances. In addition, the development of complex theories incorporating individual and structural factors seems an important step toward attaining a comprehensive understanding social dilemma behavior.



## References

- Bargh, J.A., & Thein, R.D. (1985). Individual construct accessibility, person memory, and the recall-judgment link: The case of information overload. Journal of Personality and Social Psychology, 49, 1129-1146.
- Bixentine, V.E., Levitt, C.A., & Wilson, K.V. (1976). Collaboration among six persons in a prisoner's dilemma game. Journal of Conflict Resolution, 10, 488-496.
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. Journal of Personality and Social Psychology, 39, 752-766.
- Dawes, R.M. (1980). Social Dilemmas. Annual Review of Psychology, 31, 169-193.
- Dawes, R.M., McTavish, J., & Shaklee, H. (1977). Behavior, communication, and assumptions about other people's behavior in a commons dilemma situation. Journal of Personality and Social Psychology, 35, 1-11.
- DeBono, K.G. (1985). Attitudes and persuasion: Functional theories revisited. Doctoral dissertation, University of Minnesota, Minneapolis, MN.
- DeBono, K.G. (1987). Investigating the social-adjustive and value-expressive functions of attitudes: Implications for persuasion processes. Journal of Personality and Social Psychology, 52, 279-287.

- Deutsch, M. (1960). The effect of motivational orientation upon trust and suspicion. Human Relations, 13, 123-139.
- Dunnett, C.W. (1964). New tables for multiple comparisons with a control. Biometrics, 20, 482-491.
- Edney, J.J. (1980). The commons problem: Alternative perspectives. American Psychologist, 35, 131-150.
- Ender, N.S., & Magnusson, D. (1976). Toward an interactional psychology of personality. Psychological Bulletin, 83, 956-974.
- Fazio, R.H., Sanbonmatsu, D.M., Powell, M.C., & Kardes, F.R. (1986). On the automatic activation of attitudes. Journal of Personality and Social Psychology, 50, 229-238.
- Fox, J., & Guyer, M. (1978). "Public" choice and cooperation in N-person prisoner's dilemma. Journal of Conflict Resolution, 22, 469-481.
- Griesinger, D.W., & Livingston, J.W., Jr. (1973). Toward a model of interpersonal motivation in experimental games. Behavioral Science, 19, 28-34.
- Hardin, G. (1968). The tragedy of the commons. Science, 166, 1243-1248.
- Harkness, A.R., DeBono, K.G., & Borgida, E. (1985). Personal involvement and strategies for making contingency judgments: A stake in the dating game makes a difference. Journal of Personality and Social Psychology, 49, 22-32.

- Harman, H.H. (1967). Modern factor analysis, 2d ed. Chicago: Univeristy of Chicago Press.
- Hastie, R., Park, B., & Weber, R. (1984). Social memory. In R.S. Wyer, T.K. Srull (Eds.), Handbook of social cognition (Vol. 2). Hillsdale, NJ: Lawrence Erlbaum.
- Higgins, E.T., King, G.A., & Mavin, G.H. (1982). Individual construct accessibility and subjective impressions and recall. Journal of Personality and Social Psychology, 43, 35-47.
- Howard, J.W., & Rothbart, M. (1980). Social categorization and memory for ingroup and outgroup behavior. Journal of Personality and Social Psychology, 38, 301-310.
- Jerdee, T.H., & Rosen, B. (1974). Effects of opportunity to communicate and visibility of individual decisions on behavior in the common interest. Journal of Applied Psychology, 59, 712-716.
- Johnstron, W.A., & Dark, V.J. (1986). Selective attention. Annual Review of Psychology, 37, 43-75.
- Katz, D. (1960). The functional approach to the study of attitudes. Public Opinion Quarterly, 24, 163-204.
- Kelley, H.H., & Grzelak, J. (1972). Social interaction basis of cooperators' and competitor's beliefs about others. Journal of Personality and Social Psychology, 21, 190-197.
- Kelley, H.H., & Stahelski, A.J. (1970). Social interaction basis of cooperators' and competitors' beliefs about

- others. Journal of Personality and Social Psychology, 16, 66-91.
- Kerr, N.L. (1983). Motivation losses in small groups: A social dilemma analysis. Journal of Personality and Social Psychology, 45, 819-828.
- King, G.A., & Sorrentino, R.M. (1983). Psychological dimensions of goal-oriented interpersonal situations. Journal of Personality and Social Psychology, 44, 140-162.
- Knight, G.P., & Dubro, A.P. (1984). Cooperative, competitive, and individualistic social values: An individualized regression and clustering approach. Journal of Personality and Social Psychology, 46, 98-105.
- Komorita, S.S. (1976). A model of the N-person dilemma-type game. Journal of Experimental Social Psychology, 12, 357-373.
- Kuhlman, D.M., & Marshello, A. (1975a). Individual differences in game motives of own, relative, and joint gain. Journal of Research in Personality, 9, 240-251.
- Kuhlman, D.M. & Marshello, A. (1975b). Individual differences in game motivation as moderators of preprogrammed strategic effects in prisoner's dilemma. Journal of Personality and Social Psychology, 32, 992-931.
- Liebrand, W.B.G. (1983). A classification of social dilemma

- games. Simulation and Games, 14, 123-138.
- Liebrand, W.B.G. (1984). The effect of social motives, communication and group size on behaviour in an N-person multi-stage mixed-motive game. European Journal of Social Psychology, 14, 239-264.
- Liebrand, W.B.G., Jansen, R., Rijken, V.M., & Suhre, C. (1986). Might over morality: the interaction between social values and the interpretation of decision-making in experimental games. Journal of Experimental Social Psychology, 22, 203-215.
- Liebrand, W.B.G., Wilke, H.A.M., Vogel, R., & Wolters, F.J.M. (1986). Value orientation and conformity: A study using three types of social dilemma games. Journal of Conflict Resolution, 30, 77-97.
- Lippa, R. (1976). Expressive control and the leakage of dispositional introversion-extraversion during role-played teaching. Journal of Personality, 44, 541-559.
- Luce, R.D., & Raiffa, H. Games and dilemmas. New York: Wiley, 1957.
- Mack, D., & Knight, G.P. (1972). Information on the nature of the game as a determinant of behavior in the prisoner's dilemma. Psychonomic Science, 27, 99-100.
- McClintock, C.G. (1972). Social motivation--A set of propositions. Behavioral Science, 17, 438-454.
- McClintock, C.G., & Liebrand, W.B.G. (in press). The role of interdependence structure, individual value

orientation and other's strategy in social decision making: A transformational analysis. Journal of Personality and Social Psychology.

McClintock, C.G., Messick, D.M., Kuhlman, D.M., Campos, F.T. (1973). Motivational bases of choice in three-choice decomposed games. Journal of Experimental Social Psychology, 9, 572-590.

Messe', L.A., Bolt, M., & Sawyer, J. (1971). Nonstructural determinants of behavior in the replicated prisoner's dilemma game. Psychonomic Science, 25, 238-240.

Messick, D.M. (1982). Solving social dilemmas: Individual and collective approaches. Paper presented at the University of North Carolina, Chapel Hill Social Psychology Alumni and Friends Conference.

Messick, D.M., & Brewer, M.B. (1983). Solving social dilemmas: A review. In L. Wheeler & P. Shaver (Eds.), Review of personality and social psychology, (Vol. 4, pp. 11-44). Beverly Hills, CA: Sage.

Messick, D.M., & McClintock, C.G. (1968). Motivational basis of choice in experimental games. Journal of Experimental Social Psychology, 4, 1-25.

Messick, D.M., & McClelland, C.L. (1983). Social traps and temporal traps. Personality and Social Psychology Bulletin, 9, 105-110.

Messick, D.M., Wilke, H., Brewer, M.B., Kramer, R.M., Zemke, P.E., & Lui, L. (1983). Individual adaptations and

structural change as solutions to social dilemmas.

Journal of Personality and Social Psychology, 44,  
294-309.

Miller, D.T., & Holmes, J.G. (1975). The role of  
situational restrictiveness on self-fulfilling  
prophecies: A theoretical and empirical extension of  
Kelley and Stahelski's triangle hypothesis. Journal of  
Personality and Social Psychology, 31, 661-673.

Olson, M. (1965). The logic of collective action.  
Cambridge, MA: Harvard University Press.

Orbell, J., & Dawes, R.M. (1981). Social dilemmas. In G.  
Stephenson & J.M. Davis (Eds.), Progress in Applied  
Social Psychology, Vol. 1.

Orwant, C.J., & Orwant, J.E. (1970). A comparison of  
interpreted and abstracted versions of mixed-motive  
games. Journal of Conflict Resolution, 14, 91-97.

Osgood, C.E., Suci, G.J., & Tannenbaum, P.S. (1975). The  
measurement of meaning. Urbana: University of Illinois  
Press.

Petty, R.E., & Cacioppo, J.T. (1981). Attitudes and  
persuasion: Classic and contemporary approaches.  
Dubuque, IA: Wm. C. Brown Company.

Petty, R.E., Ostrom, T.M., & Brock, T.C. (1981). Cognitive  
responses in persuasion. Hillsdale: Lawrence Earlbaum  
Associates.

- Platt, J. (1973). Social traps. American Psychologist, 28, 641-651.
- Pope, R.M., Jr., Stepp, J.M., & Lytle, J.S. (1975). Effects of price change on the domestic use of water over time. Clemson University; WRII Report, 56.
- Schelling, T.C. (1971). On the ecology of micromotives. Public Interest, 25, 61-98.
- Schroeder, D.A., Jensen, T.D., Reed, A.J., Sullivan, D.K., & Schwab, M. (1983). The actions of others as determinants of behavior in social trap situations. Journal of Experimental Social Psychology, 19, 522-539.
- Smith, M.B., Bruner, J.S., & White, R.W. (1956). Opinions and Personality. New York: Wiley.
- Snyder, M. (1974). The self-monitoring of expressive behavior. Journal of Personality and Social Psychology, 30, 526-537.
- Snyder, M., & DeBono, K.G. (1985). Appeals to image and claims about quality: Understanding the psychology of advertising. Journal of Personality and Social Psychology, 49, 586-597.
- Snyder, M., & Monson, T.C. (1975). Persons, situations, and the control of social behavior. Journal of Personality and Social Psychology, 32, 617-644.
- Snyder, M., & Tanke, E.D. (1976). Behavior and attitude: Some people are more consistent than others. Journal of Personality, 44, 510-517.



- Snyder, M., & Uranowitz, S.W. (1978). Reconstructing the past: Some cognitive consequences of person perception. Journal of Personality and Social Psychology, 36, 941-950.
- Stern, P.C. (1976). Effects of incentives and education on resource conservation decisions in a simulated commons dilemma. Journal of Personality and Social Psychology, 34, 1285-1292.
- Tabachnick, B.G., & Fidell, L.S. (1983). Using multivariate statistics. New York: Harper & Row.
- Taylor, S.E., & Crocker, J. (1981). Schematic bases of social information processing. In Higgins, E.T., Hermann, P., and Zanna, M.P. (eds.). Social Cognition: Cognitive structures and processes underlying person perception. Hillsdale, N.J.: Lawrence Erlbaum.
- Thibaut, J.W., & Kelley, H.H. (1959). The social psychology of groups. New York: Wiley.
- Tukey, J.W. (1977). Exploratory data analysis. Reading: Addison-Wesley.
- Winer, B.J. (1971). Statistical principles in experimental design. New York: McGraw-Hill.
- Wyer, R.S. (1969). Prediction of behavior in two-person games. Journal of Personality and Social Psychology, 13, 222-238.
- Wyer, R.S., & Srull, T.K. (1980). The processing of social stimulus information: A conceptual integration. In R.

Hastie, T.M. Ostrom, E.B. Ebbesen, R.S. Wyer, D.L.

Hamilton, & D.E. Carlston (Eds.), Person memory:

Cognitive basis for social perception. Hilldale, N.J.:

Lawrence Erlbaum Associates.

Wyer, R.S., Srull, T.K., Gordon, S.E., & Hartwick, J.

(1982). Effects of processing objectives on the recall of prose material. Journal of Personality and Social Psychology, 43, 674-688.

APPENDIX A  
PILOT STUDY

## Pilot Study

Subjects and Procedure

Eighty-eight male and female introductory psychology students at Michigan State University participated in the pilot study. Subjects received a half-hour of experimental credit for participation in the session. Twenty-two subjects were run in each session in the one-way (Message: evaluation-joint gain, evaluation-own gain, potency-joint gain, potency-own gain) between-subjects design.

Subjects did not participate in the harvesting task, but simply heard one of four messages. Each prerecorded message consisted of 12 males and 10 females discussing their impressions of a study investigating group member behavior they purportedly participated in the previous year. Two messages focused on evaluation issues, one message attempting to induce collectively-interested behavior and the other message attempting to induce self-interested behavior. Both messages indicated the behavior discussed (i.e., collectively-interested or self-interested behavior) was good, moral, and socially-approved, and stressed the mutual obligations, rights, and entitlements of the group members. An example of a subject on the evaluation tape attempting to induce collectively-interested behavior is the following. "I was surprised some people in the group tried to end up with the most. I don't think it was right. Sure I'd like to end up with a lot, but I didn't think it was

fair to the others. I just wouldn't feel right doing it. I think I acted in a moral way. I'm pretty religious and think it is more important for a person to act in a moral way than it is to sell oneself out for just a few pennies. So I guess this study really showed that there are two types of people in the world: moral and immoral." An example a subject on the evaluation tape attempting to induce self-interested behavior is the following. "I think it's better for everyone in the group to end up with a fair amount of money, rather than one person getting all of it. And the only way to stop these greedy people is to make sure they don't end up with a lot when they take a lot. And the way to do that is by taking a lot yourself. This way they'll learn that the only way they and everyone else in the group can get a fair amount is by everyone taking a little."

The other two messages focused on potency issues. Of these, one message attempted to induce collectively-interested behavior and the other message attempted to induce self-interested behavior. Both messages indicated the behavior discussed (i.e., collectively-interested or self-interested behavior) can lead to control, power, and domination of the game. An example of a subject on the potency tape attempting to induce collectively-interested behavior is the following. "I didn't want to be a wimp, so I tried to take a lot so I

could dominate the game and end up with more than the others. But, I found out the others got angry when I took a lot, and then they would start to take a lot also. And then everyone was worse off; that's just the way the harvest task works. The others can retaliate, and I realized it was foolish to keep taking a lot, and that I would do better if I took less. When I took less, I did better, and I felt like I controlled the situation more than when I took a lot." An example a subject on the potency tape attempting to induce self-interested behavior is the following. "Some of the people in the group kept on taking a lot for themselves. I think they were trying to be in charge of the group. They kept on taking a lot all of the time. I think that's the way to be in charge. The guy who takes the most has the most power."

After listening to the message, subjects completed a questionnaire. Two key questions asked subjects to indicate how the subjects on the tape would perceive them if they made a small harvest (considered to be cooperative) and a large harvest (considered to be self-interested). Subjects responded to the questions on a 16-item evaluation and potency scale consisting of eight evaluation items and eight potency items. For both evaluation and potency items, four items were positively worded (e.g., helpful or powerful) and four items were negatively worded (e.g., unjust or wimpy). The measure was a 7-point scale, anchored at 1 (definitely

Table A1

## Perceived Member Impressions Influenced by Messages

harvest	Message			
	eval own gain	eval joint gain	pot own gain	pot joint gain
<u>evaluation</u>				
take little	5.72bd	5.91ce	4.65abc	5.27ade
take a lot	2.32lm	2.22jk	3.42jl	3.53km
-				
x	3.40	3.69	1.23	1.74
<u>potency</u>				
take little	2.98fi	3.38g	1.98fgh	3.64hi
take a lot	5.85n	5.60	6.01op	5.27nop
-				
x	2.87	2.22	4.03	1.63

Note: Higher numbers indicate higher ratings on the scale.

Means with common subscripts differ significantly,  $p < .05$ .

not applicable) and 7 (fully applicable). After completing the questionnaire, subjects were debriefed, given credit, thanked, and excused.

Results

The data were analyzed through four one-way analyses of variance (ANOVA). Table 1 presents both the means for each ANOVA and the Tukey (1977) post hoc comparisons. The one-way ANOVA on the evaluation dimension responses to the small harvest question was significant,  $F(3,40) = 3.45$ ,  $p <$

.0001. The one-way ANOVA on the potency dimension responses to the small harvest question was significant,  $F(3,40) = 5.84$ ,  $p < .0001$ . The one-way ANOVA on the evaluation dimension responses to the large harvest question was significant,  $F(3,40) = 5.41$ ,  $p < .01$ . The one-way ANOVA on the evaluation dimension responses to the large harvest question was not significant,  $F(3,40) = 1.14$ ,  $p < .25$ . To determine whether each of the four messages effectively influenced subjects' impressions, the difference between subjects' impressions on the two key questions asking how subjects would perceive them if they made large or small harvests was obtained. Thus, one difference score represented subjects' impressions for each message across the two key questions. These means are shown in Table A1. Simple effects tests showed that subjects clearly believed the evaluation message highlighting cooperative behavior and the potency message highlighting self-interested behavior. Based on this finding, the evaluation message stressing collectively-interested behavior and the potency message stressing self-interested behavior were chosen for the study.



APPENDIX B  
EXPERIMENTAL MATERIALS

## Consent Form

MICHIGAN STATE UNIVERSITY  
PSYCHOLOGY DEPARTMENT RESEARCH CONSENT FORM  
TITLE OF RESEARCH PROJECT: RESOURCE USE STUDY

1. I have freely consented to take part in a scientific study being conducted by David N. Sattler, under the supervision of Norbert L. Kerr, Professor of Psychology.
2. This study is designed to investigate how various conditions affect the decisions people make. I may be asked to perform several tasks. One of these tasks involves deciding how much of a resource to harvest from a resource pool.
3. I understand that the study does not involve any risks or discomforts.
4. I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be made available to me at my request.
5. I understand that my participation in the study does not guarantee any beneficial results to me.
6. I understand that I have the right to refuse to participate or to withdraw from this study at any time and without penalty. I may also stop working temporarily on any task at any time I choose. Because of the scientific nature of the study, the experimenter may suspend the experiment at any time.
7. I understand that, at my request, I can receive additional explanation of the study after my participation is complete.

Date \_\_\_\_\_ Signed \_\_\_\_\_

After you have read, dated, and signed this form, please fill out the attached participant credit sheet. You are to supply your name, your student number, today's date, and to indicate which Psych class you are in (a numeric code is provided to indicate your selection). Be sure to fill in the appropriate circles beneath the boxes on the credit sheet. After you have finished filling out the credit sheet, please put it and this consent form back in your envelope and slip it out under the curtain to your booth. Then wait quietly for further instructions.

## Experimental Game Survey

You Name:

Phone:

This survey concerns how people respond in certain experimental games. The first thing we want you to do is to become familiar with the type of games we are interested in. Please read through the following instructions on how these games are played.

Here is an example of the experimental game.

Alternative A		Alternative B	
self	other	self	other
-2.50	+11.00	0.00	+10.00

Notice that there are two alternative choices, labeled Alternative A and Alternative B. These are your choices in the game. Beneath each alternative choice there is a pair of numbers, one labeled "self" and the other labeled "other." These numbers are the points you and some other person receive if you choose a given alternative.

Who is this other person? You will never know. We'll only tell you that he or she is, like yourself, a person in this same decision making task with whom you have been randomly paired. You will never meet or communicate with this "other" person in any way, nor will she or he ever meet or communicate with you.

In this example game, you can see that if you decide to choose Alternative A, you would receive -2.50 points and your paired partner would receive +11.00; if you choose Alternative B, you would receive 0.00 points and your paired person would receive +10.00 points.

That's simple enough. But there's something very important for you to understand about this game. You are not the only person making choices which affect your outcomes and the "other's" outcomes. Your paired person, the "other," makes choices too and those choices affect what happens to him or her and to you as well.

Your total outcome on each trial then depends on what you give yourself plus what your paired person gives you. Similarly, your paired person's TOTAL outcome on each trial depends on what you give him or her and also on his or her own choice.

In this task, we want you to imagine that the points you are accumulating are important to you in the following way: the more of them you accumulate for yourself, the better. Also, your paired person feels that same way about his or her points: he or she will also want to get as many as he or she can.

We simply want you to choose the Alternative that is most preferable to you. Each of you is free to make whatever choice YOU consider to be the best on each trial. Your paired person may or may not make choices similar to you.

On the following page you will consider different versions of the game. For each version, please indicate your choice-- Alternative A or Alternative B by circling your choice. As soon as you have read over and are sure you understand the above instructions you may turn to the next page and record your choices.

For each version of the game below, choose Alternative A or Alternative B. Indicate your choice by circling the chosen alternative.

Game version 1.

Alternative A  
Self Other  
-3.90 +14.50

Game version 2.

Alternative A  
Self Other  
-7.50 -13.00

Game version 3.

Alternative A  
Self Other  
0.00 -15.00

Game version 4.

Alternative A  
Self Other  
+15.00 0.00

Game version 5.

Alternative A  
Self Other  
-13.00 -7.50

Game version 6.

Alternative A  
Self Other  
-14.50 +3.90

Game version 7.

Alternative A  
Self Other  
+3.90 -14.50

Game version 8.

Alternative A  
Self Other  
-10.60 +10.60

Game version 9.

Alternative A  
Self Other  
+7.50 -13.00

Game version 10.

Alternative A  
Self Other  
+10.60 +10.60

Game version 11.

Alternative A  
Self Other  
+13.00 +7.50

Game version 12.

Alternative A  
Self Other  
+14.50 +3.90

Alternative B  
Self Other  
0.00 +15.00

Alternative B  
Self Other  
-10.60 -10.60

Alternative B  
Self Other  
-3.90 -14.50

Alternative B  
Self Other  
+14.50 -3.90

Alternative B  
Self Other  
-14.50 -3.90

Alternative B  
Self Other  
-13.00 +7.50

Alternative B  
Self Other  
0.00 -15.00

Alternative B  
Self Other  
-7.50 +13.00

Alternative B  
Self Other  
+3.90 -14.50

Alternative B  
Self Other  
+13.00 +7.50

Alternative B  
Self Other  
+14.50 +3.90

Alternative B  
Self Other  
+15.00 0.00

Game version 13.

Alternative A  
Self Other  
-7.50 +13.00

Game version 14.

Alternative A  
Self Other  
+3.90 +14.50

Game version 15.

Alternative A  
Self Other  
-3.90 -14.50

Game version 16.

Alternative A  
Self Other  
-10.60 -10.60

Game version 17.

Alternative A  
Self Other  
+14.50 -3.90

Game version 18.

Alternative A  
Self Other  
-15.00 0.00

Game version 19.

Alternative A  
Self Other  
-14.50 -3.90

Game version 20.

Alternative A  
Self Other  
-13.00 +7.50

Game version 21.

Alternative A  
Self Other  
+10.60 -10.60

Game version 22.

Alternative A  
Self Other  
+13.00 -7.50

Game version 23.

Alternative A  
Self Other  
0.00 +15.00

Game version 24.

Alternative A  
Self Other  
+7.50 +13.00

Alternative B  
Self Other  
-3.90 +14.50

Alternative B  
Self Other  
+7.50 +13.00

Alternative B  
Self Other  
-7.50 -13.00

Alternative B  
Self Other  
-13.00 -7.50

Alternative B  
Self Other  
+13.00 -7.50

Alternative B  
Self Other  
-14.50 +3.90

Alternative B  
Self Other  
-15.00 0.00

Alternative B  
Self Other  
-10.60 +10.60

Alternative B  
Self Other  
+7.50 -13.00

Alternative B  
Self Other  
+10.60 -10.60

Alternative B  
Self Other  
+3.90 +14.50

Alternative B  
Self Other  
+10.60 +10.60

## Original Message Text

"The next portion of today's study requires a few moments to set up. While the experimenter prepares for the next part of today's study, just to familiarize you with the task, we would like you to listen to several comments some students like yourself made at the end of a similar study conducted last year in which four person groups played the harvest simulation game. Please listen carefully." Before each response, the experimenter will ask variations of the questions, "What were your impressions of the harvest simulation you just participated in?" and "How should somebody play this game?"

(Evaluation dimension)

Male- "Well, everyone could either take a lot or a little. I think it was better to take a little or a medium amount, because if someone in the group took a lot, everyone in the group had to pay a bigger fine. So I guess you could say that taking a lot hurt everyone in the group. I guess there are people who would try to take as much as possible for themselves, even if it burned everyone. But I just don't think that's right. I couldn't do it. I think it's more important to do the right thing than be a pig and burn others. I guess what I'm saying is that it's pretty selfish to just screw everyone else in the group. I'd rather help the whole group succeed than be greedy even if I end up with less for myself."

Female - "Some people tried to take as much as possible so that they would get a lot of money. I really didn't like that. I don't think those people could have very much respect for themselves. After all, we were all part of a group and I think it's better that everyone in the group end up with something than one person getting it all. Maybe I could have got more if I was greedy, but I just couldn't do it. If I'm in a group, I'm going to try to do what helps the group, not just myself. I don't see how those people who were selfish could have a lot of respect for themselves. They're real sleezes."

Male - "Well, you see, what you did ended up affecting what happened to everyone else in the group. The thing that really drove this home to me was that somebody in the group kept taking a lot, and I don't think it fair, because when you're in a group, you should do what you can to help each other out. And those greedy slime-balls were only thinking of themselves. Every time they took a lot all of us had to pay a big fine. And it wasn't fair that we had to pay their fine. It's lucky for those guys that we're not allowed to meet; I'd really like to tell them just what I think of them."

Female - "Basically, you just had to take some lumber from the forest. And you could choose how much to take. There were a number of people in the group, and all of the people took lumber from the same forest."

Female - "I was surprised that some people seemed to try to get more than anyone else. I just don't think it was right. Sure I would like to end up with the most, but I didn't think it would be fair to the others. I just wouldn't feel right doing it. I think I was acting in a moral way. I'm pretty religious and think its more important for a person to act in a moral way than it is to sell yourself out just for a few pennies. So I guess this study really reminded me that there really are two types of people in the world: the moral and the immoral."

Male - "I don't know. I thought the idea was pretty good. I learned something about psychology experiments and I got my two credits for participating. And that's about it."

Male - "Everybody but the guy in the blue booth was trying to be reasonable, but that blue guy kept taking a lot. That wasn't too cool, because everyone got fined more, including him. I wouldn't do that to other people just for money. I guess some people only care about themselves."

Female - "Once in a while people made selfish choices. I didn't think that was right, especially when you're in a group. And even if others do act selfishly, I don't want to be that kind of person."

Male - "I saw the whole experiment as a moral thing. You know, whether a person acts in a good or bad way. You know, acting good meant that you tried to help everyone out and acting bad meant trying to get as much for yourself as you

could, you know, without considering how what you do affects others. I couldn't believe it when some of the guys were trying to hog it all."

Male - "I sorta feel kind of bad. At the beginning I took a lot but the fines were really high because I was taking a lot. And everyone had to pay part of the fine. I didn't mean to hurt anybody. I have a feeling the others may be pretty mad at me. I really feel bad for trying to take so much, but it took me a while to figure out what was happening."

Female - "Well I felt that I had a responsibility to the other group members so didn't take very much."

(Potency dimension)

Male - "Well, in every game there are winners and there are losers. And I'm determined to be a winner. And the way you win in this game is taking as much as you can, but not too much, most of the time. If you just take it all, you're a gonner because of the fine, but if you take just a little you're going to be a loser."

Male - Hey, I wasn't going to let anyone get away with anything at my expense, you know. I wasn't going to let guys walk all over me, you know, and take advantage of me. So every time I thought that somebody was trying to get away with something, I just took more than they did. If you didn't, you would really be taken advantage of."



Female - "I guess it's like my dad says, it's a dog-eat-dog world, so you gotta look out for number one. And you gotta get what you can for yourself or you end up with nothing. And that's the way this game worked. The only catch was that you couldn't take a whole lot all of the time, because first of all, that fine would get pretty hefty, and secondly, then the others would start taking a lot and then the fine would get so big that no one could get anything."

Female - "Well, I thought that by taking more you ended up doing better compared to the other guy. And that's what I wanted; to be the winner."

Male - "I don't know. I thought the idea was pretty good. I learned something about psychology experiments and I got my two credits for participating. And that's about it."

Male - "What did I think about it? Well I'll tell you. I'm not out to screw anyone, but at the same time I'm not into getting screwed, either. I thought the perfect outcome would be to get a little more than everyone else. 'Cause like I say, I'm not Mr. Selfish; I'm not into getting it all for me, but I try to play so that I would win. But in this game, you know, I didn't take gobs, cause that would've killed everyone. But I took just enough so I'd get more than they would."

Female - (sigh) "The others kept getting the upper hand on me. And they really influenced what happened to me. I realized toward the end that their decisions influenced the

amount I ended up with. I guess it's because I wasn't taking very much, and so I felt kind of helpless."

Male - "I don't like being stepped on and I wasn't going to let it happen in this game. So I figured it out. The best way to get ahead and dominate this game is by taking a lot. Oh yeah, but if you take way too much, you'll probably get screwed because of that fine thing. But if you take, you know, a pretty high amount, you can make sure than no one else can mess you over."

Female - "Basically, you just had to take some lumber from the forest. And you could choose how much to take. There were a couple of people in the group, and all of the people took lumber from the same place."

Male - "I didn't want to be a wimp, so I took just a bit more than the others. And it worked. I pretty much controlled what happened."

Female - "You've gotta be strategic in this game. Because if you show that you're weak, the other guys might start to take more than you, and then you've lost it. Then they pretty much can dictate what happens to you by the amount they take. I wasn't about to let that happen, so that's why I usually took a little bit more than them. I don't like anybody to tell me what to do."

Male - "I saw this thing just like any other group thing, you know. Someone is going to be the main dude and come out on top. I really don't like others to have control over me,

so I made sure that I'd be in control by taking just a little more than the other guys. I didn't think you could get away with totally taking everything, uh, just a little more."

## Message Text "Interpreted" by Reader

(Evaluation dimension)

Male - Well, everyone could either take a lot or a little. I think it was better to take a little or a medium amount, because if someone in the group took a lot, everyone in the group had to pay a bigger fine. So I guess you could say that taking a lot hurt everyone in the group. But I guess there are people who would try to take as much for themselves even if it burned everyone. But I just don't think that it's right. I couldn't do it. I think it's more important to do the right thing and be a pig and burn others. I guess what I'm saying is, is it's pretty selfish to just screw everyone else in the group. I'd rather help the whole group succeed than be greedy, even if I ended up with less for myself.

Female - Some people, um, tried to take as much as possible, so that they would get a lot of money. I really didn't like that. I don't think those people could have very much respect for themselves. Well, after all, we're all part of a group, and I think it's better that everyone in the group, um, end up with something, than I guess, one person getting it all. Um, maybe I could have gotten more if I was greedy, but I just couldn't do it. Hey, if I'm in a group, I'm going to try to do what helps the group, not just myself. I don't see how those people who were selfish could have a lot of respect for themselves. They're real sleezes.

Female - Well, I was surprised that some people tried to get more than anyone else. I just don't think it was really right. I mean, sure I would like to end up with the most, but, I don't know, I just didn't think it would be fair to the others. I just wouldn't feel right about doing it. And I think I was acting in a moral way. Well, also, I'm pretty religious, and I think it's more important for a person to act in a moral way than to, than I guess it is to just sell yourself out for a few pennies. So, well I guess this study really reminded me that there really are two types of people in the world: the moral and the immoral.

Male - I saw the whole experiment as a moral thing. You know, whether a person acts in a good or a bad way. And you know, acting good meant you tried to help everyone out, and acting bad meant trying to get as much for yourself as you could, you know, without considering how what you do affects others. I just couldn't believe it when some of the guys were trying to hog it all.

Female - Well, once in a while people really made selfish choices. I just didn't think that was right. I mean, especially when you're in a group. And even if the other people really do act selfishly, I don't want to be that kind of person.

Male - Everybody but the guy in the blue booth was trying to be reasonable, but ah, that blue guy, just ah kept taking a lot. That wasn't too cool, 'cause everyone got fined more,

including him. I wouldn't do that to other people just for money. I guess some people only care about themselves.

Male - I feel kind of bad. At the beginning, I took a lot but the fines were really high because I was taking a lot. And everyone had to pay, um, part of the fine. But I didn't mean to hurt anybody. I had the feeling that others, well, maybe were pretty mad at me. I really feel for trying to take so much. But it took me a while to figure out what was happening.

Female - Well, I sort of felt that I had a responsibility to the other group members, so I didn't take very much.

(Potency dimension)

Male - Well, it's like in every game, there are winners and there are losers. But I'm determined to be a winner. And the way that you win in this game is by taking as much as you can, but not too much, most of the time. If you just take it all, you're a gonner, because of the fine. But if you take just a little, ah, you're definitely going to be a loser.

Female - I guess it's like my dad says, it's a dog eat dog world. So you gotta look out for number one. And, and you gotta get what you can for yourself or you end up with nothing. And that's the way this whole game worked. The only catch was that you couldn't take a whole lot all the time, because first of all, um, that fine would get pretty hefty. Well, and secondly, um, then the others would start

taking a lot, and then the fine would get so big that no one could get anything.

Male - I don't like being stepped on and I wasn't going to let it happen to me in this game. So I figured it out. The best way to get ahead and dominate this game is by taking a lot. Oh yeah, but if you take way too much, you'll probably get screwed because of that fine thing. But if you take, you know, a pretty, pretty high amount, you can make sure no one else can mess you over.

Female - Hey, you've gotta be strategic in this game. 'Cause if you show them that you're weak, the others might start to take more than you. And then you've lost it. And then, they can pretty much dictate what happens to you by the amount they take. And I wasn't about to let that happen. So that's when I usually took a little more than them. I don't like anybody to tell me what to do.

Female - Well, the other's kept getting the upper hand on me. They really influenced what happened to me. I guess I realized toward the end that their decisions influenced the amount that I ended up with. I guess it's because I wasn't taking very much, so I felt kind of helpless.

Female - Basically, you just had to take some lumber from the forest, and you could choose how much to take.

Male - Ah, I wasn't going to let anyone get away with anything at my expense, you know. I wasn't going to let those guys walk all over me, and take advantage of me. So

every time I thought somebody was trying to get away with something, I just took more than they did. If you didn't, you were really taken advantage of.

Male - I saw this thing just as any other group thing, you know. Um, somebody's going to be the main dude and come out on top. I really don't think, I mean I really don't like the others to have control over me, so I made sure I'd be in control by taking just a little bit more than the other guys. Uh, I didn't think you could get away with totally taking everything, uh, just a little more.

Female - Well, um, I thought that by taking more, you ended up\* doing better compared to the other guy. And that's kind of what I wanted. To be the winner.



-----

## QUESTIONNAIRE

Your name: \_\_\_\_\_

Your color code: \_\_\_\_\_

Please answer the following questions that examine your current impressions of the experiment.

1. How much responsibility do you think you had for the final group outcome on each trial?

very little:\_\_:\_\_:\_\_:\_\_:\_\_:\_\_:very much

2. How much responsibility do you think the other member of your group had for the final outcome on each trial?

very little:\_\_:\_\_:\_\_:\_\_:\_\_:\_\_:very much

3. How many persons were in your group, including yourself?

\_\_\_\_\_

4. Do you think that if you had acted cooperatively in your harvest decisions, the other group member would also harvest cooperatively?

other would	other would
harvest	harvest
cooperatively:__:__:__:__:__:__:competitively	

5. Do you think that if you had acted competitively in your harvest decisions, the other group member would also harvest competitively?

other would	other would
harvest	harvest
cooperatively:__:__:__:__:__:__:competitively	

6. There was a fine imposed for overzealous resource use. How much did you want to avoid this fine?

not at all:\_\_:\_\_:\_\_:\_\_:\_\_:\_\_:very much

7. Do you think you made cooperative or competitive harvest decisions?

cooperative \_\_\_\_\_ competitive \_\_\_\_\_

NEXT PAGE, PLEASE

PAGE 2

One of the things we are interested in is how people in a group form impressions of other group members. Although you don't know your fellow group member, you still may have formed some impressions of him or her just by being a member of the same group. Please indicate your impressions of your fellow group member on the following scales. We realize that this may sometimes be difficult; just do the best you can. (These responses are confidential, and will not be shared with the other group member).

8. You and your fellow group member had the chance of winning some money in today's experiment. How much do you think your fellow group member wanted to win this money?

very little:\_\_:\_\_:\_\_:\_\_:\_\_:\_\_:very much

9. How difficult do you think your fellow group member found the task?

very easy:\_\_:\_\_:\_\_:\_\_:\_\_:\_\_:very difficult

NEXT PAGE, PLEASE

PAGE 3

10. Please indicate your current impressions of your fellow group member on each of the following, using the following rating scale:

- |   |                                     |
|---|-------------------------------------|
| 1 | definitely not applicable           |
| 2 | not applicable                      |
| 3 | somewhat inapplicable               |
| 4 | neither applicable nor inapplicable |
| 5 | somewhat applicable                 |
| 6 | applicable                          |
| 7 | fully applicable                    |

- |               |       |             |       |
|---------------|-------|-------------|-------|
| A. good       | _____ | I. sincere  | _____ |
| B. weak       | _____ | J. pliable  | _____ |
| C. aggressive | _____ | K. powerful | _____ |
| D. dishonest  | _____ | L. unjust   | _____ |
| E. kind       | _____ | M. helpful  | _____ |
| F. timid      | _____ | N. wimpy    | _____ |
| G. forceful   | _____ | O. dominant | _____ |
| H. unfair     | _____ | P. mean     | _____ |

NEXT PAGE, PLEASE

PAGE 4

Using the above seven-point scale from question 10, please answer the following questions.

11. If the size of the forest was 200 acres and you withdrew 20 acres--considered to be a small harvest--how do you think your fellow group member would perceive you?

- |                     |                   |
|---------------------|-------------------|
| A. good _____       | I. sincere _____  |
| B. weak _____       | J. pliable _____  |
| C. aggressive _____ | K. powerful _____ |
| D. dishonest _____  | L. unjust _____   |
| E. kind _____       | M. helpful _____  |
| F. timid _____      | N. wimpy _____    |
| G. forceful _____   | O. dominant _____ |
| H. unfair _____     | P. mean _____     |

12. Using the seven-point scale from page 3, please answer the following question.

If the size of the acreage of lumber was 200 and you withdrew 100, considered to be a large withdrawal, how do you think your fellow group member would perceive you?

- |                     |                   |
|---------------------|-------------------|
| A. good _____       | I. sincere _____  |
| B. weak _____       | J. pliable _____  |
| C. aggressive _____ | K. powerful _____ |
| D. dishonest _____  | L. unjust _____   |
| E. kind _____       | M. helpful _____  |
| F. timid _____      | N. wimpy _____    |
| G. forceful _____   | O. dominant _____ |
| H. unfair _____     | P. mean _____     |

NEXT PAGE, PLEASE

13. Please describe in your own words what you understand the purpose of this experiment to be.

14. Please give us your general impression of the experiment so far. Thank you very much. Please slip this form into your envelope and slide it out under the curtain of your booth. Please wait quietly. We will continue shortly.

APPENDIX C  
EXPERIMENTAL INSTRUCTIONS

## Instructions

First of all, I would like to thank each of you for coming today. This is a resource use simulation study in which we're trying to understand how conditions affect the decisions people make.

Today you will be asked to listen to an audiotape and to perform a number of tasks. Before we continue, the University requires us to obtain your written consent to participate in the study. The general purposes of this study are summarized on the consent form that you will find inside the envelope on your desk. Your signature on this form verifies that you have read and understand the description of the study. Please read over the consent form. If you are willing to participate in the experiment, date and sign the consent form.

You will also find a standard credit sheet clipped to the consent form. This credit sheet is used to keep a record of your participation so that you will receive proper credit in your psychology class. If you are willing to take part in the study, please fill out this form as well. To do so, put in your name, student number, today's date, and which Psych course you are to receive participation credit for. Be sure to fill in the circles beneath the boxes in which you write all this information. After you have filled out both forms, put them back in the envelope and slip them out under the curtain to your booth. Then wait quietly. We

will continue shortly. Okay, you may open the envelope on your desk and complete the enclosed forms at this time. THE TAPE WILL STOP AT THIS POINT. WHEN THE SUBJECTS HAVE FILLED OUT THE CONSENT FORM AND HAVE PASSED THEM OUT OF THEIR BOOTHS, THE FORMS WILL BE COLLECTED BY THE EXPERIMENTER.

Thank you. Please note at this time the color code of your booth. We will never refer to you by name during the study. Rather, you will be referred to only by color code.

In today's experiment, you will have the opportunity to win some money. At the completion of the entire experiment, a lottery will be held and one individual will receive the amount of money he or she earns. Details about the lottery will be provided in a few moments.

I'd now like to tell you a little more about the purposes of today's study. We are interested in how certain conditions affect the decisions people make. Today we have formed two separate groups with two persons in each group. In order to provide complete anonymity, you will not know which booth your fellow group member is in. I need to emphasize that these two groups are not competing against one another in any way. There will be no interaction between groups and the outcome of each group depends only on its own performance--not on the performance of the other group. The only reason we are running two groups at the same time is because we can complete our study faster with



two groups at once, instead of just testing one group at a time.

Your group will share use of a resource pool. The resource pool is a forest that is 200 acres in size. Your task is to harvest acres of lumber from the forest during this portion of the experiment. Specifically, your task is to harvest as many acres of lumber for yourself as possible from the forest. Each member of the group will individually and privately decide on a number of acres to withdraw from the forest. You can harvest anywhere between 20 to 100 acres during each "season" or trial. Your task is the harvest the lumber in such a way that you get the largest amount possible for yourself.

Since each member will be harvesting acres of lumber from the same forest and overharvesting can destroy the forest, the government regulates the harvesting. A government agency discourages overuse of the resource through a fine system. These constraints or regulations mean that the amount of lumber you finally end up with on each trial is affected not only by the amount you harvest but also by the amount harvested by the other group member. The government's fine or confiscation system works in the following way. As the total number of acres harvested by your group increases, the government fine increases. Each member shares equal responsibility for the fine. For example, if the total harvest were 104 acres, a fine of 80

acres would be imposed, and each member of a two-person group must pay half of the fine, or 40 acres. It does not matter which person harvested a larger share of the 104 acre total. Each must pay an equal part of the fine.

To summarize, the next task you will perform in today's experiment works as follows. Each member of a two person group harvests acres of lumber from the same forest. The number of acres that you finally end up with is in part determined by the fine imposed on each trial. The fine is determined by the total number of acres withdrawn by the group. The larger the total harvest, the larger the fine. Each group member will receive the number of acres he or she withdraws from the forest minus his or her fine. If a fine is larger than the number of acres you have, the total number of acres you have will become zero. The number of acres of lumber you have cannot go below zero.

In a moment four example screens will be presented on the screen on your desk. The example screens are similar to the screens of the actual trials. The purpose of the example screens is to familiarize you with the task. The example screens present four hypothetical trials in which a two person group harvests acres of lumber from a forest.

We will now present the four example screens. Since they are examples, you will not receive the amount of lumber indicated on your screen.

EXAMPLE SCREEN ARE PRESENTED.

## FIRST EXAMPLE SCREEN

This is the first example screen. Let's look at the way the screen is set up. The first line lists the trial number, located on the left, the clock, located in the middle, and your booth color, located on the right. The second line shows information relating to the team. The third line shows information relating to your current status. And the fourth line shows information relating to your group member's status.

Let's look more closely at the screen. Please look at the left side of the third line. This indicates the amount you harvest. In this example, you take 65 acres of lumber. Now look immediately below on the fourth line. This indicates the amount the other member of your group harvests. Here, the team member takes 55 acres of lumber. The total taken by your team is indicated on the second line at the left. In this example, your team harvests 120 acres. How much is the team fined? Look on the second line in the middle. You can see that the team is fined 100 acres of lumber. The portion of the fine that you owe is shown right below the team fine--on the third line in the middle--and the portion of the fine that the other member of your group owes is shown right below your fine--on the fourth line in the middle. Remember that the team members share the fine equally. So just how much would you get on this trial? Look on the third line on the right. You can see that you

would get 15 acres of lumber. The amount in this example your partner would receive, 5 acres, is shown at the far right on the fourth line.

#### SECOND EXAMPLE SCREEN

Here is another example screen. Notice again that the trial number is indicated in the upper left corner. The time remaining for you to select your harvest decision is indicated in the middle. At the beginning of each trial the clock is reset to 15 seconds. When the clock begins you will have 15 seconds to indicate your harvest decision by sliding the handle on your desk. The clock will count down as is now shown. Your booth color is indicated on the far right.

In this example, you take 20 acres, as shown at the left on the third line, and your partner also takes 20 acres, is shown at the left on the fourth line. The number of acres your team takes--that is, the combined harvest by you and your team member--is 40 acres, as is shown at the left on the second line. Now look at the middle of the second line. Here, you can see that the team is fined zero acres. The middle of the third and fourth lines shows that you and the other group member would not be fined. The amount you get, 20 acres, is shown at the right side of the third line, and the amount your partner gets, 20 acres, is shown at the right side of the fourth line. In this

example, both group members made small harvests and there was no fine.

#### THIRD EXAMPLE SCREEN

This example screen shows that you are harvesting a large number of acres of lumber but your partner is making small harvests. Look at the left side of the third line. You see that in this example you take 100 acres. The other team member takes 20 acres, as is shown at the left side of the fourth line. The left of the second line shows that the team takes 120 acres. The middle of the second line shows that the team is fined 100 acres. Because the fines are equally shared by both team members, the middle of the third line shows that you are fined 50 acres. The middle of the fourth line shows that your partner is also fined 50 acres. To find out how much you and the other group member receive, look at the third and fourth lines respectively. Here, you would receive 50 acres and the other group member would receive -30 acres. On any given trial, you may end up with a negative amount, as did the other team member in this example. If this occurs, you just end up with zero points. The total number of acres you end up with cannot be negative.

#### FOURTH EXAMPLE SCREEN

Here's the final example screen. Again, from left to right, the first line shows the trial number, the clock and your booth color. In this example, both you and the other

team member make large harvests. The left of the third line shows that you take 100 acres. The left of the fourth line shows that your partner takes 100 acres. And the team--the total of your harvest and the other team member--takes 200 acres, as can be seen at the left of the second line. Just how much is the team fined. The middle of the second line shows that the team is fined 200 acres. And the middle of the third line shows that you are fined 100 acres and the middle of the fourth line shows that your partner is fined 100 acres. In this example, you would get zero acres, as is shown at the right of the third line, and your partner would get zero acres, as is shown just below on the fourth line. THE INFORMATION MANIPULATIONS, INCLUDING THE RATIONALE FOR THE INFORMATION, ARE PRESENTED. FOLLOWING THE INFORMATION MANIPULATIONS, THE SPECIFIC TASK INSTRUCTIONS ARE PRESENTED.

Okay. I'd now like to tell you a little more about today's session. We are interested in studying the effects of feedback. That is, we want to see whether letting team members know the withdrawal decisions made by the entire group will affect their own withdrawal decisions. On some of the trials you will receive no feedback about the group's harvest or your own outcome. On other trials you will receive feedback concerning the harvest decisions of the other member.

In a few moments, we will begin the actual trials. The following instructions describe how you make your harvest selections. To indicate the number of acres of lumber you wish to harvest, slide the handle of the hand-grip device on your desk back and forth. As you slide the handle back and forth, the number of acres of lumber you wish to harvest will change on your screen.

You will recall from the example screens presented earlier that the trial number, the time remaining to make your harvest decision, and your booth color are indicated on the first line. The second line shows the number of acres harvested by the team, the team fine, and the number of acres the team receives. The third line shows your harvest selection, your fine, and the number of acres your receive. The fourth line shows the selection of your group member, the fine, and the amount the other member receives.

In addition, remember that when selecting your harvest decision, the number on your screen will change as you slide the handle of the hand-grip device back and forth. Because of slight imperfections in the equipment, the number of acres that you indicate may jitter around a bit. Don't let this bother you. Simply set it as close as you can to the actual number you wish to harvest.

You will have 15 seconds to indicate the number of acres of lumber you wish to harvest from the forest. The remaining time is indicated on the clock on the first line

in the center. When the 15 seconds have elapsed, the computer will record the numbers of acres indicated on your screen as your harvest decision. To summarize, to make your harvest selection, slide the handle. The amount you indicate to be harvested may change slightly, but this is due to slight imperfections in the equipment. You will have 15 seconds to indicate the number of acres of lumber you wish to harvest from the forest.

On all no-feedback trials, you will receive no information concerning the harvest decisions of the other member of your group, your fine, the other group member's fine, the number of acres the other member of your group receives, and the number of acres the team receives. On the feedback trials, you will receive this information.

The computer will signal you on the video monitor screen on your desk when to make your lumber harvest selection. Just before each trial begins you will see the number of the trial and a "READY" signal on the screen. Then, in a second or two, a "GO" signal will appear on the screen. You should then make your lumber harvest selection. You will have 15 seconds to make your selection. At the end of the 15 second trial, the computer will record your harvest selection. There will then be a brief period before the next trial begins.

There is one additional thing you should be aware of. As I mentioned earlier, at the completion of the entire



experiment one person taking part in the study will be randomly selected to receive the amount of money he or she earns. This amount is determined in the following way: each acre that you withdraw from the acreage equals a penny. The selected individual will receive a penny for each acre he or she has accumulated during the experiment.

THE ACTUAL TRIAL SEQUENCE BEGINS.

That completes the series of trials on this task. Before continuing, we would like to quickly get some of your impressions of the study to this point in the session. In a moment, the experimenter will slip an envelope containing a short questionnaire into your booth. Please fill it out completely. Then put it back into the envelope, slip it back out under the curtain to your booth, and wait quietly for further instructions.

MICHIGAN STATE UNIV. LIBRARIES



31293005338664