COMMUNICATING IN RESOURCE DILEMMAS: CAN OPINION LEADERS DO BETTER?

by

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ABSTRACT

This study examined the response strategy choices that opinion leaders made when faced with a resource dilemma compared to those made by opinion seekers, opinion followers, and opinion avoiders. It was expected that opinion leaders would choose highly effective response strategies that would ease resource dilemmas. A research question also asked whether competitive, individualistic, and cooperative social value orientations would affect the strategy choices that opinion leaders made. Participants responded to: (a) an opinion leadership scale consisting of three measures, (b) decomposed prisoner's dilemma games, and (c) four resource dilemma scenarios and the associated eight response strategy types. Analyses of variance (ANOVAs) were run for these strategy types. The results indicated that opinion leaders did not make strategy choices as expected and the hypothesis was not supported. No main effect was returned for social value orientation and the research question could not be answered. Interestingly, however, the data suggested that individuals might respond to resource dilemmas by using response strategies sequentially rather than singly and in
isolation. Moreover, the interaction between opinion leadership type and social value orientation revealed good predictive ability. Finally, a main effect for six of the eight strategy types revealed that the four resource dilemmas scenarios were not perceived as representing essentially similar "limited resource-many users" situations.
Chapter 1
THEORY AND RESEARCH

Introduction

The severely depleted lobster and fish stocks in the sea off Port Judith, RI, carry one dominant implication—all, the fish, the marine ecosystems, and the fishers suffer because of a system of open access or unregulated fishing. Lobstermen in this area are faced with the prospect of sailing as many as 70 miles out to sea each trip, hauling over 300 steel lobster traps a day, and even violence from "harbor gangs" should the informal division of the nearby seabed be violated (Tierney, 2000). Meanwhile, only 10 percent of the region's lobsters, with a normal life expectancy between 50 and 75 years, live beyond six years of age, or grow beyond two pounds, even though lobstermen report catching 30-pound lobsters a little over 50 years ago (Tierney, 2000). One reason for this clearly ecologically and economically unstable situation is insufficient communication and coordination between the fishers in this area.

In contrast, agreements that exist between the fishers of Port Lincoln in Southern Australia make it
clear that communication between common pool resource users can help maintain resource stocks sustainably (Tierney, 2000). Common pool resources such as forested lands, streams, and ponds are available to all users, have subtractable yields, and, often involve a fee for use. Because it is in their own interests to be so, these Australian fishers are conservationists, maintaining healthy fish and lobster stocks. In the 1960s the Australian government restricted the total number of licenses to which fishers had access. To maintain the future sale value of these licenses, fishers have negotiated amongst themselves and agreed to self-regulate. They adhere to the strict harvesting limit of 60 traps each and pay scientists to monitor the health of the fishery. The returns of maintaining optimal lobster and tuna stocks, economically, and in terms of reduced labor-hours, are enormous (Tierney, 2000).

In addition to the economic advantages and the ecological benefits of maintaining balanced fish and lobster stocks, the agreements between the fishers of Port Lincoln also represent a desirable situation in terms of governance. Command and control by a governing authority requires regular and frequent surveillance which is an expensive undertaking. Moreover, command and control
policies, especially those dealing with the use of resources that a community might traditionally consider its own, often do not take into consideration the community’s specific needs and are likely to be circumvented often. Due to recurring infraction of the rules, these policies are less likely to be stable than those based on widespread consensus amongst the community of users.

From the policy-maker’s standpoint, policies that encourage or support community-based communication about and voluntary cooperation over resource use are more likely to result in high compliance rates and better resource protection than command and control policies. In terms of equity of resource access, such self-governance is important as well. Top-down policy implementation so far appears not to have served large sections of the populations in many developing countries well. If, instead, small communities in such countries individually chose self-governance using widely agreed-upon rules with top-down policies implemented merely to support their own efforts, their access to adequate resources would quite likely improve. This then is the starting point for this research - cooperation and, as a consequence, more
sustainable resource-use results within communities when members engage in discussion and information sharing.

One way to encourage resource-users to engage in controlled consumption is through the influence of individuals whose opinions carry weight in their respective communities and who can generate cooperative solutions that are to the benefit of the majority.

"Opinion leaders" present themselves as particularly suited to filling this role. Opinion leaders are individuals who are regularly called upon by those in their social group(s) to offer advice, opinion, and counsel. Several factors point to their ability to encourage cooperative responses to resource problems. Opinion leaders are active communicators (Weimann, 1991), are at the center of large interpersonal communication networks (Crane, 1972), and are knowledgeable on a variety of issues (Booth & Babchuk, 1972). The question is whether opinion leaders would choose to expend the effort to formulate solutions to resource-use problems. There are some indications that they would be willing and able to do so. An explanation for this tendency lies in how efficacious opinion leaders believe themselves to be. If people believe that their actions will have a significant impact on final outcomes, then they enjoy a sense of high
self-efficacy (e.g. Kerr, 1992). Bandura (1986) believed that appraisals of self-efficacy come from the feedback that people receive from friends and acquaintances. Given that opinion leaders are repeatedly asked for help or advice on a variety of issues by others, it is very likely that opinion leaders' perceptions of their self-efficacy are high. Bandura (1986) found that a sense of high self-efficacy leads to a sustained pursuit of goals, and, consequently, the probability that opinion leaders will be both willing and able to undertake the task of finding solutions to resource problems is quite high.

The claim that perceptions of high self-efficacy will enable opinion leaders to search for solutions to resource problems presumes that opinion leaders are interested in a cooperative decision. Their interest in transmitting their knowledge to others, an inherently cooperative activity, might even predispose opinion leaders to achieving cooperative solutions. However, the types of actions that opinion leaders propose or take are dependent on whether their preferred outcome is the collective good or, instead, their own individual gain. Personal tendencies towards one or the other of these preferences are known as social value orientations (SVOs; Komorita & Parks, 1996). Three SVOs - cooperation,
competitiveness, and individualism, have been distilled from Messick and McClintock's (1968) early work in this area. In situations of interdependence, individuals who attempt to maximize their own and other people's (i.e. joint) outcomes are said to be cooperatively oriented; individuals who attempt to maximize their own gain relative to other people's gain are identified as being competitively oriented; finally, individuals who attempt to maximize their own gain regardless of the other people's outcomes are described as individualistically oriented. It follows that opinion leaders with different SVOs will respond differently to resource-use problems.

The claims made in this section are discussed in detail in the following four sections of this chapter. Section one below contains a review of the literature on resource use problems in particular and, more generally, on a class of problems called social dilemmas. Section two describes research findings that support the use of communication as an important tool for enhancing cooperation amongst individuals who either use a shared resource or who must act so that a shared resource is provided. It also details the different explanations that researchers give for the effectiveness of communication in creating mutually beneficial solutions. Section three
introduces the concept of opinion leadership and explains why opinion leaders may be one group of individuals who can contribute significantly to a community-based cooperative decision-making process. Rather than a simple dichotomy of opinion leaders versus everyone else, a finer distinction also identifies opinion seekers - individuals who have large social networks but who actively seek information from others on a limited set of topics, opinion followers - individuals who depend on opinion seekers rather than opinion leaders for advice, and, finally, isolates or opinion avoiders - individuals who are completely outside the dominant social networks that exist in any community. This section also contains a specific hypothesis that grows out of the literature review. Finally, the fourth section contains an exposition of the SVOs that both opinion leaders and non-opinion leaders might hold and how these orientations are likely to affect the actions proposed in discussions about a resource-use problem.

**Social Dilemmas**

Resource problems are an example of a more general type of problem called a social dilemma. Social dilemmas can develop when there is interdependence among a group of people (Kelley & Thibaut, 1978); in other words,
each individual's actions have an impact on all others in that interdependent situation. Social dilemmas are characterized by a conflict between each individual's desire to maximize personal interests and his/her motive to maximize collective interests (Komorita & Parks, 1996). Social dilemmas are defined by two properties (Dawes, 1980). First, each individual is always better off, at least in the short run, by making the decision to defect (i.e. choose for personal gain) rather than to cooperate, no matter what decisions all other individuals make. When individuals make a defecting choice, then they are making an individually rational choice to maximize own short-term gain as opposed to collective gain. The result of this first property, however, is that if all others in the same situation make a defecting choice, then all suffer in the long run. Thus, the second property of a social dilemma is that all individuals are better off in the long run if all cooperate than if all defect.

The Prisoner's Dilemma Game (PDG) is the best-known example of a social dilemma. Although there can be a greater number, the classic PDG includes two interdependent people. Each person in a PDG can choose either to cooperate or to defect. Based on the resulting 2x2 choice matrix, three outcomes are possible: (1) both
choose to cooperate and receive average but comparable returns, (2) one person chooses to defect while the other chooses to cooperate, with the result that the defecting player receives a large outcome while the cooperative one earns a very small one, and, (3) both choose to defect and earn low but comparable payoffs.

There are two kinds of social dilemmas including three or more interdependent people. Two prominent examples are public goods dilemmas and social traps. The research on communication in social dilemmas reviewed in the following sections is based on studies of both public goods and social trap dilemmas. Therefore, both types of dilemmas are described here.

**Public Goods Dilemmas**

An example of a public good is a public television station. Such stations receive most of their funding from private donors (Komorita & Parks, 1996). Viewer contribution, therefore, is essential to the continued existence of the station. However, once the station begins to transmit programming, it cannot prevent non-contributors from also watching. This presents a social dilemma for the viewers of the programming. Because they cannot be excluded from the use of this good, it is rational for them not to contribute and yet to continue to
enjoy the programming. One person’s decision to not contribute does not have a significant impact on the quality or quantity of programming that is broadcast. However, if most viewers acted in this way, the television station would not have the funds to continue broadcasting and would eventually have to shut down. Therefore, although in the short run all non-paying viewers benefit, everyone suffers in the end.

Two factors associated with public goods create this social dilemma. First, public goods are characterized by jointness of supply and impossibility of exclusion. Jointness of supply indicates that no matter how many individuals use them, public goods cannot be used up. So, no matter how many individuals tune in to watch the programming, it will not run out. Moreover, station managers cannot exclude non-contributing viewers from watching the programming. Second, public goods can only be provided if enough of its users contribute. While jointness of supply and impossibility of exclusion underscore the rationality of making a defecting choice, the fact that television stations cannot continue to operate in the absence of sufficient viewer contribution favors cooperation. Therefore, users are faced with a conflict between individual and collective rationality.
That is, while the personal outcome of those who continue to not contribute is always higher, all are worse off if the good is not provided (Komorita & Parks, 1996).

Research into factors that mitigate conflicts arising from social dilemmas has frequently made use of public goods dilemmas created in the laboratory. Several of these studies will be described in the literature review below. Other studies have been based on social traps, the second type of social dilemma. Social traps, including resource dilemmas, the particular focus of this study, are discussed next.

Social Traps and Resource Dilemmas

Komorita and Parks (1996) characterized a social trap as a situation in which the behavior of organisms yields two outcomes: a small positive individual outcome that is immediate and a large negative collective outcome that is delayed. As a consequence, individuals are confronted with a conflict between what is individually and what is collectively rational.

Within the sphere of social traps, one specific one, the resource dilemma, is of particular relevance to this study. A resource dilemma is a situation in which a group shares a common resource (water, forest, fitness equipment, parking space) from which individual members
can harvest. If members take too much of this resource (using water inefficiently, cutting down trees, using gym equipment for long periods, or having more cars than there is parking space), the resource is exhausted (limited water supplies, depleted forest cover, crowded gyms, crowded parking lots). In the interest of the group, moderate harvesting is the most preferred solution. However, in the interest of the individual, it is most rational to harvest maximally.

High levels of harvesting often lead to resource shortages. Such shortages indicate a less than optimal utilization strategy (Kramer, McClintock, & Messick, 1986). In other words, these shortages exemplify what Hardin (1968) described as "the tragedy of the commons." In his essay on overpopulation, he uses the example of a pasture or commons on which all the herds-people of a community graze their cattle. The number of cattle is at a level at which they can be supported optimally by the land. In this scenario, a herdsperson, in trying to maximize his or her gain, experiences great utility in the addition of an additional animal, while the negative effect is that this small increase in the herd leads to a slight overgrazing of the land. However, because all the herdspersons share this negative effect, the decision-
making herdsperson experiences, effectively, only a fraction of it. Each rational herdsperson, however, reaches this conclusion and also adds to his or her own herd. Hardin (1968) writes, "Therein, lies the tragedy. Each man (woman) is locked into a system that compels him (her) to increase his (her) herd without limit - in a world that is limited" (p. 1244; italicized words added). In the end, all the herdspeople suffer because the commons is eventually used up (or more literally, as Hardin (1968) described, the land suffers from soil erosion and the appearance of weeds).

The effort by human beings to take resource consumption to ever-higher levels in a limited world motivates this study of resource dilemmas. Dunlap and Van Liere's (1978) "spaceship earth" metaphor describes the situation adequately - there are naturally existing limits to growth. Given that there are limited natural resources and many users, how can these resources be used so that an optimal balance is created between resources and its users? A similar question has driven much research on social dilemmas. How can social dilemmas or perceptions of social dilemmas be altered, so as to make the cooperative (as opposed to the defecting) choice the most rational and
preferred one (that is, the choice with the higher payoff)?

One way, as Dawes (1980) suggested, to do so is to change the payoff structure through a system of rewards and penalties that would give the cooperative choice the higher payoff. However, as he points out, to introduce such a system implies that a governing agency must bear heavy expenditures. This expenditure might, in effect, reduce the payoffs to all (those who cooperate freely, those coerced by penalties, and those who are rewarded for cooperative behavior). Clearly, rewards and penalties are not an efficient way to increase the rate of cooperation. Findings by Braver and Wilson (1986), Dawes, McTavish, and Shaklee (1977), Jerdee and Rosen (1974), Dawes, van de Kragt, and Orbell (1988) and others suggest a promising alternative to change the payoff structure. Studies such as these found that when people facing a social dilemma have an opportunity to discuss it, rates of cooperation increase significantly. Explanations for this phenomenon have been variously that communication allows people to recognize the advantages of an all-cooperative strategy, to build commitment to the collective as a whole, to establish a group identity, and to recognize the benevolent intentions of fellow group members. In the
following section, these findings and explanations are reviewed.

**Communication during Social Dilemmas**

As part of a program of research on the conditions that affect cooperation, Deutsch (1960) conducted an important experimental study of cooperation in a social dilemma that consequently launched extensive research into the area. Deutsch was interested in people's tendency to trust or to be suspicious of their partners in situations of interdependence as affected by their perceptions of the other as well as their own intentions towards the other. He explained that to be trusting is to take a path which could lead to either harmful or beneficial events depending upon the behavior of another. To be suspicious, on the other hand, is to engage in behavior to prevent or reduce the consequences of another person's behavior. Deutsch's contention was that a person's behavior in a social dilemma is easier to predict if the motivations behind that behavior are focused at least partially on the other person rather than solely on the self. Deutsch (1960) concentrated on three relevant motivational orientations - cooperation, competitiveness, and individualism. He anticipated that cooperatively oriented individuals would have a predictable and
benevolent intention towards the interdependent person and would expect the other person to have the same towards them. Similarly, competitively oriented individuals were assumed to have a predictable but malevolent intention towards the other person and to expect the same from the other person towards themselves. However, since individualistically oriented persons are motivated solely by their own welfare predictions about their behavior, could only be made on the basis of extrinsic conditions. If these extrinsic conditions included external sanctions such as force or social disapproval, then the likelihood of individualistically oriented individuals engaging in mutual cooperation could be enhanced. Such sanctions, Deutsch suggested, could be put in place by giving interdependent individuals an opportunity to communicate by some means and thereby commit to a certain course of action. The making and keeping of (for fear of social disapproval) commitments, in other words, was expected to increase the level of mutual cooperation that individualistically oriented individuals engaged in.

Participants in Deutsch’s study played a two-person PDG. Players could achieve one of three results depending on the choices that both they and the interdependent other made: (1) both could choose
cooperatively and do equally and moderately well, (2) one could defect and earn high returns, but in so doing, cause the other to do very poorly, or, in reverse, could do very poorly after making a cooperative choice if the other chose to defect, or (3) both could do poorly if both chose not to cooperate. Participants were led to feel either that (a) the welfare of self and other was of equal concern (cooperative orientation), (b) the welfare of self was important but that the other had to be defeated (competitive orientation), or (c) the welfare of self was important regardless of the other (individualistic orientation). In order to test his contention that communication between interdependent others would result in enhanced rates of mutual cooperation, Deutsch allowed some participants to communicate their intent to their interdependent others, while others were not given this opportunity. Communication took place through notes written to each other before choices were made.

Deutsch (1960) found that the opportunity to transmit intent to an interdependent other had little or no effect for competitively oriented individuals, a weak effect for cooperatively oriented individuals, and a strong effect in the case of individualistically oriented individuals. The number of cooperative choices these
individuals made increased significantly under the communication condition. This was an important finding inspiring further research. Some of these studies, organized chronologically, are reviewed below.

Bixenstine, Levitt, and Wilson (1966) conjectured that individuals playing a six-person PDG with knowledge of the other’s choices and with the opportunity to discuss their choices would be more cooperative than those without similar opportunities. Half of the 16 groups played the first 20 trials such that group members had knowledge of each other’s choices (knowledge - K), while members of the remaining eight groups completed these trials without knowledge of group members’ choices (NK). The researchers found that the mean percentage of cooperative choices varied very little between the two conditions in these first 20 trials. Groups in the K condition experienced cooperative choice percentages between 35 and 38, while those in the NK condition experienced percentages between 41 and 44 over trials. Evidently, knowledge (or the absence of) of others’ choices did not appear to affect rates of cooperation. Following this first block of 20 trials, two additional conditions were added based on the opportunity to communicate (Communication - C). Half the groups were given 15 minutes to discuss the problem while
the remaining groups listened to music in the same time period. The authors found that the opportunity to communicate allowed K groups to dramatically increase the mean number of cooperative choices they made (83.5%). In comparison, cooperative choice percentages for the C + NK condition varied between 35 and 43, which was indistinguishable from the first 20 trials consisting only of K and NK conditions. Therefore, Bixenstine et al. stress that the discussion period works albeit in conjunction with knowledge of others’ choices to create these high rates of cooperation.

In a study by Jerdee and Rosen (1974), participants played a simulation of companies bidding for a contract. Formulated as a social dilemma, participants could either bid “complete cost,” which implied a short run sacrifice for a long term gain, or they could bid “cut cost,” which is similar to a defecting choice and focuses on short term gain. Again, only some groups within the study were given the opportunity to discuss their choices. Jerdee and Rosen (1974) found that participants in the communication condition developed highly cooperative behavior, making twice as many cooperative bids than did participants in the no-communication condition. Moreover, in a second experiment, they found that groups provided
with the opportunity to discuss their choices maintained high levels of cooperation even in the face of sustained defection by an accomplice. Groups in this communication condition on an average produced 3.1 cooperative bids as opposed to the 1.3 cooperative bids produced when groups in the no-communication condition faced sustained defection.

Dawes, McTavish, and Shaklee (1977) found that even when strangers faced with a dilemma have an opportunity to discuss it, the rates of cooperation increase significantly. Eight-person groups, with all group members strangers to each other, played a resource dilemma with the following rules: participants could earn $2.50 for a cooperative choice, and $12.00 for a defecting choice, and each was fined $1.50 for every defecting choice made by a group member. Thus, each individual had an $8.00 motive to defect. There were four experimental conditions - no communication (N); irrelevant communication (I; group discussion for ten minutes on an unrelated topic); relevant communication (C; group discussion on the dilemma); and communication plus a vote (C+V; discussion was ended with a nonbinding declaration of intended decision). Dawes et al. found that when participants could not communicate about the dilemma such
as in the N and I conditions, the proportion that defected was much higher than when they could discuss the problem (C and C+V conditions). In a replication of this study, they compared only the I and the C conditions and confirmed that, compared to the 76% of participants who defected in I, only 31% defected in C.

Brechner (1977) also examined the effect of face-to-face discussion in a simulated resource dilemma. Groups of participants could harvest points from a pool, which was constantly replenished with points proportional to the current pool size. It was in the best interests of the participants to withdraw only a few points from the pool, keeping the pool level near the top. Half the groups were allowed to speak freely with one another, while half the groups were not permitted any communication. Groups that could discuss the problem stopped harvesting from the pool before it was completely depleted, while those that could not communicate continued to withdraw points until the pool collapsed. Brechner devised pools of 24 and 48 points each and found that communication contributed to a mean of 212.84 and 236.33 points to these two pool sizes respectively, as opposed to the 40.5 and 180 points in the respective no-communication conditions.
Edney and Harper (1978) asked participants to play a resource dilemma game in which they had to collect points from a common pool. The pool was constructed so that it doubled itself at the end of every second round, while draining it ended the game. Participants were assigned to one of four experimental conditions: (a) the basic game (Game), in which participants received an explanation of the rules without additional information; (b) game + information (Information), in which participants were given the rules plus information explaining the "social dilemma characteristics" of the game; (c) game + strategy (Strategy), in which participants were given the rules and the best strategy for maximizing harvests from the pool, and (d) game + free verbal discussion (Communication), in which participants were given the rules' and an opportunity to discuss strategies for consumption and progress in the game. On the basis of mean number of points earned, number of rounds played before the pool was drained, pool replenishment, and "range index," that is, the variation between points earned by each member of the harvesting group, participants in the Communication condition did the best. The mean number of points earned in the Communication condition (59.7) was higher than that in
Game (34.2), Information (41.2), or Strategy (37.6). The number of harvesting rounds played in the Communication condition was also the highest (18.9) as compared to Game (6.4), Information (12), and Strategy (7.6). The mean number of points by which the pool replenished itself over two rounds was also dramatically different; 37.1 for the Communication condition, as opposed to 4.1 for Game, 13.9 for Information, and 6.6 for Strategy. Moreover, the range index was least for Communication (0.19) compared to Game (0.72), Information (0.46), and Strategy (0.45).

Jorgenson and Papciak (1981) studied the effects of the ability to communicate about the problem as well as of receiving feedback about the current state of a resource pool. In this case, the resource pool contained a total of 40 cents and redoubled itself after every two trials. Participants could draw between zero and four cents per trial. They were assigned to one of six experimental conditions: (1) 32 groups could speak freely about the game or about strategy during the game, while the remaining 32 were not allowed to talk or convey information during the game; (2) half of the communication and no-communication groups received feedback about the number of cents in the resource pool after each trial while the remaining groups did not receive this
information; (3) half of groups in the each of the four resultant feedback-communication groups were further assigned to a high identifiability condition where individual choices were known to all in the group while members of the remaining groups made their choices anonymously. The researchers found that participants in the free communication condition had higher mean total monetary harvests (83.70 cents) than those in the no-communication condition (38.10 cents). The interaction of communication and feedback had an even more pronounced effect (106.1 cents) when compared to the communication plus no-feedback condition (61.3 cents). Those in the communication condition also maintained the resource pool for a greater number of trials (38.78 trials) than did those in the no-communication condition (20.78 trials). Identifiability did not have an effect on total harvests and the number of trials for which the commons were maintained except in the absence of either communication or feedback. Identifiability did not interact with communication or feedback.

Braver and Wilson (1986) attempted to replicate real-life public goods situations by allowing only a few participants from each group to communicate. In this condition of partial communication, they hypothesized that
because fewer people from the group discuss the problem and therefore coordinate actions, coordination would not be sufficient to allow agreements that solve the dilemma to be reached. Nonetheless, they found that rates of cooperation (75%) were significantly higher in the partial communication condition than those in the no-communication condition (48%). Thus, they concluded that, "the present data suggest that public goods may very well be commonly - if not certainly - provided when partial communication prevails" (p. 61).

Hackett, Schlager, and Walker (1994) tested whether earlier findings revealing the positive effects of communication on rates of cooperation in public goods dilemmas were due to participants in these studies receiving equal benefits from investing their endowments. The game was designed to imitate a common pool resource for the use of which users had to pay a fee, in the form of tokens, to use. Participants, playing in groups of eight, could invest their tokens either in Market 1, which yielded a constant rate of return per token, or, in Market 2 (the common pool resource), which yielded a rate of output per token determined by the total number of tokens invested by the entire group. Increases in the number of tokens invested in the common pool resource on each trial
improved returns up to a point, after which yields declined. Thus, if a few players in the group chose to over-invest, they would enjoy higher returns, but remaining members would receive greatly lowered returns for investment given the ceiling on possible yields. Two consecutive 10-trial sequences were run. Participants were not allowed to communicate with each other during the first 10-trial sequence, but at the start of the second sequence were informed that they would have 10 minutes of discussion time before the next trial and three minutes prior to each subsequent trial.

Before each sequence, to create heterogeneity in investment levels, half the groups were randomly assigned their token allocation with four of the members given an endowment of 24 tokens each while the remaining group members received 8 tokens each. The remaining groups were assigned their token allocation on the basis of an auction. In this case, the first four participants of each group who were willing to pay a price (that increased by $0.25 every 5 seconds over the course of the auction) for the privilege of the 24-token endowment received this higher endowment, while the remaining four members of each group were assigned 8 tokens. Hackett et al. found that even under conditions of endowment heterogeneity,
discussion about the problem increased the rates of cooperation so that all individual earnings from the pool increased. In the no-communication sequence, mean earnings with random endowment assignment and auction assignment were 45.3% and 45.8% of the level possible given an optimum investment of tokens respectively. However, in the communication sequence, mean earnings in the random endowment assignment and auction assignment jumped to 93.6% and 96.1% of the optimum level respectively.

Ostrom and Walker (1991) also argued that repeated opportunities to discuss a public goods dilemma would increase cooperation. Similar to the Hackett et al. study described above, groups of participants in the study could invest their endowments, in the form of tokens, either Market 1, yielding a constant rate of return on investment, or in Market 2, yielding a return per token dependent on individual investment as a percentage of total group investment. Designed as a common pool resource problem, participants essentially imitated users who paid a fee for use of a resource. The temptation to defect was built into the game; investing more than the optimal number of tokens allowed the investor to earn higher returns (that is, use more of the resource) but it simultaneously meant that every other player on the team
would earn less because the total returns possible were now reduced. After the first 10 no-communication trials, there were two conditions: (a) participants were given one opportunity to discuss the problem followed by an opportunity to communicate after each trial, if they so chose and, (b) participants could not communicate but they did receive feedback about their own profit after each round, total group investment, and cumulative profit for the whole experiment. Ostrom and Walker found that communication allows a shift towards greater optimality in returns earned; in the communication condition on trials 11 through 20, groups earned 97.8% of total attainable earnings from Market 2, while groups in the no-communication condition earned 35.3% of total possible earnings. Greater optimality in returns earned with face-to-face discussion is also apparent while comparing blocks of trials; compared to the near-optimal returns earned in the communication condition in the second block of trials, the same groups earned only 26% of total attainable returns in trials 1 through 10 (no-communication). Further, they observed that in the communication condition, participants successfully calculated yield-improving strategies, devised verbal agreements to
implement these strategies, and also dealt with non-conforming players through verbal statements.

In a second study, Ostrom and Walker (1991) tested whether experienced participants had realized the importance of communication in improving efficiency. If so, they reasoned, players would be willing to pay for the opportunity to engage in discussion. Participants from the communication condition in the previous study played the same game, although now at least five group members had to contribute one dollar to pay for the opportunity to discuss the problem. All groups engaged in discussion only once as they experienced difficulty in coordinating contributions towards a discussion opportunity. The authors note that although net yields from Market 2 shifted upward from the 42% of total possible earnings achieved during the first ten no-communication rounds to 80% even under these costly conditions, fewer opportunities to communicate inhibit the development of a coordinated strategy.

These studies make it clear that opportunities to discuss social dilemmas dramatically increase the rates of cooperation. Why are these opportunities to communicate so influential? Several explanations are offered to answer this question. Among these are that face-to-face
discussions allow individuals to make promises to their group and therefore commit themselves to future courses of action; that such communication allows for the coordination of behavior so as to produce optimal results; that face-to-face discussions act as a signal transmitting information to the rest of the group; that discussion about the dilemma allows individuals to perceive consensus on the best way to proceed; and that communication creates group identity. Research supporting these different explanations is reviewed below.

**Commitments and Promise-Making**

Deutsch’s (1960) study, reviewed earlier, was the first study that pointed towards the use of the opportunity to communicate to make commitments to cooperate. Deutsch manipulated participants’ behavior so that they made choices similar to those made by individuals with cooperative, competitive, and individualistic orientations respectively. He was most interested in the effect of communication opportunities on the behavior of individualists because they are motivated to act solely for their own gain. In this study, rather than face-to-face communication, participants in the communication condition wrote notes about their choices to their partners before they made their choices. In keeping
with his hypothesis, Deutsch found that the opportunity of even this written expression of intent increased the tendency for individualists to choose cooperatively.

Subsequent research has found some support for this hypothesis. The Jerdee and Rosen (1974) study described earlier emphasized that the opportunity to discuss the problem established what they call the "norm of social responsibility." In their study, participants simulating companies bidding for a contract made twice as many cooperative or complete cost bids in the communication condition as opposed to those in the no-communication condition. In other words, communication had the effect of establishing and maintaining cooperative behavior. Jerdee and Rosen argue, "as long as subjects could discuss the problem with each other and determine that the group as a whole was committed to behave responsibly, they were able to "keep the faith" (p. 715). Clearly, however, this and Deutsch's study draw upon increased rates of cooperation, subsequent to opportunities to communicate, as indirect evidence of the formation of commitments between players. More direct support that opportunities to communicate allow interdependent individuals to make commitments to each other comes from studies by Ostrom and Walker (1991),

Ostrom and Walker (1991) argue that discussion opportunities offer individuals the chance to make and extract promises. In their study, as described earlier, groups of participants could choose to invest their endowment, in the form of tokens, either in Market 1, which offered them a constant rate of return, or in Market 2, which yielded a return dependent on the investor's percentage of total group investment. In the face-to-face discussion condition, participants had four minutes of discussion time after 10 trials. After each subsequent trial, they had the choice of initiating a discussion. Ostrom and Walker found that these opportunities to discuss the dilemma translated into higher rates of cooperation, and therefore, higher total earnings for each player. More interestingly, when one or more participants disregarded investment agreements reached during discussion and over-invested, the other group members, rather than begin investing more themselves (to prevent loss to themselves or to control the defector's behavior), used evocative terms such as "scumbucket" and "pimp" with reference to the unknown defector. Ostrom and Walker suggest that such terms are used to arouse guilt or to
remind defectors that they are ignoring some social norms. Such words were usually sufficient to change the behavior of the defector.

A similar finding emerged in a study by Ostrom, Gardner, and Walker (1994). The structure of the game was similar to the Ostrom and Walker (1991) study discussed above. As a variation, however, participants received endowments varying from 8 (low endowment) to 25 tokens (high endowment), which they could invest in Market 1 to earn a constant rate of return, or in Market 2 to earn a return based on the percentage of total tokens they invested. Subsequent to the first ten trials participants could hold face-to-face discussions after each trial. The high endowment game was particularly fragile because it took just three over-investors to ruin the market. Ostrom et al. observed that in all the communication conditions, participants offered and extracted promises, which resulted in higher joint yields than the no-communication rounds. Moreover, verbal sanctioning was used for defectors. Participants used words and phrases such as “greedy” and “getting a free ride” for defectors but rather than react with sub-optimally large investments in the face of defection by a group member, cooperative group members continued to stress the need to trust each other
and refrain from “screw(ing) ourselves too” (p. 156). The authors concluded that keeping promises appears to be “a more fundamental shared norm than cooperation per se” (p. 168).

Orbell, van de Kragt, and Dawes (1991) studied unanimity in promise-making among group members and found it to increase rates of cooperation. Promises serve to indicate that all the promising individuals have bought into the cooperative solution and, therefore, feel committed to act in that way. In this study, participants in groups of 14, each with a “promissory note” for $5.00, were told that after ten minutes of free discussion time, they would be divided into two seven-person groups. They were told that at that time they would have to make one of three choices: (1) keep this $5.00 endowment for one’s self, (2) give it to the six members of one’s own group, in which case each other group member would receive $2.00 for a total group benefit of $12.00, or (3) give it to the seven members of the other group, earning each member of that group $3.00 for a total group benefit of $21.00. Observers recorded instances of promising during the ten minutes of free discussion. Only promises to give to the other group were recorded, as at this time, participants had not been split into their seven-person subgroups. Half
of the subgroups were given a further 10 minutes of discussion time, although the presence or absence of this additional discussion time did not have an effect on promise-making. In general, promising was a frequent behavior and in a majority of the cases, promises were kept. Of the 336 participants, 249 (74.1%) made promises to give to the other group and 77.5% of these promise-making individuals held to it during choice-making. The "unanimity in promising" hypothesis was supported; 84.1% of choices were cooperative when everyone in the group promised to give, in contrast to the 57.8% of cooperative choices when fewer than the 14 group members promised. Orbell et al. said that promising individuals monitor the number of others who have promised and only accept their own promise as a binding commitment when everybody else has promised.

Kerr and Kaufman-Gilliland (1994) tested two competing explanations for the impact of communication on cooperation, that communication leads to the creation of group identity, and that a discussion opportunity results in the making of relevant commitments. In order to distinguish between these two possible explanations, the authors considered the potentially moderating role of the efficacy of the cooperative act; in other words, the
extent to which the cooperative act would bring the group closer to achieving the public good. They argued that this moderating effect would only be seen if the creation of group identity was responsible for the group discussion/cooperation association. Working from suggestions made in other studies that when individuals identify with a group the distinction between personal and collective welfare is blurred, Kerr and Kaufmann-Gilliland argued that the group identity explanation implies that, even with communication, people will not increase their levels of cooperation unless they are convinced that their actions will have an impact on obtaining the good. In contrast, the efficacy of the cooperative act would have no effect on the level of cooperation if the impact of group discussion on cooperation lies in it giving individuals the opportunity to make commitments to cooperate. The researchers argued that rewards in the form of pride for keeping commitments made, or the costs in the form of guilt, embarrassment, or social censure for breaking commitments, would boost cooperation even if the cooperative act was ineffective.

Participants in this study played an investment game in groups of five. Participants received a "share" when a 100-point pool was divided amongst each five-person
group. Share sizes differed in each of a block of eight trials for each participant. Possible share sizes were 1, 8, 15, 22, 29, 36, 43, and 50. The larger a person’s share size, the greater efficacy they had in terms of achieving the public good. Participants received $10 prior to each trial and had to choose either to “keep” or to “invest” this endowment. If the share sizes of all those who chose to invest their $10 summed to 51 points, then all group members (investors and non-investors alike) received a bonus of $15. If the point total equaled 50 points or less, then no bonus money was earned on that trial. Half the groups were allowed to discuss the problem before playing a block of eight trials. Further, half the groups across the communication – no communication conditions made their choices anonymously, while the remaining half did not.

Kerr and Kaufmann-Gilliland (1994) found little support for the moderating effect of the efficacy of the cooperative act. Post-trial questionnaires revealed that group discussion did indeed strengthen group identity. However, even when efficacy levels were low, group discussion led to rates of cooperation that were 30% higher than of groups that did not discuss the problem. What reinforces the commitment hypothesis over the group
identity hypothesis, as revealed in the content analyses of group discussions, is the large number of commitments made to cooperate either unconditionally or if share size dropped below some level. Moreover, these commitments to cooperate were closely and appropriately related with subsequent cooperative behavior. Anonymity of choice-making also did not lower rates of cooperation. Group members who thought they were making their choices anonymously were as likely to honor their commitments as those whose choices were not anonymous. The authors suggested that this finding pointed to a strong possibility that the norm of honoring commitments is internalized and held even when these commitments are costly.

Also supporting the commitment explanation is a study by Kerr, Garst, Lewandowski, and Harris (1997). Drawing on the finding in previous studies that group discussion is characterized by the soliciting or giving of promises, which can be associated with a subsequent level of cooperation in the group, Kerr et al. suggested that face-to-face discussion works because of the operation of a commitment norm. They explained that while a norm can be administered by a social group, it can also be a personal or self-administered norm, which will be adhered to even
in the absence of external surveillance. Participants, in groups of five, played a public goods game similar to the one described in the Kerr and Kaufman-Gilliland study above. There were three experimental conditions: (a) no discussion, choices made anonymously, (b) discussion, choices made anonymously, and (c) discussion, choices made with knowledge of others. Discussion had the expected effect of raising rates of cooperation to a significantly higher level than compared with the no-discussion condition. Importantly, anonymity had no effect on the level of cooperation, indicating that the commitment to cooperate and subsequent cooperative behavior is an internalized norm. Violation of these norms is a violation of one’s sense of self.

Braver (1995) reviewed the results of Braver and Wilson’s (1984) study in which they set out to test whether discussion leads to group agreements to solve the dilemma together, which then allows for enough contributions to ensure that a public good is provided. Braver and Wilson (1984) believed that when individuals engage in group discussion, they freely make a commitment to one another to act in a certain way and, having done so, feel bound to honor this agreement. Participants in this study played a “lifeboat game” in which they could
either choose "Jump," in other words, return a stake of $5, or they could choose "Don’t jump" and keep their $5 stake. In nine-member groups, the first three members who jumped would lose their stake, but their actions would allow the remaining six to obtain an additional $10 each. Before starting, participants were asked to indicate how much they needed the money. Further, they were told that previous groups had made use of a lottery to decide who would keep the $5 stake and who would return it. For this purpose a tin can and nine slips of paper with the words "Return" and "Keep" printed on them were provided for the participants, although they were not required to use it. Participants were then given 10 minutes of discussion time in the presence of the experimenter and asked to make their choices.

Braver and Wilson (1984) found that each of the eight groups decided to hold a lottery. Of those drawing the return slip, 71% actually returned the $5. This was despite the finding that 42% of those who had drawn the return slip had stated that they needed the money "very badly" at the start of the experiment. Content analyses of group discussions revealed that participants were concerned with whether they could trust each other to hold to the results of a lottery. This question was resolved
when one member asked the others to declare aloud their commitment to abide by the lottery’s results. Although in reality such verbal assurance is unenforceable, participants readily made promises to cooperate once they heard others doing the same and most held to their promises. They, in other words, upheld the agreements entered into freely even when it opposed their self-interest substantially to do so. Braver (1995), therefore, believed that “when communication is permitted, individuals tend to gravitate without coercion to cooperative agreements which very reliably solve the provision problem” (p.85).

In addition to the commitment hypothesis, the transmission of information by an individual to the rest of the group is also hypothesized to be an important use of communication. Such information is used by the rest of the group to assure themselves of the cooperative intentions of their group members. Chen and Komorita (1994) used the idea of “pledging” as a way for individuals to communicate their intentions to others. They define a pledge as an “informal poll of group members regarding their preference or intention in a contribution decision” (p. 369). They hypothesized that when group members make their contribution decisions known through a
pledge in a public goods game, members learn of each others' contribution intentions, which will enhance rates of cooperation. Chen and Komorita suggested that pledging involves a form of commitment making the act less prone to change.

In their study, five-person groups could contribute, over ten trials, between zero and 10 points to a personal account that was not shared with the rest of the group, and which accrued no interest, or they could contribute to a joint account and receive 100% interest on their investment. The points in this joint account would then be divided equally among all group members. There were three pledge conditions: (a) non-binding (group members made tentative contribution decisions but did not have to adhere to them), (b) minimum-binding (all members were required to contribute at least the minimum amount pledged by any group member), and (c) a no-pledge or control condition (members simply made a contribution decision on each trial). After each trial, participants received feedback about every other person's contribution, the mean contribution of the group, and the points each person received on that trial.

The authors found contributions to be greater (6.14 points) in the minimum-binding condition than in the
non-binding condition (3.06 points) or the no-pledge condition (3.81 points). More importantly, the correlation between mean pledges and mean contributions made in the non-binding condition was .52 while the same procedure for the minimum binding pledge resulted in a significantly different figure of .83. The authors believed that pledges in the non-binding condition were used to deceive rather than to communicate intentions, which, when discovered by the other group members to be deceptive, may have led to the decreased rates of cooperation. In the minimum binding pledge, however, the pledge acted more like a signal to communicate intentions (for example, a minimum pledge of zero indicated no desire to contribute). A post-study questionnaire revealed that 46% of participants in the minimum-binding pledge condition perceived pledging as a way to communicate one’s own intentions to group members, while none of the participants in the non-binding condition held this perception. Binding pledges, in other words, transmitted more reliable information to the rest of group.

Thus, a lot of research supports the idea that promising and commitment making is involved in the communication-cooperation relationship. More basic, however, than the idea that communication builds
commitment is the hypothesis that being able to discuss the problem allows discussants the chance to coordinate actions to achieve optimal results for all. Scholars such as Hackett et al. (1994) have argued that agreements that are made during periods of discussion are non-binding and, therefore, cannot be assumed to hold the promise-making individual to the agreement. Instead, they say that just having the opportunity to communicate allows individuals to build "social capital" through the pooling of ideas, experience, or individual wisdoms that results through discussion. Hackett et al. believed that this capital can be the resource that attenuates cheating in the face of non-binding agreements. In the next section, five studies are reviewed that support this idea.

Coordination of Optimal Behavior

Bixenstine et al. (1966) conjectured that the often dramatic results obtained by allowing participants discussion time might follow from individual members seeing the need for cooperation and sharing this insight with the rest of the group. This allows group members to make contribution or harvesting decisions that benefit the group as a whole.

The study by Brechner (1977), described earlier, involved a content analysis of participants' discussions
in the communication condition, which revealed that participants: (1) conversed most frequently about their progress in the game, (2) made requests to begin or cease withdrawing points from a common pool, and (3) made strategy suggestions that would allow members to accumulate points or that allowed the pool to refill. Clearly, when communication was allowed, only one member of the group needed to be aware of the importance of avoiding pool depletion to alert the others to the situation. However, in the absence of discussion, all the group members needed to become aware of the situation individually to prevent the collapse of the pool. Although groups in the communication condition did not develop a strategy that optimized point totals, the opportunity to communicate allowed group members to coordinate their harvesting actions to prevent pool depletion. These groups were also able to significantly improve the mean number of points earned compared to groups in the no-communication condition.

Jorgenson and Papciak (1981) concluded from their study described earlier, that the opportunity to communicate, “allowed groups to develop a coordinated harvest strategy” (p. 382). Content analyses of group discussions revealed that groups used this period to share
and combine individual wisdom about harvest strategies. The authors studied mean harvest figures for the first seven trials (all but two groups maintained the resource pool for at least seven trials) and found that communication-feedback groups not only started out by requesting less on the first trial, but they also used a strategy of alternating a request for a small amount on one trial with a large amount on the next: This strategy allowed the pool to replenish itself more completely, thereby allowing participants to maintain the pool for longer and, as a consequence, to accrue greater harvest totals. This strategy was used for the communication-no feedback groups as well, although requests per trial were higher than for the communication-feedback groups. Although Jorgenson and Papciak could not find statistically significant evidence to this end, they found that all members of several communicating groups tended to request the same amount, whether high or low, across trials, thereby maintaining equity in earnings amongst group members. In the no-communication-feedback groups, in contrast, requests were higher per trial and while participants eventually agreed on a low request/ high request strategy on alternating trials, it took at least five trials for this request pattern to develop. Finally,
in the no-communication-no-feedback groups, requests per trial were the highest across all groups and no discernable request pattern developed causing an early exhaustion of the resource pool.

The study by Hackett et al. (1994), described earlier, also supports the hypothesis that the opportunity to discuss the situation allows individuals to coordinate their actions. The researchers expected that homogeneity amongst users would allow them to adopt self-governing institutions to resolve resource dilemmas to everyone's satisfaction. However, the task of agreeing and sustaining agreements is more difficult when users have differing levels of need for the resource because of possible disagreements on what constitutes a fair distribution of benefits. For example, estimating a fair division of common water resources between farmers with differing farm sizes is more difficult than if all the farmers have similar sized farms. Should they use the resource proportionally, that is, according to the size of their farms, or should there be equal appropriation, that is, all have an equal quota? Participants' endowments in this study were, therefore, varied across trials to examine the sharing rules that develop under these conditions of heterogeneity.
As described earlier, endowments in the form of tokens were either randomly assigned by the experimenters or allotted through an auction (that is, participants who desired a high endowment had to pay for the privilege). The opportunity to communicate, even under conditions of heterogeneity in the random assignment condition, allowed participants to earn close to the maximum possible returns from the resource pool. In the pre-communication conditions, these earnings were much lower—varying across the different groups between 25 and 62% of the optimum. The results for the auction assignment condition were more varied because competition amongst group members to acquire the higher endowment dissipated total earnings. However, earnings still increased for all users, and a content analysis showed that players developed sharing rules that attempted to equalize payoffs for those with both small and large endowments. Those with large endowments began each trial by paying for that privilege. Group members, therefore, allowed them to allocate more tokens to the shared pool, and thereby earn higher returns than those with small endowments. In short, participants were able to coordinate their actions, so that even under conditions of varying endowments, they were able to maximize their harvests.
Gardner, Ostrom, and Walker (1994), in an echo of Hackett et al. (1994), say, "communication allows individuals to agree on a joint strategy and to begin a process of building trust in others to abide by that agreement" (p. 403). They explain that in the absence of sanctioning, communication builds trust and guides consequent changes in the patterns of behavior. In their study, participants played an investment game, in groups of eight, similar to the one used in the Ostrom, Gardner, and Walker (1994) study described above. Approximately half the groups received an endowment in the form of 10 tokens (low endowment) and the other half in the form of 25 tokens (high endowment). The high endowment situation is more fragile than the low endowment one because just three players could invest all their tokens in the shared pool and appropriate all possible earnings. In the low endowment condition, seven group members would need to invest all their tokens in order to ruin the game. All groups had the opportunity to discuss the problem for 10 minutes after 10 rounds and then for three minutes after each successive round. Net earnings increased in both low and high endowment plus communication conditions.

In explaining these results, the authors noted that even when there were deviations from agreements,
cooperative behavior did not end. Instead cooperators responded with a "measured reaction" (p. 388), that is, they agreed to continue investing at agreed-upon levels and in doing so, managed to restore cooperative behavior. A content analysis of the group discussions revealed that participants did not discuss punishing the defecting players by over-investing themselves. Instead they stressed the need to continue investing the agreed-upon number of tokens. At least one player would recognize that they would all lose if they punished the defectors ("that hurts us as well," "we all lose", p. 403). Thus, discussion gives resource users "a chance to discover the approaches others are using in the game. Without communication, they do not know what to do in the situation they face and adopt strategies that vary tremendously" (Gardner, Ostrom, & Walker, 1994, p. 405).

The studies discussed above provide a good deal of direct evidence that opportunities to communicate allow individuals the chance to coordinate consumption or contribution strategies so that all group members can benefit. Other researchers argue, however, that group discussion results in higher levels of cooperation due to the creation of group identity. According to this explanation, when individuals discuss a common problem,
they experience a strong sense of solidarity, or a feeling of being in the "in-group," which in turn leads to higher rates of cooperation (Dawes, van de Kragt, & Orbell, 1988). When individuals begin to identify with a group, they are hypothesized to be more concerned with the outcomes of fellow group members than their own outcomes. Group identity reorders the priorities and concerns of individuals (Bouas & Komorita, 1996). Three studies that support this idea are reviewed below followed by the review of a study that suggests that group identity might not, in fact, be the main reason for the heightened rates of cooperation following the opportunity to communicate.

**Discussion and Group Identity**

An early study that drew a connection between higher post-discussion levels of cooperation and group identity was by Bonacich (1972). He based his study on the speculation that conflict in the form of a PDG would increase cohesion and friendliness in an informal group. He suggested that knowledge of their interdependence makes individuals cultivate friendliness and attractiveness in order to increase their influence over one another. Friendliness is viewed as a strategy for making one's suggestions for cooperation more powerful and for reducing others' suspicions of one's own intentions. Moreover, when
group members know that the others have made personal sacrifices for what is collectively conceived of as the common good, then they perceive that they owe their group members something in return, leading to high cohesion and solidarity.

In Bonacich’s (1972) study, participants in groups of five could choose to contribute a certain amount of money to each of the other four players during each of the five trials, with the recipient obtaining a bonus of 25 cents in addition to the contribution. Alternatively, a player could choose to keep the money on each trial. The amount of the possible contribution varied on each trial and according to whether the group was assigned to the low or high dilemma condition. The amount that group members, assigned to the low dilemma condition, could give varied from $0.01 on the first trial up to $0.20 on the fifth trial. Groups in the high dilemma condition could give from one to $0.75 over the first four trials. On the fifth trial, however, the game was modified for the groups in the high dilemma condition so that the temptation to defect was very high. If anyone chose to keep their money they could earn up to $17 while all those who chose to give lost all their money. In addition, on this fifth trial, groups in the high dilemma condition had a third
strategy alternative, "protect," which allowed an individual to earn $0.50 and exit the game, while the remaining four players played a four-person prisoner's dilemma game. This allowed the others to choose to cooperate, without the fear of losing everything. All 20 groups were allowed 15 minutes of unrestricted discussion time prior to each trial. All choices were made in secret. Bonacich expected that because members of high dilemma groups risked more and were faced with higher temptation, they would spend more time discussing the problem, would engage in more normative behavior (such as labeling a non-cooperator and a non-cooperative act as immoral) in the absence of the ability to sanction defectors, and would demonstrate a higher level of solidarity because group members would feel greater friendliness for each other for having resisted the temptation to defect. A content analysis of the tape-recorded discussion showed that time spent in discussing the problem decreased for low dilemma groups from 594 seconds in the first trial to 136 seconds in the fifth trial, while high dilemma groups maintained a fairly constant mean - from 558 seconds in the first trial to 509 seconds in the last trial. The content analysis yielded evidence for Bonacich's hypothesis that members of high dilemma groups would use more normative behavior. In
general, Bonacich found that terms used (such as "cheat," "screw," "sneaky" etc.) were more negative than positive and that high dilemma groups used significantly more evaluative terms than did low dilemma groups in the first four trials.

In addition, in order to test the level of solidarity, after each trial participants were asked to assess whether the mood of the group had been one of friendliness, unfriendliness, or indifference. In the third and fourth trials, members of high dilemma groups felt significantly more friendly than members of the low dilemma groups. In the absence of sanctions, cohesive groups were more likely to use group norms to control non-cooperative behavior. Thus, Bonacich concluded that when the dilemma presents increased temptation and risk, not only do group members bring greater normative controls into play, but also experience greater cohesion as a group.

Dawes, van de Kragt, and Orbell (1988) suggested that group identity could radically affect cooperation rates independently of the consequences for the choosing individual. Their study required that participants in groups of nine choose either to keep a $5 endowment or to contribute it to the group. The possibility of receiving a
$10 bonus existed depending on how many people chose to give away their $5. There were two conditions: (1) A "contingent" condition in which if five or more group members including the choosing participants chose to give away their $5.00, all received a $10 bonus, and (2) A "non-contingent" condition in which the remaining four or more group members needed to contribute their $5 for the initial investors to earn the bonus $10. The contingent condition allowed participants to help themselves; by being one of the five to give away the initial $5, all could earn the $10 bonus. In the non-contingent condition, participants always received $5 more for keeping than giving away the initial $5; $15 rather than $10 if five or more others gave it away and $5 rather than 0 if not. The non-contingent condition represented a dilemma because although all earned $10 by giving away the initial $5 the dominating strategy was to keep the $5. Half the groups in the contingent condition were allowed to discuss the situation for a maximum of 10 minutes while half were not and, similarly, half the groups in the non-contingent conditions were allowed to communicate while half were not. Volunteering to or holding a lottery to decide who would give away their $5 was forbidden.
Dawes et al. found that in both the non-contingent and contingent conditions, discussing groups made between 75 and 85% cooperative choices, while in the silent non-contingent and contingent conditions only between 30 and 45% of the choices were cooperative. Thus, discussion and not the decision rules had the more powerful effect. Content analyses of the discussions revealed that participants framed the problem in terms of what “we” should do and made frequent statements that the best outcomes involved their keeping and others giving. The authors conclude that this is because a heightened sense of interdependence is created which leads to a greater number of cooperative choices.

To a lesser extent, support for the group identity hypothesis comes from Chen (1996). Using the idea of pledge-making from the Chen and Komorita (1994) study, Chen wanted to know whether differences arose in cooperation rates when individuals made group-based rather than individual-based pledges. Group-based pledging implies that an individual’s pledge is determined by the pledges made by group members. Thus, minimum-binding (contributing at least the minimum that any group member has pledged) or mean-binding (contributing the average amount pledged by the group) pledges are group-based
pledges. In contrast, non-binding (pledges that did not have to be adhered to) or binding (contributing at least as much as one pledged) pledges are individual-based because contribution is determined solely by one’s own pledge.

Chen asserted that four important differences between group-based and individual-based pledging would lead to higher rates of cooperation in group-based pledging. First, because individual contribution amounts in group-based pledging are determined by group pledges, group members will experience a feeling of interdependence. In contrast, individual-based pledging leads group members to feel greater independence from each other. Second, because all group members are contributing the same amount in group-based pledging, they share a sense of common fate. Individual-based pledging, conversely, does not encourage individuals to view themselves as sharing group gains or losses. Third, group members make commitments to the group during group-based pledging. Such commitments are less changeable than those made to oneself. Finally, each member’s pledge has an impact on the amount required by the rest of the group while individual-based pledging has no effect on the contribution decisions that group members make. Chen
explained that the first three issues related to group identity, while the last related to criticality (that is, individuals perceive themselves as an effective and important part of the group). Group-based pledging, therefore, would lead to an enhanced knowledge of group members’ pledges and therefore, of group members themselves, an increased emotional-affective tie to the group through the sense of common fate, and a higher valuation of group membership. In other words, group-based pledging would result in a heightened sense of group identity.

Similarly to the game played in the Chen and Komorita (1994) study, participants, in groups of four, could choose to invest between zero and 10 points either in a personal account which earned no interest or in a joint account which doubled in value after each of the ten trials. These points would be divided equally amongst all group members. There were three conditions with variations within some conditions: (1) Group-based pledging: (a) 20%-Mean in which participants were asked to contribute at least 20% of the mean points pledged by the group. (b) 100%-Mean in which members asked to contribute at least the mean pledge of the group. (2) Individual-based pledging: (a) 20%-Ind in which participants were asked to
contribute at least 20% of their own pledge. (b) 100%-Ind in which participants were asked to contribute at least what they pledged. (3) Control: (a) 100%-Mean at trial 1 and at trial 5 in which participants were given the same instructions as in the 100%-Mean condition and in addition, were asked to complete a scale to assess group identity to test whether group identity changed over trials. Chen expected group identity to remain unchanged if it was the cause of cooperation but to change over time if cooperation engendered group identity. (b) Face-to-face discussion in which participants could discuss the game for five minutes before they made their contribution decisions and (c) No-pledge condition in which participants' simply played the game without pledges or discussion.

Chen found that individuals who made group-based pledges made higher mean contributions than those who made individual-based pledges (5.95 versus 3.23). The level of pledge bindingness created differing levels of cooperation; the 100%-Mean group-based pledging condition resulted in the highest level of cooperation, while the 20%-Mean group-based pledging condition did not evoke significantly higher contributions than the 20%- and 100%-Mean individual-based pledging. Chen concluded that
although this did not provide support for the group identity hypothesis, it underscored the importance of cooperation as a result of criticality. Further, he found that participants experienced the greatest group identity in the face-to-face discussion condition followed by the group-based pledging conditions and lastly the individual-based pledging conditions. Group identity did not change significantly when tested after trial 1 and then trial 5 lending support to the hypothesis that group identity enhances cooperation. Chen, therefore, concluded that group identity produced the greatest effect when it contained some degree of commitment (e.g. the mean binding pledge) and enhanced participants' sense of criticality. He suggested that group identity might be necessary but not enough to induce cooperation.

In clear opposition to the studies reviewed above, a study by Bouas and Komorita (1996) tested the idea of group identity versus the concept of perceived consensus as reasons for increased post-discussion rates of cooperation. They suggested that when group members discuss a problem that is common to them, no matter what the problem is, they will experience feelings of group identity. In contrast, perceived consensus is an impression that individuals form of their group members'
dilemma-relevant intentions. They suggested that if individuals perceive consensus amongst their group on an issue that requires choice-making by them all, each expects cooperation from the others, thus decreasing the risk of a cooperative choice and increasing overall rates of cooperation. Participants, in groups of four, could make a single all-or-none contribution of 8 points (each member's endowment) either to a personal account (with zero interest) or to a joint account where total investment would double in value and be divided equally among all group members. These point values would then be converted into lottery tickets to be used in a lottery conducted later in the year. Participants were told that the amount of the lottery was undetermined and could be worth either $5 or $50 based on the drawing of a slip of paper.

Drawing on previous studies, Bouas and Komorita (1996) used the idea of a common fate manipulation to evaluate the group identity explanation. If group members believe that they are the recipients of some common fate they are more likely to be moved to act as group members rather than individuals. The lottery, mentioned earlier, was used to create the common fate. Groups were divided into four experimental conditions: (1) discuss the dilemma
during 10 minutes of face-to-face discussion with a common fate manipulation before playing the game, (2) discuss a recent tuition hike which was relevant to all the participants during 10 minutes of face-to-face discussion with a common fate manipulation, (3) play the game with a common fate manipulation but without discussion, and, (4) simply play the game. After making their investments, participants were asked to complete a questionnaire that included a group identity scale and measures of perceived consensus and expectations of cooperation from group members.

Bouas and Komorita (1996) found that the mean proportion of group members who cooperated in the discuss-dilemma condition was .81 compared to the .17 in the common fate manipulation and the .13 each in the common fate only and control conditions. Mean scores on the group identity scale in the discuss-dilemma and discuss-tuition hike conditions differed significantly from the remaining two conditions. This led the authors to conclude that although group identity is created when individuals discuss a common problem it is not enough to induce cooperation. A common fate manipulation alone does not encourage cooperation either. However, participants' expectations of cooperation from group members in the
discuss-dilemma condition was significantly greater than in the other three conditions. Mean perceived consensus scores showed that participants in the discuss-dilemma and discuss-tuition hike conditions differed significantly from the other conditions, but the authors interpreted this to mean that participants in the discuss-tuition condition understood the question to be about consensus on the tuition issue rather than the dilemma. Bouas and Komorita concluded that perceived consensus and not group identity was critical in generating cooperation.

In conclusion, the studies reviewed above offer three primary explanations (commitments, activity coordination, group identity) for the success of communication as a tool to increase cooperation. Underlying these studies is the idea that discussion time appears to be able to knit together diverse strangers to work towards a common goal. Clearly, the motivation to study communication in social dilemmas is strong. The studies cited above, however, have not attempted to examine more closely the strategies that participants use to initiate cooperation. Nor has there been an attempt to identify individuals who are predisposed to being more effective than others in producing negotiated solutions. These are the fundamental questions that this research
turns on. Previous research points to the existence of specific individuals within communities, known as opinion leaders, who have the potential to influence comparatively large groups of people to act in pro-social ways. In the following section, a brief review of the literature on opinion leadership explores this possibility.

**Opinion Leadership**

What is opinion leadership? Rogers (1995) defined it as "the degree to which an individual is able to influence other individuals’ attitudes or overt behavior informally in a desired way with relative frequency" (p. 27). For example, Booth and Babchuk (1972) studied medical opinion leadership amongst 800 middle-aged and elderly respondents and identified 80 active opinion leaders (advising more than one person in a 12-month period about medical doctors or services), whose advice on health services was followed in 88 of 95 cases by acquaintances, co-workers, friends, and kinfolk. Who are opinion leaders? Noelle-Neumann (1985) describes them as influential people, who exist in every strata of society, serving as "multipliers" - individuals who transmit "their knowledge, attitudes and modes of behavior to many people" (p. 20).

Katz and Lazarsfeld (1955) understood opinion leadership to be the simplest form of leadership, being
exercised casually and almost invisibly within a network of personal relationships. They explained that opinion leaders normally "guide opinion and its changes rather than lead directly in action" (p. 138). In other words, they are not necessarily the authoritative, charismatic, or leading figures of their social networks (Weimann, 1994). In fact, Weimann (1991, 1994) preferred to call them "influentials" rather than opinion leaders because he saw the term "opinion leaders" to be restrictive, implying that they provide leadership in a limited number of subjects. In this research, I use these two terms interchangeably.

Opinion leaders are characterized chiefly by their technical competence or knowledge, social accessibility, and conformity to the norms of the system within which they live (Rogers, 1995). Each of these characteristics is discussed in greater detail next.

A dominant characteristic associated with opinion leaders is their knowledge. They are considered a source of advice and/ or technical competence amongst their peers (Rogers, 1995; Weimann, 1994). Booth and Babchuk (1972) found that the 80 active opinion leaders in their study were well-read and had first hand knowledge about the health facilities or personnel about which they offered
advice. Rogers and Kincaid (1981) reported on "cadres" in the People's Republic of China; political, administrative, or technical leaders held in respect by peer followers partly because they read and were expected to read the People's Daily (the official national newspaper of the Communist Party of China). Myers and Robertson (1972) surveyed housewives in Los Angeles, CA and found that, in general, those identified as opinion leaders talked more about particular topics, felt that they knew more than their friends, and were more interested than others in a variety of topics.

Some debate exists as to whether opinion leaders are knowledgeable in just a few or in several subject areas. Katz and Lazarsfeld's (1955) findings led them to conclude that opinion leadership is subject-specific and, therefore, opinion leadership in one field does not necessarily imply opinion leadership in other fields. Marcus and Bauer (1964), however, saw this conclusion as leading to the implication that opinion leadership tends to be an all-or-nothing phenomenon. They re-analyzed the Katz and Lazarsfeld data and concluded that the range of personal influence is much more varied and that it is quite possible for degrees of opinion leadership to exist across domains. Other studies provide evidence to support
the idea that opinion leadership extends over several fields. Booth and Babchuk (1972) hypothesized that active opinion leaders (those who had advised more than one person in a 12-month period) would be influential over several subject areas. They found that not only did the opinion leaders in their sample advise friends and relatives on medical matters, but 50% had also discussed organizational affiliation (clubs, civic groups, and volunteer organizations) with someone who was thinking of joining. By comparison only 19% of occasional opinion leaders (those who offered medical advice to only one person in a 12-month period) had engaged in such discussions. Myers and Robertson (1972), in their sample of housewives mentioned earlier, found some overlap among topics (at least in related areas) in which opinion leaders had influence.

Linked to these studies' conclusion that opinion leaders are likely to be knowledgeable is Weimann's (1991) finding that influentials tend to be particularly active communicators. In testing the validity of the "Strength of Personality Scale" (PS scale), which was designed to identify the influence that individuals have amongst friends and relatives, Weimann found that high scorers on the scale were most involved in the flow of information.
Weimann sociometrically mapped the personal communication networks of an Israeli kibbutz to create a "who (speaks) to whom" matrix (italicized word added). Six items of information, two categorized as "general news," two as "consumer information," and two as "gossip," were disseminated in the kibbutz prior to the study to trace their flow. People were classified either as communicators (people who were described as sources of information and influence) or receivers (people who were not sources of information). Weimann then compared this classification to their scores on the PS scale and found that the average score of receivers was significantly lower than the average score of communicators. In other words, not only are opinion leaders more likely to assimilate new information but they are also more likely to pass it on to their friends and acquaintances.

Besides knowledge and the ability and willingness to communicate their knowledge, the related concepts of "gregariousness" and "communication network" are associated with opinion leaders. "Gregariousness" is defined as the extent of contact with other people, while Rogers (1995) defines a "communication network" as a set of "interconnected individuals who are linked by patterned flows of information" (p. 28). Rogers (1995) maintains
that opinion leaders are distinguished primarily by their unique (usually central) and influential position in their communication networks. These networks, moreover, tend to be large and varied, which points to opinion leaders' gregariousness. For example, Katz and Lazarsfeld (1955), while investigating the effect of personal influence in a cross section of women in the four areas of household purchasing, fashion, movie attendance, and local public affairs, found that gregariousness was an important determinant of positioning as an opinion leader. In other words, women identified as opinion leaders in the study tended to have a large number of friends and belonged to several organizations. This gregariousness, in the form of club and organizational memberships and involvement in voluntary associations, seems logical given that opinion leaders can only be called so, if in fact, they have widespread contact with and can influence other individuals to follow their advice or use their information.

Coleman, Katz, and Menzel (1966) examined the transmission of personal influence through communication amongst medical colleagues by studying the diffusion of information about the new antibiotic "gammanym." Respondents were asked to name their close associates in
the medical community. Three networks were identified—advice, discussion (of cases and therapy), and social. In each case, it was found that a few doctors were at the center of the networks and were highly integrated into the medical community. These individuals were frequently chosen as advisors, discussion partners, and friends. They were also the individuals who had adopted gammamyn soon after its introduction (in keeping with Rogers', 1995, assertion that opinion leaders tend to be fairly innovative).

Booth and Babchuk (1972) found that the active opinion leaders in their study, mentioned earlier, reported, on an average, 9.4 friends and relatives with whom they were close, while those who had recounted advising only one person on medical matters in a 12-month period reported 7.7 friends. Active advisors were also more involved in formal voluntary organizations, with 70% of these individuals belonging to three or more such groups. In comparison, only 50% of the occasional advisors belonged to three or more such groups.

Crane (1972) studied the interconnectedness among sociologists based on the idea that scientific growth is a process of diffusion and that the innovations of each scientist builds on previous work. She found that highly
productive scientists (with ten or more publications to their name) were also members of one of four large collaborative research groups, which, in turn, linked the other smaller research cliques directly or indirectly into a network or an "invisible college" (defined as an informal network of researchers formed around an intellectual paradigm to study a common topic). All of the high producers were, moreover, the leaders of their cliques and in contact with one another about current research.

These studies highlight the fact that opinion leaders are distinguished by a high degree of social activity and network centrality that guarantees their accessibility to friends and colleagues. In addition to the characteristics of gregariousness and positioning within a social network, researchers note that opinion leaders function within the norms of their communities. A relevant finding by Katz and Lazarsfeld (1955) was that the women in their study were more likely to turn to an influential of like status when seeking an opinion. There are two implications of this finding. First, contrary to the belief that opinion leadership percolates down from the economically strong to the economically weaker strata, it tends to be horizontal and exists at every social
level. Second, individuals probably become influential in their social spheres precisely because they share some common norms with those who seek their opinion. In fact, according to Weimann (1994), opinion leaders are characterized by intellectual similarity with the individuals with whom they interact, rather than by superiority. Such similarity, Weimann believes, "facilitates common language, considerations, interests, values, and evaluations" (p. 73). Opinion leaders are homophilous, in other words, with those in their social networks. This homophily is crucial to the maintenance of their position as opinion leaders because, as Rogers (1995) explains, the most effective knowledge gain, attitude formation and change, and overt behavioral change takes place between people who share common meanings, beliefs, and a mutual language. Individuals who differ widely from those in their social system are unlikely to be able to influence them noticeably. Underscored is the idea that opinion leaders are members of the social system which they influence.

In summary, opinion leaders are characterized by their knowledge across different topic areas and their associated willingness to pass on this knowledge, their position within generally large social networks, and their
adherence to the norms of their social system. These characteristics suggest that opinion leaders have the potential to act as agents to bring about change without legislation and enforcement. Researchers have recognized this potential and have used opinion leaders to modify behavior and attitudes during the course of intervention programs. A few of these studies are reviewed next.

Kelley et al. (1991) based an intervention program to alert homosexual men to the risks of AIDS on the influence possessed by opinion leaders in that community. They identified and located 22 individuals who were greeted positively most often in two large gay bars by other men in the club, and asked each to invite a friend who was considered very popular with gay men. Thirty nine men and four women were invited to join a training program that consisted of four weekly 90 minute sessions reviewing the basic epidemiology of HIV infection, high risk behavior, precautions to reduce risk, characteristics of effective health promotion messages, and model conversations based on these characteristics. These “opinion leaders” identified four male friends with whom they would initiate a conversation endorsing safe sex, and these conversations were then reviewed in the last session. Male club patrons were surveyed before and
after the intervention, and it was found that there was a 30% drop in the proportion of men who engaged in unprotected anal intercourse, pointing to the potential of opinion leaders.

In another study, Grossberg, Tillotson, Roberts, Roach, and Brault (1993) identified 26 natural opinion leaders from four floors of a nine-floor residence hall. These opinion leaders were trained over a three-week period to initiate conversations about safe sex with hall residents on their floors. Anonymous pre- and post-intervention questionnaires on dating behavior, use of alcohol and drugs, sexual activity, and use of condoms were administered to all 565 men in that residence hall. Responses from the five control and four experimental floors were compared: those who had conversed about safe sex with opinion leaders expressed a greater intention to use a condom, were more aware that sexual activity without intercourse was safer for both partners, and were more likely to have condoms than students from the control floors. The point is that even these brief programs of intervention by opinion leaders do influence at least a few individuals to act in the direction of the influence.

Because opinion leaders are able to assimilate and pass on information in a way that is appropriate to
their peers, they present themselves as a compelling choice for study. It is also important to make a note of where other individuals stand in relation to opinion leaders. McCleneghan (1977) for example, maintained that the ability to be influential is a continuous variable and, therefore, if there are opinion leaders at one end, then one can imagine that there are individuals who have little, if any, influence over their friends and relatives at the other end. In between these two extremes exist other categories based on relative influence. The next section reviews studies which point towards these other categories.

Non-Opinion Leaders

Although it is widely agreed that it occurs along a continuum, to better understand the phenomena of opinion leadership would suggest breaking up the continuum into four categories: opinion leaders, opinion seekers, opinion followers, and opinion avoiders. This section is comprised of a discussion of the latter three categories. Wright and Cantor (1967) define opinion seekers as individuals who seek out another’s views on one or more issues. Their sample consisted of 200 graduate students in a variety of fields of study. The authors sociometrically mapped the network links of these students with reference to success
in graduate school, intellectual issues in the field of study (e.g. foreign affairs), and questions about their profession. They found 18 individuals to be opinion seekers. These were individuals who frequently talked about U.S. foreign affairs, frequently asked peers for information on the topic, and had a particular peer as an opinion leader in the area. Opinion seekers are less likely than opinion leaders to be interested in seeking information in multiple areas. The authors found that only four percent of opinion seekers sought input from others in all the discussion topics included in the study while 56% were interested in only one or two of these topics. Thus, opinion seekers generally have a preferred source of information for topics of interest and have a fairly large group of friends or acquaintances with whom they can discuss these issues.

A third category on the opinion leadership continuum is that of the opinion avoider. Wright and Cantor (1967) defined an opinion avoider, also known as an isolate, as a person who neither seeks nor provides opinions on particular issues and topics. At the heart of this classification is the fact that these individuals do not have the large networks of friends and co-workers that mark opinion leaders and seekers. Wright and Cantor
categorized 39 of the 200 graduate students in their study as opinion avoiders. These individuals were found to seldom discuss topics of common interest or seek the opinions of peers and they did not have an opinion leader with whom they consulted. Other studies also indicate the presence of opinion avoiders. For example, when Rogers and Kincaid (1981) studied the adoption of family planning in 24 Korean villages, they identified isolates who had no network links. Not only were their homes more likely to be located at the periphery of the villages, but they were also only one-third as likely as the other villagers to be members of a "Mother's Club" (a village-level organization established to encourage family planning practices among women of child-bearing age and to serve as a channel for family planning information and supplies). Coleman et al. (1966), in their study of the diffusion of information about and use of a new antibiotic described earlier, found that a sociometric mapping of the medical profession revealed that while some individuals were highly integrated into the community, other doctors were highly isolated from the community, sharing little news on medical innovations and information. Crane (1972), in her study of invisible colleges discussed earlier, found that isolated mathematicians were less integrated into the
social networks specializing in that area than were members of large collaborative research groups. She defined them as individuals with no collaborative scientist-scientist or student-teacher ties.

Not only are opinion avoiders less integrated into social networks, they communicate much less with their peers and can be associated with all the outcomes of lower communication levels. Crane found that isolates were much less likely to be named by other researchers as people with whom they discussed their current research. In turn, isolates named fewer people with whom they discussed their research or even engaged in informal communication. The opinion avoiders in Wright and Cantor's (1967) study similarly expressed less interest in the field of study than opinion leaders or seekers. Twelve percent of these isolates were found to avoid discussions in all relevant topics, while 72% avoided discussing at least one topic. Crane concluded from her data that isolates have less influence in the development of the field than do members of large research groups. Coleman et al. (1966) also found that isolated doctors were chosen less frequently as advisors, discussion partners, and friends. A consequence of this smaller social and professional network is that these doctors, with less information and fewer assurances
from the early adopters of the gammanym, adopted the drug later. In a similar vein, Rogers and Kincaid (1981) found that the isolated Korean villagers were a fourth as likely to adopt family planning methods than those with better-developed social networks. In general, isolates' failure to discuss matters of common interest with peers leads to their later adoption of new innovations.

The research by Wright and Cantor (1967) also suggests that there might be yet a fourth category. They found that opinion seekers, because they seek out information so actively from opinion leaders, serve as opinion leaders to other individuals. Fifty three percent of opinion seekers on the topic of foreign affairs in their study were also opinion leaders for others on the topic. It is quite likely that these others are part of extensive social networks from where they can obtain information on a variety of issues, but which they use passively, preferring to go along with the opinion seeker's actions or opinions. These individuals are called opinion followers in this study.

Returning now to the category of opinion leaders, an important question that arises is how do opinion leaders generate opinions and/or plans of action that are considered by members of their communication network to be
effective or desirable? Naturally, it does not follow
that, just because they are active and effective
communicators, they will come up with efficacious and
well-received plans. This research, however, proposes that
opinion leaders, by virtue of their position as leaders,
do come up with opinions or plans that are widely accepted
in their social network. They are able to do so because
they experience a high sense of self-efficacy, which
allows them to generate relatively complex and clearly
verbalized goals. Bandura (1986) proposed that self-
efficacy is a person's perception of his/ her own ability
to carry out specific courses of action. The higher this
sense of efficacy, the greater is the likelihood that the
individual will attempt more complex tasks. In the section
below, past research on self-efficacy is reviewed and its
relationship to the concept of opinion leadership is
discussed.

**Self-Efficacy**

Perceived self-efficacy, as defined by Bandura
(1986), is a person's judgment of his/ her capabilities to
organize and execute courses of action required to attain
certain levels of performance. Those who perceive
themselves to be highly efficacious are those who can
organize cognitive, social, and behavioral subskills into
integrated courses of action to serve many purposes (Bandura, 1986). Bandura maintains that perceived self-efficacy not only draws together existing subskills but also promotes, through perseverance, the development of new ones.

Bandura, Adams, and Beyer (1977) found that self-efficacy is a consistently accurate predictor of performance on tasks of varying difficulty. Participants in their study suffered from chronic snake phobias and were required to perform increasingly threatening tasks with a red-tailed boa constrictor. Bandura et al. conjectured that perceptions of efficacy created through direct versus vicarious experiences would have differential effects on task performance. Participants assigned to a "participant modeling" condition copied the actions of the therapist and then engaged in self-directed performance where they touched, held, and allowed the snake to crawl freely in their laps. In a "modeling" condition, participants observed a therapist perform the same graduated set of activities. In a control condition, participants did not undergo any treatment but stayed the same length of time in the experimental room. Bandura et al. found that participants in the participant modeling condition enjoyed far more enhanced perceptions of
efficacy than did those in the modeling alone or the control conditions. The researchers also found a high degree of congruence between the judgments of capability participants made and their actual performance. In terms of participant modeling, there was 89% congruence between judgments and actual performance; for modeling this figure was 86%. This points to perceptions of efficacy as being a fairly accurate indicator of performance.

Individuals who have a high sense of self-efficacy are also likely to judge themselves capable of engaging in activities of increasing difficulty. In research by Locke, Frederick, Lee, and Bobko (1984) participants were asked to list many different uses of common objects over seven one-minute trials in one of three experimental conditions. In a "high strategy" condition, they were trained to use strategies to maximize the list of uses. In a "low strategy" condition, they were told to list only good or high quality uses, while participants in a control condition were simply given the task to perform. Trials one through three were training trials, while Trial 4 was a post-training trial. On the fifth trial, approximately half the subjects were asked to list 12 uses and the remaining were asked to set their own quantitative goal. On the sixth trial all participants...
were asked to set their own quantitative goals, while on the seventh trial, participants were free to choose either a specific goal or a non-specific one (i.e. “do your best or no goal at all). The authors found that the high strategy group demonstrated the highest performance, while the low strategy participants demonstrated the poorest performance, with the control group in the middle. More interestingly, Locke et al. found a strong positive correlation between the magnitude of self-efficacy and the goals that participants were free to choose in the sixth and seventh trials. In other words, participants who experienced a sense of high self-efficacy chose more challenging goals. Research by Bandura and Cervone (1983) supports this finding. Participants in their study with a sense of high self-efficacy tended to become more involved in the task when faced with ambitious goals and when receiving positive feedback about their performance, compared to a slackening in effort by participants who perceived themselves to have low self-efficacy. That is, not only do those with high self-efficacy choose tougher goals, but they also persist in achieving these goals.

Both Locke et al. (1984) and Bandura et al. (1977) found that the most effective way for individuals to enjoy heightened levels of self-efficacy was through
experiencing successful task performance. However, according to Bandura (1986) individuals also become aware of their own self-efficacy through positive appraisals of their performance by others. Chambliss and Murray (1979) found that the positive feedback individuals receive about their ability to undertake and succeed in a variety of tasks, particularly more difficult ones, can contribute to success particularly when the heightened appraisal is within realistic bounds.

To summarize, two important pieces of information can be abstracted from the preceding discussion: (1) a heightened sense of self-efficacy correlates with a sustained effort to complete even challenging tasks, and (2) individuals enjoy an increased sense of self-efficacy through positive feedback. This information has important implications for the role of opinion leaders in complex resource problems. These implications are discussed in the following section.

**Opinion Leaders in Resource Dilemmas**

Several points from the above discussion indicate that opinion leaders might be motivated to act so that resource dilemmas are eased. Resource dilemmas, as discussed earlier, present individuals with conflicting resource-use choices that lead either to immediate
personal gain in the short-term or to gains spread amongst many resource users over the long term. Opportunities to communicate about the problem encourage resource users to cooperate, maintain the resource and, in essence, eliminate the conflicts in decision-making. However, issues such as restricted community use of limited resources are quite likely to result in the voicing of several opposing viewpoints. Such a situation is likely to need considerable negotiating skill to work out solutions agreeable to most if not all community members. Opinion leaders, as pointed out earlier, have characteristics that suggest that they would be the most appropriate individuals to facilitate and encourage discussion about and solutions for the issue. Of course, just because opinion leaders are knowledgeable about a variety of issues, are gregarious and have large social networks, and offer opinions that respect the norms of the community does not necessarily imply that they will be able to negotiate through the difficult issue of community resource use. The previous discussion on self-efficacy, however, does offer answers to this issue.

Since perceptions of self-efficacy are a result of feedback that individuals receive about their performance, it is quite likely that opinion leaders enjoy
a sense of high self-efficacy. This is because opinion leaders receive feedback in two ways that very likely heighten their perceptions of self-efficacy. The first type of feedback that they receive is through simple observation; people to whom they have transmitted knowledge/attitudes/behavior can be observed to be acting on that information, expressing those attitudes, or enacting those behaviors. The second type of feedback, concurrent with Bandura's (1986) explication, is verbal; friends or acquaintances from their large interpersonal network ask opinion leaders for advice or help on a regular basis, indicating to them that their previous advice or opinions were efficacious or useful. Heightened self-efficacy, as mentioned earlier, leads to sustained efforts by the individual to accomplish a task, even if the task is one that he/she had not encountered before. The implication is that opinion leaders, because of a sense of high self-efficacy, when faced with a resource dilemma might make repeated efforts to find solutions that eliminate the dilemma. In summary, positive feedback received verbally or through observation heightens individuals' perceptions of self-efficacy, which in the case of opinion leaders, leads to their attempts to influence people around them. When these individuals are
now faced with resource dilemmas, they will make some effort to generate effective communicative strategies that attempt to address the issue.

Self-efficacy is only one possible explanation for why opinion leaders work hard to communicate effectively. A second possible explanation as to why opinion leaders would produce more effective communicative strategies than others might lie in the fact that opinion leaders are conscious of, and enjoy their position in their social system and, therefore, draw on the cognitive processing required to generate effective strategies. Should they express poor strategies, it is likely that they will quickly lose their leadership positions. Additionally, should these strategies be radically outside what is acceptable within their social circle, they would no longer enjoy this status (Rogers, 1995). Therefore, they must at some level negotiate with community members and express attitudes or modes of behavior that are acceptable to their group.

This paper uses three criteria to define effective strategies in the context of resource dilemmas. First, an effective strategy will include people other than the opinion leader either as beneficiaries or as discussants of the strategy. Since the consequences of
these dilemmas result from the decisions made by the collective, the more people who make similarly cooperative choices, the higher is the probability that the resource will be maintained more efficiently. Second, an effective strategy will not recommend requesting additional resources. Returning to Kramer, McClintock, and Messick's (1986) assertion that the shortages we experience are more indicative of sub-optimal resource use than a genuine resource shortage, it is clear that most of these shortages can be corrected through a more efficient use of existing resources. Third, an effective strategy will verbalize a reasonably concrete plan of action. Users sharing a resource must not only be able to discuss the dilemma, they must be able to coordinate their actions on specific agreed-upon plans of action in order to address the dilemma.

The literature so far supports the proposition that opinion leaders will be able to produce good communicative strategies. Therefore, the hypothesis that this paper makes is:

H1: Opinion leaders, when faced with a resource dilemma, and offered the opportunity to communicate with others facing the same situation, will produce communicative strategies that will address the problem more effectively than strategies that opinion seekers, opinion followers, and opinion avoiders will produce.
A weakness in this hypothesis lies in the fact that just because opinion leaders might be able to produce strategies that encourage cooperation amongst resource users does not mean that they will necessarily want to produce such strategies. The concept of social value orientation (SVO) might be able to fill this gap. SVO offers itself as a final variable in the identification of opinion leaders as a group who negotiate through social dilemmas most successfully. In a social dilemma, if individuals value the outcomes that both they and every other similarly involved individual receives, then they are classified as having a cooperative SVO. The following research points to the strong possibility that opinion leaders are likely to be cooperatively oriented.

**Social Value Orientation**

SVOs are a type of individual difference. Terhune (1970) described individual differences or personality variables as more or less enduring behavior potentials that an individual possesses. He explained that these behavior potentials do not direct behavior until aroused by a particular situation, or state of environment in which the individual finds himself/herself at a given point in time. Behavior, in other words, is the result of independent behavior potentials, situational influences,
and a unique interaction between the two factors. This explanation allows for use of individual differences as a way to predict expected behavior in a variety of situations, but particularly, expected behavior in an interaction with interdependent others.

SVOs refer to the pre-dispositions that individuals have "for a specific pattern of outcomes, in a setting of outcome dependence, that is consistent over time" (Komorita & Parks, 1996, p. 106). Social values are motivational orientations, which Weingart, Bennett, and Brett (1993) defined as generalized goals that individuals have that both direct and limit their behavior. According to Deutsch (1960), the intention to act (the motivational orientation) must be accompanied by conditions that are sufficient and attractive for the consummation of this intention (to act in a particular way) in an interdependent situation. Then, depending on the conditions that are necessary for the enactment of behavior and given a set of known situational conditions, we can expect to see or not see a particular behavior.

Deutsch (1960) focused on three different motivational orientations: cooperation, competitiveness, and individualism. A cooperative orientation refers to the motivation an individual experiences to act so that both
own and other's welfare is maximized. In other words, the individual tries to achieve maximum joint outcomes for everyone involved (Komorita & Parks, 1996). A competitively oriented individual, on the other hand, experiences high motivation to maximize own outcomes relative to the other person. This implies that a competitive individual will not necessarily achieve the highest possible personal outcomes possible in that situation. Finally, an individualistically oriented person is concerned about maximizing own outcomes regardless of the outcomes of others and will, therefore, aim to attain the highest possible personal outcomes in the given situation. For the sake of brevity, individuals with cooperative, competitive, and individualistic SVOs will henceforth be referred to as cooperators, competitors, and individualists, respectively.

Researchers believe that SVOs represent one component of personality that directs behavior (Komorita & Parks, 1996). It is generally thought that components of personality remain stable over time. Kuhlman, Camac, and Cunha (1986) reviewed three unpublished studies that found that these SVOs do endure over time. In each of these studies, the researchers first administered what are called "decomposed Prisoner's Dilemma Games" (DPDG) to
individuals to measure their motivational orientation. DPDG, to be described in detail in the following chapter, are a set of specially constructed choice-making tasks that respondents are asked to approach as though they were in a situation of interdependence. Depending on the choices that individuals make in these tasks, they are classified as cooperators, competitors, and individualists. Then, between four to six weeks later, participants in each of these studies were asked to complete a variety of tasks. In one study, for example, cooperators and competitors were assigned to work environments which were either inherently cooperative or which engendered competition. The researchers found that cooperators demonstrated the greatest effort (as measured by time spent working on an anagram before giving up) while working in a cooperative environment, while competitors showed the greatest effort in a competitive environment.

To what extent do SVOs explain variation in behavior? In general, studies have shown that when faced with decision tasks in interdependent situations, individuals demonstrate a strong correlation between their SVOs and the choices they make. The next section briefly reviews the method by which decision-making in situations
of interdependence is studied in the social sciences, followed by findings that indicate that SVOs are an important variable in explaining differences in behavior.

**Social Value Orientations and Behavior**

In a typical study of SVOs and behavior, participants first play several trials of DPDG to determine participants' SVOs. Similar to decision-making in Prisoner's Dilemma Games (PDG), participants make decisions based on a choice matrix, the only difference being that although they do not actually have partners at this time they are asked to act as though their decisions do affect another person. After SVOs have been determined, participants undertake specific decision-making tasks. Most of the studies to be reviewed below have made use of this experimental game structure to understand variations in behavior in situations of interdependence.

Kuhlman et al. (1986) found that knowledge of a person's SVO allows for greater accuracy in the prediction of the way in which he/she will make choices in an interdependent situation. Studies by Kuhlman and Marshello (1975) and Kuhlman and Wimberly (1976) first classified individuals according to their SVO and then asked them to play several trials of the PDG with variations in feedback about the partners' choices. Both studies found that
cooperators tend to make more cooperative choices than do competitors and individualists over several trials of the PDG. McClintock and Liebrand (1988) studied the choices of individuals across four different experimental game structures and found that the mean level of competitive or defecting choices cooperators made was lower than those made by competitors. Liebrand, Wilke, Vogel, and Wolters (1986) studied the effect of SVOs across three experimental games and found that even when cooperators received feedback that the majority of individuals in their eight-person group were making a defecting choice, they continued to choose cooperatively. Competitors and individualists were more affected by feedback that a majority of group members was making a defecting choice.

Experimental games have often been manipulated to represent the real-life problems that constitute social dilemmas. Resource dilemmas are well represented in this type of research and SVOs have often been studied within this context. Such studies have revealed that SVOs appear to have an impact on the consumption decisions of participants. The study by Kramer, Messick and McClintock (1986), mentioned earlier, first identified participants as cooperators and non-cooperators (that is, competitors and individualists). Groups of six participants then had
to withdraw as many points as they could from a slowly-replenishing common resource pool (worth 300 points) over 12 trials with the goal of accumulating as many points as possible for themselves. After each trial, participants’ received false feedback about the level of the resource pool. Approximately, half the groups received feedback that the group as a whole had used the resource at a rate that allowed it to sustain itself through replenishment. The remaining groups received feedback that the level of the resource pool had dropped steadily from 300 down to 26 points over the course of the 12 trials. Kramer et al. found that cooperators accumulated fewer resources for themselves, even when they received feedback that the future of the resource was threatened and, therefore, did not have any incentive at that time to restrict consumption. Meanwhile, non-cooperators consumed at a high level and did not alter their consumption behavior even when they knew that the resource would be destroyed.

Liebrand and van Run (1985) recorded similar results in their study. They found that even though competitors and individualists received feedback that they were withdrawing more than the others in their group, they did not reduce their withdrawals. This study employed, in addition to the three most common SVOs of cooperation,
competitiveness, and individualism, a fourth SVO called altruism. Altruistic individuals are more concerned about the outcomes of the other than of self and, as a consequence, make choices in an interdependent situation that will benefit the other more than themselves. The researchers found that altruists and cooperators, in contrast with competitors and individualists, withdrew less than the others did from the pool.

Another area in which SVOs are of significant interest is negotiation. De Dreu and Boles (1988) examined the effect of SVO on the heuristics or rules of thumb that individuals selected as relevant to negotiation. They found that cooperative participants chose more cooperative heuristics such as "share and share alike," while competitors and individualists judged competitive heuristics such as "your gain equals my loss" to be more effective negotiation strategies.

Clearly, differences in SVOs correlate strongly with behavior in situations of interdependence. This leads to the expectation that SVOs will guide individual behavior as well as act as a fairly accurate indicator as to expected behavior.

Research by Noelle-Neumann (1985) has shown that opinion leaders will often enact behavior that implies a
cooperative orientation. She found that high scorers on the PS scale (that is, opinion leaders) enjoy transmitting knowledge to others. The desire to teach is an inherently cooperative one, since the sharing of knowledge benefits both teacher and student. Moreover, she found that those with high scores on the PS scale tended to express a desire to help others. Cooperative orientations at least in the experimental situations just reviewed have led to greater benefits to the cooperating group. Therefore, it is of significant interest to examine whether influential people, in general, tend to want maximum benefits for the group as a whole, rather than seeking maximum or relative maximum gain for self. However, in the absence of substantial evidence supporting such a finding, rather than hypothesize about the dominant orientations of opinion leaders, I merely pose a research question.

RQ1: Will there be a difference between the communicative strategies that cooperative opinion leaders choose and the ones that competitive or individualistic opinion leaders choose based on the number of other resource users who benefit from it?

Conclusion

Policies that are designed to prevent natural resources from being depleted but that do not take into account the needs of the communities that use the resource
are usually unsuccessful. Command and control policies are expensive to institute and administer and suffer from frequent infractions. However, involving communities in the process of natural resource maintenance by encouraging communication amongst community members resulting in agreed-upon, and therefore, stable plans to maintain the resource sustainably might be a viable alternative. Opinion leaders present themselves as particularly important individuals in this process, for it is hypothesized that they have characteristics that will allow them to verbalize reasonably concrete plans that will be widely accepted in their social circles as a way to solve the resource problem. This research explores the extent to which opinion leaders will choose cooperative solutions to resource shortages.
Chapter 2

METHOD

Overview

This study was designed to test the hypothesis and investigate the research question posed in the previous chapter through a series of surveys. In late Spring 2001, participants from the Department of Communication, University of Delaware, were given scenarios of resource dilemmas and were asked to indicate the probability with which they would choose each of a set of communication strategies relevant to each situation. They were also asked to complete a combination of personality scales as well as make choices within a set of decision tasks so that they could be classified according to opinion leadership (OL) type and social value orientation (SVO) respectively.

The personality scales and the decision tasks were administered separately from the surveys on the resource dilemma scenarios to prevent confounding the results through priming. Students completed the former in laboratory sessions while the latter was completed in class. Student responses were kept confidential. In the
following sections, the sample, the study design, the measurement instruments, and the study procedure are described.

**Participants**

Participants for this study consisted of 178 students taking COMM 301 (Introduction to Communication Research Methods). Of these, data from only 155 students was usable. This was because 23 students either did not complete one of the two parts of the study or did not choose consistently in the set of decision tasks and so could not be classified according to a specific SVO. Students participated in this study as part of a course research requirement and were given two points for the completion of both parts of the study.

**Study Design**

The three independent variables in this study were OL type, SVO, and the resource dilemma scenarios. Four OL types were considered: opinion leaders, opinion seekers, opinion followers, and isolates or opinion avoiders. Participants were measured for one of three SVOs - cooperativeness, competitiveness, or individualism. Four resource dilemma scenarios were presented to participants. These resource dilemma scenarios were modeled on shortages
that students commonly face on a university campus and sought to present participants with conflicting choices that either resulted in immediate personal gain or in gains for the student community over the long term. The study, therefore, had a 4 (opinion leaders/ seekers/ followers/ avoiders) X 3 (cooperative / competitive / individualistic) X 4 (resource dilemma scenarios) design with scenarios within subjects.

The "Strength of Personality Scale" (PS scale) was designed by Noelle-Neumann (1985) to identify the influential individuals in any population. This scale is used in the current study to classify individuals in this population of students according to OL type. The PS scale was used in combination with questions modeled on two of those found in the "Spare Time" section of the Social Adjustment Scale - Self Report (SAS-SR) designed by Weissman and Paykel (1976; as cited in Corcoran & Fischer, 2000) as well as the Sociopolitical Control Scale (SPCS) designed by Zimmerman and Zahniser (1991; as cited in Corcoran & Fischer, 2000). These scales were used in combination so as to ascertain the strength of personality, extent of social networks, and sense of political efficacy, as well as leadership expressed by participants.
The second independent variable, the SVO held by participants in this study, was measured through the use of decomposed Prisoner's Dilemma games (DPDG). Several studies (Kuhlman & Marshello, 1975; McClintock & Liebrand, 1988) have validated their use in identifying the most preferred outcome that each participant values in a situation of interdependence with other individuals. The third independent variable of the study were the four resource dilemma scenarios, which participants responded to by stating the probability, on a 0-10 scale, with which they would use each of eight response strategy types.

These strategy types are the dependent variables in this study. Participants could choose from one of eight strategies: (a) demand more resources ("Demand"), (b) express an intention to act so that one's own need for resources is met ("Selfish"), (c) express an intention to talk to the authorities about the problem ("Intention"), (d) express emotions such as anger and frustration at the state of affairs ("Emotion"), (e) verbalize an efficient plan using an alternative resource ("Different resource") (f) seek the opinion of others in the same situation ("Opinion seeking"), (g) talk about the problem without making an effort to find a solution ("Talk"), and (h) verbalize an efficient plan using the given resource.
efficient"). The combined scales, DPDG, and the method by which these strategies were selected are described in the following section.

**Measurement Instruments**

**Strength of Personality Scale (PS Scale)**

Noelle-Neumann and others at the Institut fur Demoskopie Allensbach were asked to develop an instrument to identify active and influential persons independent of social status. They used indicators such as the ability to succeed, personal influence, leadership, and charisma to carry out this identification (Noelle-Neumann, 1985). The result was the Strength of Personality Scale (PS Scale), which consists of 10 statements of self-description, which require yes/no responses. These statements are the result of a factor reduction of an original 34-item questionnaire. This factor analysis additionally assigned different weights to the yes and no responses to each of the 10 statements based on the loadings on the first factor. These weights are summed to calculate strength of personality. Respondents choose the response most appropriate for them for each statement and the weights of their responses are then summed. The lowest possible score is 75 and highest possible score 149 (Noelle-Neumann,
1985). A high score indicates that the respondent has a strong personality, while lower scores indicate that individuals have less influence in their social groups. Please refer to Appendix A for the PS scale.

Weimann (1991) administered the PS scale to two different samples to test for its validity. In the first sample, participants were drawn randomly from the adult Jewish population of Israel. Replicating the procedure used by the Allensbach Institut, respondents were interviewed using a pre-structured 34-statement questionnaire, among which were the final 10 PS scale items. The second sample consisted of members of an Israeli kibbutz community. In this sample, personal communication networks and the flow of information and influence in this network was mapped sociometrically. Each member in the community was asked to list and rate, on the basis of strength, his or her conversational ties with other members in the community. This data was arranged in a who-to-whom matrix, each entry representing a communication tie, characterized by its strength. The flow of information was studied by tracing the path of six items (two each under “general news,” “consumer information,” and “gossip”). Respondents were asked whether they were aware of these items and, if so, who had
told them about it. With regard to influence, respondents were asked about the role they played (consulting, seeking advice, being influenced) in two issues that the kibbutz voted on. Scores from the PS scale were then cross-classified with this data. Weimann found that individuals with high strength of personality scores were more strongly linked to other individuals in the community, and especially to those within their social group. Moreover, individuals who had high scores were also located in central positions in the networks of their groups. Finally, he found that those who had high PS scores were the most active communicators of news and consumer information. These results corroborate the opinion leadership characteristics noted in other studies and led Weimann to conclude that the scale was a valid measure of strength of personality based on the close correlation between PS scores and the role respondents had in the flow of information and influence in their communities. Weimann also carried out split-half reliability tests for the first sample as well as the German sample from which the Allensbach Institut had collected data. The samples yielded coefficients of .76 and .78 respectively.

A factor analysis of the PS scale conducted during the current study showed that statements 2 and 10
dealt with behavior in social situations, statements 3, 4, and 8 were concerned with issues of leadership, while statements 6, 7 and 9 focused on strong personalities. Although, Noelle-Neumann (1985) classified the responses to fit four categories (Strong, 111-149; Above average, 91-110; Moderate, 81-90; Weak 75-80) to maintain sufficient power for categorization in the current study, the sample was divided at the median score (132). Thus, in the present study, the upper half of the sample was considered to have strong personalities and the lower half was considered to be weak. Please refer to Appendix A for the weighted PS scale.

Sociopolitical Control Scale (SPCS)

The SPCS, designed by Zimmer and Zahniser (1991), is a measure to determine self-perceived sociopolitical control. This 17-item instrument was constructed to distinguish between sociopolitical and other types of perceived control (Corcoran & Fischer, 2000). It has two subscales - leadership competence (items 5-8, 14-17), and policy control (items 1-4, 9-13). The scale is used in this study because of its usefulness to clinicians in community practice in measuring "the sense of empowerment in clients" and understanding the experiences of "volunteers, activists, and community isolates" (Corcoran
& Fischer, 2000; p. 791). One of the 17 items was omitted because it did not appear to be relevant to this current study.

Zimmerman and Zahniser (1991) tested the SPCS in three samples differing in terms of participation in community activities. The first consisted of 390 undergraduates enrolled in an introductory psychology course, the second included 205 citizens recruited at voluntary organization meetings, and the third involved 143 members of four Methodist churches. Zimmerman and Zahniser found that the SPCS had good internal consistency, with alphas for the leadership and policy control subscales ranging from 0.75 to 0.78. The authors also found good construct validity, with correlations in the expected directions with locus of control, alienation, and willingness to lead measures.

The instrument is designed with a six-point scale ranging from strongly disagree to strongly agree. Items 9-16 are reverse scored. Higher scores signify higher leadership competence and policy control. A factor analysis conducted during the current study showed that statements 5-8 and 16 were concerned with leadership; statements 1-4 and 13 gauged political participation in a general sense, while 9-15 dealt with political
participation at the local level. Although statement 13 repeats itself in political participation at the general and local levels, it seems to express a sense of general political (non-) efficacy.

A primary reason for considering opinion leaders as individuals who can engender higher rates of cooperation amongst members of a community is that they experience a heightened sense of self-efficacy. Self-efficacy, as measured by the SPCS might be considered a concept that closely ties in to a sense of empowerment or political efficacy within the community. In addition it allows for the identification of the role that each individual might play in his or her community, such as, for example, whether they are active or they are more isolated. For these reasons, the SPCS was used to determine the position that individuals occupy (leader, seeker, follower, or avoider). Please refer to the combined personality scale in Appendix A for the SPCS items used in this study.

Social Adjustment Scale - Self Report (SAS-SR), Spare Time Section

The SAS-SR was designed by Weissman and Paykel (1976; as cited in Corcoran & Fischer, 2000) to measure adaptive functioning within a variety of social contexts.
Of interest for this research was the spare or leisure time section which attempts to measure the extent of an individual's range of social activities. One question from this section was used as a model for three questions in the combined personality scales (questions 1-3), while a second, question 4, was used with only a slight alteration in the response type, and as a model for another question (question 5) added for this study. Questions 1-3 and 5 have multiple-choice responses and are scored on a 1-5 scale, with higher scores indicating a greater number of friends contacted or the number of times an individual discusses politics with friends or co-workers in the space of two weeks. Question 4, on the other hand, required respondents to note the number of times they had gone out socially over a two-week period with other people. Since the respondents in the current study are undergraduates with active social lives, this method allowed them to record more accurately the number of times they actually went out. The lowest and highest number of outings listed were noted and used to construct five discrete intervals, each with a range of four. This question was again scored on a 1-5 scale so that the higher the number of social outings, the higher the score the respondent received.
These questions yielded answers that were important in the categorization of participants in this study. Those with many friends, in conjunction with their personality type and sense of political efficacy, were classified as one of the three - leaders, seekers, or followers, while those with few friends were categorized as opinion avoiders. Please refer to Appendix A for these questions in the combined personality scale.

Combined Opinion Leadership Scale

In combination, the three measures described above were used to ascertain the degree to which individuals were leaders in their social networks. Given that previous research found the size of social networks to be a key factor in identifying opinion leaders, it was used as a primary determinant for classification. Opinion leaders were classified as such if they scored highly in terms of strength of personality, size of social networks (i.e. many friends), and if they experienced a sense of high political efficacy. Opinion seekers were those who had strong personalities, many friends, but low political efficacy. It was assumed that these individuals were more comfortable seeking advice before taking action. Opinion followers were assumed to be a more diverse group. They were assumed to have weak personalities (which prevented
them from undertaking group leadership), large social networks, and who could experience both low and high political efficacy. The inability to lead was considered as the factor on which the classification of opinion followers hinged. Opinion avoiders were probably the most diverse group, given that the only constant factor in their classification was the absence of a large social network. Thus, opinion avoiders had very small social networks, could have strong or weak personalities, and, experienced either high or low efficacy.

**Decomposed Games**

Messick and McClintock (1968) distilled three main SVOs: cooperation, competition, and individualism. Given a situation of interdependence with others, cooperators will seek to maximize joint outcomes, competitors will act to maximize the difference between own and others' outcomes, while individualists will seek to maximize own outcomes regardless of the outcomes that others achieve.

The most widely used method to identify these SVOs is through the use of decomposed Prisoner's Dilemma games (DPDG). DPDG were first used by Messick and McClintock (1968) and later refined in the study by Kuhlman and Marshello (1975).
Typically, participants are asked to play 15 trials of these games. They are presented with a game on each trial; each describes three possible pairings of outcomes to two people, self and other. They are asked to examine one game at a time and are instructed to assume that the points in each cell have real value, are important to them, and that it should be their objective to obtain as many units as possible. They are also told that they are playing this game with another individual, a “paired person” or an interdependent other, whose identity they will not learn at any time. The number of points accumulated is also important to this paired person. Participants are told that the decisions that they make to accumulate a certain number of points directly affects the number of points their paired partner gets, just as the decisions that the paired person makes affects their own totals.

Table 2.1 Example of Decomposed Prisoner’s Dilemma Games (DPDG) drawn from Kuhlman, Camac, & Cunha (1986, p. 153)

<table>
<thead>
<tr>
<th>Game Number One</th>
<th>Game Number Two</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Outcome to self</strong></td>
<td><strong>Outcome to other</strong></td>
</tr>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>
Table 2.1 presents two example games, which make plain how DPDGs are used to measure SVOs. In Game One, a cooperative individual can be expected to choose B because this maximizes joint gain; choice B sums to 10 (highest joint outcome), while choice A sums to nine and choice C sums to four. A competitive choice in Game One is C because this maximizes the difference between self and other; a competitor will earn four points more than his/her partner in choice C, while this difference will only be three in choice A and zero in choice B. An individualist might be expected to choose A in Game One because the gain for self is maximized; he/she earns six points with choice A, the highest number possible in the game. Choices B and C would earn five and four points respectively.

In contrast, in Game Two, the cooperative choice would be A; choice A sums to 10 points, while choices B and C sum to eight and four points respectively. The competitive choice would also be A because difference between self and other is maximized; the competitor earns eight more points than his/her partner in this choice as opposed to the two and four point difference in choices B and C. An individualist would also be most likely to choose A for it achieves high outcomes for self regardless
of outcomes to the other; he/she earns nine points in choice A whereas these earnings would be in five for choice B and four for choice C.

Over 15 trials, a perfect score for any choice pattern (cooperation, competition, individualism) would be 15. However, if participants choose cooperatively, competitively, or individualistically 60% of the time, or in nine of 15 trials, then they are classified according to that choice pattern. (Please refer to Appendix B for the 15 decomposed games used in the study, the response sheet, and instructions.)

Several studies (Camac, 1986; Kuhlman, Camac, & Cunha, 1986) have shown this to be a valid method for the identification of SVOs. Kuhlman, Camac, and Cunha (1986) reviewed several studies in which participants were asked to complete a set of decomposed game tasks and then, four to six weeks later, were asked to complete tasks such as estimating the proportions of people in the sample who would choose cooperatively, competitively, and individualistically in a set of decision-making tasks. Each group estimated that its own orientation was most prevalent. In their study, Kramer, Messick and McClintock (1986) first identified participants as cooperators, competitors, and individualists (the latter two were
classified as non-cooperators). Then, in an apparently unrelated task, they presented participants with a resource dilemma. They found that cooperators accumulated fewer resources for themselves per trial than did non-cooperators. Moreover, when participants received feedback that the resource pool was being rapidly depleted, non-cooperators did not alter their consumption behavior, whereas cooperators demonstrated personal restraint. Unfortunately, in the studies reviewed so far, there appears to be no documentation of a reliability analysis for decomposed Prisoner's Dilemma games.

**Communicative Strategies**

What sort of responses will people use when they are faced with resource shortages? This is one of the questions that this research hopes to answer. However, in order to obtain response choices that are externally valid, it was important that the scenarios to which they were asked to respond be ones that they perceived as realistic. Therefore, five scenarios, each relating to resource shortages that undergraduates commonly face, were formulated. These scenarios were the result of informal conversations with students from two sections of Comm312 in Fall 2000. These are shortages of fitness equipment at the gym, of computers loaded with specific software at the
Pre-testing was carried out on February 5, 2001 in two sections of COMM 350. One goal of this pretest was to determine whether the scenarios were realistic and whether students found it easy to imagine themselves in such scenarios. Each of the five scenarios was presented in the same order to each student. The second goal of this pretest was to compile a list of responses that students would offer to the scenarios. This would ensure that in the final survey participants could choose from realistic responses. Therefore, they were asked four questions. These questions were:

(1) What would you say in this situation?

(2) What would you not say in this situation?

(3) On a scale of 1 (very unrealistic) to 5 (very realistic), how realistic do you think this situation is?

(4) On a scale of 1 (not easily) to 5 (very easily), how easily can you imagine yourself in a situation like this?
Students completed the survey voluntarily and received extra credit for it. Please refer to Appendix C for the surveys used in this pretest.

In Table 2.2, the means for each scenario in terms of how realistic respondents found it and how easy they found it to imagine themselves in such a situation are presented.

Table 2.2 Means for Scenario Realism and Ease of Imagination

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Fitness Ctr.</th>
<th>Software</th>
<th>Study Areas</th>
<th>Food</th>
<th>Parking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 31</td>
<td>N = 31</td>
<td>N = 31</td>
<td>N = 30*</td>
<td>N = 31</td>
</tr>
<tr>
<td>Very unrealistic (1) to Very Realistic (5)</td>
<td>4.42</td>
<td>4.06</td>
<td>2.65</td>
<td>4.36</td>
<td>4.26</td>
</tr>
<tr>
<td>Not very easy to imagine (5) to easy to imagine (1)</td>
<td>3.87</td>
<td>3.32</td>
<td>2.97</td>
<td>4.03</td>
<td>3.39</td>
</tr>
</tbody>
</table>

N is the number of responses; * One response was not obtained for this scenario.

It is clear that the weakest scenario was “Study areas.” The mean score for this scenario was below the mid-point. Therefore, this scenario was dropped from the study. Students also later revealed that there are other late night study areas of which I was not aware.
The next task was to generate verbal responses for the valid scenarios that could be ordered according to effectiveness. Strategies are characterized as effective according to three efficiency criteria listed below:

(a) Number of people involved: Since the negative consequences of these dilemmas result from decisions made individually, the more people who make similarly cooperative choices (in this case, either as beneficiaries of the strategy or as discussants), the higher is the probability that the resource will be maintained more efficiently.

(b) Use of existing resources: In light of Kramer et al.'s (1986) assertion that the shortages we experience are often more indicative of sub-optimal resource use rather than an actual resource shortage, it is clear that some of these shortages can be corrected through a more efficient use of existing resources. Therefore, effective strategies are those that do not recommend requesting additional resources.

(c) Verbalization of a concrete plan of action: Common resource users must not only be able to discuss the dilemma, they must be able to coordinate their actions on specific agreed-upon plans of action in order to address the dilemma.
Answers to the pre-test questions "What would you say?" and "What would you not say?" were used to establish a set of relevant strategies. A total of 172 responses to these questions were obtained, including some responses containing multiple suggestions and, therefore, expressing multiple ways of addressing the situation. These responses were first listed and then examined for and categorized according to the specific goals to which they appeared relevant. Seven goals were identified: (a) demand more resources ("Demand"), (b) express an intention to talk to the authorities about the situation ("Intention"), (c) express an intention to act alone ("Selfish"), (d) express an emotion such as anger or frustration at state of affairs ("Emotion"), (e) verbalize an efficient plan using an alternative resource ("Different resource"), (f) seek the opinion of others in a similar situation ("Opinion seeking"), and (g) expression of an intention to talk about the problem without verbalizing possible solutions ("Talk"). The words in parentheses indicate how each strategy is labeled in the subsequent tables. Table 2.3 below gives the total number of responses in each category for each resource dilemma.
An eighth response was added - verbalize an efficient plan using the given resource ("Efficient") - so that there is a clear distinction between using the same resource more efficiently and the efficient use of an alternative but available resource. This distinction is important, because while using an alternate but available resource takes the pressure off the main resource, to only use the alternative resource is to use the main resource inefficiently. Therefore, if a group decided to use an alternative resource, the result of such a decision would be continued resource use inefficiency.

Finally, these eight strategies were compared to the efficiency criteria to examine how well each fit the criteria. Below, each criterion is listed followed by the strategies that match it.
Criterion 1: Includes others either as beneficiaries or as discussants of the plan.

1. Efficient: A more efficient use of resources requires cooperation from users.

2. Different resource: In order to substantially take the pressure off a given resource, several users will have to agree to use an alternative available resource.

3. Talk: A discussion among resource users is generated about the issue.

4. Intention: Because the resource user plans to talk to the authorities, changes made to the resource will ultimately benefit all users.

5. Demand: In order for the authorities to recognize that users do not enjoy sufficient use of resources, several users must voice their concerns. Thus, significant cooperation is required amongst dissatisfied users to make themselves heard. Moreover, if authorities meet their demands, all users benefit.

Criterion 2: Use of an existing resource.

1. Efficient: The efficient strategy proposes to change the way in which the resource is used so that all users have adequate access to it, without requiring additional resources.

2. Different resource: The proposal comprises the use of an alternative but already available resource. Therefore, the provision of additional resources is unnecessary.
Criterion 3: Verbalize a concrete plan of action.

1. Efficient: In order for resource users to coordinate their actions, they need to discuss and agree on a specific course of action.

2. Different resource: A plan to use an alternative resource is, in effect, verbalization of a concrete plan because others learn of the alternative resource and can then coordinate their actions to use this resource.

3. Intention: A resource user lets other users know of his/her intention to talk to the authorities and allows users to develop a way in which to present their concerns.

4. Demand: An intention to demand additional resources from the authorities is a concrete plan.

A high, medium, and low ordering was based on how well the eight strategies matched the three criteria. If strategies met all three criteria, these were classified as high effectiveness strategies. Therefore, efficient and different resource, which matched all three criteria, were classified as high effectiveness strategies. Strategies that met two or only one criteria were classified as medium effectiveness strategies. Thus, intention, demand, and talk were classified as such because they met at least one criterion. Finally, strategies that did not meet any of the criteria were classified as low effectiveness strategies. In this category were the opinion seeking,
selfish, and emotion strategies. In each case, the resource user expressed frustration or anger about the state of affairs, acted to ensure that regardless of other users, he/she would have access to the resource, or asked for advice from others on the best way to act in the situation (without indicating how he/she planned to use that advice).

Wording was generated for the responses representing the eight strategy types for each of the scenarios using student responses collected in the first pre-test whenever appropriate. Please refer to Appendix E for the surveys designed for the main study.

In order to check for the validity of the efficiency ordering of the eight strategies, seven graduate students in the Department of Communication were asked to read the four scenarios, the strategies, and the efficiency criteria, and then code the eight strategies for effectiveness for each scenario. However, this exercise yielded very little inter-coder reliability and was abandoned. In spite of this, the classification was retained as it was based on a set of theoretically sound criteria.

A second validation check was conducted to check whether each of these eight strategy types could be
accurately matched to the wording representing them in the scenarios. Each of 17 students from Comm456 was presented with the survey, which contained the four scenarios in the same order as well as the eight possible responses, each of which were preceded by blanks. The eight strategy types followed this, each identified by a letter from A through H (Please see Appendix D for the survey used for this validation check). Students were asked to read the scenarios and then match the strategy type to the responses, by writing the letter for the relevant strategy type next to the matched response. The results of this validation check are presented in Table 2.4.
Table 2.4 Number of correct and incorrect matches between strategy type and response

<table>
<thead>
<tr>
<th>Fitness Ctr.</th>
<th>Software</th>
<th>Food</th>
<th>Parking</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>I</td>
<td>C</td>
<td>I</td>
</tr>
<tr>
<td>Same resource</td>
<td>16</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Efficient</td>
<td>17</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Demand</td>
<td>16</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>Talk</td>
<td>13</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Intention</td>
<td>12</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Opseek</td>
<td>16</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Selfish</td>
<td>16</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Emotion</td>
<td>15</td>
<td>2</td>
<td>14</td>
</tr>
</tbody>
</table>

* Indicates poor match - the intention response was mistaken most frequently for the opinion seeking strategy.
^ Indicates poor match - the opinion seeking response was most frequently mistaken for the intention strategy.
** Indicates poor match - the intention response was most frequently mistaken for emotion.
^^ Indicates poor match - the emotion response was most frequently mistaken for intention.

While in most cases students were able to match the response to the strategy type fairly accurately, clearly some responses were confusing and could not be categorized easily. These responses were re-examined and re-worded to clarify the strategy type. Other responses were re-examined as well and tweaked wherever necessary.

**Study Procedure**

Data collection for the independent variables (OL type and SVO) was separated from the collection of data...
for the dependent variable (choice of response strategy type) to avoid confounding the results. Data on OL type and SVO were collected first. I informed students in their COMM 301 class about the opportunity to participate in a study to be conducted over the following few weeks as part of their course research requirement. Students volunteering to participate in the study were then given a list of alternative dates and times and asked to choose a convenient time and date. Each date/time slot allowed for 12-16 participants, although the number of participants ranged from two to 16 students in experimental sessions. Students were asked to present themselves, according to this schedule, to the Communication Laboratory.

Upon entering the room, students’ names were checked off on the sign-up sheet to verify that those who had signed up were present. They were asked to seat themselves in chairs arranged at a distance from each other, facing a projection screen. Both the DPDG with its response sheet and the combined personality scale were placed in advance on these chairs. Students were first asked to read and sign an informed consent form (all consent forms used the study can be found attached to the respective surveys in the Appendix). The order in which the DPDG and the combined personality scale were
administered was reversed for each alternate group of participants to ensure randomization.

The researcher read out loud the appropriate printed instructions before participants began each of the two tasks (the DPDG and the personality scale). They were then assured of the confidentiality of their responses. In the case of the decomposed games, after the instructions were read, participants were shown four example rounds (Please refer to Appendix B for the four examples used in the study). They had the option of actually noting their responses on the scrap paper provided or simply paying attention to the way in which the tasks were to be completed. This was to ensure that they understood the manner in which these games were to be played. Because students were able to choose their most preferred experimental session, it was possible that groups of friends attended the sessions together. In order to guard against students influencing one another’s choices, the same 15 DPDG were presented in five different orders. After any questions were answered, participants were asked to complete the tasks.

After completing the first task, either the DPDG or combined personality scale, depending on which was presented first, participants were asked to remain seated
without conversing with one another until everyone was ready to begin the second task. At the end of the second task, students were thanked and asked not to discuss the study with others.

There were approximately 20 sessions of data collection in the first round of the study. After these sessions, participants were assigned numbers taken from the class roster, which were noted on their response forms, both to the DPDG and the combined personality scale. The consent forms were then detached from the DPDG response sheet and the combined personality scale to ensure confidentiality in the study.

The responses to the DPDG were then examined and the participants’ SVOs calculated. Participants were characterized as cooperative, competitive, or individualistic. In this process, 20 students could not be classified according to any specific SVO because they did not choose consistently. The scores obtained on the combined personality scale were also calculated and students were characterized as opinion leaders, opinion seekers, opinion followers, and opinion avoiders depending on strength of personality, size of social networks, and sense of political efficacy.
A few weeks later, for an apparently unrelated study, Dr. C. Pavitt handed out a survey containing the four scenarios and the eight strategy choices and explained that participants must imagine that they were faced with these scenarios. The order of the scenarios was counterbalanced for randomization. Participants were asked to judge the strategies according to the probability, on a 0 (lowest probability) to 10 (highest probability) scale, with which they would use each of these strategies in the situation described in the scenario. This survey also included questions to validate the findings of the first pretest that tested scenario realism and the ease with which participants would imagine themselves in the situations. This validation check was also used to make certain that the eight response types covered at least the most likely student responses to these scenarios. This validation check comprised of three questions.

(1) Is there something else you would say that is not listed above? What would you say?

(1 a) Indicate the probability with which you would say this (participants responded using a scale of 0 (lowest probability) to 10 (highest probability)).

(2) On a scale of 1 (very unrealistic) to 5 (very realistic), how realistic do you think this situation is?
On a scale of 1 (not easily) to 5 (very easily), how easily can you imagine yourself in a situation like this?

Most students responded to the survey in class, although 8-10 surveys were handed in a day or so later. Three students completed either the laboratory or the in-class session but not both and so their data was not used. In the following chapter, the data from this study is examined.
Chapter 3

RESULTS

Introduction

A hypothesis and a research question were posed in Chapter One regarding the communicative strategies that individuals are likely to use given the position of influence they hold relative to others in their social group and to their own SVOs. Previous research indicates that there is a continuum of influence along which people are located, with opinion leaders being most influential, followed by opinion seekers, opinion followers, and, finally, opinion avoiders. Research also suggests that opinion leaders are likely to enjoy a high sense of self-efficacy and, therefore, might be expected to expend greater effort than others in trying to overcome a difficult situation or complex problem. Resource dilemmas, by their nature, may be classified as complex problems for they require agreement and cooperation amongst all users about the proposed solution for resource maintenance. The hypothesis stated that opinion leaders, when faced with a resource dilemma, will choose communicative strategies that will address the resource dilemma more effectively.
than those produced by opinion seekers, followers, or avoiders. Communicative strategies were classified as being effective based on whether (a) they involved people other than the participant, either as beneficiaries or as discussants, (b) they used available resources rather than requesting additional resources, and (c) they verbalized a concrete plan of action.

A research question was also posed, which asked whether there would be a difference between the communicative strategies that opinion leaders choose based on their SVOs. Specifically, I asked whether the communicative strategies that cooperative opinion leaders would choose would differ from those chosen by competitive and individualistic opinion leaders based on the number of people who benefited from them.

Findings regarding the hypothesis and research question are presented in this chapter. Data from eight one-way analyses of variance (ANOVAs) run for each of the eight communicative strategy types ("efficient," "different resource," "demand," "intention," "talk," "selfish," "opinion seeking," and "emotion") are discussed first with differences among specific means examined through Bonferroni's multiple comparison test. Chi-square
cross-tabulations, which explore the relationship between SVOs and OL type, follow.

**Participants**

Participants for this study consisted of 178 students from the Department of Communication at the University of Delaware. Of these, data from only 155 respondents could be used because the remaining 23 either did not complete one of the two parts of the study or did not choose consistently on the 15 decomposed Prisoner’s Dilemma Games (DPDG) and so could not be classified according to a specific SVO.

The “Strength of Personality Scale” (PS scale; Noelle-Neumann, 1985) was used in combination with questions modeled on two of those found in the “Spare Time” section of the Social Adjustment Scale - Self Report (SAS-SR) designed by Weissman and Paykel (1976; described in Corcoran & Fischer, 2000) as well as the Sociopolitical Control Scale (SPCS) designed by Zimmerman and Zahniser (1991; described in Corcoran & Fischer, 2000) to identify the position of respondents along the opinion leadership continuum. Using the categorization method described in the previous chapter, 39 individuals were classified as opinion leaders, 16 as opinion seekers, 37 as opinion followers, and 63 as opinion avoiders.
DPDG were used to measure respondents' SVOs. Of the 155 participants, 38 were classified as competitively-, 29 as individualistically-, and 88 as cooperatively-oriented individuals. Twenty-one of the original 178 participants did not choose consistently on the DPDG and therefore, their data was unusable. Finally, in an apparently unrelated session, respondents were presented with four resource dilemmas followed by eight possible communicative responses. They were asked to rate these responses on a 0-10 scale according to the probability with which they would use them. To validate the findings of the first pretest which tested whether the resource dilemma scenarios were realistic and easy to imagine, participants were asked to respond to two additional questions.

1. On a scale of 1 (very unrealistic) to 5 (very realistic), how realistic do you think this situation is?

2. On a scale of 1 (not easily) to 5 (very easily), how easily can you imagine yourself in a situation like this?

**Validation of Scenarios**

ANOVAs were run for the degree to which participants found the scenarios realistic and the ease with which they could imagine themselves in the situations described in the scenarios. The scenarios were
significantly different from each other for both scenario realism ($F(3, 605) = 34.714; p = 0.000$) and for ease of imagination ($F(3, 605) = 16.632; p = 0.000$). See Table 3.1 for relevant data.

<table>
<thead>
<tr>
<th>Validity</th>
<th>Sum of Squares</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realism</td>
<td>78.539</td>
<td>34.714</td>
<td>0.001*</td>
</tr>
<tr>
<td>Ease of imagination</td>
<td>59.372</td>
<td>13.632</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

* denotes significant results

The means for scenario realism and ease of imagination were calculated, which show that participants found the parking scenario most realistic ($M = 4.673$), while the least realistic for them was the scenario requiring limited software use for class assignments ($M = 3.789$). These means and those obtained during the first pretest are comparable and in each case, the means are above the midpoint. In terms of the ease with which participants could imagine themselves facing similar situations, the scenario regarding the use of fitness equipment had the highest mean ($M = 4.132$), while the software use scenario has the lowest mean ($M = 3.283$). Again, these means are very close to those obtained for the first pretest and above the midpoint indicating a
satisfactory level of ease of imagination. Please refer to Table 3.2 for the relevant data.

**Table 3.2 Scenario Means for Scenario Realism and Ease of Imagination**

<table>
<thead>
<tr>
<th>Realism</th>
<th>Scenario</th>
<th>Mean (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitness Center</td>
<td>4.592</td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td>3.789</td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>4.125</td>
<td></td>
</tr>
<tr>
<td>Parking</td>
<td>4.673</td>
<td></td>
</tr>
</tbody>
</table>

**Ease of Imagination**

| Fitness Center | 4.132   |
| Software      | 3.283   |
| Food          | 3.822   |
| Parking       | 3.915   |

**Communicative Strategies**

ANOVA was run for each of the eight communicative strategies or response types. Results of these are given in Table 3.3. These results, presented according to the low-, medium-, high-effectiveness strategy classification, are discussed in greater detail in this section.
Table 3.3 Analyses of Variance

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sum of Squares</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategy Type: EFFICIENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opinion Leadership (OL) Type</td>
<td>49.097</td>
<td>4.148</td>
<td>0.042*</td>
</tr>
<tr>
<td>Social Value Orientation (SVO)</td>
<td>15.630</td>
<td>1.649</td>
<td>0.269</td>
</tr>
<tr>
<td>Scenario</td>
<td>452.930</td>
<td>35.768</td>
<td>0.005*</td>
</tr>
<tr>
<td>OL Type * SVO</td>
<td>26.206</td>
<td>0.972</td>
<td>0.472</td>
</tr>
<tr>
<td>OL Type * Scenario</td>
<td>35.511</td>
<td>0.864</td>
<td>0.569</td>
</tr>
<tr>
<td>SVO * Scenario</td>
<td>28.440</td>
<td>1.030</td>
<td>0.428</td>
</tr>
<tr>
<td>OL Type * SVO * Scenario</td>
<td>80.906</td>
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<td>0.626</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>OL Type</td>
<td>34.046</td>
<td>1.496</td>
<td>0.281</td>
</tr>
<tr>
<td>SVO</td>
<td>23.561</td>
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</tr>
<tr>
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<td>1190.513</td>
<td>49.017</td>
<td>0.000*</td>
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<tr>
<td>OL Type * SVO</td>
<td>93.776</td>
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</tr>
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<td>OL Type * Scenario</td>
<td>68.251</td>
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<td>0.021*</td>
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<tr>
<td>SVO * Scenario</td>
<td>22.121</td>
<td>1.165</td>
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<td>OL Type * SVO * Scenario</td>
<td>42.535</td>
<td>0.303</td>
<td>0.998</td>
</tr>
<tr>
<td><strong>Strategy Type: DEMAND</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OL Type</td>
<td>99.376</td>
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</tr>
<tr>
<td>SVO</td>
<td>45.558</td>
<td>2.993</td>
<td>0.125</td>
</tr>
<tr>
<td>Scenario</td>
<td>234.934</td>
<td>16.082</td>
<td>0.104</td>
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<td>OL Type * SVO</td>
<td>48.246</td>
<td>0.785</td>
<td>0.593</td>
</tr>
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<td>61.511</td>
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<td>45.671</td>
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<td>0.585</td>
</tr>
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<td>1.755</td>
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<tr>
<td><strong>Strategy Type: TALK</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>OL Type</td>
<td>62.305</td>
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<td>0.078</td>
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<td>59.004</td>
<td>0.915</td>
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<tr>
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<td>50.274</td>
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</tr>
<tr>
<td>OL Type * SVO * Scenario</td>
<td>130.041</td>
<td>1.092</td>
<td>0.356</td>
</tr>
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</table>

* denotes significant results
Table 3.3 Contd.

<table>
<thead>
<tr>
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<th>Sig.</th>
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</thead>
<tbody>
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<tr>
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<tr>
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<td>39.786</td>
<td>2.466</td>
<td>0.198</td>
</tr>
<tr>
<td>OL Type * SVO</td>
<td>60.935</td>
<td>2.109</td>
<td>0.103</td>
</tr>
<tr>
<td>OL Type * Scenario</td>
<td>69.418</td>
<td>1.612</td>
<td>0.173</td>
</tr>
<tr>
<td>SVO * Scenario</td>
<td>15.997</td>
<td>0.559</td>
<td>0.759</td>
</tr>
<tr>
<td>OL Type * SVO * Scenario</td>
<td>86.694</td>
<td>1.068</td>
<td>0.381</td>
</tr>
</tbody>
</table>

* denotes significant results
High Effectiveness Strategies

Efficient strategy type

The efficient strategy indicates a communicative response which proposes a way to use the existing resource more efficiently (for example, all users using the same amount of the available resource according to some schedule). In other words, the strategy states that users are able to use similar levels of the resource while maintaining it at a sustainable level. OL type was found to have a main effect on the probability with which participants would choose the efficient response ($F(3, 9) = 4.148; p = 0.042; \omega^2 = 0.01$). Bonferroni’s multiple comparisons test of the means shows that opinion avoiders and opinion seekers were the most different with respect to their choice of this strategy. Avoiders were the most likely of the four categories to choose the efficient response type ($M = 6.9722$), while seekers were the least likely to do so ($M = 6.1563$), although the difference was only marginally significant ($p = 0.066$). These findings are not consistent with the expectation that opinion leaders would be most likely to choose the efficient strategy. Relevant data can be found in Table 3.4.
Scenario type also had a main effect in this case ($F(3, 3.339) = 150.977; p = 0.005; \phi^2 = 0.11$). People chose the efficient strategy type most in the case of the fitness equipment scenario and least in the case of the software use for coursework scenario (Please refer to Table 3.5 for relevant data).
Table 3.5 Scenario Means for EFFICIENT Strategy Type

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Mean (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitness Center</td>
<td>8.091</td>
</tr>
<tr>
<td>Software</td>
<td>5.174</td>
</tr>
<tr>
<td>Food</td>
<td>6.114</td>
</tr>
<tr>
<td>Parking</td>
<td>6.882</td>
</tr>
</tbody>
</table>

Different resource strategy type

The different resource strategy type involved suggesting the use of an alternative existing resource rather than the limited resource provided by the authorities. In other words, this strategy choice implies that users will switch to an already existing resource and therefore, relieve the pressure on the given resource. A significant interaction effect was found between OL type and SVO ($F(6, 18.018) = 6.612; p = 0.001$) for this strategy. Opinion avoiders who chose the different resource strategy the most were competitive ($M = 4.6875$) and those who chose it the least were individualistic ($M = 3.4839$). Interestingly, opinion followers who chose this strategy the most, unlike the other OL types, were individualistic ($M = 5.2727$) and those who chose it the least were cooperative ($M = 4.1500$). Opinion seekers who chose this strategy the most were competitive ($M = 5.3750$) while those who chose it the least were individualistic ($M = 4.1500$).
Opinion leaders who were cooperative chose the different strategy the most ($M = 4.9318$) and those who chose it the least were competitive ($M = 4.6000$). See Table 3.6 for relevant data.

Table 3.6 Interaction between OL Type and SVO in DIFFERENT RESOURCE Strategy Type

<table>
<thead>
<tr>
<th>OL Type</th>
<th>SVO</th>
<th>Mean (M)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opinion Avoider</td>
<td>Competitor</td>
<td>4.6875</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Individualist</td>
<td>3.4839</td>
<td>31/4*</td>
</tr>
<tr>
<td></td>
<td>Cooperator</td>
<td>4.4615</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>4.3984</td>
<td>62</td>
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<td>Competitor</td>
<td>4.9583</td>
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</tr>
<tr>
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<td>Individualist</td>
<td>5.2727</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Cooperator</td>
<td>4.1500</td>
<td>20</td>
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<td>Total</td>
<td>4.6149</td>
<td>37</td>
</tr>
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<td>Opinion Seeker</td>
<td>Competitor</td>
<td>5.3750</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Individualist</td>
<td>3.5833</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Cooperator</td>
<td>4.8571</td>
<td>7</td>
</tr>
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<td></td>
<td>Total</td>
<td>4.8125</td>
<td>16</td>
</tr>
<tr>
<td>Opinion Leader</td>
<td>Competitor</td>
<td>4.6000</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Individualist</td>
<td>4.7143</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Cooperator</td>
<td>4.9318</td>
<td>22</td>
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<tr>
<td></td>
<td>Total</td>
<td>4.8077</td>
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</tr>
</tbody>
</table>

* One data point missing

The different resource strategy also revealed a main effect for scenario type ($F(3, 9.101) = 49.017; p = 0.00; \omega^2 = 0.18$). The different resource strategy was chosen most to address the problem of the crowded fitness
center followed by the parking scenario. It was chosen least for the food scenario (Refer to Table 3.7).

Table 3.7 Scenario Means for DIFFERENT RESOURCE Strategy Type

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Mean (M)</th>
</tr>
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<tbody>
<tr>
<td>Fitness Center</td>
<td>7.306</td>
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<tr>
<td>Software</td>
<td>3.299</td>
</tr>
<tr>
<td>Food</td>
<td>2.883</td>
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<tr>
<td>Parking</td>
<td>4.845</td>
</tr>
</tbody>
</table>

Finally, the different resource strategy revealed an interaction effect between OL type and scenario type \(F(9, 34.030) = 2.595; p = 0.021\), which largely reflects the main effect revealed for scenarios. The order in which opinion avoiders, opinion followers, and opinion leaders chose the different resource strategy for the four scenarios is the same; the strategy was chosen most for the fitness center, followed by parking, software, and, finally, least for the food scenarios. This order changes for opinion seekers; they were most likely to choose this strategy in the case of the fitness center scenario but least likely to do so in the case of computer software scenario. Refer to Table 3.8 for this data.
Table 3.8 Interaction between OL Type and Scenario in DIFFERENT RESOURCE Strategy Type

<table>
<thead>
<tr>
<th>OL Type</th>
<th>Scenario</th>
<th>Mean (M)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opinion Avoider</td>
<td>Fitness Center</td>
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<tr>
<td></td>
<td>Software</td>
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<td>62*</td>
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<tr>
<td></td>
<td>Food</td>
<td>2.4762</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Parking</td>
<td>4.3492</td>
<td>63</td>
</tr>
<tr>
<td>Opinion Follower</td>
<td>Fitness Center</td>
<td>7.4324</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Software</td>
<td>3.7027</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Food</td>
<td>3.0000</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Parking</td>
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<td>37</td>
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<td>Opinion Seeker</td>
<td>Fitness Center</td>
<td>6.8750</td>
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</tr>
<tr>
<td></td>
<td>Software</td>
<td>3.0625</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Food</td>
<td>3.6250</td>
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</tr>
<tr>
<td></td>
<td>Parking</td>
<td>5.6875</td>
<td>16</td>
</tr>
<tr>
<td>Opinion Leader</td>
<td>Fitness Center</td>
<td>7.6154</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Software</td>
<td>4.2051</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Food</td>
<td>2.4872</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Parking</td>
<td>4.9231</td>
<td>39</td>
</tr>
</tbody>
</table>

* one data point missing

**Medium Effectiveness Strategies**

Demand strategy type

Demand was the strategy aimed at increasing the stock of resources available by asking authorities to provide more. With the demand strategy, OL type had a significant effect ($F(3, 9) = 4.847; p = 0.028; \omega^2 = 0.02$). Bonferroni’s multiple comparisons test of the means shows that the greatest difference in the choice of this
strategy is between opinion followers, who chose the strategy the least ($M = 6.8716$), and opinion leaders, who chose it the most ($M = 7.8141$). This difference was significant at $p = 0.004$. Opinion seekers chose the demand strategy next only to opinion leaders ($M = 7.7344$), while opinion avoiders appear to be less likely to choose this strategy ($M = 7.3929$). These findings are not consistent with the hypothesis because opinion leaders were expected to be less likely to choose the demand strategy. See Table 3.9 for relevant data.
Moreover, there was a significant three-way interaction between OL type, SVO, and scenario in this strategy type ($F(18, 572) = 1.755; p = 0.027$). An examination of the results shows that competitive and cooperative opinion avoiders chose demand least for the parking scenario, while individualistic opinion avoiders chose it least for the fitness center scenario. They do not differ in that all three SVOs used it most for the software scenario. Competitive and individualistic opinion followers also chose the demand strategy least for the parking scenario, while cooperative opinion followers

### Table 3.9 Opinion Leadership: Means and Multiple Comparisons for DEMAND strategy type

<table>
<thead>
<tr>
<th>OL Type</th>
<th>Mean(M)</th>
<th>Comparison with</th>
<th>Mean Diff.</th>
<th>Sig.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opinion</td>
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<td>0.5212</td>
<td>0.226</td>
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<tr>
<td></td>
<td></td>
<td>Opinion Seeker</td>
<td>-0.3415</td>
<td>1.000</td>
<td>63</td>
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<tr>
<td></td>
<td></td>
<td>Opinion Leader</td>
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<td>0.525</td>
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<tr>
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<td>Opinion Avoider</td>
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<td>0.226</td>
<td>37</td>
</tr>
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<td>Opinion Seeker</td>
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<td></td>
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<td>Leader</td>
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<td>Opinion Seeker</td>
<td>0.7027</td>
<td>1.000</td>
<td>39</td>
</tr>
</tbody>
</table>

* denotes significant results
chose it the least for the food scenario. Individualistic and cooperative followers chose the strategy most for the software scenario and competitive followers chose it most for the fitness center scenario. Opinion seekers with competitive and individualistic SVOs chose this strategy the least for the parking scenario. Competitive and cooperative seekers were similar in that both groups chose the strategy most for the fitness scenario. Individualistic seekers chose the strategy most for the software scenario. Finally, opinion leaders who were competitive chose demand the least for the software scenario while individualistic and cooperative leaders chose the strategy least for the parking scenario. While competitive leaders chose the strategy most for the fitness center, individualistic and cooperative opinion leaders chose it most for the software scenario. Please refer to Table 3.10 for relevant data.
<table>
<thead>
<tr>
<th>OL Type</th>
<th>SVO</th>
<th>Scenario</th>
<th>Mean (M)</th>
<th>N</th>
</tr>
</thead>
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<td></td>
<td>Food</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Parking</td>
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</tr>
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<td>Total</td>
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<tr>
<td>Cooperator</td>
<td></td>
<td>Fitness Center</td>
<td>8.9091</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Software</td>
<td>9.0000</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Food</td>
<td>8.0455</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Parking</td>
<td>5.2727</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>7.8068</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>7.8141</td>
<td>39</td>
</tr>
</tbody>
</table>
Talk strategy type

The talk strategy type revealed a significant main effect for scenario \( F(3, 3.779) = 48.847; p = 0.002; \omega^2 = 0.19 \). In this case, talking about the situation without verbalizing a solution was most likely to be chosen in the software scenario and least likely to be chosen in the food scenario. See Table 3.11 for relevant data.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Mean (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitness Center</td>
<td>5.963</td>
</tr>
<tr>
<td>Software</td>
<td>7.586</td>
</tr>
<tr>
<td>Food</td>
<td>2.907</td>
</tr>
<tr>
<td>Parking</td>
<td>5.074</td>
</tr>
</tbody>
</table>

Intention strategy type

The intention strategy type, defined as expressing an intent to take the problem to the authorities, only revealed a main effect for scenario \( F(3, 3.494) = 24.182; p = 0.008; \omega^2 = 0.07 \). Intention was most likely to be chosen with regard to the parking scenario \( M = 7.283 \) and least likely to be chosen with regard to the software one \( M = 4.737 \). See Table 3.12 for relevant data.
Table 3.12 Scenario Means for INTENTION Strategy Type

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Mean (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitness Center</td>
<td>5.585</td>
</tr>
<tr>
<td>Software</td>
<td>4.737</td>
</tr>
<tr>
<td>Food</td>
<td>5.196</td>
</tr>
<tr>
<td>Parking</td>
<td>7.283</td>
</tr>
</tbody>
</table>

**Low Effectiveness Strategies**

Selfish strategy type

The selfish strategy type involved respondents expressing an intention to act so that the problem was solved for themselves alone. This strategy revealed a significant main effect for scenario \( F(3, 5.359) = 33.265; p = 0.001; \omega^2 = 0.12 \). The means for the scenarios show that this strategy was most likely to be chosen in the case of fitness equipment (\( M = 7.278 \)) and least likely to be chosen in the case of food (\( M = 4.191 \)). See Table 3.13 for relevant data.
Table 3.13 Scenario Means for SELFISH Strategy Type

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Mean (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitness Center</td>
<td>7.278</td>
</tr>
<tr>
<td>Software</td>
<td>7.117</td>
</tr>
<tr>
<td>Food</td>
<td>4.191</td>
</tr>
<tr>
<td>Parking</td>
<td>6.633</td>
</tr>
</tbody>
</table>

Opinion seeking strategy type

Opinion seeking, or asking other people how they would act in a similar situation, also revealed significance for scenario type \(F(3, 2.401) = 28.95; p = 0.02; \omega^2 = 0.07\). Asking for someone else’s opinion was chosen most in the software scenario \(M = 6.859\) and least in the fitness equipment scenario \(M = 4.574\). Please refer to Table 3.14 for relevant data.

Table 3.14 Scenario Means for OPINION SEEKING Strategy Type

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Mean (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitness Center</td>
<td>4.574</td>
</tr>
<tr>
<td>Software</td>
<td>6.859</td>
</tr>
<tr>
<td>Food</td>
<td>5.784</td>
</tr>
<tr>
<td>Parking</td>
<td>6.728</td>
</tr>
</tbody>
</table>

Emotion strategy type

In the case of the emotion strategy type, defined as expressing emotions such as anger or frustration at the
For relevant data,

from option leaders (p = 0.001) please see Table 3.15.

significant from option seekers (p = 0.01) as well as

that the four old types made option followers and option

showed that there were differences between the choices

to choose the emotion strategy. Bonferroni's post hoc test

the expectation that option leaders would be least likely
d o so (M = 7.4459). These findings are not consistent with

M = 7.9365), while option followers were least likely to

option followers were less likely to choose this strategy.

= 8.9452) trials them in the use of this strategy.

likely to choose (M = 8.5833), while option seekers (M

4.971; p = 0.026; w = 0.03). Option leaders were most

situational, option leadership had a main effect (F(3, 9) =

s.153
### Table 3.15 Opinion Leadership: Means and Multiple Comparisons for EMOTION strategy type

<table>
<thead>
<tr>
<th>OL Type</th>
<th>Mean (M)</th>
<th>Comparison with</th>
<th>Mean Diff.</th>
<th>Sig.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opinion</td>
<td>7.9365</td>
<td>Opinion Follower</td>
<td>0.4906</td>
<td>0.156</td>
<td>63</td>
</tr>
<tr>
<td>Avoider</td>
<td></td>
<td>Opinion Seeker</td>
<td>-0.5166</td>
<td>0.496</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Opinion Leader</td>
<td>-0.6468</td>
<td>0.017*</td>
<td>63</td>
</tr>
<tr>
<td>Opinion</td>
<td>7.4459</td>
<td>Opinion Avoider</td>
<td>-0.4906</td>
<td>0.156</td>
<td>37</td>
</tr>
<tr>
<td>Follower</td>
<td></td>
<td>Opinion Seeker</td>
<td>-1.0072</td>
<td>0.010*</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Opinion Leader</td>
<td>-1.1374</td>
<td>0.001*</td>
<td>37</td>
</tr>
<tr>
<td>Opinion</td>
<td>8.4531</td>
<td>Opinion Avoider</td>
<td>0.5166</td>
<td>0.496</td>
<td>16</td>
</tr>
<tr>
<td>Seeker</td>
<td></td>
<td>Opinion Follower</td>
<td>1.0072</td>
<td>0.010*</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Opinion Leader</td>
<td>-0.1302</td>
<td>1.000</td>
<td>16</td>
</tr>
<tr>
<td>Opinion</td>
<td>8.5833</td>
<td>Opinion Avoider</td>
<td>0.6468</td>
<td>0.017*</td>
<td>39</td>
</tr>
<tr>
<td>Leader</td>
<td></td>
<td>Opinion Follower</td>
<td>1.1374</td>
<td>0.001*</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Opinion Seeker</td>
<td>0.1302</td>
<td>1.000</td>
<td>39</td>
</tr>
</tbody>
</table>

* denotes significant results

### Social Value Orientation and Opinion Leadership type

In order to examine the distribution of the different social values amongst the four categories of opinion leadership, SVO was cross-tabulated with OL type. The cross-tabulation is given in Table 3.16. These differences were found to have a significant chi-square ($p = 0.001$).
Table 3.16 SVO * OL Type Cross-tabulation:
Number of individuals in each OL type cross-tabulated with each type of SVO

<table>
<thead>
<tr>
<th>SVO Type</th>
<th>Opinion Avoider</th>
<th>Opinion Follower</th>
<th>Opinion Seeker</th>
<th>Opinion Leader</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitor</td>
<td>16</td>
<td>6</td>
<td>6</td>
<td>10</td>
<td>38</td>
</tr>
<tr>
<td>Individualist</td>
<td>8</td>
<td>11</td>
<td>3</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>Cooperator</td>
<td>39</td>
<td>20</td>
<td>7</td>
<td>22</td>
<td>88</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>37</td>
<td>16</td>
<td>39</td>
<td>155</td>
</tr>
</tbody>
</table>

Opinion avoiders were the largest of the four OL types, constituting 40.6% of the sample. Opinion avoiders were also the most cooperative of the four categories, with almost 62% of the 63 opinion avoiders possessing that SVO. Opinion avoiders were also the least individualistic; only 13% of individuals in this OL type possessed this SVO.

Opinion seekers tended to be the smallest group numerically amongst the four OL types making up just 10% of the 155 participants. Opinion seekers were clearly the least cooperative of the four OL types with only 44% of the 16 individuals in this OL type possessing this SVO. Thirty eight percent of opinion seekers were competitive, making this the most competitive SVO.

Opinion followers, unlike the other three OL types, were twice as likely to be individualistic (30%) than competitive (16%). Opinion followers also represented
the most individualistic SVO; 38% of the 29 individualists in the study were opinion followers. As with the other OL types, however, cooperators form the largest group amongst opinion followers (54%).

Opinion leaders tend to be largely cooperative (56%). Opinion leaders tend not to be individualistic as the smaller percentage (18%) shows. In comparison with the other OL types, opinion leaders rank third in terms of individualism.

Summary

It was hypothesized that opinion leaders would choose communicative strategies that were more effective in addressing the resource dilemma than would opinion avoiders, opinion followers, and opinion seekers. Based on a specific efficiency criteria, efficient and different resource were judged to be high effectiveness strategies; talk, demand, and intention were judged to be medium effectiveness strategies; opinion seeking, selfish, and emotion were judged to be low effectiveness strategies. However, of these only the efficient, demand, and emotion strategies returned significant results with regard to OL type. Opinion leaders were found to be slightly less likely than opinion avoiders to choose the efficient strategy, which was classified as a high effectiveness
strategy. Further, opinion leaders are the most likely of the four OL types to use the demand strategy, which is a medium effectiveness strategy. Opinion leaders are also the most likely to use the emotion strategy, which is a low effectiveness strategy. Thus, there is no support for the hypothesis.

The research question asked whether there were differences in the strategy choices that cooperative, competitive, and individualistic opinion leaders would make. No main effects were returned for SVO indicating that there is no evidence to support such an idea.

Significantly, in almost each strategy type, scenario type returned a significant result. This study therefore, reveals that resource users do not perceive all resource dilemmas similarly. Therefore, they might bring different strategies into play depending on the situation they face. Moreover, the results also suggest that there is value in revisiting the characterization of the eight response strategy types. The results and these issues are discussed in greater detail in the next chapter.
Chapter 4

DISCUSSION

Introduction

The primary purpose of this research was to examine the response strategy choices that opinion leaders would make when faced with a resource dilemma. Opinion leaders are informal leaders in their social group(s), influencing the attitudes and behaviors of their friends and relatives. A resource dilemma is a situation where individuals can either, individually, choose to engage in unrestricted consumption and eventually suffer resource shortages, or, collectively, agree to controlled consumption and thereby long term resource use. It was expected that opinion leaders would choose response strategies that would ease resource dilemmas.

In this study, the choices of opinion leaders were compared to choices made by non-opinion leaders. Non-opinion leaders are characterized as such based on the level of influence they have in their social networks. Although influence is assumed to occur along a continuum, participants in this study were categorized as opinion leaders, opinion seekers, opinion followers, and opinion
avoiders based on factors such as strength of personality and size of social networks. This research also examined the social value orientations (SVO) of individuals along the opinion leadership continuum and differences in strategy choices based on SVO. Data was gathered using a personality scale to determine opinion leadership (OL) type, decomposed prisoner’s dilemmas games (DPDG) to determine SVO, and surveys consisting of four resource dilemma scenarios and eight possible responses to identify strategy choice. ANOVAs were run for each of the eight communicative strategies. A main effect was returned for OL type for three strategies and no main effect was found for SVO.

This chapter begins by examining the extent to which the results supported the hypothesis. It goes on to re-examine the strategy classification used in this study because the results suggest that these strategies might have been unable to fully capture the way in which people formulate responses to complex problems. An alternative classification is suggested. This section also suggests additional reasons for the absence of support for the hypothesis. Finally, the four resource dilemma scenarios are re-examined and reasons for the main effects revealed in six of the eight response types are suggested. The
second section examines the data relevant to the research question, while exploring more fully the role of SVO as a predictor of behavior. The third section suggests directions for future research. The final section provides a conclusion to this thesis.

**Opinion Leadership and Strategy Choice**

This section begins with a review of the dependent variable in this study - the eight response strategies generated for each of the four resource dilemmas. Effective strategies were defined as (1) including people other than the individual either as beneficiaries of the strategy or as discussants, (2) not recommending requesting additional resources, and (3) verbalizing a reasonably concrete plan of action. Eight strategies were formulated in response to the four resource dilemmas: (a) demand more resources ("Demand"), (b) express an intention to act so that one's own need for resources is met ("Selfish"), (c) express an intention to talk to the authorities about the problem ("Intention"), (d) express emotions such as anger and frustration at the state of affairs ("Emotion"), (e) verbalize an efficient plan using an alternative resource ("Different resource") (f) seek the opinion of others in the same situation ("Opinion seeking"), (g) talk about the problem without
making an effort to find solution ("Talk"), and, (h) verbalize an efficient plan using the given resource ("Efficient"). These strategies were compared to the efficiency criteria, described above, and were ordered depending on the number of criterion that the strategies matched. Accordingly, the different resource and efficient strategies were classified as high effectiveness ("high") strategies because they met all three criteria. The intention, demand, and talk strategies were categorized as medium effectiveness ("medium") strategies because they matched at least one or two of the three criteria. Finally, the selfish, emotion, and opinion seeking strategies were classified as low effectiveness ("low") strategies because they did not meet any of the criteria.

Participants were asked to select the probability with which they would use each of the eight strategies in the four scenarios. The expectation was that opinion leaders would choose high strategies, that is, the efficient and different resource strategies. Two factors support this hypothesis. First, opinion leaders are very likely to enjoy a sense of high self-efficacy. Bandura (1986) defined self-efficacy as a person’s perception of his/her own ability to carry out specific courses of action. Self-efficacy research shows that positive
feedback can contribute to heightened perceptions of self-efficacy and therefore, success in task performance (Bandura, 1986; Chambliss & Murray, 1979). Opinion leaders can be thought of as receiving positive verbal feedback when friends or acquaintances ask them for advice or help on a regular basis, thereby reinforcing the validity of their suggestions or advice. The sense of self-efficacy generated by this feedback should lead opinion leaders, faced with a resource dilemma, to make an effort to generate effective communicative strategies that attempt to address the issue. Second, opinion leaders are unlikely to suggest solutions to resource dilemmas that inadequately, or are unable to, address the problem. Opinion leaders are conscious of, and enjoy their position in their social network and, therefore, will quite likely work hard to generate effective strategies. Should they produce inadequate strategies, opinion leaders will quickly lose their leadership positions.

ANOVA was run for these eight strategies which revealed main effects for OL type for only the efficient, demand, and emotion strategies. Surprisingly, however, opinion avoiders rather than opinion leaders were most likely to choose the efficient (high) strategy. Further, opinion leaders were also the most likely to choose the
demand strategy, which was categorized as a medium effectiveness strategy. Finally, opinion leaders were also most likely to choose the emotion (low) strategy. In summary, there was no support for the hypothesis that opinion leaders would choose high effectiveness strategies in response to resource dilemmas.

Further analysis suggests that this lack of support might stem from the way in which the efficiency criteria were used to classify the response strategy types as high, medium, and low. An alternative classification is discussed next.

**An Alternative Characterization of the Strategies**

As discussed in Chapter Two, extensive pre-testing of both the response strategy types and the scenarios was carried out before the study was conducted. One of these pre-tests involved a validation of strategy classification. Fellow graduate students were presented with the efficiency criteria and the four scenarios, and were asked to code the eight response types for efficiency. However, little agreement was obtained amongst coders and between the coders and the researcher. This test was eventually abandoned, given that the classification of the strategies was based on sound theoretical criteria. However, the results obtained in
this study suggest that the classification of the response strategy types, as high, medium, and low, was unable to capture the richness in the way that individuals perceive strategy choices.

For example, a colleague who participated in the failed validation suggested that the expression of emotion, which was classified as a low effectiveness strategy but which opinion leaders were found to be most likely to choose, might be the first step in recognizing that a problem exists and requires a solution. That is, an emotional reaction could be thought of as an expression of an individual’s level of awareness and acceptance of the situation. With greater anger or frustration being expressed, the individual might be moved to attempt to formulate more complex response to the problem and in doing so, solve the problem for many.

Similarly, participants might also have perceived the demand strategy differently from the way in which it was classified in this study. Demand, classified as a medium strategy, might have been viewed as a “first response” strategy; such a strategy would require a small amount of cognitive effort and some coordination amongst resource users but, if successful, would ensure that all resource users would have access to the resource.
The data in this study does reveal that such patterns in choice-making may indeed exist. Strategy type is plotted against strategy choice means in Figure 4.1 which shows that all four OL types were most likely to choose the emotion strategy followed by the demand strategy and were least likely to choose the efficient strategy.

Figure 4.1. Strategy choice means plotted against strategy type: all four OL types demonstrated a similar choice pattern for the three strategies
Therefore, rather than using the efficiency criteria, the results in this study suggest that there may be greater value in classifying the strategies as either prosocial or proself in terms of the level of cooperation required for individuals to benefit from the proposed solutions. Therefore, prosocial strategies would be those that required substantial levels of cooperation between resource users. Proself strategies would include strategies that secured the resource for the person expressing the solution either at the cost of, or regardless of, resource availability for others.

According to this classification criterion, both the efficient and the intention strategies would be labeled as prosocial. The efficient strategy involves significant levels of cooperation among resource users in order to succeed. This is also true for the intention strategy which is an expression of intent to talk to the authorities about the problem. For this action to take place, resource users would have to come to an agreement about who would speak to the authorities, what they would say, and from whom they could claim to have support.

In contrast, strategies such as demand, selfish, and different resource could be classified as proself strategies. The demand strategy enjoys direct statistical
support for such a characterization. Across each OL type, individualists were consistently the most likely to choose this strategy suggesting that individualistic participants judged that demanding more resources would ensure that they, at least, would have access to the resource. Although the selfish strategy did not return a main effect for OL type or SVO, individuals choosing this strategy are likely to be most concerned about meeting their own resource needs. While responses associated with the different resource strategy were worded to include others in the plan, participants may simply have seen it as a way to, at the minimum, fulfill their own need for the resource. An interaction effect between OL type and SVO revealed that 22 of the 38 competitors in the study were most likely to choose the different resource strategy (as opposed to the 11 of 29 individualists and 22 of 88 cooperators). This suggests that more than half the competitors considered switching to another resource as a way of benefiting while ignoring the level of resource access that other users would have. Thus, in a re-characterization, different resource might be classified as a proself strategy.

The remaining three strategies - talk, emotion, and opinion seeking, are neither cooperative nor
individualistic, but might simply be expressions of dissatisfaction with the current state of affairs. As mentioned above, emotion might be the expression of the level of activation that the speaker experiences. The greater the emotion expressed by the speaker, the higher the willingness he/she would have to take action. The opinion seeking and talk strategies may or may not lead to the undertaking of action.

This re-characterization might possibly reveal results that support the idea that opinion leaders will respond with more effective strategies than others. However, strategy characterization might not be the only reason for the absence of support for this study's hypothesis. Three other explanations suggest themselves. First, opinion leaders might best respond to complex problems, such as resource dilemmas, if they have experienced situations requiring similar action before and for which they developed successful response strategies (what Bandura (1986, p.399) called "enactive attainment"). Second, opinion leaders might be able to better formulate responses to resource dilemmas if they receive information about the "most-effective" strategies. Third, although the scenarios were intended to engender similar reactions,
participants appear to have perceived each quite differently. These three issues are discussed next.

Enactive Attainment and Strategy Training

Bandura (1986) explained that successes attained during performance or "enactive attainments" are the most influential source of information about one's own efficacy, because it is based on "authentic mastery experiences" (p. 399). Therefore, successes boost appraisals of efficacy, whereas failures, particularly if they occur early in the course of events and in spite of substantial effort, lower them. Perceptions of higher self-efficacy lead to improved task performance as well as to more ambitious task goals.

Bandura, Adams, and Beyer (1977), in their study described earlier, formulated three experimental conditions centered on snake phobias. When participants first copied the actions of a therapist and then engaged in self-directed performance involving touching and holding a red-tailed boa constrictor, they enjoyed enhanced perceptions of efficacy in contrast to those who simply watched the therapist perform the same set of activities with the snake or those who did not undergo any treatment but stayed the same length of time in the experimental room. Further, the researchers found that
participants' performance closely matched the judgments they made about their own capability. That is, previous successful performance led to perceptions of higher self-efficacy and to heightened task performance.

More supporting evidence can be found in the study by Locke, Frederick, Lee, and Bobko (1984) in which participants listed as many different uses of common objects as possible over seven one-minute trials. Participants who were asked to maximize the list of uses, no matter how unusual, they experienced the highest sense of self-efficacy, demonstrated the best performance on all trials, and chose the most challenging goals when they were free to do so on the sixth and seventh trials, when compared to participants asked to list only good or high quality uses or those who were simply given the task to perform. Thus, individuals who have previously performed well experience higher self-efficacy which leads them to judge themselves capable of completing tougher tasks.

The Locke et al. study contains another piece of information - strategy training improves performance. Strategy training, that is, training in the use of strategies to address assigned tasks, enhanced the effect of self-efficacy and, in turn, these participants' performance and goal choice.
In brief, it is possible in this current study that opinion leaders (and perhaps members of the other three opinion leadership categories as well) would have chosen more effective strategies if (a) they had experienced problems with solutions requiring substantial coordination and cooperation amongst the concerned parties; within the student community members of student government or organizers of a university-wide event can be thought to fit this category, and, (b) they were given information about the most effective solutions to resource dilemmas.

Resource Dilemma Scenarios

One last possible explanation for the results is suggested by the finding that a main effect for scenario type occurred in six (efficient, different resource, talk, intention, selfish, opinion seeking) of the eight response strategy types. Although each was intended to model analogous resource dilemmas, it appears that participants did not perceive the scenarios as representing essentially similar situations of "limited resources-many users." Results obtained for the scenarios across these six strategies are discussed below.

Participants were most likely to choose efficient, different resource, and selfish in the case of
the fitness center scenario. One possible implication of this choice pattern is that they perceived the fitness center as a resource belonging to the student community and, therefore, solutions to the problem lay with students themselves. It points also to the possibility that this scenario perhaps came closest to representing a resource dilemma because there are a variety of ways to respond to a situation of limited common pool resources without requiring resource use to be directed by the authorities.

The software scenario appears to have been perceived quite differently, with talk and opinion seeking the most likely chosen strategies. This is somewhat non-intuitive, given that one might expect students to react more actively to a shortage of coursework-related resources. But it appears that students were most likely to either discuss it amongst themselves or try to determine how other students have coped in the same situation. It could be that students either simply adjust their schedule to work when those particular computers are available or buy their own copies of the software.

The food scenario did not reveal any strategies that could be rated as highly likely to be used. Given that it is relatively easy to meet one's food needs without either cooperation from fellow resource users or
help from the authorities, this is not too surprising. Students quite likely do not think of it as an issue for discussion, seeking instead, alternative food sources individually.

Surprising, however, was the fact that the parking scenario only revealed intention (express intention of talking to the authorities about it) as a strategy that was most likely to be used. Undergraduate students have been known to protest strongly against the limited parking available to them. This might be because parking presents itself as so universally problematic that perhaps individuals do not see it as having a solution, cooperation notwithstanding. Personal solutions that exist to this problem generally require a lifestyle or locational change and, therefore, are perhaps hard to undertake.

It is possible, then, that even though these scenarios were perceived as realistic by participants, they were not perceived consistently as resource dilemmas. There might be greater value in designing scenarios that speak less to them as possible research participants and more to them as members of a community in which their actions can make a difference. The range of strategies available to them might, as a consequence, expand. These
new scenarios would also have to be tested extensively to confirm similar perceptions across scenarios.

The discussion so far has revealed that problematic issues such as the characterization of strategies and the perception of scenarios could have contributed to the absence of support for the hypothesis. I now turn to examine the results relating to the research question.

**Social Value Orientation and Strategy Choice**

I asked whether cooperative opinion leaders would choose different strategies from individualistic or competitive opinion leaders. Statistical analysis revealed no main effect for SVO and therefore, no support for this idea. This is interesting given that previous SVO research found it to be a consistently reliable predictor of behavior. The absence of results suggests that OL type might have overwhelmed the effect of SVO.

The lack of results quite likely also stems from the small cell sizes of some of the SVO-OL type categories. Cell sizes for individualistic opinion avoiders, competitive opinion followers, competitive and individualistic opinion seekers, and individualistic opinion leaders were between 3 and 8 in number. Such small
cell sizes may not have enough power to reveal significant relationships.

More information about the role of SVO in this study, however, is revealed in an examination of the cross-tabulation between SVO and OL type. These results, examined next, provide possible explanations for at least a few response strategy choices.

**Social Value Orientation and Opinion Leadership Type**

In addition to the ANOVAs, a cross-tabulation was run between SVO and OL type. The results obtained from this procedure suggest explanations for the types of strategies chosen by each category on the opinion leadership continuum.

One of the surprising findings of this study was that opinion avoiders' choice-making was fairly consistent and more in keeping with that hypothesized for opinion leaders, at least for the three strategies for which opinion leadership type revealed an effect. Thus, opinion avoiders were more likely to use the efficient strategy, classified here as a high effectiveness strategy, and were less likely to use demand (medium effectiveness strategy) and emotion (low effectiveness strategy) than opinion leaders. The cross-tabulation between SVO and OL type provides some answers for these unexpected results.
Opinion avoiders were found to be most likely to be cooperative both within and across categories. In fact, the odds of opinion avoiders being cooperative was almost two and a half times greater than their being competitive and almost five times greater than their being individualistic. The predominance of the cooperative SVO offers an explanation for opinion avoiders being most likely to choose the efficient (prosocial) and less likely to pick the demand (proself) strategies.

A second surprise finding was that opinion followers, in contrast with the way in which they are characterized both in this study and elsewhere (Wright & Cantor, 1967), did not necessarily go along with the strategy choices of opinion seekers, who were believed by Wright and Cantor to function as opinion leaders for them. It was expected that opinion followers, despite the presence of large social networks and varying levels of a sense of political efficacy, would follow rather than make independent choices. Thus, one could imagine that they would choose an information seeking strategy such as opinion seeking or an affective one such as emotion. However, this was not the case. Opinion followers, when compared to opinion seekers, were more likely to choose the efficient strategy and less likely to choose the
demand and emotion strategies. As with opinion avoiders, the results of the cross-tabulation give some reasons for the strategy choices of opinion followers. This is the only OL type in which the odds of an opinion follower being individualistic was higher than him/her being competitive. Given this tendency towards individualism, the fact that opinion followers chose the efficient strategy over opinion seekers is understandable. Although the efficient strategy can be classified as a prosocial one, an individualist could perceive it as a way to gain access to the resource regardless of whether others benefited simultaneously. Results for the demand strategy are less clear, given that opinion followers are least likely to use a strategy that would increase the resource for everyone, that is, one that an individualist might choose.

Opinion seekers, although conforming to expectations in some ways, unexpectedly diverged in others. Wright and Cantor (1967) suggested that opinion seekers would seek the opinions of opinion leaders and, in the case of the demand and emotion strategies, they do indeed closely approximate opinion leaders in their choice of strategies. However, opinion seekers were least likely to choose the efficient strategy, although the likelihood
of opinion leaders choosing the strategy was quite high. The results from the SVO-OL type cross-tabulation provide some explanation for this last result. Unlike the other three categories, opinion seekers were found to be almost as likely to be competitive as cooperative. This suggests that, while they may generally behave reasonably cooperatively, in situations in which they perceive a threat to their own resource use, they will switch to being competitive such as by rejecting the efficient strategy.

The case of opinion leaders is perhaps less easy to explain through the dominant social values of the group. Although they were twice as likely to be cooperative as competitive and three times more likely to be cooperative as individualistic, their choice-making does not reflect these findings. Opinion leaders were actually less likely than opinion avoiders to choose the efficient strategy, belying the dominance of their cooperative nature. Opinion leaders were most likely to choose the demand strategy, which if re-classified would be considered a proself strategy, despite the finding that they tend not to be individualistic or proself.

An examination of SVOs provides some insight into the choice-making behavior of the OL types. This finding,
as well as others described earlier, presents directions for further research. Three issues arise primarily; exploring in greater detail the idea of the interaction of OL type and SVO as an important indicator of behavior, examining and explaining more fully the concept of opinion leadership, and designing future studies to fit the idea of social dilemmas more accurately both theoretically as well as in the perceptions of the participants. These issues are discussed briefly below.

**Directions for the Future**

The results obtained in this study offer several directions for future research. Three research pathways, relating to the characteristics of all four OL types, the interaction between SVO and OL type, and resource dilemmas and strategy choices, present themselves.

A surprising finding of this study was that opinion leaders did not make strategy choices as anticipated. They were expected to choose strategies classified as highly effective but instead chose those classified as medium or low in effectiveness. One reason for this finding might be that opinion leaders do not see themselves as the principal actors in a social problem, at least during the early stages, and so do not generate effective solutions. Although much literature exists on
typical opinion leadership behavior, I did not find studies that examined their behavior specifically in the context of problem solving. I hypothesized that perceptions of high self-efficacy would relate to strong problem solving skills. While this might be true, it is possible that opinion leaders see formal community leaders as the “first responders” to problems faced by the community, before they themselves get involved. Therefore, it might be valuable to investigate how opinion leaders act either when their communities are actually faced with a resource dilemma or in an experimental setting that closely approximates a real-life situation. Do opinion leaders react right away to a problem or only after they perceive that formal community leaders are unable to do so on their own; that is, does their involvement take place over a few identifiable stages?

Another question that might be answered through this research is whether opinion leaders’ use of a sequence of response strategies depends on what they believe to work. Earlier it was suggested that the emotion strategy, classified here as low in effectiveness, might in fact be the first step in recognizing that a problem exists and requires a solution. Expressions of anger or frustration could be thought of as an expression of an
individual's level of awareness and acceptance of the situation, which would subsequently lead to more effective strategy choices. For example, after an expression of emotion, one might choose the demand strategy, perceived perhaps as a "first response" requiring minimum cognitive effort and coordination amongst resource users but ensuring that all resource users would have access to the resource. Were the demand strategy to be unsuccessful, then one might imagine a move to greater problem solving efforts amongst resource users. Such a move might involve, for example, the use of the efficient strategy.

Such an investigation might also reveal whether there are differences in the way that opinion leaders who have faced problems similar to resource dilemmas act versus those who have not. This would provide evidence for or against the argument of enactive attainment that I used previously in this chapter. Simultaneously, researchers would have the opportunity to identify and observe the behavior of opinion seekers, opinion followers, and opinion avoiders. Although Noelle-Neumann's (1985) PS scale stated that there were four possible levels of opinion leadership, these categories were not described in detail. Descriptions in other studies were also partial and make little mention of opinion followers. The results
of this thesis possibly suffer from inadequate descriptions (therefore, imprecise predictive capabilities) of the four OL types. Such research would allow for the design of more accurate paper-pencil tests to identify individuals in each category.

A second research avenue is the exploration of the interaction between SVO and OL type. Although no main effects were revealed for SVO alone, the cross-tabulation with OL type revealed that, in combination, the two personality variables have fairly good predictive ability. For example, opinion avoiders were found to be largely cooperative and to choose cooperatively. Likewise, opinion seekers were likely to switch to competitive strategy choices if they felt their resource use was threatened, in keeping with an equal tendency towards competitiveness and cooperativeness. This was also true for opinion followers, who were found to tend towards individualism and who were likely to make strategy choices to satisfy at least their own resource needs. The possibility that the combination of OL type and SVO have good predictive value requires further testing.

Finally, there is value in re-examining people’s perceptions of resource dilemmas and the design of scenarios in a research study. Participants in studies
reviewed in chapter one clearly recognized their roles in resource protection or provision, but this was almost certainly because the experimental scenario was carefully spelt out for them. But do individuals recognize a resource dilemma when they are faced with one in every day life? The rolling blackouts that California residents suffered in early 2001 might be some evidence to argue that people do not identify a resource dilemma until they are directly threatened by the shortage or absence of the resource. Although the electricity shortages were a false scarcity caused by energy companies, individuals did not react to early warnings by conserving energy until they actually began to experience power outages. Therefore, a pertinent research question would be whether individuals recognize resource dilemmas in their daily lives or whether only severe shortages trigger concern and subsequent cooperative action and conservation. Moreover, because participants in the current study appeared to perceive each scenario as essentially representing a different situation, the research suggested above would allow researchers to design resource dilemma scenarios that future research participants would recognize as such.
Conclusion

The goal of this research was to examine response strategy choices made by opinion leaders in resource dilemmas. My expectation was that these individuals are most likely to respond to complex resource dilemmas with relatively concrete verbal suggestions that allow a large number of individuals to benefit from it. The motivation for this research comes from my belief that self-governance in resource use is far more stable, affordable, and sustainable than policies simply imposed on resource users by governing authorities. However, this research was unable to support this hypothesis. Those classified as opinion leaders were found to rarely choose strategies that were categorized as effective. Several limitations in the study design, however, lead me to feel that these results are not representative of the way in which opinion leaders would act. Most communities are unlikely to coalesce unless there is a driving force in the shape of a formal or informal leader. Case studies would probably reveal that where communities have successfully protected and maintained their resources, there were individuals around whom community members assemble. A famous example, although this was not strictly a case of resource protection, is India's M. K. Gandhi who, although not a
formal leader, was able to exert a profound influence on the way Indians chose to resist British colonial rule.

The question is how do these formal or informal leaders generate agreement and cooperation amongst community members. It seems very likely that the research suggested in the preceding section would eliminate the primary weaknesses in this study and reveal that opinion leaders do or are capable of producing effective solutions in response to resource dilemmas. In other words, opinion leaders might not see themselves as the first responders or might not have experienced similar situations before, but when faced with a resource dilemma, will eventually suggest solutions that create cooperation among community members over resource use. For the vast majority of the world’s populations with poor access to basic resources such as clean water and cooking fuel, such self-governance might be the only way to attain acceptable living standards.
Appendix A

WEIGHTED PS SCALE FOR DETERMINING STRENGTH OF PERSONALITY

<table>
<thead>
<tr>
<th>Item</th>
<th>Weight</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I usually count on being successful in everything I do.</td>
<td></td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>2. I am rarely unsure about how I should behave.</td>
<td></td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>3. I like to assume responsibility.</td>
<td></td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>4. I like to take the lead when a group does things</td>
<td></td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td>5. I enjoy convincing others of my opinion.</td>
<td></td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>6. I often notice that I serve as a model for others.</td>
<td></td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>7. I am good at getting what I want.</td>
<td></td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>8. I am often a step ahead of the others.</td>
<td></td>
<td>18</td>
<td>9</td>
</tr>
<tr>
<td>9. I own many things others envy me for.</td>
<td></td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>10. I often give others advice and suggestions.</td>
<td></td>
<td>12</td>
<td>6</td>
</tr>
</tbody>
</table>

Maximum score 149

Minimum score 75
INSTRUCTIONS TO PARTICIPANTS (COMBINED PERSONALITY SCALE)

Thank you for coming here/waiting. On the survey that you have are first printed ten statements. Please read through these statements carefully and then respond by circling the Yes/No response that describes you most accurately. Next you will find five questions that ask you to select the answer that describes your own interactions with friends best. Finally, you will be asked to respond on a 1-6 strongly agree- strongly disagree scale with the 16 statements that follow. This survey will take you a few minutes. Thank you for your time. I ask that you not discuss this session with anyone.
CONSENT FORM: COMBINED PERSONALITY SCALE

PLEASE NOTE: YOU MUST BE 18 YEARS OR OLDER TO PARTICIPATE IN THIS STUDY

The purpose of this survey is for us to learn a little about you. You will be asked to respond to two sets of self-descriptive statements as well as some questions about yourself. Participation is voluntary and you are free to discontinue participation at any time prior to the completion of the project.

The results of this study will contribute to our scientific knowledge but will probably have no direct benefits or risks to you as a participant. The task should take about 20 minutes to complete.

All responses will be confidential. While I must ask you to sign this sheet, do not enter your name or social security number on any of the other sheets. In all probability the responses will be used in publications and research reports presenting statistical data, but all personally identifying material will be removed.

I will answer any specific inquiries you have concerning this study. More general questions about the rights of participants in research can be directed to the Office of the Vice Provost for Research (302-831-2136).

Anisha Shankar
Department of Communication
Project Director

I have read the above and give my consent to participate in this study.

________________________  _______________________
Signature                Date

________________________
Printed Name
COMBINED PERSONALITY SCALE

I. Please circle the Yes/ No response for each of the following ten statements that describe you most accurately.

1. I usually count on being successful in everything I do. Yes No
2. I am rarely unsure about how I should behave. Yes No
3. I like to assume responsibility. Yes No
4. I like to take the lead when a group does things together. Yes No
5. I enjoy convincing others of my opinion. Yes No
6. I often notice that I serve as a model Yes No
7. I am good at getting what I want. Yes No
8. I am often a step ahead of the others. Yes No
9. I own many things others envy me for. Yes No
10. I often give others advice and suggestions. Yes No

II. Please indicate your response to the following five questions with a check mark in the box preceding each possible response.

1. How many friends have you seen and spoken to face-to-face in the last two weeks?
   1.☐ Nine or more friends.
   2.☐ Five to eight friends.
   3.☐ Two to four friends.
   4.☐ One friend.
   5.☐ No friends.

2. How many friends have you spoken to on the telephone in the last two weeks?
   1.☐ Nine or more friends.
   2.☐ Five to eight friends.
   3.☐ Two to four friends.
   4.☐ One friend.
   5.☐ No friends.
3. How many friends have you emailed or contacted using instant messaging in the last two weeks?

1. □ Nine or more friends.
2. □ Five to eight friends.
3. □ Two to four friends.
4. □ One friend.
5. □ No friends.

4. How many times in the last two weeks have you gone out socially with other people? For example, visited friends, gone to movies, bowling, church, restaurants, invited friends to your home, or any other activities that you engage in with friends.

5. How many times in the last two weeks have you discussed politics with friends/co-workers/professors/relatives?

1. □ More than three times.
2. □ Three times.
3. □ Twice.
4. □ Once.
5. □ None.

III. Please use the 6-point scale following each of the 16 statements below to indicate how strongly you agree or disagree with the statements as they apply to you. "1" indicates that you “strongly disagree” while “6” indicates that you “strongly agree.”

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Strongly disagree)</td>
<td>(Strongly agree)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| 1 | There are plenty of ways for people like me to have a say in what our government does. | 1 | 2 | 3 | 4 | 5 | 6 |
| 2 | People like me are generally well qualified to participate in political activity and decision-making in our country. | 1 | 2 | 3 | 4 | 5 | 6 |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td><strong>I feel I have a pretty good understanding of the political issues that confront our society.</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 6</td>
</tr>
<tr>
<td>4</td>
<td><strong>I enjoy political participation because I want to have as much say in running the government as possible.</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 6</td>
</tr>
<tr>
<td>5</td>
<td><strong>I am often a leader in groups.</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 6</td>
</tr>
<tr>
<td>6</td>
<td><strong>I can usually organize people to get things done.</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 6</td>
</tr>
<tr>
<td>7</td>
<td><strong>I would prefer to be a leader rather than a follower.</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 6</td>
</tr>
<tr>
<td>8</td>
<td><strong>Other people usually follow my ideas.</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 6</td>
</tr>
<tr>
<td>9</td>
<td><strong>A good many local elections aren't important enough to bother with.</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 6</td>
</tr>
<tr>
<td>10</td>
<td><strong>So many people are active in local issues and organizations that it doesn't matter much to me whether I participate or not.</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 6</td>
</tr>
<tr>
<td>11</td>
<td><strong>It hardly makes any difference who I vote for because whoever gets elected does whatever he or she wants to do anyway.</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 6</td>
</tr>
<tr>
<td>12</td>
<td><strong>Most public officials will not listen to me no matter what I did.</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 6</td>
</tr>
<tr>
<td>13</td>
<td><strong>Sometimes politics and government seem so complicated that a person like me can't really understand what's going on.</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 6</td>
</tr>
</tbody>
</table>

191
<table>
<thead>
<tr>
<th></th>
<th>I like to wait and see if someone else is going to solve a problem so that I don’t have to be bothered by it.</th>
<th>1 2 3 4 5 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>I would rather not try something that I’m not good at.</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>15</td>
<td>I would rather someone else took over the leadership role when I’m involved in a group project.</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>1 2 3 4 5 6</td>
</tr>
</tbody>
</table>
Appendix B

INSTRUCTIONS TO PARTICIPANTS: DECOMPOSED PRISONERS' DILEMMA GAMES

Thank you for coming here today. This experiment involves decision-making. Since I am interested in individual decisions in these tasks, I ask that you do not talk or communicate in any way with other students in this room. I am interested in your honest responses. There are no "right" or "wrong" responses in these tasks and I expect that people may vary in their responses. I will now read a set of instructions for this task. It is important that you listen to these instructions carefully.

You have been paired with another person in this study. You will be asked to make some choices in the next few minutes. The choices that you make will affect your own outcomes as well as the outcomes of your paired person. I ask that you make these choices as though these totals are important to you and the more accumulate the better it is for you. Your paired person also views these totals as important and seeks to accumulate as many points
as possible. You will not learn the identity of this paired person at any time.

On the sheet you have received are printed several sets of numbers in boxes labeled A, B, and C. In each box are two numbers labeled "I get" and the other labeled "He/She gets." These numbers correspond to the units that you and your paired person receive if you choose a given box. Indicate on your response sheet which of the three boxes you consider to be the best of the three choices. Keep in mind that you must treat these units as though they were important to you and the more you accumulate, the better it is for you. Similarly, your paired person also considers his/her outcomes to be important and seeks to accumulate as many points as possible.

We will begin by playing a few sample games so that everyone gets used to the decision tasks. I will display the game on the screen and you must select the best choice for the trial. I will display each example for no more than one minute. Write down your choices, if you wish, on the pieces of paper I have given each of you. (After the four examples) If there are no questions, we will now begin the actual tasks.
(At the end of the experimental session) Thank you for your time. I ask that you not discuss this session with anyone.
EXAMPLE DECOMPOSED GAMES

The following are the four example decomposed games used to ensure that participants understood and could play these games. Each game was displayed separately on the overhead projector for no more than a minute. The order in which the games were displayed were randomized for each session.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;I Get&quot;</td>
<td>8</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>&quot;He/ She Gets&quot;</td>
<td>8</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;I Get&quot;</td>
<td>5</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>&quot;He/ She Gets&quot;</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;I Get&quot;</td>
<td>5</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>&quot;He/ She Gets&quot;</td>
<td>1</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;I Get&quot;</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>&quot;He/ She Gets&quot;</td>
<td>0</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>
CONSENT FORM: DECOMPOSED PRISONER'S DILEMMA GAMES

PLEASE NOTE: YOU MUST BE 18 YEARS OR OLDER TO PARTICIPATE IN THIS STUDY.

The purpose of this study is to learn how people make decisions when the rewards they get are equally dependent on their own decisions and the decisions their partners make. Participation is voluntary and you are free to discontinue participation at any time prior to the completion of the project.

You will be presented with a set of different outcomes for yourself and a paired person, whose identity you will not learn at any time. You will be asked to choose the outcome you prefer most.

The results of this study will contribute to our scientific knowledge but will probably have no direct benefits or risks to you as a participant. The task should take about 25 minutes to complete.

All responses will be confidential. While I must ask you to sign this sheet, do not enter your name or social security number on any of the other sheets. In all probability the responses will be used in publications and research reports presenting statistical data, but all personally identifying material will be removed.

I will answer any specific inquiries you have concerning this study. More general questions about the rights of participants in research can be directed to the Office of the Vice Provost for Research (302-831-2136).

Anisha Shankar
Department of Communication
Project Director

I have read the above and give my consent to participate in this study.

Signature ___________________________ Date ___________________________

Printed Name ___________________________
DECOMPOSED PRISONER’S DILEMMA GAMES (DPDG)

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
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<tbody>
<tr>
<td>&quot;I Get&quot;</td>
<td>6</td>
<td>7</td>
<td>4</td>
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<tr>
<td>&quot;He/She Gets&quot;</td>
<td>4</td>
<td>6</td>
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<tr>
<td>&quot;I Get&quot;</td>
<td>6</td>
<td>6</td>
<td>7</td>
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<td>&quot;He/She Gets&quot;</td>
<td>2</td>
<td>6</td>
<td>4</td>
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<tr>
<td>&quot;I Get&quot;</td>
<td>7</td>
<td>6</td>
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<tr>
<td>&quot;He/She Gets&quot;</td>
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<tr>
<td>&quot;I Get&quot;</td>
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<td>7</td>
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<tr>
<td>&quot;He/She Gets&quot;</td>
<td>4</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>&quot;I Get&quot;</td>
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<td>5</td>
<td>2</td>
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<tr>
<td>&quot;He/She Gets&quot;</td>
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<td>0</td>
</tr>
<tr>
<td>&quot;I Get&quot;</td>
<td>6</td>
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<td>5</td>
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<tr>
<td>&quot;He/She Gets&quot;</td>
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<td>1</td>
<td>5</td>
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<tr>
<td>&quot;I Get&quot;</td>
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<tr>
<td>&quot;He/She Gets&quot;</td>
<td>5</td>
<td>7</td>
<td>4</td>
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<tr>
<td>&quot;I Get&quot;</td>
<td>9</td>
<td>8</td>
<td>8</td>
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<tr>
<td>&quot;He/She Gets&quot;</td>
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<tr>
<td>&quot;I Get&quot;</td>
<td>8</td>
<td>7</td>
<td>9</td>
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<tr>
<td>&quot;He/She Gets&quot;</td>
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RESPONSE SHEET FOR DPDG

Please study the sheet I have just handed out and then circle the letter (A / B / C), which you think is best choice for that trial.

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Appendix C

CONSENT FORM: PRETEST FOR SCENARIO REALISM AND EASE OF IMAGINATION

PLEASE NOTE: YOU MUST BE 18 YEARS OR OLDER TO PARTICIPATE IN THIS STUDY.

The following survey contains five different situations. The purpose of this study is to test how realistic these situations are and how easy it is for you to imagine yourself facing them. Participation is voluntary and you are free to discontinue participation at any time prior to the completion of the project.

In each of the five situations case you are asked to write down what your responses would or would not be. You are also asked to note on a scale of 1-5 how realistic and easy to imagine these scenarios are.

The results of this study will contribute to our scientific knowledge but will probably have no direct benefits or risks to you as a participant. The task should take about 15 minutes to complete.

All responses will be confidential. While I must ask you to sign this sheet, do not enter your name or social security number on any of the other sheets. In all probability the responses will be used in publications and research reports presenting statistical data, but all personally identifying material will be removed.

I will answer any specific inquiries you have concerning this study. More general questions about the rights of participants in research can be directed to the Office of the Vice Provost for Research (302-831-2136).

Anisha Shankar
Department of Communication
Project Director
SURVEYS USED TO DETERMINE SCENARIO REALISM AND EASE OF IMAGINATION AS WELL AS TO NOTE RESPONSE STRATEGY TYPES.

You and many of your friends are very conscious of fitness and like to work out in the fitness center located in the Carpenter Sports Building every day. However, lately, you find that there are many more people at the center than there is equipment. This means that you have to wait between 5 and 20 minutes to use the equipment. You find you end up with cramped muscles and stiffness because of the long breaks between your different exercises. In conversations with your friends...

What would you say in this situation?

What would you not say in this situation?

On a scale of 1 (very unrealistic) to 5 (very realistic), how realistic do you think this situation is?

1 2 3 4 5

On a scale of 1 (not easily) to 5 (very easily), how easily can you imagine yourself in a situation like this?

5 4 3 2 1
You are taking a course in Economics. Your course requires you to use computer software called EVIEWS. This program is expensive to purchase ($450). Fortunately, the computers at the computer laboratory housed in Purnell Hall are loaded with EVIEWS. This allows you to do your coursework. However, you find that it is almost impossible to get a free computer towards the end of the semester. It means waiting 10-15 minutes for a computer. You have twice submitted an assignment late because of this. You chat with fellow students...

What would you say in this situation?

What would you not say in this situation?

On a scale of 1 (very unrealistic) to 5 (very realistic), how realistic do you think this situation is?

1 3 4 5

On a scale of 1 (not easily) to 5 (very easily), how easily can you imagine yourself in a situation like this?

5 4 3 2 1
Exam week starts in six days. You live in the dorms and therefore, find that it is hard for you to get a place to study undisturbed. You find you are most productive when using the study areas late at night. However, because there are only two study areas (Morris library and the Abbey) that are open late, you almost never find anywhere to sit without being disturbed. You discuss this problem with other students...

What would you say in this situation?

What would you not say in this situation?

On a scale of 1 (very unrealistic) to 5 (very realistic), how realistic do you think this situation is?

1  2  3  4  5

On a scale of 1 (not easily) to 5 (very easily), how easily can you imagine yourself in a situation like this?

5  4  3  2  1
You find that many of your classes are scheduled either in Smith Hall or Gore Hall. You have continuous classes between 11 and 2pm most days. You have a 15-minute break at 12:05pm when you get a bite to eat. Because it is the closest place, you dash over to Smith Hall and eat at Smitties. However, you are not the only one with this idea and normally, there is a crowd there waiting to be served. You end up either going hungry or going over to the Trabant Student Center or therefore being late for class. You discuss this with friends who face a similar situation...

What would you say in this situation?

What would you not say in this situation?

On a scale of 1 (very unrealistic) to 5 (very realistic), how realistic do you think this situation is?

1 2 3 4 5

On a scale of 1 (not easily) to 5 (very easily), how easily can you imagine yourself in a situation like this?

5 4 3 2 1
You do not live very close to campus. But you have a car and so getting to school is not a problem. However, parking is. You find that you must park near the Field House and then take the bus to school. You find that you waste time just getting to school. You are often late for class because of this. Your other friends also face the same situation. You sit down with them to talk of ways of avoiding this situation...

What would you say in this situation?

What would you not say in this situation?

On a scale of 1 (very unrealistic) to 5 (very realistic), how realistic do you think this situation is?

1 2 3 4 5

On a scale of 1 (not easily) to 5 (very easily), how easily can you imagine yourself in a situation like this?

5 4 3 2 1
Appendix D

RESOURCE DILEMMA SCENARIOS WITH LABELED RESPONSE CHOICES

Scenario 1: You and many of your friends are very conscious of fitness and like to work out in the fitness center located in the Carpenter Sports Building (CSB) every day. However, lately, you find that there are many more people at the center than there is equipment. This means that you have to wait between 5 and 20 minutes to use the equipment. You find you end up with cramped muscles and stiffness because of the long breaks between your different exercises. In conversations with your friends, you say:

1. “I think we should find another place to work out at to avoid the time wait.” ("Different Resource")

2. “We should check to see when the gym is less crowded and work out then.” ("Efficient")

3. “What do you do when you get cramps from having to wait to use the exercise machines?” ("Opinion seeking")

4. “The University should buy more equipment. It’s dumb that we have to wait to exercise!” ("Demand")

5. “CSB is too small for this University!” ("Emotion")

6. “I’m going to find another place to work out at. The gym at CSB has too many people!” ("Selfish")

7. “We should discuss this problem and try and come up with solutions so that we can get a decent workout.” ("Talk")

8. “We should talk to the people at CSB and ask them to improve the situation for us.” ("Intention")
Scenario 2: You are taking classes at the Department of Economics. Several of these courses require you to use computer software called EVIEWS. This program is expensive to purchase ($450). Fortunately, the computers at the computer laboratory housed in Purnell Hall are loaded with EVIEWS. This allows you to do your coursework. However, you find that it is almost impossible to get a free computer towards the end of the semester. It means waiting 10-15 minutes for a computer. You have twice submitted an assignment late because of this. Therefore, you chat with fellow students:

1. "This is ridiculous! Let's say something to the professor. Maybe he/she can come up with a way of dealing with this situation." ("Intention")

2. "I go to the computing site earlier so that I get my work done on time." ("Selfish")

3. "Damn it! I am sick and tired of waiting for these slow computers. People are just checking their email and I have work to do!" ("Emotion")

4. "The University should load EVIEWS on more computers in all the computer labs on campus." ("Demand")

5. "What do you guys do when you need to complete an assignment and there aren't any computers available?" ("Opinion seeking")

6. "Maybe we should work out a schedule when each of us uses the computers so that no one loses out on computer time." ("Efficient")

7. "I'm sure we can figure out a way of improving the situation for ourselves! We need to plan!" ("Talk")

8. "Why don't we pool in some money and buy the program and then load it onto our personal computers? That way everyone gets to work in peace." ("Different resource")
Scenario 3: You find that many of your classes are scheduled either in Smith Hall or Gore Hall. You have continuous classes between 11 and 2pm most days. You have a 15-minute break at 12.05pm when you get a bite to eat. Because it is the closest place, you dash over to Smith Hall and eat at Smitty’s. However, you are not the only one with this idea and normally, there is a crowd there waiting to be served. You end up either going hungry, or being late for class because you went over to the Trabant Student Center. You discuss this with friends who face a similar situation and say:

1. “UD officials should increase the number of cashiers at Smitty’s as well as the space available to them.” (“Demand”)

2. “Why don’t we meet here after class when it is less crowded? We can snack on something till then.” (“Efficient”)

3. “So where do you eat when Smitty’s is so crowded?” (“Opinion seeking”)

4. “We need to come up with some ideas to deal with this problem we seem to have in getting lunch!” (“Talk”)

5. “I wish the lines weren’t so long at Smitty’s!” (“Emotion”)

6. “Let’s go speak to the Dean and ask him to find a way to resolve this problem.” (“Intention”)

7. “I think I’m just going to bring my lunch everyday because I have no time to buy it in between class.” (“Selfish”)

8. “Why don’t we get our dining hall to pack us lunch on the days that we have consecutive classes?” (“Different resource”)
Scenario 4: You do not live very close to campus. But you have a car and so getting to school is not a problem. However, parking is. You find that you must park near the Field House and then take the bus to school. You find that you waste time just getting to school. You are often late for class because of this. Your other friends also follow the same procedure. You sit down with them to talk of ways of avoiding this situation:

1. "Why don't we just move to a place on the bus route or somewhere within walking distance of campus, so that we don't have to take our cars into school?" ("Different resource")

2. "Why don't we car pool? We can split the cost of parking and improve our chances of being able to park within walking distance of school?" ("Efficient")

3. "We really need to figure out a way of making parking a little easier for ourselves!" ("Talk")

4. "We should petition for more parking areas for students!" ("Demand")

5. "What are some of the other less popular parking lots on campus?" ("Opinion seeking")

6. "I always apply early for a parking spot. That is the only way to get a spot close to closer to class." ("Selfish")

7. "Our parking situation is really pathetic!" ("Emotion")

8. "We should speak to the Dean of students about addressing this concern of ours." ("Intention")
CONSENT FORM: VALIDATION CHECK TO TEST MATCH BETWEEN RESPONSES AND STRATEGY TYPES

PLEASE NOTE: YOU MUST BE 18 YEARS OR OLDER TO PARTICIPATE IN THIS STUDY.

The purpose of this study is a validation check to examine whether strategy types and a set of responses to a problem can be matched up accurately. Participation is voluntary and you are free to discontinue participation at any time prior to the completion of the project.

You will be presented with a set of possible situations in which people are communicating about how a problem can be solved. Further you will be given a list of eight strategy types labeled A through H. In each situation, for each of the eight possible responses, you will be asked to indicate which strategy type that response represents. Indicate this using the alphabet label of the strategy type.

The results of this study will contribute to our scientific knowledge but will probably have no direct benefits or risks to you as a participant. The task should take about 20 minutes to complete.

All responses will be confidential. While I must ask you to sign this sheet, do not enter your name or social security number on any of the other sheets. In all probability the responses will be used in publications and research reports presenting statistical data, but all personally identifying material will be removed.

I will answer any specific inquiries you have concerning this study. More general questions about the rights of participants in research can be directed to the Office of the Vice Provost for Research (302-831-2136).

Anisha Shankar
Department of Communication
Project Director
I have read the above and give my consent to participate in this study.
You and many of your friends are very conscious of fitness and like to work out in the fitness center located in the Carpenter Sports Building (CSB) every day. However, lately, you find that there are many more people at the center than there is equipment. This means that you have to wait between 5 and 20 minutes to use the equipment. You find you end up with cramped muscles and stiffness because of the long breaks between your different exercises. In conversations with your friends, you say:

At the bottom of the page are eight strategy types. Match these types with the possible responses given below. Indicate in the blank against each response the strategy type through its alphabet label (A though H).

1. "I think we should find another place to work out at to avoid the time wait."
2. "We should check to see when the gym is less crowded and work out then."
3. "What do you do when you get cramps from having to wait to use the exercise machines?"
4. "The University should buy more equipment. It's dumb that we have to wait to exercise!"
5. "CSB is too small for this University!"
6. "I'm going to find another place to work out at. The gym at CSB has too many people!"
7. "We should discuss this problem and try and come up with solutions."
8. "We should talk to the people at CSB and ask them to improve the situation for us."
Strategy types:

A Request cooperation to use the same resource more efficiently.
B Request cooperation to use an available but alternative resource.
C Demand more resources.
D Talk to authorities about resolving issue.
E Make statement to discuss issue without specific plan or intention to act.
F Ask for advice/opinion.
G Act alone to resolve the problem for self.
H Make statement without plan.
You are taking classes at the Department of Economics. Several of these courses require you to use computer software called EVIEWS. This program is expensive to purchase ($450). Fortunately, the computers at the computer laboratory housed in Purnell Hall are loaded with EVIEWS. This allows you to do your coursework. However, you find that it is almost impossible to get a free computer towards the end of the semester. It means waiting 10-15 minutes for a computer. You have twice submitted an assignment late because of this. Therefore, you chat with fellow students:

At the bottom of the page are eight strategy types. Match these types with the possible responses given below. Indicate in the blank against each response the strategy type through its alphabet label (A though H).

___ 1. “This is ridiculous! Let’s say something to the professor.”

___ 2. “I go to the computing site earlier so that I get my work done on time.”

___ 3. “Damn it! I am sick and tired of waiting for these slow computers. People are just checking their email and I have work to do!”

___ 4. “The University should load EVIEWS on more computers in all the computer labs on campus.”

___ 5. “Do you know when is a good time to visit the lab, so that it is not so crowded?”

___ 6. “Maybe we should work out a schedule when each of us uses the computers so that no one loses out on computer time.”

___ 7. “What do you think we should do about this problem?”
8. "Why don’t we pool in some money and buy the program and then load it onto our personal computers? That way everyone gets to work in peace."

**Strategy types:**

A Request cooperation to use the same resource more efficiently.

B Request cooperation to use an available but alternative resource.

C Demand more resources.

D Talk to authorities about resolving issue.

E Make statement to discuss issue without specific plan or intention to act.

F Ask for advice/opinion.

G Act alone to resolve the problem for self.

H Make statement without plan.
You find that many of your classes are scheduled either in Smith Hall or Gore Hall. You have continuous classes between 11 and 2pm most days. You have a 15minute break at 12.05pm when you get a bite to eat. Because it is the closest place, you dash over to Smith Hall and eat at Smitty’s. However, you are not the only one with this idea and normally, there is a crowd there waiting to be served. You end up either going hungry, or being late for class because you went over to the Trabant Student Center. You discuss this with friends who face a similar situation and say:

At the bottom of the page are eight strategy types. Match these types with the possible responses given below. Indicate in the blank against each response the strategy type through its alphabet label (A though H).

1. "UD officials should increase the number of cashiers at Smitty’s as well as the space available to them.”

2. “Why don’t we meet here after class when it is less crowded? We can snack on something till them.”

3. “Where do you get food when Smitty’s is crowded?”

4. “Who has ideas on what we can do to deal with this?”

5. “I wish the lines weren’t so long at Smitty’s!”

6. “Let’s go speak to the Dean and ask them to find a way to resolve this problem.”

7. “I think I’m just going to bring my lunch everyday because I have no time to buy it in between class.”

8. “Why don’t we get our dining hall to pack us lunch on the days that we have consecutive classes?”
Strategy types:

**A** Request cooperation to use the same resource more efficiently.

**B** Request cooperation to use an available but alternative resource.

**C** Demand more resources.

**D** Talk to authorities about resolving issue.

**E** Make statement to discuss issue without specific plan or intention to act.

**F** Ask for advice/opinion.

**G** Act alone to resolve the problem for self.

**H** Make statement without plan.
You do not live very close to campus. But you have a car and so getting to school is not a problem. However, parking is. You find that you must park near the Field House and then take the bus to school. You find that you waste time just getting to school. You are often late for class because of this. Your other friends also follow the same procedure. You sit down with them to talk of ways of avoiding this situation:

At the bottom of the page are eight strategy types. Match these types with the possible responses given below. Indicate in the blank against each response the strategy type through its alphabet label (A though H).

1. “Why don’t we just move to a place on the bus route or somewhere within walking distance of campus, so that we don’t have to take our cars into school?”

2. “Why don’t we car pool? We can split the cost of parking and improve our chances of being able to park within walking distance of school?”

3. “Our parking situation at the University is horrible and needs to be reworked!”

4. “We should petition for more parking areas for students!”

5. “What are some of the other less popular parking lots on campus?”

6. “I always apply early for a parking spot. That is the only way to get a spot close to class.”

7. “I wish there was somewhere else to park, which was closer than Field House.”

8. “We should speak to the Dean of students about addressing this concern of our.”
Strategy types:

A Request cooperation to use the same resource more efficiently.

B Request cooperation to use an available but a alternative resource.

C Demand more resources.

D Talk to authorities about resolving issue.

E Make statement to discuss issue without specific plan or intention to act.

F Ask for advice/opinion.

G Act alone to resolve the problem for self.

H Make statement without plan.
Appendix E

CONSENT FORM: RESOURCE DILEMMA SURVEYS

PLEASE NOTE: YOU MUST BE 18 YEARS OR OLDER TO PARTICIPATE IN THIS STUDY.

The purpose of this study is to learn how people communicate with each other when they are faced with a problem as a group. Participation is voluntary and you are free to discontinue participation at any time prior to the completion of the project.

You will be presented with a set of possible situations in which people are communicating and asked to imagine yourself in that situation. For each situation, you will be asked to indicate using a scale of 0-10 the probability with which you are likely to use each response.

The results of this study will contribute to our scientific knowledge but will probably have no direct benefits or risks to you as a participant. The task should take about 20 minutes to complete.

All responses will be confidential. While I must ask you to sign this sheet, do not enter your name or social security number on any of the other sheets. In all probability the responses will be used in publications and research reports presenting statistical data, but all personally identifying material will be removed.

I will answer any specific inquiries you have concerning this study. More general questions about the rights of participants in research can be directed to the Office of the Vice Provost for Research (302-831-2136).

Charles Pavitt
Department of Communication
Project Director
You and many of your friends are very conscious of fitness and like to work out in the fitness center located in the Carpenter Sports Building (CSB) every day. However, lately, you find that there are many more people at the center than there is equipment. This means that you have to wait between 5 and 20 minutes to use the equipment. You find you end up with cramped muscles and stiffness because of the long breaks between your different exercises. In conversations with your friends, you say:

Using a 0 (zero probability) - 10 (highest probability) scale, indicate the probability with which you will use each response.

1. "I think we should find another place to work out at to avoid the time wait."

   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

2. "We should check to see when the gym is less crowded and work out then."

   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

3. "What do you do when you get cramps from having to wait to use the exercise machines?"

   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

4. "The University should buy more equipment. It’s dumb that we have to wait to exercise!"

   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
5. "CSB is too small for this University!"

6. "I'm going to find another place to work out at. The gym at CSB has too many people!"

7. "We should discuss this problem and try and come up with solutions so that we can get a decent workout."

8. "We should talk to the people at CSB and ask them to improve the situation for us."

9. Is there something else you would say that is not listed above? What would you say?

Indicate the probability with which you would say this:

On a scale of 1 (very unrealistic) to 5 (very realistic), how realistic do you think this situation is?
This?

easy

Can you imagine yourself in a situation like this?

On a scale of 1 (not easy) to 5 (very easy), how

5 4 3 2 1 0
You are taking classes at the Department of Economics. Several of these courses require you to use computer software called EVIEWS. This program is expensive to purchase ($450). Fortunately, the computers at the computer laboratory housed in Purnell Hall are loaded with EVIEWS. This allows you to do your coursework. However, you find that it is almost impossible to get a free computer towards the end of the semester. It means waiting 10-15 minutes for a computer. You have twice submitted an assignment late because of this. Therefore, you chat with fellow students:

Using a 0 (zero probability) - 10 (highest probability) scale, indicate the probability with which you will use each response.

1. "This is ridiculous! Let's say something to the professor. Maybe he/she can come up with a way of dealing with this situation."

   0  1  2  3  4  5  6  7  8  9  10

2. "I go to the computing site earlier so that I get my work done on time."

   0  1  2  3  4  5  6  7  8  9  10

3. "Damn it! I am sick and tired of waiting for these slow computers. People are just checking their email and I have work to do!"

   0  1  2  3  4  5  6  7  8  9  10

4. "The University should load EVIEWS on more computers in all the computer labs on campus."

   0  1  2  3  4  5  6  7  8  9  10

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5. "What do you guys do when you need to complete an assignment and there aren't any computers available?"

6. "Maybe we should work out a schedule when each of us uses the computers so that no one loses out on computer time."

7. "I'm sure we can figure out a way of improving the situation for ourselves! We need to plan!"

8. "Why don't we pool in some money and buy the program and then load it onto our personal computers? That way everyone gets to work in peace."

9. Is there something else you would say that is not listed above? What would you say?
On a scale of 1 (very unrealistic) to 5 (very realistic), how realistic do you think this situation is?

0   1   2   3   4   5

On a scale of 1 (not easily) to 5 (very easily), how easily can you imagine yourself in a situation like this?

0   1   2   3   4   5
You find that many of your classes are scheduled either in Smith Hall or Gore Hall. You have continuous classes between 11 and 2pm most days. You have a 15-minute break at 12.05pm when you get a bite to eat. Because it is the closest place, you dash over to Smith Hall and eat at Smitty’s. However, you are not the only one with this idea and normally, there is a crowd there waiting to be served. You end up either going hungry, or being late for class because you went over to the Trabant Student Center. You discuss this with friends who face a similar situation and say:

**Using a 0 (zero probability) - 10 (highest probability) scale, indicate the probability with which you will use each response.**

1. “UD officials should increase the number of cashiers at Smitty’s as well as the space available to them.”

   0 1 2 3 4 5 6 7 8 9 10

2. “Why don’t we meet here after class when it is less crowded? We can snack on something till then.”

   0 1 2 3 4 5 6 7 8 9 10

3. “Where do you all eat when Smitty’s is so crowded?”

   0 1 2 3 4 5 6 7 8 9 10

4. “We need to come up with some ideas to deal with this problem we seem to have in getting lunch!”

   0 1 2 3 4 5 6 7 8 9 10
5. "I wish the lines weren't so long at Smitty's!"

6. "Let's go speak to the Dean and ask him to find a way to resolve this problem."

7. "I think I'm just going to bring my lunch everyday because I have no time to buy it in between class.

8. "Why don't we get our dining hall to pack us lunch on the days that we have consecutive classes?"

9. Is there something else you would say that is not listed above? What would you say?

Indicate the probability with which you would say this:
Is this realistic? How realistic do you think this situation is? On a scale of 1 (very unrealistic) to 5 (very realistic).
You do not live very close to campus. But you have a car and so getting to school is not a problem. However, parking is. You find that you must park near the Field House and then take the bus to school. You find that you waste time just getting to school. You are often late for class because of this. Your other friends also follow the same procedure. You sit down with them to talk of ways of avoiding this situation:

Using a 0 (zero probability) - 10 (highest probability) scale, indicate the probability with which you will use each response.

1. "Why don’t we just move to a place on the bus route or somewhere within walking distance of campus, so that we don’t have to take our cars into school?"

2. "Why don’t we car pool? We can split the cost of parking and improve our chances of being able to park within walking distance of school?"

3. "We really need to figure out a way of making parking a little easier for ourselves!"

4. "We should petition for more parking areas for students!"

5. "What are some of the other less popular parking lots on campus?"

0 $\underline{1} \underline{2} \underline{3} \underline{4} \underline{5} \underline{6} \underline{7} \underline{8} \underline{9} \underline{10}$
6. "I always apply early for a parking spot. That is the only way to get a spot close to class."

7. "Our parking situation is pathetic!"

8. "We should speak to the Dean of students about addressing this concern of ours."

9. Is there something else you would say that is not listed above? What would you say?

Indicate the probability with which you would say this:

On a scale of 1 (very unrealistic) to 5 (very realistic), how realistic do you think this situation is?
REFERENCES


