This is to certify that the

thesis entitled

Leader's Messages as an
Approach for Solving Social Dilemmas

presented by

Ileana del Pilar Rodriguez-Maldonado

has been accepted towards fulfillment
of the requirements for

Master degree in Arts

Major professor

Date April 2, 1993.

DATE DUE	DATE DUE	DATE DUE

LEADER'S MESSAGES AS AN APPROACH FOR SOLVING SOCIAL DILEMMAS

By

Ileana del Pilar Rodríguez-Maldonado

A THESIS

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

MASTER OF ARTS

Department of Psychology

1993

ABSTRACT

LEADER'S MESSAGES AS AN APPROACH FOR SOLVING SOCIAL DILEMMAS

By

Ileana del Pilar Rodríguez-Maldonado

Solutions to social dilemmas have been mainly studied through two approaches: structural and normative. A model was proposed to integrate principles of these two approaches to study potentially more efficient ways of encouraging cooperative behaviors. Leader's messages were studied as potential sources of structure of the collectivity's beliefs about the social dilemma situation. In one experiment the content of a message addressing the social dilemma situation, and the legitimacy of the source delivering the message were manipulated. The content of the message varied according to two dimensions of causal attributions about the situation. These dimensions were locus (i.e. internal and external), and stability (i.e. stable and unstable). It was hypothesized that purely optimistic messages (i.e. external and unstable attributions) would result in more cooperative behaviors than purely pessimistic messages (i.e. internal and stable attributions). A second hypothesis predicted that the source higher in legitimacy would encourage the highest level of cooperation. In general, the results did not support the hypotheses. The pessimistic, internal attributions yielded the highest level of cooperation, and the low legitimacy source, when making internal attributions about the collectivity, encouraged more cooperation than did the high legitimacy source. Alternative explanations and practical implications are discussed.

To my family. To my parents, whose happiness is still my most valued reward. To my father, Justo P. Rodríguez, for he inspired my fascination with human behavior, and to my mother, Arminda Maldonado, who showed me the beauty of behaving like a human. And finally, to my sister, Mariela, and my brother, Justo, the most beautiful human beings in the world.

ACKNOWLEDGMENTS

The works presented here were possible thanks to the commitment to excellent education of Norbert L. Kerr, who with great dedication guided me through this learning process. The revisions of the document and wise contributions of Lawrence A. Messé and Galen V. Bodenhausen must also be recognized.

In order to successfully engage in this empirical research endeavor, the helping had of many individuals was very much needed, and even more appreciated. The staff of the Psychology Department at Michigan State University, as always, facilitated the process by providing the materials resources, but even more helped with their human resources. Thanks to the experimenters, Heather Bailey, Jodi Brewer, Kerry Day, Jody Lotridge, Jenniffer Lutostanski, Sunny Mann, and Samantha Robbins. The labor intensive experiment was skillfully handled by these undergraduate psychology majors, whom with their work demonstrated their interest and compromise to the scientific research in social psychology.

Finally, thanks to all my friends, here in the United States and back home in Puerto Rico, for their love and support were a constant source of strength and motivation.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

A social dilemma emerges when a decision must be made between alternatives that benefit the individual and benefit the collectivity. Social dilemmas are the basic decision structure behind problems such as overpopulation, limited resource management, and pollution. The decisions involved in a social dilemma have strong implications regarding the quality of life of the individuals and their society.

Two principal properties define the competition between the society and the individual in social dilemmas (Dawes, 1980). First, for each individual the payoff is higher for a defecting choice than for a socially cooperative choice, regardless of the decisions of the other individuals in the society. Second, all the individuals are better off if all cooperate than if all defect. To cooperate, or not to cooperate, that's the question!

The practical question then is: how to get people to cooperate? The empirical pursuit for cooperative behavior in the face of a dilemma has been guided by two main approaches: structural or collective solutions and utilities or individual restraint (Dawes, 1980). Structural solutions involve the management of rewards and coercion in order to produce cooperative behavior (Hardin, 1968, p. 1247; Messick & Brewer, 1983). Structural solutions generally involve changes in the task, or the structure, or dynamics of the group. Reducing group size is an example of a structural solution (e.g. Kerr,

1989). On the other hand, the utilities point of view relies on the capacity of the individual to follow personal and societal standards that will prevent acts of defection. Behaviors such as altruism and the following of social norms are solutions that require individual adjustment, and are based on individual differences that could reflect contrasting beliefs and values regarding the dilemma situation. An example, of the effect of different personal beliefs in a social dilemmas situation was observed by Talarowski (1982) who reported that people who cooperate in a limited natural resource situation tend to attribute the causes of the dilemma to external sources, while the people who do not cooperate attribute the limitation to internal sources.

Because of the collective nature of structural solutions they are costly, and sometimes impossible to implement, and the enforcement of utilities is dependent on voluntary individual standards. Although it has been argued that in the long run, structural solutions are more effective and permanent than the normative approach (Heilbroner, 1974), norms do have important effects on behavior in social dilemmas (Kerr, 1991). Some researchers have suggested that the effectiveness of these solutions depends on particular characteristics of the social dilemma in question (Samuelson, Messick, Wilke, & Rutte, 1984).

The literature in social dilemmas has been divided by these two approaches with a lack of interest in the potential relationships between changes in the social structure and the beliefs and norms held by the individuals. A fusion of these approaches could yield more applicable, cost efficient and enduring solutions. A better understanding of the combination of external and internal influences that an individual works with when

making the decision to cooperate or not to cooperate in a dilemma was the challenging purpose of this thesis.

CHAPTER 1

Leadership and the Fusion of Structural and Normative Approaches to Social Dilemmas

In many cases part of being a leader is making decisions and managing resources, therefore in social dilemma situations they are agents of structure. The simulations of social dilemmas that take place in the laboratories and that study leadership and resource management, often fail to respond to the dynamics of the current overpopulated world (Dawes, 1980). Leadership in a social dilemma context has generally been explored from the perspective of the manager. These experiments have focused mainly on structural approaches in which legitimate entities serve as managers of the resources when the individuals give up their free access to their share of the resources (Rutte & Wilke, 1985; Rutte & Wilke, 1984; Shippee, 1978). Most of the social dilemmas of interest are shared by thousands to millions of people, a setting where the value of collective or individual solutions may vary from the laboratory setting. The capacities of, and the expectations about legitimate sources or leaders may be different in the real world. Legitimacy in this context refers to the degree in which the source of the standards is collectively agreed upon. For example, regarding a shortage of water, a leader might be able to appeal to the equality norm shared by the masses, but a leader can hardly limit the access of the

consumers to the water. If leaders had the capacity to manage resources, and be equitable with the members of the society, then there would be no dilemma, no decision-making process needed.

A potentially important tool that legitimate sources may manipulate is the access to collectivities and opportunity to persuade them. When a leader speaks, the followers may pay attention, and the careful study of this phenomenon may shed some light onto the solutions for social dilemmas. In terms of messages, it has been found that the most persuasive are the ones that are more logical, interesting, emotional, assertive, face-preserving, predictable, factual, less concise, and less ambiguous (Hazleton, Cupach, & Liska, 1986). Educational messages highlighting long-term consequences and the effectiveness of individual action has been found to increase cooperation in a water scarcity situation (Thompson & Stoutemyer, 1991). Could a legitimate source provide a society with beliefs to adopt and utilize while confronting a social dilemma? And would it make any difference if the source who promoted such beliefs was legitimate or not?

A model that incorporated principles of the structural and the normative oriented solutions was developed. The persuasion potential of leaders was studied as one possible link between these two different orientations. The content of messages explaining the social dilemma situation to the followers was seen as a tool to structure the beliefs of the people regarding the problem. A focus on the process of ascription of attributions responded to the behavioral implications of causal explanations that have been supported by empirical research. Two theories that tie motivation to the attributional process in

achievement-related situations will be discussed, along with some applications to social dilemmas that already have been researched. The model advanced in this thesis relating the process of ascribing attributions by legitimate sources to cooperative behaviors in the collectivity will then be presented.

The process of searching for causal relationships is broadly used by individuals as the means to understand and master the world (White, 1959). Attributing effects to particular sources is a tool used to obtain knowledge and to effectively manage the self and the environment (Kelley, 1971). Attributions are phenomenal rather than objective causality because they represent the causal world as perceived by the individual (Weiner, 1985). Corresponding to the phenomenological character of attributions they are formed through a dynamic process; attributions are not made only once, but at multiple time points because of repeated observations of the phenomenon in question (Lau, 1984).

Causal ascriptions play an important role in contexts in which the individual has a goal and decisions made have the potential of affecting the outcome, such as social dilemma situations. In general, these contexts are known as achievement-related contexts (Weiner, 1985). The results of decisions in social dilemmas can be interpreted in terms of success or failure as any other achievement-related situation. In a social dilemma situation causal ascriptions serve as a way of understanding the dilemma, and as feedback regarding the achievement-related results.

Weiner (1985) proposed a model of motivation and emotion in which the attributions made by the individual play a key role. This model suggests that causal ascriptions influence the expectancies related to the goal, and also these causal perceptions

determine the emotional experience related to the results. He further argued that these effects on expectancies and affective responses have a direct effect on the motivation to perform particular behaviors.

An incredible number of causal perceptions are available in the memory, but in a situation in which the decisions made can result in success or failure, a few causal perceptions are dominant (Weiner, 1985). Three such dominant causal dimensions were proposed in this theory: locus, stability, and controllability. It has been suggested that the underlying causal dimensions might be less than these three because these have shown not to be orthogonal (Anderson, 1983a), but Weiner (1985) argues that because they are not independent empirically it does not mean that they can't be conceptually independent dimensions. On the other hand, the existence of additional attributional dimensions has been suggested, e.g., intentionality (Weiner, 1979), and globality (Abramson, Seligman, & Teasdale, 1978).

Emerging from the three dimensions specified by Weiner (1985) (i.e. locus, stability, and controllability) the most common attributions are to ability and effort. Previously attributions such as ability and effort had been related to the dimensions of locus and stability in a 2 X 2 categorization scheme (Weiner et al., 1971). Ability was thought to be internal and stable, effort as internal and unstable, task difficulty was classified as external and stable, and luck as external and unstable. Even across cultures (Triandis, 1972) it has been found that success is usually attributed to high ability and high effort, and failure is attributed to low ability and lack of effort (Weiner, 1985).

In his model, Weiner relates cognitive processes with affective and behavioral responses through the key process of ascribing causal links. In a problem solving context, the attributional process becomes of special importance because of its relevance for achievement-related settings.

Another model of attributions goes beyond the Motivation and Emotion Model (Weiner, 1985) and suggests that the attributional process is not only important in achievement-related contexts, but that individuals can be characterized as possessing particular tendencies to ascribe attributions in specific ways as part of their personality (Abramson, Seligman, & Teasdale, 1978). This is the reformulated Learned Helplessness Model.

The reformulated Learned Helplessness Model suggests that when people confront a negative event they try to explain it, and that these explanations are based on three dimensions: personalization, permanence, and pervasiveness. (To simplify the terminology it would be useful to clarify that the personalization dimension corresponds to the locus dimension, and permanence to the stability dimension, both presented in the Model of Motivation and Emotion. Pervasiveness corresponds to the term globality suggested by Abramson et al. (1978)). According to the theory individuals who attribute negative events to internal, stable, and a global causes, have greater risk for depression, health, and achievement deficits (Abramson et al., 1978; Peterson & Seligman, 1984; Seligman, Kamen & Nolen-Hoeksema, 1988; Seligman & Schulman, 1986).

The tendency to explain events in a particular way has been termed Explanatory Style. Longitudinal studies support the stability of explanatory styles through a period

of 52 years (Burns & Seligman, 1989; Nolen-Hoeksema, S., Girgus, J. S., & Seligman, M. E. P.). Explanatory styles, because of their relevance to the quality of the relationship of the individual with the world, have been related to the concepts of optimism and pessimism. This theory postulates that optimistic explanatory styles are the ones that attribute negative events to external, unstable, and specific sources, and the opposite for positive events. The pessimistic explanatory style consists of internal, stable, and global attributions for negative events, and the opposite for positive events (Seligman, 1990). Explanatory styles are individual differences (e.g. Peterson & Seligman, 1984), therefore all behaviors affected by explanations are influenced by the explanatory style of the individual.

From the social psychological perspective, a very attractive application of the personal explanatory styles has been the study of the effect of an individual's explanatory style on the behavior of others. Zullow, Oettingen, Peterson, and Seligman (1988) studied the effects of the explanatory styles of national leaders at the social level. They found that shifts towards a more optimistic style from the leader would predict more action, while a pessimistic style would predict more promotion of passivity. In another study, Zullow and Seligman (1988) argued that American voters prefer and vote for optimistic presidents. These observations agree with the literature in leadership which suggest that effective leaders are active, rather than passive (Worfford & Srinivasan, 1983), persistent leaders are evaluated more highly (Graves, 1985), and that the leader's communication style (i.e. confrontative or speculative) has effects on the communication of the group and on the perceptions of the leader orientation (Barlow, Hansen, Fuhriman, & Finley, 1982).

The research on attributional processes has already been considered in the social dilemma setting. In a field study mentioned earlier Talarowski (1982) surveyed people in the community of Santa Barbara, California, which at the moment confronted a limitation of their water resources. He found that the people who used more water attributed the causes for the drought to the people in the community and did not really believe that there was a shortage of water, while the individuals who cooperated and used less water felt that the drought represented a real shortage of the natural resource and not that it was caused by the people. These results implicate the attributional process in the decision making process within social dilemmas.

Different motivations regarding a resource dilemma have been proposed as the alternatives that influence the participants (Messick & Brewer, 1983; and Samuelson et al., 1984). These motivations are (a) self interest, (b) a desire to use the resource wisely, and (c) conformity to an implicit group norm.

In an experimental social dilemma investigation, Rutte, Wilke, & Messick (1987) looked at the effects of people-induced and nature-induced scarcities, and the type of motivations involved in the situation. In this experiment half of the subjects were exposed to a scarce resource, and the other half to an abundant resource. Within these conditions, half the subjects believed that the level of the resource was caused by the people, and the other half believed it was attributable to the environment. They found that across conditions in the abundance situation all subjects used more of the resource, but interestingly the difference between the scarcity and abundance conditions was greater in the external or environment condition than in the internal or people-induced condition.

This analysis of differences offers some insight into the effect of the attributions made about cooperative behaviors. When the problem of scarcity could be attributed to the environment then the participants used less of the resource than when the scarcity was caused by the individuals. And when the environment was producing plenty they took more than when the abundance was caused by individual restraint.

Rutte and her colleagues (1987) explained their results in terms of the normative motivations involved in each condition. They argue that different motivations are influencing the decision of the participants because of the causal attributions made. Both, internal and external attributions conditions were influenced by a desire to use the resource intelligently, but when the problem was attributed to the people (i.e. internal attributions) a motivation to conform to an equality norm was triggered. The relevance of the normative influence in the internal attribution condition can be seen as the effect of priming social norms by making salient the behavior of the other members of the group. But norms are not the only thing that attributions touch upon, the attributional process is potentially a much more powerful tool, and beliefs, emotional experience, and courses of action have been related to it (e.g. Weiner, 1985).

CHAPTER 2

Theoretical Model and Hypotheses

Moving towards a broader use of theoretical ideas of human behavior, the role of attributions in the approach to problem solving becomes of interest. The literature has already presented evidence for a relationship between individual causal ascriptions on cooperative behavior, but can another person's attributions have an impact on an individual's cooperative behavior? And, if such an effect is possible, would the legitimacy of the source moderate the impact on cooperative behavior? The model advanced here relates the attributions made by an external source to the participation on cooperative behaviors by individuals. The causal model presented through the message was to be determined in terms of the presence of the locus and stability dimension outlined by Weiner (1985). Most researchers agree on the influence of these two dimension on attributions in achievement situations (e.g. Weiner, 1985; Abramson et al., 1978). The four combinations of the levels of locus and stability (i.e. internal-stable, internal-unstable, external-stable, and external-unstable) were expected to yield different kinds of causal models. External and/or unstable attributions for failure, which have been related to action as opposed to inaction, were proposed to enhance cooperative behaviors in a social dilemma. On the other hand, internal and/or stable causal ascriptions for

failure, with an established relationship with helpless attitudes and behaviors, were expected to lead to inaction and therefore to low cooperative or non-cooperative behaviors. The causal models presented by an external source were expected to affect the behaviors of individuals in ways similar to their individually developed attributions, in different degrees according to the legitimacy of the source. According to this model the legitimacy of the source of information about the social dilemma was to affect the agreement with their perspective, and therefore the actions of the collectivity in regards to the dilemma situation. Based on the legitimacy of the source, when the source was high in legitimacy their perspective was expected to be more credible and therefore more internalized and agreed with. On the other hand, when the source of information about the social dilemma was low in legitimacy their credibility was expected to be low and therefore the internalization and acceptance of their ideas predicted to be low. The expression by a leader of a external and/or unstable attributions regarding the causes of failure in a social dilemma was expected to enhance cooperative behaviors in the collectivity, while internal and/or unstable attributions were expected to lead to inaction and selfish behaviors.

To test this model two hypotheses were developed. The first hypothesis was regarding the proposed link between the kinds of attributions present in a message and subsequent cooperative behavior by those who receive the message in a social dilemma situation. For a group of individuals confronting negative results in a social dilemma situation, if the content of an explanatory message attributed the failure to external and=or

unstable circumstances, then it was expected that the target group members would cooperate more than if the message was pessimistic in style.

The second hypothesis addressed the predicted difference in the effectiveness of the message depending on the source. If the source of the message was high in legitimacy the effect predicted in the first hypothesis, was predicted to have a stronger impact than if the source of the message was low in legitimacy. The legitimacy of the message source was expected to affect the credibility of the source and the effectiveness was hypothesized to work through a process of internalization and acceptance of the message. When the source of the message was highly legitimate more internalization of the message was predicted than when the source was low in legitimacy. A discussion of the experimental method through which these hypotheses were studied follows.

CHAPTER 3

Empirical Design and Methodology

Participants

The participants were 160 students enrolled in the introductory psychology classes at Michigan State University. Students participated in order to fulfill a course requirement.

Materials and Design

The hypotheses were investigated in a 2 x 2 x 2 factorial design. The variables manipulated were the causal models of the messages, and the legitimacy of the source of the message. The causal model of the messages was determined by the presence of the dimensions of locus (internal vs. external) and stability (stable vs. unstable). The legitimacy of the source of the message varied in terms of the process through which they were assigned to offer the message. Half of the participants went through a process of democratic elections to select a leader who would address the collectivity (high legitimacy), and the other half of the participants were told that the source would be randomly selected by the experimenter (low legitimacy).

The Explanatory Styles Questionnaire (Seligman, 1990) and Social Motivation Measure (Liebrand, 1984) were administered to the some of the students in the subject

pool for this experiment. The Explanatory Styles Questionnaire (Seligman, 1990) provided a measurement of the general optimism or pessimism of the participants. The Social Motivation Measure (Liebrand, 1984) provided a pre-measure of the tendencies of the participants regarding cooperative behavior.

The participants (1) first engaged in a social dilemma game session; (2) then they received feedback and an attributionally-laden message regarding the negative performance of the group in the first game session, (3) after this they were given the opportunity to participate in another social dilemma game session; (4) and finally they made their own attributions and will gave their own evaluation on the group and answered a manipulations check questionnaire. All the procedures were in paper and pencil. For a detailed description of the experimental procedure and instructions see Appendix A.

In order to provide some information for the election of a leader, at the beginning of the experiment the participants were asked to give a brief description of themselves by answering five questions that they found in a small piece of paper on their desk. This questions asked for their room, age, major, two hobbies, and the writing of a sentence about themselves. In the high legitimacy conditions the participants later received a copy which presumably contained the information of the other group members (see Appendix B), and based on this they voted for a group leader. The participants in all the conditions answered the four questions at the beginning of the experiment, but only the participants in the high legitimacy conditions used them for the election.

Social dilemma game sessions. The social dilemma to which the participants were exposed was one of natural resources scarcity. In each game session the participants had

the opportunity to take from a shared resource, one opportunity per year, for fifteen years. The materials for each game session included a summary sheet of the characteristics of the resource and other natural conditions affecting it (see Appendix C), a blank sheet for calculations, and fifteen (15) computer bubble sheets, in which the participants entered the number of their group (which served as a subject identification number), the session number (1 or 2), the number of the year (1 to 15), and the amount of the resource that they took for that year.

Feedback and message. After the first social dilemma game session, the participants received feedback indicating that the community failed to maintain the resource for the whole fifteen years. This feedback was in the form of a graphic, presumably provided by a computer, in which the participants saw how the community depleted the common resource by the eight year of using it. This graphic also included a list of their potential earnings per year which corresponded to the amount of the resource that they took each year (see Appendix D).

After receiving the feedback they received a message which came from, either the elected source or from a randomly selected source, depending on the condition. This message was in the form of a checklist followed by a written message from the indicated source. Appendix E is the checklist received by participants in the high legitimacy conditions, and Appendix F is the one received by participants in the low legitimacy conditions. The sheet had a list of sixteen (16) alternative attributions for the failure of the group. This checklist constituted the causal model manipulation. The causal model of the messages was determined in terms of the presence of the locus and stability

dimensions in causal attribution statements, and the written message was basically a paraphrasing of the content of the items corresponding to the condition. For each one of the combination of causal attribution dimensions (i.e. internal-stable, internal-unstable, external-stable, external-unstable) there were four items, which, depending of the condition, were the ones marked as the selection of the member sending the message. The items used in the attributions checklist were selected as the most fitting for each dimension by eleven (11) independent judges. At the bottom of the page there was space for comments and all the conditions received the same neutral comment reminding the participants of their task, followed by a sentence paraphrasing the causal attributions exposed in the checklist according to the condition. The neutral message read: *"Since we all benefit if we keep the lake, we should try to keep it as long as possible."* For the attributions and messages corresponding to each condition see Appendix G.

Manipulations check. After the second session of the social dilemma game the participants were asked to use one of the attributions checklist to enter their selections of attributions for the failure in the first game session (see Appendix H), and to fill a manipulations check questionnaire (see Appendix I).

Procedure

The experimental sessions required the presence of five (5) participants, who were individually greeted, and asked to be seated in one of the available rooms. In each separate room there was a desk and a chair. On the desk the participants found a pencil, a consent form, and a folder with the background questions, summary sheet, fifteen (15) bubble sheets, and the blank sheet for calculations. As they were greeted, they were asked to read, sign, and turn in the consent form with their experiment credit card. Once all the participants were in their respective rooms and had turned in their consent forms with their experiment credit cards, the experimenter instructed them to open the folder and answer the questions in the small piece of paper.

Social dilemma simulation. The participants were asked to consider themselves as part of the five (5) members community of Blue Valley, a center for the growing of corn. Blue Valley was presented as a simulation of a real farming community with a water scarcity problem. The cover story of the simulation of the real community served best as the explanation for the changing patterns of the weather.

The dilemma was set as follows. Most of the rainfall in Blue Valley occurred during winter time, therefore during the farming season the community depended completely on Blue Lake for all its irrigation water. The unit of measurement of the resource was to be the gallon, and their productivity was measured in tons of corn. The participants were informed of the amount of water available in the first year, the approximate range of likely rain in a year, the rate of the process of evaporation depending on the level of the water, the minimum and maximum levels of production, the

amount of water and land needed to make a profit at farming, and the value of their individual productions. After receiving this information through recording and a written summary, they were asked to specify the amount of water that they wanted to use for each year, and the average amount of water they thought the other members in the group were taking, for fifteen (15) consecutive years. They entered this information in a sheet for each year.

The participants were provided with a monetary incentive. For every ton of corn that they produced they had a potential gain of ten dollars ($10.00). At the beginning of the experiment the participants were told that the potential monetary gain in a future lottery could amount to one hundred dollars ($100.00). The amount of water that they took each year represented a potential monetary gain in the lottery. The entries in the lottery were each one of the taking trials, in which the maximum possible amount of water to take is enough to grow ten tons of corn, amounting to the potential gain of one hundred dollars ($100.00).

Social dilemma game. The social dilemma game sessions was constituted by fifteen (15) trials in which the participants had the opportunity to use the natural common resource. Before they actually engaged in the experimental trials they listened to a recording that introduced them to the social dilemma task, the particular characteristics of the natural resources and the situation of their community. The participants were asked to think of their group as a community of farmers sharing a water supply, and each trial represented a year in which they had the opportunity to take the amount of water they wanted to

achieve their individual economical goals, taking in consideration the general needs of the community.

Feedback, election and message. Once they had finished these fifteen (15) trials they received feedback indicating that their group failed in sustaining the common resource. With this feedback they also receive a summary of their potential earnings based on the amount of the resource the community took in each trial. The failure feedback lead to the second part in which the participants in the high source legitimacy conditions were asked to elect a community leader ostensibly based on a photocopy of the descriptions of other members of the group. After this they were told that one of them, always the person that each one voted for, had been elected as a leader and that he would proceed to send a message to the group. On the other hand, the participants in the low source legitimacy conditions were told that one of them has been randomly selected (always another) to examine and comment on the group's performance. The rest of the procedure was the same as for the high legitimacy condition. After this, election/selection procedure the participants received the message, presumably from the elected leader or from the randomly selected member. Once they received the message the subjects had another opportunity to participate in the social dilemma game for another fifteen (15) sessions.

Manipulation check and debriefing. After they finished the second session the experimenters administered the attributions checklist and the manipulation check questionnaire. The attributions checklist was the same instrument used to communicate the causal model presumably developed by the external source previously, but on this occasion the participants were asked to enter their own attributions for the failure in the

first session. The manipulation check questionnaire investigated opinions about the message and the source of the message. After the completion of the questionnaire the participants were excused and debriefed individually in order to guarantee their anonymity. The debriefing information appears in Appendix J.

CHAPTER 4

Empirical Results

The experimental session provided three main data sources. The participants engaged in two identical social dilemma game sessions [one before (session 1) and the other after (session 2) the causal model manipulation], and the third data source was the manipulations check.

Pre-Experiment Data

Besides the experiment other sources of information were the Social Motivation Questionnaire, and the Explanatory Styles Questionnaire, which were administered before the experiment session to part of the subject pool. The administration of these questionnaires was deficient, yielding a very low number of subjects that both took the questionnaires and participated in the experiment. Only 32 of the 160 experiment participants answered the Social Motivation Questionnaire, and because of the uneven distribution in experimental conditions the data were not useful.

The way in which the individual level of cooperation was studied was through and Analysis of Variance of the harvesting behaviors after the message manipulation by the harvesting behaviors before the message manipulation. The level of cooperative behaviors during the pre-manipulation session were determined by a median split of scores. The

median of the scores for the first session was 327 gallons of water. A main effect for the initial level of cooperation was found ($F(1,169)=50.427$, $p<.001$). The participants that cooperated more during the pre-manipulation session cooperated more (i.e. took less water) during the post-manipulation session ($M=179.17$), than did the participants that cooperated less during the first session ($M=285.42$). Interactions of the original levels of cooperation with the content of the message were not found.

The Explanatory Styles Questionnaire was completed by a total of 67 experiment participants. Surprisingly 46 out of the 67 participants fell in the "very pessimistic" range of scores according to the scale developed by Seligman (1990). Of the other participants, 14 were classified as "moderately pessimistic", 4 as "average", and 3 as "moderately optimistic". None of the participants fell in the "optimistic" and "very optimistic" categories. Because of the low variability in this categorization no further analyses were performed with these data.

Manipulations check

A Factor Analysis on the post-experiment questionnaire was performed to examine the effectiveness of the manipulations of attributional dimensions and legitimacy of the source of message. The resulting three factors were studied in terms of their correspondence to the manipulations of interest. The three factors were labeled task evaluation of source of message (Eigenvalue=2.93472), agreement with and realism of the source of message (Eigenvalue=1.84714), and internal-external attributions (Eigenvalue=1.28236). Other questions addressed the stable-unstable attributions, liking of the source, optimism of the source, and optimistic feeling of the participant. Table 1

presents the factors that resulted from the analysis, the questions that loaded in each factor, and their respective weights.

Table 1: Factor Analysis of Manipulations Check Questionnaire

Items[1]	Analyst's Task Evaluation	Agreement and Realism of Analyst	Internal vs External
How much did you agree with... the message...?	.33838	**.69394**	-.11361
Was this analysis... realistic?	.06905	**.83449**	.05449
How much would the person who sent the message think that it was something about the particular group...?	-.09239	.15177	**.81765**
How much would the person who sent the message think that ... the community would be likely to fail in most other tasks too?	-.27396	.12836	.68994
How much did the person who sent the message consider the environment responsible...?	-.24982	.19644	**-.70275**
How much would the person who sent the message think that the causes... could be changed in a later session?	.02343	-.03239	.01920
How much did you like the person... who ...sent the message?	.43866	.49323	.12555
How optimistic ... the person who sent the message is?	.12172	.16957	-.17852
Do you think this person did a good job?	.78911	.32047	-.00610
Would you have rather had another person evaluating...?	**-.88367**	-.12023	.06487
How optimistic did you feel ...?	.06500	.48132	.05077

[1] For the exact wording of the items in the manipulations check questionnaire see Appendix I.

Analysis of Variance of the indices by the independent variables of locus, stability, and legitimacy of the source of the message were performed. The task evaluation of source of message index was formed by averaging the two questions addressing the quality of the job and the subject's position regarding a change of source of message (see Table 1). For this task evaluation factor, a main effect for source of message was found, $F(1,144)=6.405$, $p<.012$. On a scale of 1 (very good) to 5 (not at all) leaders were evaluated more positively (M=2.53) than randomly assigned members (M=2.91) in performing their analyzing task.

The agreement with and realism of the source of the message factor was based on two questions which inquired about agreement with the message, and asked for an evaluation of the realism of the message respectively (see Table 1). In a scale of 1 (very good) to 5 (not at all) participants in the high legitimacy conditions agreed more with their source and evaluated their message as more realistic (M=2.65) than did the participants in the low legitimacy conditions (M=2.79) ($F(1,156)=4.31$, $p<.040$).This finding suggests different degrees of likability and credibility due to the level of legitimacy of the source. The reported opinions of the individuals who democratically agreed upon the source of the message were closer to the opinions of their source that were the opinions of the individuals who received a message from a randomly assigned source.

In the post-experiment questionnaire various questions were designed to assess the perception of the internal, external, stable, and unstable attributions for the causes of

failure during the first session of taking water out of the lake. The two questions designed to measure the perception of internal vs external attributions in the messages loaded significantly on the factor labeled internal-external attributions. These questions are presented in Table 1. A main effect for locus was found ($F(1,146)=28.91$, $p<.001$). On a 1 (very much) to 5 (not at all) scale, participants in internal conditions evaluated the attributions made by the source as more internal ($M=2.58$) than did the participants in the external conditions ($M=3.40$), showing that the internal-external attributions manipulations worked as expected. Also a main effect for legitimacy of the source of the message was found ($F(1,146)=6.04$, $p<.015$). When the message was received from a high legitimacy source the participants perceived less internality in the attributions ($M=3.24$) than did the participants in the low source legitimacy conditions ($M=2.82$). These findings contribute to the understanding of the effect of the legitimacy of the source of the message. Not only is the opinion of the source higher in legitimacy agreed with more, but his opinions were evaluated under a different light. The elected leaders were seen as less likely to blame the group than was any other group member.

The answers to the two questions designed to measure the effectiveness of the stability dimension manipulation did not correlate highly enough to be classified as a distinct factor in the Factor Analysis. Only the question addressing the perception of unstability in the attributions, that is, the possibility for change in future situations resulted in significant variance in the answers according to conditions. On the 1 (very much) to 5 (not at all) scale measuring unstability there was a main effect of stability. Perceptions of unstability were greater in the unstable conditions ($M=1.90$) than the stable

conditions (M=2.75) (F(1,156)=25.51, p<.001). The manipulation of unstability in the attributions was perceived by the participants as intended. A main effect for locus was also found for this question. Participants in the internal conditions perceived the unstable attributions to be more unstable (M=2.06) than did the participants in the external conditions (M=2.61) (F(1,156)=10.18, p<.002). These results indicate some dependence between the manipulations of stability and internality. The locus of the attributions seem to have had an effect of the perception of stability in the messages. The more internal were the message source's attributions, the less stable they were perceived to be. A two way interaction of locus by legitimacy of the source (F(1,156)=5.39, p<.022) was also found. Figure 1 shows the graphic plot of this interaction. Within the high legitimacy conditions, the participants in the internal condition (M=1.85) perceived the attributions made by the source as significantly more unstable than did the participants in the external condition (M=2.84) (F(1,156)=17.38, p<.001), but not in the low legitimacy conditions.

For the stability measure a significant three way interaction between stability, locus and legitimacy of the source was also found (F(1,156)=15.093, p<.001). Figure 2 shows the means and a graphic plot of the interactions. In the high legitimacy conditions the participants in the stable and external condition evaluated the attributions they received as being more stable (M=3.56) than did the participants in the stable and internal condition (M=1.95) (F(1,156)=24.98, p<.001). This trend was not present in the low legitimacy conditions. On the other hand, in the low source legitimacy conditions the participants in the unstable and external condition evaluated the attributions as more stable (M=2.32) than did the participants in the unstable and internal condition

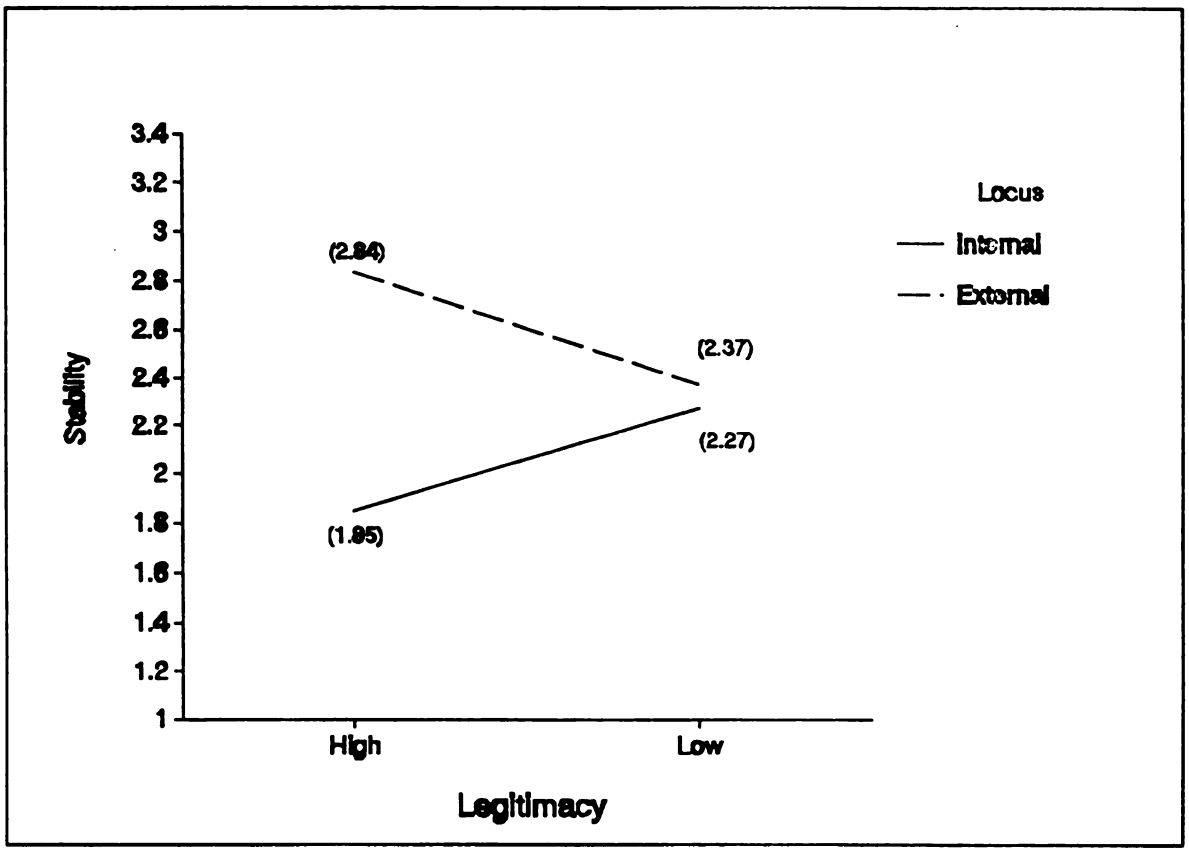


Figure 1: Two-Way Interaction Between Locus and Legitimacy of Source

(M=1.65) (F(1,156)=4.08, p<.025). No simple effects for the unstable conditions were found within the high legitimacy conditions. Clearly, the effect of the stability manipulation was not independent of the locus and role manipulations.

The liking of the source by the participants was looked at through the question: "how much did you like the person who made the analysis and sent the message?", which was answered on a 1 (very much) to 5 (not at all) scale. The analysis of variance on this questions showed marginal main effects for the locus and for the legitimacy of the source variables. The marginal main effect for locus (F(1,156)=2.93, p<.089) suggested that the

individuals in the internal conditions liked the source of the message slightly more (M=2.63) than did the individuals in the external conditions (M=2.82). The marginal main effect for the legitimacy of the source variable (F(1,156)=.062) suggested that the participants in the high legitimacy conditions liked the source of their message slightly more (M=2.62) than did the participants in the low legitimacy conditions (M=2.83). There was a marginally significant two way interaction between the variables of locus and stability (F(1,156)=3.73, p<.055). A simple effects analysis showed that within the external conditions the participants in the stable conditions liked the source significantly more (M=2.44) than did the participants in the unstable conditions (M=2.88) (F(1,156)=6.81, p<.01), while in the internal conditions the level of stability did not affect the participants liking of the source of the message.

The optimism of the person who sent the message as perceived by the experimental participants was measured through the question: "how optimistic a person do you think the person who sent the message is?". This question was answered on a 1 (very much) to 5 (not at all) scale. An ANOVA yielded a main effect for stability (F(1,154)=27.48, p<.001). The means show that the participants in the stable condition thought that the source of the message was significantly less optimistic (M=3.08) than did the participants that received unstable attributions in their message (M=2.32). Although the other factors did not show main effects, there was a significant three way interaction found (F(1,154)=12.28, p<.001). Analysis of simple effects uncovered that within the low source legitimacy conditions the participants in the stable conditions perceived the source as more optimistic when the attributions were external (M=2.67) than when the

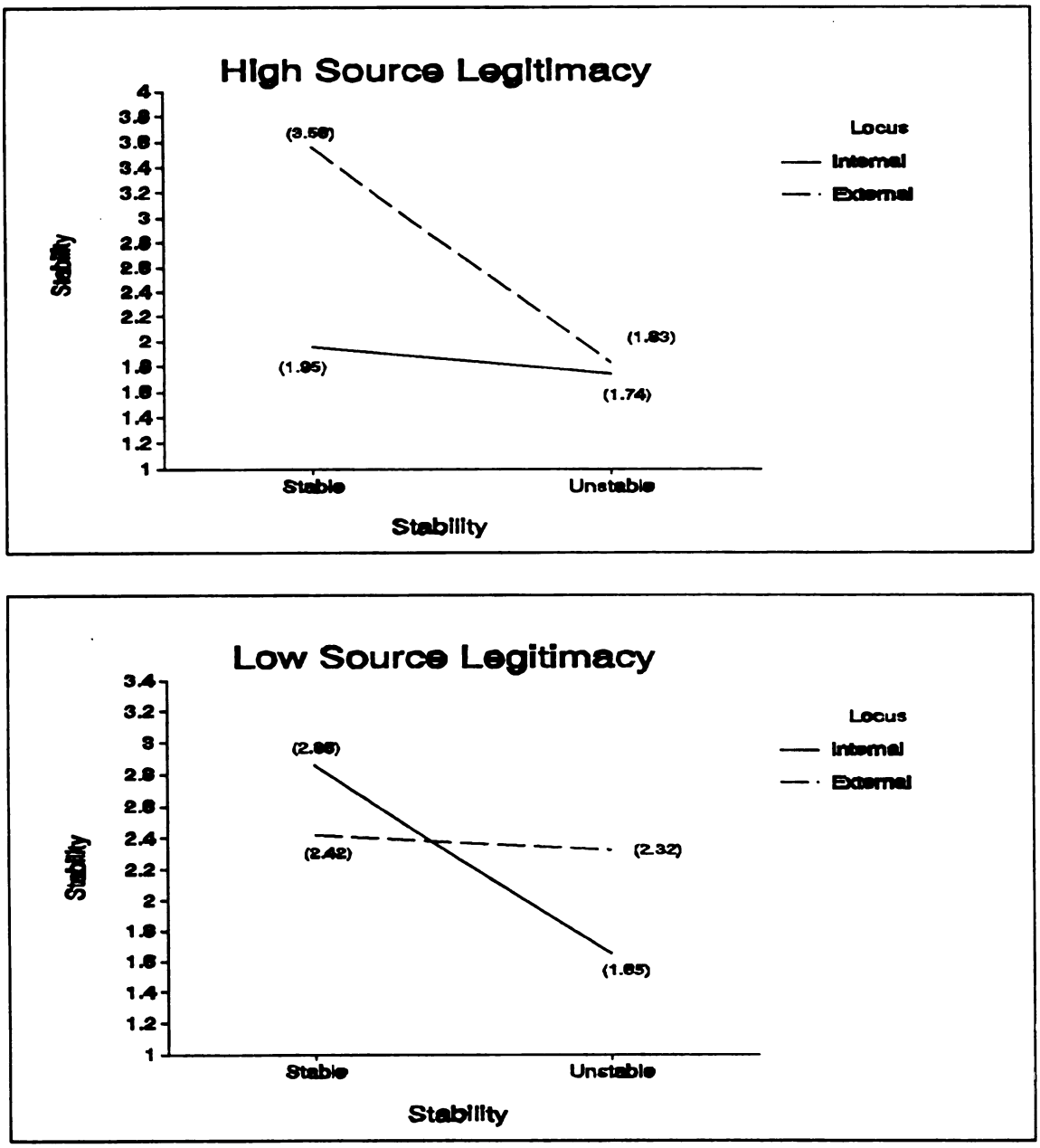


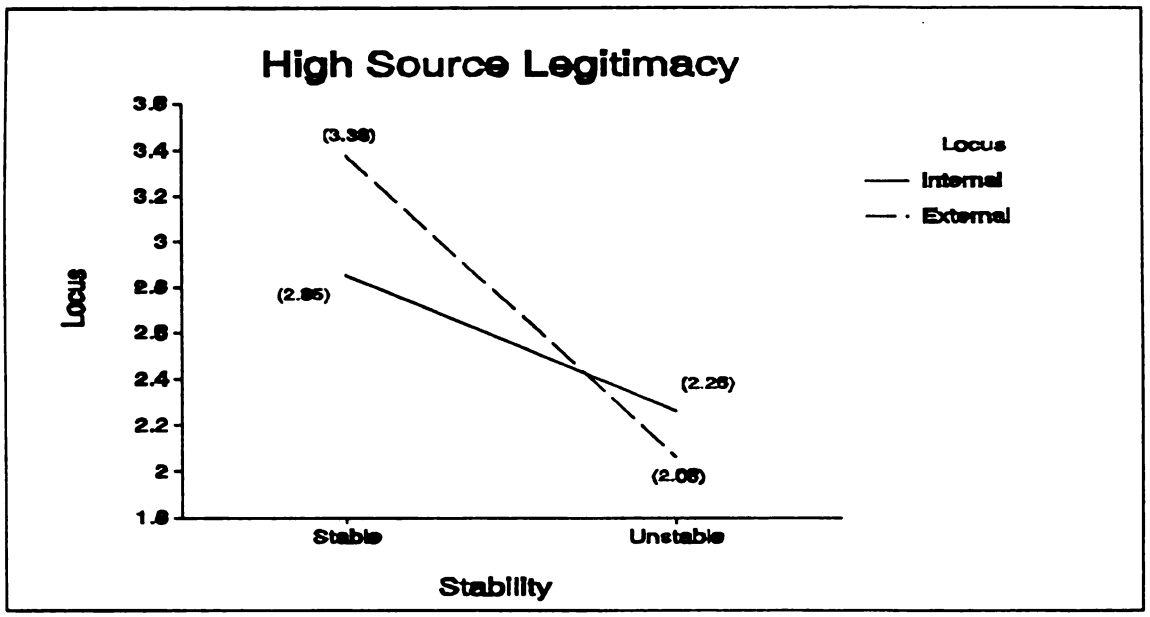
Figure 2: Three-Way Interaction Between Locus, Stability and Legitimacy of Source

attributions were internal (M=3.33) ($F(1,154)=48.14$, $p<.001$), while in the unstable conditions the participants thought of the source as more optimistic when the attributions were also internal (M=2.10) than when the attributions were external (M=2.77)

($F(1,154)=5.36$, $p<.025$). In the high source legitimacy conditions the level of the locus variable did not have significant effects over the stability main effect mentioned previously. Graphic representation of these interactions is presented in Figure 3.

The last area covered by the manipulations check questionnaire was the feeling of optimism of the participants during the experiment. This question read: how optimistic did you feel during the second session of 15 years that the lake would not be completely used up? As the other questions this one was to be answered in a 1 (very much) to 5 (not at all) scale. An ANOVA on the scores of this question showed a significant two way interaction between the variables of stability and legitimacy of the source of the message ($F(1,144)=6.85$, $p<.01$). Simple effects analysis showed two effects. First within the high legitimacy conditions participants in the unstable conditions were more optimistic ($M=2.39$) than were the participants in the stable conditions ($M=2.95$) ($F(1,144)=4.72$, $p<.05$). The second effect was within the stable attributions conditions the individuals that were in the low legitimacy conditions were significantly more optimistic ($M=2.46$) than were the participants in the high legitimacy conditions ($M=2.95$) ($F(1,144)=3.94$, $p<.05$).

The attributions checklist was analyzed by creating clusters of attributions pertaining to each end of the dimensions of locus and stability. This attributions checklist was administered to the participants after the second session of taking water from the lake was over, and the task was to enter their personal explanations for the failure during the first session.



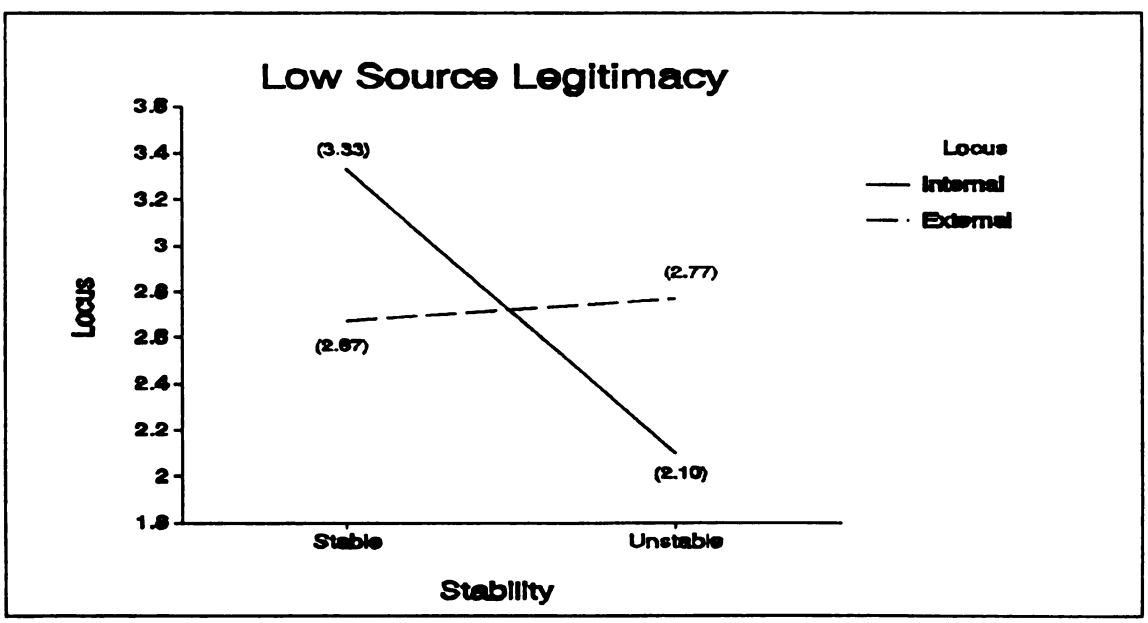


Figure 3: Perceived Optimism of the Source of the Message

The sixteen (16) items to which the participants were exposed were four-items sets, formed by the four possible combinations of locus and stability attributions (i.e. internal-stable, internal-unstable, external-stable, external-unstable). Four clusters

were created: internal, external, stable, and unstable attributions, each cluster with eight items (e.g. the internal cluster included the internal-stable and the internal-unstable items). A list of the items for each cluster is shown in Table 2. A cluster value was calculated for the participants by giving a one (1) point value to the items from their respective condition clusters that were selected, and a negative one (-1) point for every item from the opposite clusters that was selected. The sum of these points was the cluster value for the participant. For each of these cluster values Analyses of Variance were performed to examine if patterns in the selection of attributions was related to the causal model to which the participants were exposed.

A main effect for locus was found for the internal cluster ($F(1,162)=22.961$, $p<.001$). Out of eight opportunities the mean selection of internal attributions in the internal condition was of 1.67, while in the external condition the selection was of -1.79 on average. For the external cluster a main effect for locus was also found ($F(1,169)=24.419$, $p<.001$). In the external conditions external attributions were selected 2.69 in average, while participants in the internal conditions selected these attributions -.89 out of eight opportunities.

A main effect of stability was found for the stability cluster ($F(1,162)=12.711$, $p<.001$). Participants in the stable conditions selected the stable items -.14 times out of eight chances, while the mean for the unstable conditions was of -1.76 items. Even though the difference was significant the selection of stable items was not popular.

Table 2: Attributions Checklist: Attributions Dimensions Clusters

Explanatory Styles Dimensions	Attributions Checklist Items
Internal	We were all being selfish out of inexperience with the task. We are just not good as a community. We just need to try harder not to use up the lake. We keep making dumb decisions. We didn't understand what we had to do to keep the lake going. I think that we can't seem to understand how we're supposed to use the lake. I think that we were not motivated enough. We are all too greedy.
External	We all need the water, but because some years were really dry, we got into trouble. This task is very difficult. There's just not enough water in the valley for all the farmers to do well. The lake is too small for all of us to share. It is hard to tell when and how much will it rain. It all depends on the weather. We are just having bad luck with too many years with low rainfall. Growing corn just doesn't pay enough profitable in this valley. The task is complicated, but it should get easier with practice.

Table 2 (cont'd)

Explanatory Styles Dimensions	Attributions Checklist Items
Stable	We are just not good as a community. This task is very difficult. There's just not enough water in the valley for all the farmers to do well. We keep making dumb decisions. I think that we can't seem to understand how we're supposed to use the lake. We are all too greedy. There's just not enough water in the valley for all the farmers to do well. The lake is too small for all of us to share. Growing corn just doesn't pay enough profitable in this valley.
Unstable	We were all being selfish out of inexperience with the task. We just need to try harder not to use up the lake. We didn't understand what we had to do to keep the lake going. I think that we were not motivated enough. We all need the water, but because some years were really dry, we got into trouble. It is hard to tell when and how much will it rain. It all depends on the weather. We are just having bad luck with too many years with low rainfall. The task is complicated, but it should get easier with practice.

For the unstable cluster of attributions a main effect for stability was found ($F(1,162)=7.068, p<.009$). Participants in the unstable conditions significantly selected more the unstable items ($M=2.4$) than did the participants in the stable conditions ($M=1.14$).

The participants showed a clear tendency to select the items within the causal model proposed by the external source of the message as their personal attributions for the failure. A marginal main effect resulted for the locus dimension within the unstability cluster ($F(1,162)=3.479$, $p<.064$), which shows the participants in the internal condition with a higher tendency to select unstable items ($M=2.22$) than the participants in the external conditions ($M=1.32$). No effects for the source of the message were found. Exists the possibility of influence of the timing (i.e. after the second session) of the administration of the checklist. Overall the experiment was complicated and long, and the participants may have been tired, a factor that may have influenced the fact that the participants checked the items most familiar to them. The participation on a second session of social dilemma game, in which they had the opportunity to improve their previously failing acts, before presenting their personal attributions may have also influenced their answers.

In general the attributional manipulations resulted not only in recognition of the particular causal model presented by an external source, but also in the selection of items representative of their respective conditions as their personal explanations for the failure in the social dilemma task. Still the manipulation of stability was not completely independent as shown by the pattern of interactions with the manipulation of internality.

The manipulation of internality moderated the perception and preference of the manipulation of stability in the attributions. Regarding the legitimacy of the source of the message, the results showed interesting patterns of interactions with the particular attributional styles. Most significantly, the legitimacy of the source of the message seemed to have moderated the interpretation of the manipulations of internality. Participants who received the message from an elected leader generally perceived the attributions as more external and unstable than did the participants in the randomly assigned source conditions.

Experiment results

During one session of drawing water from the lake the participants had fifteen opportunities to take from 0 to 500 gallons water per trial. Cooperation in this social dilemma game was measured in terms of the amount of water taken during each trial. The amount of water taken in the trials was averaged within each of the two sessions for each participant.

To study the effect of the message manipulations on the cooperative behaviors of the participants, an Analysis of Variance was performed to study the impact of the variables locus, stability and legitimacy of the source of the message during the second session of drawing water form the lake. Main effects for locus and stability were found, while the legitimacy of the source of the message had no main effect on the cooperative behavior of participants. Participants in the internal conditions cooperated more, that is, took less gallons of water (M=217.44) than the participants in the external conditions (M=260.09) ($F(1,156)=6.778$, $p<.01$). This results run opposite to the first hypothesis.

Internal attribution, which the Learned Helplessness Theory interpret as more pessimistic, yielded more cooperative behavior than did the external attributions, interpreted as more optimistic.

A main effect for stability was also found ($F(1,156)=7.801$, $p<.006$). Participants in the unstable conditions cooperated more ($M=217.62$) than did the participants in the stable conditions ($M=262.56$). This results agree with the first hypothesis, since the participants that were exposed to the more optimistic attributions, in terms of stability, cooperated more than did participants that received more pessimistic information.

To study potential behavioral trends within the 15 trials session of taking water from the lake an analysis by blocks of trials was performed. The second session was divided in three sequential blocks, each one formed by five trials. The three blocks from the second session of taking water from the lake were studied through a repeated measures multiple analysis of variance. This analysis showed significant between subjects effects for the variables of locus ($F(1,156)=6.52$,$p<.012$) and stability ($F(1,156)=7.85$,$p<.006$), but not for the source variable. There were no significant within subjects block effects.

The pre-manipulation game session was analyzed to check the effectiveness of random assignment. An Analysis of Variance of session 1 by the variables of locus, stability, and legitimacy of the source of message was performed. A main effect for stability was uncovered ($F(1,161)=4.29$, $p<.04$). During session 1 the participants in the unstable conditions took significantly less of the resource ($M=300.04$) than did the participants in the stable conditions ($M=331.88$). The individuals were randomly assigned

to the conditions in which they participated and they had not yet been exposed to the failure feedback and attributional message, therefore this difference is plausibly attributed to chance. Because of these results the data from this first session was used in further statistical analysis to control for the variability existing previous to the causal model manipulations.

In order to take into consideration the selection confound an Analysis of Variance of the difference between the amount of water taken during the first session and the amount taken during the second session was performed. For this analysis the dependent variable was the amount of water taken during session 1 minus the amount taken during session 2 of the social dilemma game. The higher the difference, the higher the level of cooperation during the session following the attributions manipulation.

The Analysis of Variance of the difference between the first session of taking water from the lake and the second session resulted in a main effect for locus but not for stability. The difference between the first session and the second session was larger for the internal conditions (M=92.82) than for the external conditions (M=62.59) ($F(1,155)=5.440$, $p<.021$). This analysis also resulted in a marginal two way interactions of locus by legitimacy of the source ($F(1,155)=3.576$, $p<.06$). Simple comparisons analysis showed that the locus effect was stronger in the low legitimacy conditions ($F(1,155)=8.73$, $p<.01$) where individuals in the internal conditions took in average 102.34 gallons of water less in session 2 than in session 1. On the other hand, within the member conditions this difference in the external condition was only of 47.94 gallons of

water. The other simple effect was not significant (F(1,155)=.1055, p>.25). The means and graphic plot for this interaction are presented in Figure 4.

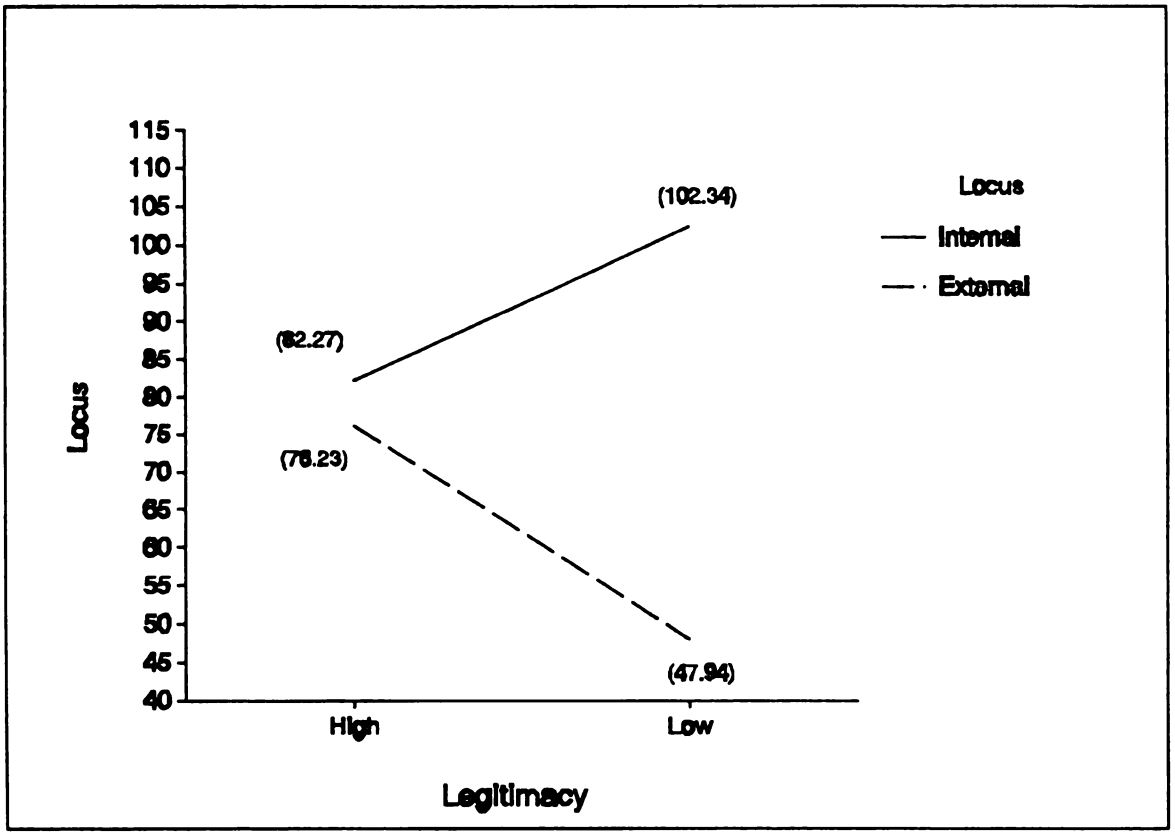


Figure 4: Difference in Cooperation Between Session 1 and Session 2

An Analysis of Covariance of Session 2, with Session 1 as a covariate, yielded similar results to the Analysis of Differences.

To further study the impact of the legitimacy of the source on the reception of the message the credibility of the source was controlled for in an Analysis of Covariance of the difference between the first session and the second session scores. The credibility data was taken from the *Agreement With and Realism of the Source* factor resulting from the manipulations check questionnaire. The analysis showed that once the variability

brought in by the credibility of the source was controlled, not only was the locus by source interaction not significant ($F(1,161)=.479$, $p<.49$), but also the main effect for locus in the message content disappeared ($F(1,161)=1.996$, $p<.16$). These results suggest that the credibility of the source had a mediating role in the reception and behavioral response to the message.

CHAPTER 5

Discussion of Results and Practical Implications

In this empirical work the general goal was to study the enhancement of cooperative behaviors with a model that incorporated principles from the structural and normative approaches to solving social dilemmas. The work on personal attributional styles and motivation was used as a framework for studying the effects of belief systems offered by structure agents or leaders on cooperation. Two hypotheses were researched, one addressed the relationship between achievement related attributions and cooperation, and the other looked at the impact of the source of the attributions on the participants.

The first hypothesis proposed that after failure in a resource scarcity situation, external and/or unstable failure attributions from an external source (i.e. not the self) would yield higher levels of cooperation from the participants than would internal and/or stable causal ascriptions for failure. Contrary to expectations, the external and/or unstable attributions did not result in the highest level of cooperation. Rather, internal attributions yielded more cooperation from the participants than the more external attributions, in the resource scarcity dilemma. It seems that being personally blamed for failure (i.e. internal attributions) by an external source in this group task did not develop helplessness and thus encourage inaction. Rather, the individuals whose failure had been attributed to

themselves engaged in more cooperative behavior. Besides laying the blame on the group members, the internal attributions seem to have allowed for control of the fate of the scarce resource and the community, as opposed to external attributions which put all responsibility on the environment. To a certain extent, external attributions may have promoted helpless attitudes and behaviors. When the task of the source is to promote cooperative behaviors, the communication of potential control over the problem may be fairly relevant.

The finding that internal attributions overall yielded higher levels of cooperation than the external attributions suggests that in a social dilemma situation the degree to which the individuals have a sense of control over circumstances collectively shared may affect the individual level of motivation to solve the problem. The kinds of attributions that have been related to helplessness and inaction in competitive situations resulted in the highest levels of cooperative behaviors.

Weiner (1985) in his Theory of Achievement Motivation and Emotion called for a distinct dimension of attributions which he named controllability. This dimension is conceptually, but not empirically, independent from the locus and stability dimensions, the two most agreed about by researchers. The controllability dimension was developed to address the individual's volitional control over certain circumstances. Weiner distinguishes the locus and stability dimensions from the controllability dimension arguing that optional control may be found in any combination of the locus and stability dimensions. For example, causes may be internal and stable and still under optional control (e.g. laziness). Attributions related to this controllability dimension may be of

particular relevance to the explanatory process and behaviors involved in social dilemmas.

Wortman and Brehm (1975) developed a model integrating the Reactance Theory and the Learned Helplessness Theory. These two theories predict contradicting implications for the perceptions of lack of control. The theory of psychological reactance (Brehm, 1966, 1972) predicts that when a person's behavioral freedom is threatened, he or she will be motivated to restore freedom and control. On the other hand, as discussed previously, the Learned Helplessness Theory (Seligman, 1975) argues that exposure to low or no control situations encourages passivity and helplessness. The Wortman and Brehm model clarifies the temporal focuses of these two theories. The Reactance Theory is not concerned, as Learned Helplessness, with general feelings of control, but rather with control over particular outcomes. Social dilemmas are generally overwhelming situations that last for very extended periods of time, but this factor was not addressed in the experiment presented here. Rather, the participants were only briefly exposed to this dilemma, therefore the possibility for generalization of helplessness was minimal.

Regarding the stability dimension of the attributions, the effects of this manipulation were clouded by an non-equivalence of subjects to conditions most plausibly attributed to chance, evidenced in the significantly high level of cooperation in the unstable conditions before the attribution manipulation was introduced. When this error of chance was controlled through an Analysis of differences between harvesting behaviors in session and the behaviors in session 2, the level of stability of the attributions did not significantly affect the cooperative behaviors.

The literature on achievement related attributions and motivation has consistently found relevant effects for the stability dimension of causal explanations (Weiner, 1985; Abramson, et al., 1978). For example, Dweck (1978) when studying the development of explanatory styles in children, found that internal and stable failure attributions led to poorer academic performance than internal and unstable attributions. Similar results for the stable attributions have been found in other achievement related situations such as competitive sports (Seligman, Nolen-Hoeksema, Thornton, & Thornton, 1990). The stability manipulation in the experiment presented here was not very strong or unequivocal, as reflected by the post-experiment questionnaire. It could still be that the temporal dimension of failure attributions is not as relevant as the locus dimension is for cooperative behaviors in social dilemmas, but based on the experimental procedure another potential explanation was developed. The experimental context may have affected the relevance of the stability variable. The information that the participants, and presumably the message's source, received was fairly limited since they had only participated in one session as part of this resource scarcity problem. The stability attributions may have been discounted because the person that analyzed the situation and emitted the message had information limited to only one session about the situation and about the other participants. The participants may have assumed that the source of the message did not have enough information across time in order to derive such temporal attributions.

A stronger and clearer manipulation of the stability dimension of attributions could potentially contribute to a better understanding of the factors affecting the motivation to cooperate.

The second hypothesis made reference to the legitimacy of the source of the message, suggesting that an elected leader would be more effective at promoting cooperation than would a randomly selected member of the group. The results uncovered patterns more complex than those predicted.

Research on causal attributions (Weiner, 1985), and the explanatory styles approach to helplessness developed in the reformulation of the Learned Helplessness Theory by Abramson and others (1978) and Seligman (1991) specifically addresses the relationship between attributions created by an individual and his or her effectiveness in achievement related behaviors. Based on these theories, predictions were made regarding the effects of attributions made by sources external to the individuals. In doing this, the credibility and acceptance of the attributions was assumed. However, attributions made by the self should hold the highest level of credibility when compared to any other source. In this empirical work the credibility of the source of the message was indirectly manipulated through the legitimacy of the source recognized by the participants. Some of the most interesting results of this research were found in the relationship between the credibility of the source and the behavioral response to the attributionally laden message. Across various analyses the credibility of the source interacted (marginally) with the internal vs external attributions. The results show a complex trend in which the

effectiveness of the internality of their attributions is moderated by the legitimacy of the source.

Messick & Brewer (1983) and Samuelson (1984) outlined three motivations in social dilemmas: self interest, desire to use the resource wisely, and conformity to a group norm. Experimental work on social dilemmas has suggested that internal attributions trigger conformity to an equality norm resulting in more cooperative behaviors (Rutte, et al., 1987). The interpretation of the results found by Rutte and her colleagues was that both, internal and external attributions influenced the interest in using the resource intelligently, but that internal attributions also primed a social norm for conformity, as the behaviors of others were made salient. The results of the empirical work presented here suggest the possibility of other motivations in response to the attributional process. A self-interest motivation may explain these findings. The behavioral response to the internal attributions suggests the possibility of reactance to the message as a way to protect, defend, or sustain a positive self-image. When the message was emitted by a low credibility source, the participants may have been attempting to behaviorally contradict his attributions which characterized the group as responsible of the failure in the task. By contradicting or challenging this negative internal attributions they are actually suggesting a motivation to protect a positive image they may hold about themselves. This interpretation is bolstered by the interaction between the locus of the attributions and the legitimacy of the source of the message. In general, the low credibility source, when expressing internal attributions, was more effective in the encouragement of cooperative behaviors than was the higher credibility source. If participants that received internal

attributions were attempting to contradict the message by engaging in high levels of cooperative behavior, the credibility of the source should have an effect on the amount of challenging behaviors directed towards it. In the analysis of the manipulation checks, it was found that randomly assigned group member had less credibility in the eyes of the participants than did the elected leaders. The unflattering opinions of the low credibility source were more subject to refutation and contradiction than the opinions of the leader who was elected and a higher credibility source. Thus, this source of message interaction effect supports the logic of the original hypothesis because the leader's message may have been more accepted and less challenged than was the message of the group member.

Future Research

The experimental design used to study these hypotheses did not include a control condition in which the participants receive no message from any external source. It would be interesting to look at the attributions created by the individuals in social dilemma situations and their effects on cooperative behaviors. In terms of the credibility variable, it would be interesting to observe the differential impact of highly credible attributions derived by the individual and attributions acquired from an external source lower in credibility. The research here suggests that when working on social dilemma situations, purely optimistic external messages instead of encouraging action and cooperation, may result in inaction and helplessness, especially if the source is not credible. However, if the source is sufficiently credible the opposite and originally predicted result might be expected. Causal attributions for the level of achievement in a social dilemma, when developed by the self, should result in the levels of motivation

predicted by the Model of Motivation and Emotion (Weiner, 1985). Not only attributions made by the self, but in general, stronger source credibility manipulations may offer a more complete view of the relationship between this factor and the impact of the attributionally laden messages on the audience. As the credibility of the source gets closer to the level of self credibility the effects may be more in accordance to the predictions made by the Model of Motivation and Emotion and the reformulation of the Learned Helplessness Theory. The results presented here did suggest that the participants agreed with and accepted the messages coming from the high credibility source more than when the message came from a low credibility source. On the other hand, the participants appeared to react against and contradict the low credibility source through their behaviors.

The reformulation of the Learned Helplessness Theory also argues for the stability of explanatory styles in individuals (Seligman, et al., 1988), therefore the particular ways in which attributional styles affect the cooperative behaviors of individuals should contribute to the understanding of the dynamics of social dilemmas.

In social dilemma situations, were the interests of the individuals are in conflict with those of the collectivity, the factor of potential control seem to be very relevant. Research on self-efficacy in social dilemmas (e.g. Kerr, 1991) has already been shedding some light on the idea that in order for individuals to engage in cooperative behaviors there needs to be at least an expectation that the actions taken will have some effect on the outcome for the collectivity. In terms of the attributions built in messages from external sources, more research needs to be done. The work by Weiner (1985) on the

controllability dimension of attributions should be considered when studying social dilemmas.

Practical Implications

The practical implications of this research work lie in the finding that beliefs systems and motivation to cooperate may be affected by attributions for collective failure sources external to the individual. Because social dilemmas are generally shared by masses of individuals, realistic solution approaches must take in consideration the lack of control of the structuring agents and the diversity of individual norms, values, and beliefs. The work presented here offers some insight into the connection between the capacities of structuring agents and the beliefs and motivations of the individuals sharing the dilemma. Low credibility sources were more effective than the high credibility source in encouraging cooperative behaviors when they made personal, unflattering attributions for the group's failure. The participants seemed to be motivated to contradict and challenge the message sent by low credibility source.

In terms of interventions, these findings suggest that to encourage action in collectively shared problems the communication of potential control for each individual, even if it means blaming the people, would be more effective than a more flattering detachment from responsibility. Regarding the source of the attributions, this research suggests that the participants were motivated to challenge the message sent by an external source with their actions, which should be taken into consideration as a potential drawback in interventions. A leader that opts for attributing the difficulties in a social dilemma to the individuals involved may expose her or his leadership position and

propositions to the rejection of the followers. A peer, with less, but still something, to lose, who stands up and blames the individuals for the collective problem should be the most effective encourager of cooperation.

APPENDICES

APPENDIX A

Experiment Procedure and Instructions

Natural Resources Experiment

PART I: Introduction to Task, and Initial Trials

1. Enter the subjects individually into the lab and ask them to sit in one of the room, and read, sign, and slip under the door the experiment consent form with their experiment credit card. (Part of the experiment is to guarantee to the participants their complete anonymity, therefore it is very important that they are welcomed and later debriefed individually.)

The cover story of this experiment requires the presence of five (5) participants in each session. In case that there are less than five (5) subjects for the session it is the experimenters task to give the illusion that the session is complete.

Once all the subjects are in their rooms proceed with the instructions.

Experimenter reads:

Welcome to the Natural Resources Experiment. By now you all should have already read, signed, and turned in the consent form with your experiment credit card. On your desks you should also find a folder, and a #2 pencil.

Open the folder and take the small piece of paper with four questions. After answering these questions please pass the piece of paper under your door. (Take the pieces of paper and take them into the experimenters room)

Now you will hear a recording that will explain the experimental task.

Recording:

Welcome to the Natural Resources Experiment. In this experiment you are going to take part in the simulation of a real community with a natural resource scarcity problem. Each one of the participants in this session is one of five farm owners, members of the community of Blue Valley, which depends of the Blue Lake for all its water needs. Blue Valley is a simulation of a real valley which receives most of its rain during winter time, therefore during the time of preparing the land and growing the crops the farmers need to rely completely on the irrigation process, an all the water for irrigation is supplied by Blue Lake. Since Blue Lake is the main source of water for the agriculture, your economy is based on the conservation of this natural resource. As the farm owner you determine how much water your farm will use every year. The more land you irrigate, the more crops you can grow. The more crops you grow, the better your income. Also, your crop size will determine the amount of money that you may personally receive in a lottery I'll describe shortly.

Lets take a closer look at the situation in this community. Blue Valley is a center for the growing of corn, and the productivity of your farm is measured in tons. It requires 50 gallons of water to irrigate one acre of land so that you can grow 1 ton of corn. Every farmer in this community has the same amount of land, 10 acres. Therefore the maximum of amount of production for each farm in a year is 10 tons of corn. We want you to see this situation as a farm owner, and a farm owner would want to produce the highest amount of tons of corn in a year, for as many years as possible. What you

have to do as the farm owner is to give your employee instructions regarding the amount of water you want on a certain year to achieve your economical goals, this is to grow the amount of tons of corn you want. The more water you draw from the lake, the better for you because more water means more tons of corn, and therefore more profit for you.

However, there's a problem. The amount of water in Blue Lake is limited. If every farmer drew as much water as he could possibly use, and produced the whole 10 tons of corn each and every year, in a few years, the lake would be used up and all the farmers would go bankrupt. So, as a farmer, you have to be concerned with producing as large a crop for as many years as possible, but you also have to be concerned with the survival of the lake.

Different things can affect the level of water in Blue Lake. Blue Lake now contains 10,000 gallons of water. Its level depends upon the amount of rain in that year, the evaporation rate, and the use by the farmers in the community. Every year the rain replaces somewhere between 500 and 1500 gallons of water. Of course, the weather is not entirely predictable; in fact, in our community, you don't even know if it has been a particularly dry or wet year when you decide how much water to draw from the lake. Another important factor is that the lower the level of the water in the lake, the faster it evaporates. This means that when the lake is full, this is 10,000 gallons or more, the evaporation rate is of 1% per year, when the level drops to half-full the evaporation rate goes up to 5%, and when there is only around a quarter of the lake left the evaporation rate is 10%. Therefore, the less water left, the faster it will disappear because of the natural evaporation process. All these factors you should take into consideration when

deciding on how much water to take from the lake. Before we start the experimental task you will be provided with a summary of these natural characteristics of the lake.

A session will be a simulation of the situation of a real life farming community during a 15 years period. To simulate the rainfall rate in a year we will randomly take a year which will be assigned as the starting year, and after that your community will have the same pattern of weather as the real life valley. Your job as a farm owner is to decide how many tons of corn you want to produce in a year, and depending on that give instructions to your employee as to how much water he should take from the lake in that year. Because of your minimum and maximum limits you know that you should take something between 0 gallons and 500 gallons of water for a year. With zero (0) gallons of water you would not be able to produce any tons of corn, therefore going bankrupt, and the 500 gallons of water would be enough to irrigate all 10 acres of land you own, and produce the maximum of 10 tons of corn in the year. Taking more than 500 gallons of water a year would result in the ruining of your land. When you decide on how much water to take, you won't know the level of the rainfall, nor the amount of water that the other community members are taking, just as they won't know what you are taking. Only at the end of the 15 years of using the lake will you learn how well the community has managed the use of Blue Lake. Remember that the more water you take, the more tons of corn you can produce, and the more money you earn. Plus, at the end of the term we'll pay one, randomly selected person, $10.00 per ton of corn for one randomly selected trial. For example, if you are the randomly selected person, and your production for year #2 is selected then you will receive the amount of ten times the number of tons

of corn you produced, so if you earned 8 tons, you will receive 80 dollars. Remember that you will only make profit when there is enough water in the lake that year to take and produce what you want. If, for example, on year #2 you want to take 200 gallons of water to produce 4 tons of corn, but the lake has already been used completely, there will be no water to take and you will have zero production, and therefore zero earnings. It is in your best interest to make as much profit for as many years as possible, because that increases your chances of making some real profit at the end in the lottery.

In order to do this you should consider the natural processes involved, such as the beginning level of the lake, the rain and the evaporation rate, and of course your very important personal needs as a farmer. Although everyone's responses will affect the accessibility of the water, all responses will be completely anonymous, this is, the amount of water that you personally take will not be known to the other members of the community at any time. Even at the end of this experimental session you will be excused and leave the lab separately to guarantee your anonymity.

So, to review, you and four other farmers must decide each and every year for 15 years how much water you want to take out of Blue Lake. The more water you take, the more crops you can grow, and the more money you can make. You each make this decisions in ignorance of how much water the other farmers have taken, and in ignorance of how much rain has fallen to replenish the lake, eventually the lake can be dried up and then no one can grow any more crops or earn any money in subsequent years.

On your desk you have a folder with a note with your group number, 15 bubble sheets which are the experiment forms, a summary of the characteristics of the lake and

your land, and a blank sheet of paper which you can use to make any calculations. In each bubble sheet you will enter your group's number in column 1, the session number in column 2, the number of the year in column 3, and the amount of water you want to take that year in column 4. Also in the area where is says COURSE we will ask you to enter the average amount of gallons of water you think each one of the other members of the community is taking in each year. In front of you there is a copy of this question and a sample bubble sheet which indicated where to enter each piece of information.

Experimenter reads:

I will now describe the procedures. This exercise is divided in three parts. The first part will be a 15 year session to draw water from the lake, the second part will consist of:

***leader conditions*: electing a leader who will analyze and discuss how the community worked during those first 15 years,...**

***member conditions*: having a person from the community analyze and discuss how the community worked during those first 15 years,...**

and the third part will be a second session of 15 years drawing water from the lake.

The 15 years sessions will be as follows. You will be drawing water from the lake one year at a time, and for each year you will write your information in a bubble sheet. When I say "Start year no.1" you take one bubble sheet and you will have 1 minute to write and mark your group's number, the session number, the year number, the amount of water you want to take from the lake for that year, and the average amount of water you think the other community members are taking. At the end of that minute I will announce to "End year number 1" and you should pass the bubble sheet under the door, then I will take it and enter it into the computer which will process it and will later give us some information on how the community managed the lake. This procedure will be repeated for each one of the 15 years.

Now we will give you two minutes to study the summary of the different factors that may affect your decisions and make some calculations if you want, and then we will start the first 15 years session.

(Wait 2 minutes)

Now get ready to start...

Start year no.1...(wait 1 minute)... **End year no.1** (get sheets and take them to Experimenter B) (After starting the "computer noise cassette", Experimenter B has to get the bubble sheets for each trial and enter their decisions -divided by 50- in the log book for the 15 years, and in the RESULTS SESSION 1 SHEET -what is entered in the log book multiplied by 10- for the first 8 years, and for years 9 to 15 enter zeros in the RESULTS SESSION 1 SHEET)... **Start year no.2... Start year no.15... End year no.15.**

Part II: Feedback and Attributions for Failure

Experimenter reads:

Well, everyone has entered their decisions of the amount of water they wanted for these 15 years of growing corn. Now the computer is processing all the information and will provide us with a graphic showing how this community used their water.

Leader conditions: **At this time we will ask you to elect a leader for your group of farmers. This will be done with the information you provided us at the beginning of the experiment. Since you can't vote for yourself, we have photocopied the descriptions of the other members in your group, and we will ask you to circle your choice for group leader.** (Give copies to participants). (Give them 1 minute to look at the alternatives, and continue instructions). **The person you elect as a leader will have the task of analyzing how the group is doing at the farming simulation based on the first session feedback. We will give that person a list of various ideas given by leaders in other experimental sessions, and he or she will pick the ones that most describe the situation of this group. Your leader will also prepare a message for the community addressing your progress in managing the scarce water resource. Once the leader has made their decision and prepared the message you will all receive a copy of their analysis.**

Now I will pick up your votes. (pick up the ballots, take them to Experimenter B, and pick up the RESULTS SESSION 1 SHEETS for each participant).

O.K. the computer has the information for the first session ready. Here is the feedback for each one of you farmers. (give each participant their respective RESULTS SHEET). **DO NOT READ THE FOLLOWING BUT RATHER SAY IT IN YOUR OWN WORDS. PARTICIPANTS MUST NOT GET THE IMPRESSION THAT THIS IS A PRE-PREPARED SPEECH!!** **Here are the results of the first session. It shows your individual harvest and potential earnings for each year. This results are shown in a graphic which shows the level of the water during each year with the changes caused by the rainfall, the evaporation rate, and the amount of irrigation water drawn by each farmer. AS YOU CAN SEE THE LAKE WAS DRIED BY YEAR NUMBER 8. SO YOU HAVE 8 YEARS OF PRODUCTIVITY, THE SEVEN YEARS AFTER THAT DIDN'T PRODUCE ANYTHING BECAUSE THERE WAS NO WATER IN THE LAKE. THAT IS WHY YOU HAVE ZERO DOLLARS ($0) AS POTENTIAL EARNINGS FOR YEARS 9 TO 15.**

(Go into the experimenters room to give them time to swallow this story and to give the impression that you are counting votes. During this time make sure that each message sheet has marked the appropriate room for the elected leader -the elected leader is always the person the participant voted for-).

O.K. the group has elected a leader! Now I will go into his room and explain what he has to do. I will be right back with you. (Go into the experimenter room and close the door, wait 1 minute, to give impression you are giving instructions to the elected leader. Come out of the room, close the door, and continue instructions).

I have now given the leader the list of ideas that other leaders in other experimental sessions thought might be related to the productivity of the group, in this case he has the list of explanations for failure since, as the graph shows, this group failed to keep the lake going for the full 15 years. As soon as the leader completes the analysis I will give you a copy of this information.

(Knock the experimenters room door, enter, close the door, take the copies of message to the members of the group, and go out again.)

Here are the copies of your leader's message.

(Give copies to subjects, make sure each participant is receiving their corresponding sheet).

(Wait 2 minutes and continue instructions)

Member conditions: **At this time we will use the pieces of paper with the four questions you gave us at the beginning of the experiment to randomly select someone that will analyze the situation of Blue Valley. This person that we will randomly select will have the task of analyzing how the group is doing at the farming simulation based on the first session feedback. We will give that person a list of various ideas given in other experimental sessions, and him or her will pick the ones that most describe the situation of this group. This person will also prepare a message for the community regarding the progress of the community regarding the management of the water scarcity problem. Once this community member has made his or her decision you will all receive a copy of the analysis.**

O.K. the computer has the information for the first session ready. (give copies of graphic to participants, and their respective RESULTS SESSION 1 SHEET). **DO NOT READ THE FOLLOWING BUT RATHER SAY IT IN YOUR OWN WORDS. PARTICIPANTS MUST NOT GET THE IMPRESSION THAT THIS IS A PRE-PREPARED SPEECH!!** **Here are the results of the first session. It shows the individual harvest and potential earnings for each year. This results are shown in a graphic which shows the level of the lake during each year after every member of the group had taken out their irrigation water. AS YOU CAN SEE THE LAKE WAS DRIED BY YEAR NUMBER 8. SO YOU HAVE 8 YEARS OF PRODUCTIVITY, THE SEVEN YEARS AFTER THAT DIDN'T PRODUCE ANYTHING BECAUSE THERE WAS NO WATER IN THE LAKE. THAT IS WHY YOU HAVE ZERO DOLLARS ($0) AS POTENTIAL EARNINGS FOR YEARS 9 TO 15.**

(Wait 1 minute, to give them time to swallow this story.)

O.K. we have a randomly selected a person to study the situation of the community! I am now going to give the instructions to this person and I will be right back with you. (Go into the experimenter room and close the door, wait 1 minute, to give impression you are giving instructions to the selected group member. During this time make sure that the message sheets are the ones corresponding to the condition, and that each one has marked E as the ROOM were the person randomly selected is from. In the member conditions it is not really crucial that each participant receives their corresponding message sheet, since they are all led to believe that the person randomly

selected is the one in ROOM E. Come out of the room, close the door, and continue instructions). **I have now given this person the list ideas that other people in other experimental sessions thought might be related to the productivity of the group, in this case he has the list of explanations for failure since this group failed to keep the lake going for the full 15 years. As soon as this person completes the analysis I will give you a copy of this information.**

(Knock the experimenters room door, enter, close the door, take the copies of message for the members of the group, and go out again.)

Here are the copies of your fellow community member's message.

(Give copies to subjects.)

(Wait 2 minutes and continue instructions)

Part III: Final 15 trials

Experimenter reads: **Well, now that you know how your community did previously, we are going through the second and final 15 years session. We will randomly select another year as the starting year for the weather, therefore the pattern of weather may vary some from the last session, but the rest of the rules remain the same. At the end of the 15 trials you will receive some more information on your own productivity and earnings. Here are another 15 bubble sheets** (give each participant 15 bubble sheets). **Remember to write and mark your group's number, the session number, the year number, the amount of water you want, and the average amount of water you think the other community members are taking in**

each year. We will start will year no.1. Start... End year no.1... get all entries... (Experimenter B, remember to continue filling their RESULTS SESSION 2 SHEET and the log book) **...start year no.2...start year no.15... end year no.15.** (After everyone has finished year no.3) **Now that we have finished entering all the information for these 15 years session I am going to ask you to answer some questions regarding the experiment. First of all I am going to give you an analysis and message checklist, just like the one you receive after the failure in session 1, and I will ask you to mark the ones that you considered were the causes of the failure during the first session.** (Give them the checklist) **As soon as you enter your selections slip the page under the door.** (Take the checklists from each one, and write the group number of that participant, and the room in which he or she is in. It is very important that these checklists are properly identified.) **Now I will ask you to answer the following questionnaire. Make sure you answer the questions on both sides of the page.** (Give participants the questionnaire). **Once you finish slip the questionnaire under your door.** (As they start turning in their questionnaires you can get their RESULTS SESSION 2 SHEET with a debriefing sheet for each one of them. Give them 2 half hour credits and excuse each one individually!!)

APPENDIX B

Election Ballot

ROOM: *A*[1]

AGE: *21*

MAJOR: *English*

MENTION TWO (2) HOBBIES:
Horseback Riding
Reading

WRITE A SENTENCE ABOUT YOURSELF:
I like nature and being outside,
and I love animals.

ROOM: *C*

AGE: *18*

MAJOR: *Physics*

MENTION TWO (2) HOBBIES:
Aerobics
Watch T.V.

WRITE A SENTENCE ABOUT YOURSELF:
I am very much into fitness, I think
a gook health is very important.

[1] This election ballots were handwritten.
All the participants were told that they were in Room B.

APPENDIX B (cont'd)

ROOM: *D*

AGE: *19*

MAJOR: *Engineering*

MENTION TWO (2) HOBBIES:
Play Pool
Jogging

WRITE A SENTENCE ABOUT YOURSELF:
This is my 2nd year in college,
and I'm making a lot of friends.

ROOM: *E*

AGE: *19*

MAJOR: *Humanities*

MENTION TWO (2) HOBBIES:
Reading
Cycling

WRITE A SENTENCE ABOUT YOURSELF:
I'm in my second year in humanities
and I like it here a lot.

APPENDIX C

Summary of Conditions for Social Dilemma Game

SUMMARY

Blue Lake:

1. Initial level of water at year no. 1 = 10,000 gallons.

2. 500 - 1500 gallons added to the lake per year by rainfall.

3. Some water is naturally lost through the process of evaporation, and the less water left, the faster it evaporates.

-full lake = 1% evaporation rate/year

-half lake = 5% evaporation rate/year

-quarter lake = 10% evaporation rate/year, and so forth

Farming:

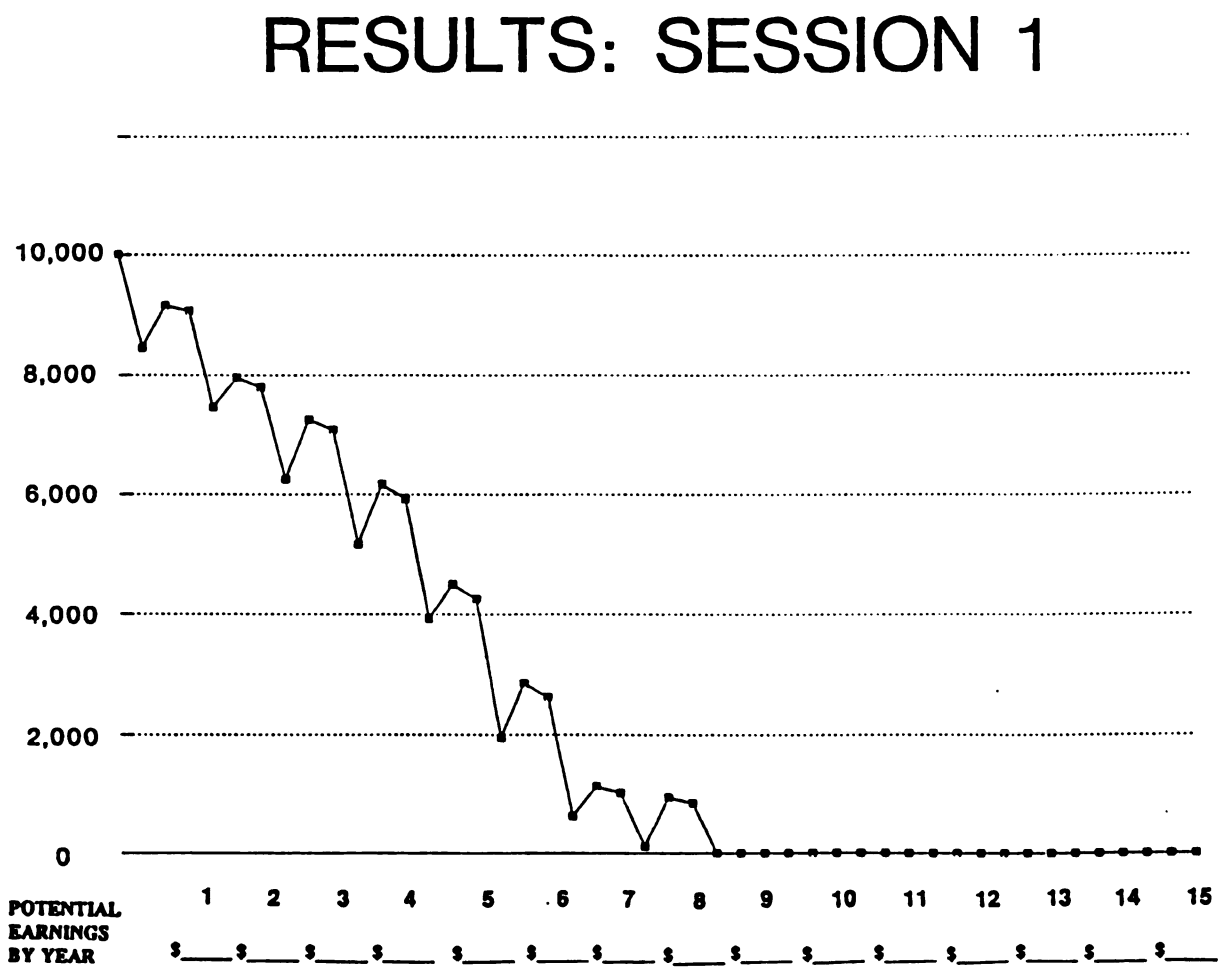
1. 50 gallons of irrigation water to grow one ton of corn, which also takes one acre of land to grow.

2. You own 10 acres of land.

3. If you win the lottery you'll receive $10.00 per ton for one randomly selected year.

APPENDIX D

Achievement Manipulation



APPENDIX E

Attributions Checklist and Message for High Legitimacy Source Conditions

THE ELECTED LEADER

IS THE PERSON IN ROOM

A B C D E

ANALYSIS AND MESSAGE

The following items are expressions that people in other sessions of this same experiment have used to explain when their own community failed to keep the water resource going for the whole 15 years. A person in your community has studied this list and has marked the ones he/she considers to be the ones that explain the situation in this particular community. This statements should serve as an understanding of the ways this community has worked with the water scarcity problem.

_____ 1. We were all being selfish out of inexperience with the task.

_____ 2. We are just not good as a community.

_____ 3. We all need the water, but because some years were really dry, we got into trouble.

_____ 4. This task is very difficult.

_____ 5. We just need to try harder not to use up the lake.

_____ 6. There's just not enough water in the valley for all the farmers to do well.

_____ 7. We keep making dumb decisions.

_____ 8. The lake is too small for all of us to share.

_____ 9. It is hard to tell when and how much will it rain. It all depends on the weather.

_____10. We didn't understand what we had to do to keep the lake going.

_____11. We are just having bad luck with too many years with low rainfall.

_____12. I think that we can't seem to understand how we're supposed to use the lake.

_____13. I think that we were not motivated enough.

_____14. Growing corn just doesn't pay enough to be profitable in this valley.

_____15. The task is complicated, but is should get easier with practice.

_____16. We are all too greedy.

Message:_____

_____

APPENDIX F

Attributions Checklist and Message for Low Source Legitimacy Condition

THE RANDOMLY SELECTED MEMBER IS THE PERSON IN ROOM

A B C D E

ANALYSIS AND MESSAGE

The following items are expressions that people in other sessions of this same experiment have used to explain when their own community failed to keep the water resource going for the whole 15 years. A person in your community has studied this list and has marked the ones he/she considers to be the ones that explain the situation in this particular community. This statements should serve as an understanding of the ways this community has worked with the water scarcity problem.

_____ 1. We were all being selfish out of inexperience with the task.

_____ 2. We are just not good as a community.

_____ 3. We all need the water, but because some years were really dry, we got into trouble.

_____ 4. This task is very difficult.

_____ 5. We just need to try harder not to use up the lake.

_____ 6. There's just not enough water in the valley for all the farmers to do well.

_____ 7. We keep making dumb decisions.

_____ 8. The lake is too small for all of us to share.

_____ 9. It is hard to tell when and how much will it rain. It all depends on the weather.

_____10. We didn't understand what we had to do to keep the lake going.

_____11. We are just having bad luck with too many years with low rainfall.

_____12. I think that we can't seem to understand how we're supposed to use the lake.

_____13. I think that we were not motivated enough.

_____14. Growing corn just doesn't pay enough to be profitable in this valley.

_____15. The task is complicated, but is should get easier with practice.

_____16. We are all too greedy.

Message:_____

_____

APPENDIX G

Attributions and Messages for each Condition

INTERNAL AND STABLE	EXTERNAL AND STABLE
We are just not good as a community. We keep making dumb decisions. I think that we can't seem to understand how we're supposed to use the lake. We are all too greedy. *"... The basic problem here is that we are all just too selfish or just not able to play this game right.I don't think that this is likely to change much."*	This task is very difficult. There's just not enough water in the valley for all the farmers to do well. The lake is too small for all of us to share. Growing corn just doesn't pay enough to be profitable in this valley. *"... The basic problem here is that what we have to do is too complicated, plus there is just not enough water to make everyone happy. I don't think that this is likely to change much."*
INTERNAL AND UNSTABLE	**EXTERNAL AND UNSTABLE**
We were all being selfish out of inexperience with the task. We just need to try harder not to use up the lake. We didn't understand what we had to do to keep the lake going. I think that we were not motivated enough. *"... The problem here is that we were confused and not really trying, but I think that we can change that."*	We all need the water, but because some years were really dry, we got into trouble. We are just having bad luck with too many years with low rainfall. The task is complicated, but is should get easier with practice. It is hard to tell when and how much will it rain. It all depends on the weather. *"... The problem here is that the task is fairly complicated.The lake is small and it just hasn't been raining enough.The task will get easier and our luck should change."*

APPENDIX H

Manipulations Check Attributions Checklist

ANALYSIS AND MESSAGE

The following items are expressions that people in other sessions of this same experiment have used to explain when their own community failed to keep the water resource going for the whole 15 years. A person in your community has previously studied this list and has marked the ones he/she considers to be the ones that explain the situation in this particular community. **Now we would like you to mark the items that you consider may explain the failure of the community during the first session.**

_____ 1. We were all being selfish out of inexperience with the task.

_____ 2. We are just not good as a community.

_____ 3. We all need the water, but because some years were really dry, we got into trouble.

_____ 4. This task is very difficult.

_____ 5. We just need to try harder not to use up the lake.

_____ 6. There's just not enough water in the valley for all the farmers to do well.

_____ 7. We keep making dumb decisions.

_____ 8. The lake is too small for all of us to share.

_____ 9. It is hard to tell when and how much will it rain. It all depends on the weather.

_____10. We didn't understand what we had to do to keep the lake going.

_____11. We are just having bad luck with too many years with low rainfall.

_____12. I think that we can't seem to understand how we're supposed to use the lake.

_____13. I think that we were not motivated enough.

_____14. Growing corn just doesn't pay enough to be profitable in this valley.

_____15. The task is complicated, but is should get easier with practice.

_____16. We are all too greedy.

APPENDIX I

Manipulations Check Questionnaire

NATURAL RESOURCES EXPERIMENT QUESTIONNAIRE

1. How much did you agree with the analysis and the message regarding the failure of the community to keep the lake during the first session of 15 years?

1	2	3	4	5
very much				not at all

2. Was this analysis of the performance of the community realistic?

1	2	3	4	5
very much				not at all

3. How much would the person who sent the message think that it was something about the particular group of people making up the community that caused the failure to preserve the lake in the first session?

1	2	3	4	5
very much				not at all

4. How much would the person who sent the message think that the community's failure to preserve the lake in the first session meant that the community would be likely to fail in most other tasks too?

1	2	3	4	5
very much				not at all

5. How much did the person who sent the message consider the environment responsible for the termination of the water after the first 15 years?

1	2	3	4	5
very much				not at all

6. How much would the person who sent the message think that the causes for the failure in the first session could be changed in a later session?

1	2	3	4	5
very much				not at all

7. How much did you like the person who made the analysis and sent the message?

1	2	3	4	5
very much				not at all

8. How optimistic a person do you think the person who sent the message is?

1	2	3	4	5
very much				not at all

9. Do you think this person did a good job?

1	2	3	4	5
very much				not at all

10. Would you have rather had another person evaluating the performance of the community?

1	2	3	4	5
very much				not at all

11. How optimistic did you feel during the second session of 15 years that the lake would not be completely used up?

1	2	3	4	5
very much				not at all

12. In your own words, what do you think was the purpose of this experiment?

13. Did anything about this experiment strike you as confusing or odd?

APPENDIX J

Debriefing Information

NATURAL RESOURCES EXPERIMENT

DEBRIEFING SHEET

Thank you for participating in this experiment. Here we were interested in the effect of causal attributions on cooperation in a social dilemma situation. A social dilemma is a situation in which the personal interests of the participants are in conflict and competition with the interests of the collectivity. Some interesting situations which may result in social dilemmas are overpopulation, resource depletion and pollution. This dilemmas are characterized by two simple properties: (a) the social payoff to each individual for defecting behavior is higher than the payoff for cooperative behavior, regardless of what the other society members do, yet (b) all individuals in the society receive a lower payoff if all defect than if all cooperate. The key to solve social dilemmas is in the cooperation by the group members, therefore the research looking for solutions to social dilemmas has concentrated its efforts in searching ways to increase cooperation in groups.

This experiment approached the motivation for cooperation through the attributional process involved in an achievement-relevant situation. It has been found that in situations in which a person either succeeds of fails people tend to search for explanations for their results. It has also been suggested that the way in which people explain their successes or failures, this is, their explanatory style, constitutes an important part of their personality, particularly determining their optimism or pessimism. We were interested on the effect of the explanatory style of one person in the group on the rest of the group.

If you would like to receive more information regarding this experiment please contact Ileana P. Rodríguez at Baker Hall 410.

References:

Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology*, 31, 169-193.

Seligman, M. E. (1991). *Learned optimism.* New York: Alfred A. Knopf.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92, 548-573.

LIST OF REFERENCES

LIST OF REFERENCES

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87*, 49-74.

Anderson, C. A. (1983a). The causal structure of situations: The generation of plausible causal attributions as a function of type of event situation. *Journal of Experimental Social Psychology, 19*, 185-203.

Barlow, S., Hansen, W. D., Fuhriman, A. J., & Finley, R. (1982). *Small Group Behavior, 13*, 518-531.

Brehm, J. W. (1966). *A theory of psychological reactance.* New York: Academic Press.

Brehm, J. W. (1972). *Responses to loss of freedom: A theory of psychological reactance.* N.J.: General Learning Press.

Burns, M. O., & Seligman, M. E. P. (1988). Explanatory style across the lifespan: Evidence for stability over 52 years. *Journal of Personality and Social Psychology, 56*, 471-477.

Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology, 31*, 169-193.

Graves, L. M. (1985). Effects of leader persistence and environmental complexity on leadership perceptions: Do implicit beliefs discourage adaptation to complex environments? *Group and Organization Studies, 10*, 19-36.

Hardin, G. J. (1968). The tragedy of the commons. *Science, 162*, 1243-1248.

Hasleton, V., Cupach, W. R., & Liska, J. (1986). Message style: An investigation of the perceived characteristics of persuasive messages. *Journal of Social Behavior and Personality, 1*, 565-574.

Kelley, H. H. (1971). *Attributions in social interactions.* Morristown, NJ: General Learning Press.

Kerr, N. L. (1991). Efficacy as a causal and moderating variable in social dilemmas. To appear in W. Liebrand, D. Messick, & H. Wilke (Eds.). *A social psychological approach to social dilemmas.* New York: Permagon Press.

Kerr, N. L. (1989). Illusion of efficacy: The effects of group size on perceived efficacy in social dilemmas. *Journal of Experimental Social Psychology, 25*, 287-313.

Lau, R. R. (1984). Dynamics of the attribution process. *Journal of Personality and Social Psychology, 46*, 1017-1028.

Lerner, E. M. Hetherington, & M. Perlmutter (Eds.), *Child development in lifespan perspective*, Hillsdale, NJ: Erlbaum.

Liebrand, W. B. G. (1984). The effect of social motives, communication and group size on behaviour in a N-person multi-stage mixed-motive game. *European Journal of Social Psychology, 14*, 239-264.

Messick, D. M. & Brewer, M. B. (1983). Solving social dilemmas: A review. *Review of Personality and Social Psychology, 4*, 11-44.

Nolen-Hoeksema, S., Girgus, J. S., & Seligman, M. E. P. (1986). Learned helplessness in children: A longitudinal study of depression, achievement, and explanatory style. *Journal of Personality and Social Psychology, 51*, 435-442.

Peterson, C., Seligman, M. E. P. (1984). Pessimistic explanatory style is a risk factor for physical illness: A 35-year longitudinal study, *Journal of Personality and Social Psychology*, 55, 23-27.

Rutte, C. G., & Wilke, H. (1984). Social dilemmas and leadership. *European Journal of Social Psychology, 14*, 105-121.

Rutte, C. G., & Wilke, H. (1985). Preference for decision structures in a social dilemma situation. *European Journal of Social Psychology, 15*.

Rutte, C. G., Wilke, H. & Messick, D. M. (1987). Scarcity or abundance caused by people or the environment as determinants of behavior in the resource dilemma. *Journal of Experimental Social Psychology, 23*, 208-216.

Samuelson, C. D., Messick, D. M., Rutte, C. G. & Wilke, H. (1984). Individual and structural solutions to resource dilemmas in two cultures. *Journal of Personality and Social Psychology, 47*, 94-104.

Seligman, M. E. P. (1975). *Helplessness.* San Francisco, Calif.: Freeman.

Seligman, M. E. P. (1991). *Learned optimism.* New York: Alfred A. Knopf.

Seligman, M. E. P., Kamen, L. P., & Nolen-Hoeksema, S. (1988). Explanatory style across the lifespan: achievement and health. In R. M. Seligman, M. E. P., Nolen-Hoeksema, S., Thornton, N., & Thornton, K. M. (1990). Explanatory Style as a mechanism of disappointing athletic performance. *Psychological Science, 1*, 143-146.

Seligman, M. E. P., & Schulman, P. (1986). Explanatory style as a predictor of productivity and quitting among life insurance sales agents. *Journal of Personality and Social Psychology, 50*, 832-838.

Shippee, G. E. (1978). Leadership, group participation and avoiding the tragedy of the commons. Unpublished dissertation, Arizona State University.

Talarowski, F. S. (1982). Attitudes toward and perceptions of water conservation in a Southern California community. Unpublished Pd.D. dissertation, University of California, Santa Barbara.

Thompson, S. C., & Stoutemyer, K. (1991). Water use as a commons dilemma: The effects of education that focuses on long-term consequences and individual action. *Environment and Behavior, 23*, 314-333.

Triandis, H. C. (1972). *The analysis of subjective culture.* New York: Wiley.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*, 548-573.

Weiner, B., Frieze, I. H., Kukla, A., Reed, L., Rest, S., & Rosenbaum, R. M. (1971). *Perceiving the causes of success and failure.* Morristown, NJ: General Learning Press.

White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66*, 297-333.

Wofford, J. C., & Srinivasan, T. N. (1983). Experimental tests of the leader-environment-follower interaction theory of leadership. *Organizational Behavior and Human Performance, 32*, 35-54.

Wortman, C. B. & Brehm, J. W. (1975). Responses to uncontrollable outcomes: An integration of reactance theory and the learned helplessness model. In Berkowitz, L. (Ed.), *Advances in Experimental Social Psychology, 8*, 277-337.

Zullow, H. M., & Seligman, M. E. P. (1988). Pessimistic rumination predicts electoral defeat of presidential candidates: 1900 to 1984. *Psychological Inquiry, 1*, 52-61.