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Structural Characteristics of Norms in Resource Dilemmas

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Running head: **NORMS IN RESOURCE DILEMMAS**

Abstract

This research investigated the utility of Jackson's (1966) Return Potential Model (RPM) for assessing the structural characteristics of norms for choice behavior in a sequential resource dilemma. Two computer-controlled laboratory experiments were performed to test the conflict hypothesis (Thibaut & Kelley, 1959): normative power will increase as the degree of perceived conflict of interest between group members increases. The results of Study 1 demonstrated that subjects clearly perceived an equality norm in this resource sharing situation. In Study 2, three independent variables were manipulated in a 2 x 2 x 2 factorial design: (1) resource use (scarcity, abundance), (2) inequity in others' behavior (low, high), and (3) causal attribution for scarcity/abundance (group, environment). The results of Study 2 replicated the basic finding in Study 1 and showed further that the structure of the equality norm varied systematically as a function of both resource use and causal attribution. Consistent with the conflict hypothesis, normative power was higher under conditions of resource scarcity and high inequity. Contrary to expectations, under scarcity conditions, normative power was actually highest in the environment attribution rather than the group attribution condition. These findings suggest that the RPM approach has considerable promise as a reliable and useful method for obtaining quantitative measures of existing norms of small groups in laboratory settings.

Structural Characteristics of Norms in Resource Dilemmas

Historically, there has been considerable agreement among social psychologists that norms serve to regulate members' behavior in small groups (Festinger, Schachter, & Back, 1950; Hackman, 1992; Homans, 1950; Lewin, 1951; McGrath, 1984; Sherif, 1936; Thibaut & Kelley, 1959). For years, the norm construct has been used as a popular and appealing explanation for a vast array of empirical findings in the area of group dynamics (e.g., Cartwright & Zander, 1968). The validity of such normative explanations rests on the assumption that norms exist and are potent influences on group members' attitudes and behaviors. Rarely, however, have researchers attempted to assess norms directly to document their independent existence and importance as a mediator (or moderator) of group members' behavior. The more typical research strategy has been to observe group members' behavior and then invoke norms as a post-hoc explanation to account for behavioral regularities.

This lack of empirical verification has led some recent observers to question earlier assumptions about norms and their presumed importance for group members' behavior (Goodman, Ravlin, & Schminke, 1987). This pessimistic view is clearly evident in the area of prosocial behavior, beginning with Darley and Latane's (1970) critique of normative explanations. Darley and Latane (1970) were concerned primarily with the conceptual problem of circular reasoning associated with the post-hoc use of the norm construct. This discontent has also been echoed in later reviews of the literature on altruism (Krebs & Miller, 1985).

The present article adopts a more optimistic position.

Specifically, we employ a conceptual and measurement model of norms developed originally by Jackson (1966) to demonstrate how norms can be measured quantitatively in the context of a resource dilemma, a mixed-motive conflict belonging to the larger class of situations known as social dilemmas (Dawes, 1980; Messick & Brewer, 1983). This situational context is ideal for studying norms due to the inherent conflict between individual self-interest and collective welfare. It is precisely this type of choice dilemma where norms may be influential in a decision-maker's calculus (Dawes, 1980).

Past research on social dilemmas has acknowledged the importance of norms as a determinant of choice behavior. For example, Kerr (1995) has argued forcefully that many empirical findings in social dilemma research can be interpreted in terms of the activation of general interaction norms such as commitment, equity, and reciprocity. He notes that a large majority of social dilemma studies have emphasized other theoretical explanations for choice behavior, most notably game theory. Kerr (1995) suggests that this game theoretic orientation may have inhibited researchers from investigating norms directly as either an independent or dependent variable (for exceptions, see Bonacich, 1972; Thibaut & Faucheux, 1965). Kerr (1995) concluded that one important direction for future research on norms in social dilemmas is to provide more direct empirical evidence for the existence and mediating effects of norms on choice behavior. This call for more process-oriented research in this area is also echoed by Komorita and Parks' (1995) comprehensive review of the social dilemma literature.

To summarize, despite the continued theoretical interest in normative explanations for social behavior, experimental social psychologists appear to have neglected the next logical step of developing methodologies to assess norms empirically. We believe that this lack of attention to measurement issues has resulted in at least two serious problems for research on norms. First, we have a limited understanding of the processes by which norm formation occurs, beyond that provided by Sherif's (1936) seminal early studies (see however, Bettenhausen & Murnighan, 1985, **1991**). For example, little research has addressed the important question of how people identify or locate norms in their immediate social environment. Recent work by Prentice and Miller (1993) demonstrates that there can be considerable misperception of social norms, sometimes resulting in a state of pluralistic ignorance. If a reliable and valid methodology for assessing norms could be established, then new avenues could be opened for generating and testing competing causal models of the norm formation process. Second, the absence of independent measures of norms in previous empirical studies has made the existing research on norms vulnerable to criticism regarding the actual mediating or moderating impact of norms on group members' behavior (e.g., Goodman et al., 1987).

The present research addresses directly the first problem noted above. We present data from two experiments that demonstrate how norms can be measured quantitatively in a resource dilemma paradigm and identify situational factors that can modify group members' perceptions of these norms.

Study 1

One broad objective of the present research was to investigate the utility of Jackson's (1966) Return Potential Model (RPM) for measuring norms. We used the RPM to assess subjects' feelings of approval or disapproval for various behavioral choices by other group members in a resource dilemma situation. This methodology consists of a standardized questionnaire that elicits subjects' expectations regarding appropriate and inappropriate behavior by other group members. Jackson's (1966) conceptual and measurement model allows one to derive a set of specific structural characteristics that describe the type of norm that exists within a group. The RPM defines a norm in a given interaction situation in terms of the distribution of potential approval or disapproval by others for various behavioral alternatives of an actor along a particular dimension. Thus, norms may be described by a behavior dimension and an evaluation dimension, represented graphically in a two-dimensional space (see Figure 1 for an example of a return potential curve).

Jackson's (1966) definition of a norm is similar to what Cialdini, Kallgren, and Reno (1991) have described as an injunctive norm. This type of norm refers to the behaviors that one "ought" or "should" perform in a specific social situation. Cialdini et al. (1991) contrast this injunctive norm with a descriptive norm, which defines what behaviors are actually being performed by the majority of others, without regard to prescriptions or social sanctions. The present research is concerned with resource dilemma situations in which both injunctive and descriptive norms are potentially operating.[1] The conceptual definition of Jackson's (1966) RPM, however, restricts itself to the measurement of an injunctive norm. Descriptive norms are operationalized in the present research by the feedback patterns that subjects receive about other group members' resource consumption decisions. Thus, the injunctive norm in this resource dilemma situation will be measured by the RPM questionnaire and the descriptive norm will be manipulated experimentally.

Jackson's (1966) RPM defines five structural characteristics of any given norm: (a) point of maximum return, (b) range of tolerable behavior, (c) potential return difference, (d) intensity, and (e) crystallization. Jackson (1975) further extended the RPM by describing two additional indices that can be derived by combining the latter two characteristics (i.e., intensity and crystallization). He refers to these as normative power and conflict potential. These two measures provide a useful summary of the structure of a norm in a given situation. An important assumption of Jackson's (1966) measurement model is that group members' expectations for behavior, as indexed by the evaluative ratings, will ultimately be expressed verbally or nonverbally during group interaction. Thus, the RPM assesses the potential for normative regulation of behavior in a specific social situation. Jackson's (1960, 1964, 1965, 1968) empirical work, conducted in diverse field settings, has provided indirect support for this assumption by demonstrating characteristic and reliable differences in norms between various subgroups or departments within organizations that were observed to be in conflict.

Theoretical Approach and Hypotheses

Where do norms originate from in resource dilemma situations? Thibaut and Kelley (1959) hypothesized that group members may "import" behavioral rules that have been used in previous relationships. It follows that rules that are highly salient from past experience will be more likely to be imported than rules that are less frequently encountered. In this vein, several recent authors have suggested that the "share equally" rule may serve as a decision heuristic for individuals in resource sharing situations (Allison & Messick, 1990; Allison, McQueen, & Schaerfl, 1992; Messick, 1993; Rutte, Wilke, & Messick, 1987; Samuelson & Allison, 1994). When this equality heuristic is shared by all or a majority of group members, then it may be regarded as an established norm (Rutte et al., 1987). It is interesting to note here that the use of the equality rule appears universal across many cultures, leading A.P. Fiske (1991) to propose it as one of four fundamental organizing principles of social relationships.

Thus, our first hypothesis was that subjects in a resource dilemma situation will "import" the equality rule and this norm should be clearly reflected in the overall RPM ratings. In this study, we also manipulated two independent variables: (a) the degree of inequity in other group members' outcomes (low, high), and (b) the subject's causal attribution for the amount remaining in the common pool (group, environment). It was expected that these two factors would influence subjects' perceptions of the equality norm, resulting in different profiles on the structural characteristics measured by the RPM.

Our theoretical approach to the inequity variable follows from interdependence theory (Kelley & Thibaut, 1978; Thibaut & Kelley, 1959). The central idea is that norms are most likely to emerge in exchange situations in which there is a high degree of conflict of interest (Bonacich, 1972; Thibaut & Faucheux, 1965). In Kelley & Thibaut's (1978) terminology, norms are most needed when the pattern of group members' outcomes is either intermediate correspondence or noncorrespondence. In these situations, members can achieve higher outcomes by establishing accepted behavioral rules that cut costs, thereby obviating the need for ad hoc use of power to resolve disputes. Based on this logic, we predicted that normative power should be significantly higher under conditions of high perceived conflict of interest (i.e., high inequity conditions where subjects observe sizable inequities among other group members' outcomes). Under conditions of low inequity, perceived conflict of interest should be reduced and normative power should be attenuated. Thus, we hypothesized that the equality norm should be more strongly endorsed by high inequity subjects compared to low inequity subjects.

This general effect, however, was expected to be moderated by the attributional manipulation. Rutte et al. (1987) have demonstrated that causal attributions for scarcity or abundance can affect group members' conformity to other members' harvest behavior in a resource dilemma. Specifically, they found that subjects who attributed resource scarcity (or abundance) to other group members' behavior were more likely to conform to the implicit norm derived from feedback about their harvest choices.[2] In contrast, subjects who attributed the scarcity (or abundance) to the environment (e.g., luck, chance) were more likely to apply the equality rule directly and divide the remaining resource pool equally with another group member.

Based on the experimental results of Rutte et al. (1987), we hypothesized that interpersonal conflict within the group should be greater in the group attribution condition than in the environment attribution condition. When subjects are exposed to a high inequity situation and the size of the remaining resource is attributed to others' behavior, then they should be more likely to believe that stronger injunctive norms are required to restrain those group members who have violated the equality rule. In contrast, when subjects attribute the remaining resource amount more to environmental factors beyond others' control, then there should be less potential for intragroup conflict and hence less need to develop and enforce norms.

To summarize, the basic prediction for the RPM measures in Study 1 was for an interaction between inequity and causal attribution, with normative power highest in the high inequity-group attribution condition and lowest in the low inequity-environment attribution condition. No clear predictions could be made for the other two cells of the design except that the normative power indices should be intermediate in magnitude relative to the previous two conditions.

Finally, due to the expected salience and power of the equality norm in this experimental situation, we hypothesized that subjects, overall, would request an equal share of resources from the common pool. Therefore, no significant differences between experimental conditions were predicted for the behavioral measure of request size. The mean value of this dependent variable was expected to be very close to 5 points--the equal division point in Study 1.

Method

Subjects

The subjects were 66 undergraduate students at Texas A&M University who participated in the study to fulfill a course requirement in introductory psychology. Subjects were scheduled in groups of six. Confederates were used for those groups in which fewer than six subjects arrived for the experiment. Each subject was randomly assigned to one of the experimental conditions. The number of subjects per condition ranged from 15 to 17.

Design

The experiment used a 2 (Inequity) X 2 (Cause) between-subjects factorial design crossing two levels of inequity in other members' outcomes (low, high) with two levels of causal attribution (group, environment). Both factors were manipulated during the second decision-making session. No experimental variables were manipulated in Session 1.

Apparatus

The experiment was conducted in a computer laboratory using an Apple Macintosh as a file server. One Apple Macintosh microcomputer was located at each of six semi-private work stations. Partitions separated the work stations so that subjects could not see each other. These computers were connected to the file server using MacServe software (Infosphere Corp.). Subjects responded to questions by clicking a "mouse" located at each work station. The experiment was programmed using HyperCard 1.2 (Apple Computer Corp.). The computer program displayed all instructions and presented all pretrial and posttrial questions on each computer's video monitor.

Procedure

Session 1. On arrival at the laboratory, each subject was randomly assigned to a computer station. The subjects were instructed by the experimenter to remain seated and to refrain from talking with other subjects during the experiment. The experimenter then told subjects that the experimental task involved requesting resources from a common pool. It was emphasized that each resource unit was exchangeable for cash at the end of the experimental hour. The subjects were then instructed that they would be using the network of computers to interact with others in the group. The experimenter explained the operation of the "mouse" and told subjects that all further instructions would be presented on their computer screens. A personal record sheet and pencil were provided for each subject to write down group members' requests from the resource pool. All questions about the operation of the computers were answered by the experimenter at this time.

The computer instructions stated that the study was concerned with decision making in groups. Specifically, subjects were told that the researchers were interested in studying how people make decisions in groups that share common resources. Examples were provided of "real-life" situations in universities and private corporations in which general funds are allocated among the various colleges or departments.

The instructions then explained the specific details of the experimental task. Subjects were told that they were members of a six-person group that would have access to a resource pool of 30 points. The subjects were informed that they could each request from 0 to 10 points from the common pool. Each resource point was worth 25 cents in cash which would be paid to the subject at the conclusion of the experimental session. Subjects were given two objectives in the experiment: (a) to take as many points as possible from the pool for themselves, and (b) to take care that the total requests of the six group members did not exceed the amount available in the common pool. The instructions stated clearly that if the group members requested a total amount greater than 30 points, then all members of the group would receive 0 points (see Rutte et al., 1987, for details on the experimental task). This task was designed to represent the essential features of a social dilemma (Dawes, 1980; Messick & Brewer, 1983).

Subjects were told that they would make requests from the common resource pool using a sequential procedure. Each group member would be randomly assigned a number between 1 and 6. This number indicated the sequential order in which subjects were allowed to make their point requests. Thus, the member assigned the number "1" would choose first, followed by the member assigned to position number "2", then member number "3", and so on until the sixth member of the group made his or her request. Each subject was told that he or she would be shown the point request of each member who chose before them in the sequence. The instructions stated that each member would be assigned a different color name (e.g., red, orange, yellow, etc.) to maintain anonymity. Subjects were told that the total amount requested by the group would not be revealed until the end of the experimental hour.

Following the instructions, subjects were presented with a brief 11-item questionnaire. These questions were designed to assess subjects' understanding of the experimental task, beliefs about optimal strategies, and expectations about other members' behavior.

The sequential decision task began immediately following this questionnaire. Subjects received their position and color assignments from the computer. In Session 1 of this experiment, all subjects were assigned to the first position. The instructions, of course, led subjects to believe that each member would receive a different position assignment. Thus, the decision problem for subjects in Session 1 was to choose how many resource points to take from a common pool of 30 points, with the constraint that their request had to be in the range from 0 to 10 points. Subjects then made their point requests by clicking the "mouse" until the desired number appeared on their computer screen. Only whole integer numbers were permitted as responses. Following this choice, subjects were told to wait momentarily while the other group members made their choices. Subjects in Session 1 did not receive any feedback about the point requests made by other subjects who were purportedly assigned to positions 2 through 6.

Session 2. At this point, Session 1 of the experiment was completed. Subjects were then presented with additional instructions stating that a second decision-making session would follow in which subjects would receive a new position assignment and then repeat the sequential decision task. In this second session, the computer assigned all subjects to the fifth position. That is, each subject was given preprogrammed feedback about the first four group members' requests before being asked to make his or her choice. As in Session 1, subjects were led to believe, of course, that each member of the group would be randomly assigned to a different position in the sequence.

The independent variables were manipulated during this second decision-making session. Half of the subjects (low inequity) saw the first four group members request amounts in the following order: 6, 5, 4, 5. The remaining half of the subjects (high inequity) were shown the following feedback pattern: 7, 3, 8, 2. Thus, inequity was operationalized in this study by manipulating the variance of members' outcomes, while holding the mean request constant. Consequently, the sum total of resources requested by the "bogus" others was identical in the two conditions (i.e., 20 points), resulting in an average request size of 5 points.

Subjects' causal attributions for the amount of resources left in the common pool were manipulated by providing different instructions about whether the four other members (choosing before the subject) either knew the initial pool size in advance of making their choices (group attribution condition) or did not know the initial pool size (environment attribution condition). In the group attribution condition, subjects were told that the initial size of the common resource pool would be 30 points in the second session. Thus, in this condition, subjects were provided with information suggesting that all four members in positions 1-4 made their choices in full knowledge of the actual maximum pool size. In the environment attribution condition, subjects were told the size of the common resource pool would not be revealed until after the first four members had already made their requests. Thus, in this condition, the group member assigned to the fifth position (i.e., the subject) would be the first person to learn the initial size of the common pool. Environment attribution subjects were further instructed prior to the beginning of the second decision-making session that the common pool could contain any amount between 6 and 30 points. Rutte et al. (1987) used a similar manipulation to vary subjects' causal attributions for resource scarcity or abundance in this sequential resource dilemma task. The range of permissible requests in Session 2 was the same as in Session 1: 0 to 10 points.

All other aspects of the sequential choice procedure used in Session 2 were identical to Session 1. After viewing the requests of the four previous group members on their video screens, subjects were asked to indicate how many points they wished to request from the amount remaining in the common pool. In all conditions, this remaining amount was always 10 points. Following their choices, subjects were told to wait a few moments while the last group member ostensibly made his or her request. Subjects did not receive feedback about this sixth member's choice.

Upon completion of Session 2, a postexperimental questionnaire consisting of a series of 7-point Likert-type scales was administered. These questions included checks on the inequity and cause manipulations, ratings of other members' behavior, and self-reports of decision rules used by subjects.

A final set of questionnaire items were designed to measure subjects' expectations for appropriate behavior in this resource dilemma task. These questions were constructed based on Jackson's (1966) Return Potential Model. Using this measurement procedure, subjects were asked to indicate on a 7-point Likert-type scale, ranging from -3 (highly disapprove) through 0 (indifferent) to +3 (highly approve), the degree of approval or disapproval they would feel toward an hypothetical group member "X" if he or she took a specified number of points from the pool. Subjects were told to assume a total resource pool of 30 points used by a group of six persons, with each member allowed to request between 0 and 10 points. Ratings were obtained for requests ranging from 0 points to 10 points. This set of 11 ratings defines a return potential curve for each subject. These RPM ratings were then averaged across subjects within each experimental condition to obtain four return potential curves for the study.

Following the postexperimental questionnaire, each subject was escorted to a private room where the experimenter provided a detailed debriefing about the purpose of the study and the deceptions regarding the preprogrammed feedback. Due to the nonrandom nature of the position assignments and the false feedback about others' choices, all subjects were paid $5.00 for their participation. After receiving cash payments, all subjects were thanked for their participation and excused.

Results and Discussion

Analysis of the pre-experimental questions indicated that subjects understood the experimental task according to the instructions. Of the 66 subjects, 64 (97%) correctly reported the size of the group and the number of points available to the group. For purposes of data analysis, the two subjects who made errors were deleted from the sample, leaving a total of 64 participants.

Manipulation Checks

To assess the effectiveness of the experimental manipulations in Session 2, several questions were included in the postquestionnaire. Two items were designed to measure the impact of the inequity manipulation: 1) "How fair are the differences among group members in the amounts requested from the common pool?" (1=Not at all fair; 7=Very fair), and 2) "How satisfied are you with these differences in point requests among group members?" (1=Not at all satisfied; 7=Very satisfied). Univariate 2 (Inequity) X 2 (Cause) ANOVAs on the responses to these questions revealed significant main effects for inequity, $F(1, 60) = 25.56$, $p < .001$, $F(1, 60) = 24.51$, $p < .001$, respectively. High inequity subjects reported that the differences were less fair ($M = 2.97$) than did low inequity subjects ($M = 4.72$). Moreover, high inequity subjects ($M = 3.50$) were less satisfied with the differences in point requests compared to low inequity subjects ($M = 5.22$).

Due to the increased complexity of the cause manipulation, a variety of postquestionnaire items were used to assess its effects. First, two items were included that asked subjects to report factual information such as: 1) "Who was the first person in the group to know the initial maximum size of the common pool?", and 2) "To what extent did you think that other group members who made requests before you in the sequence were aware of the initial size of the common resource pool?" (1=Not at all aware; 7=Very aware). Univariate 2 (Inequity) X 2 (Cause) ANOVAs on these questions found significant main effects for cause, $F(1, 60) = 227.95$, $p < .001$, $F(1, 60) = 63.46$, $p < .001$, respectively. Environment attribution subjects ($M = 4.79$) reported correctly that the group member in the 5th position was the first person to know the pool size, while group attribution subjects ($M = 1.35$) believed that the member in the 1st position was the first to know the pool size. Similarly, environment attribution subjects ($M = 3.27$) stated that other group members were less aware of the initial pool size than did group attribution subjects ($M = 6.32$).

Second, to assess the effect of this manipulation on subjects' causal attributions for the amount of resources left in the common pool, a third post-questionnaire item asked, "To what extent was luck or random chance responsible for the amount of points left in the common pool by others who chose before you? (1=Not at all responsible; 7=Very much responsible). A 2 (Inequity) X 2 (Cause) ANOVA revealed the expected main effect for cause, $F(1, 60) = 32.91$, $p < .001$, as well as a significant interaction effect, $F(1, 60) = 5.51$, $p <$

.03. Overall, environment attribution subjects (M = 4.15) believed that the amount left was more due to luck or random chance that did group attribution subjects (M = 2.06). However, the Inequity X Cause interaction indicates that this effect was more pronounced in the high inequity condition (environment condition, M = 4.56; group condition, M = 1.63) than in the low inequity condition (environment condition, M = 3.77; group condition, M = 2.53).

In summary, the manipulation checks reported above suggest that the independent variables of inequity and cause were manipulated effectively, although it appears that the attributional impact of the cause manipulation was somewhat stronger under conditions of high inequity than low inequity.

Structural Characteristics of Norms

Mean Ratings. Jackson's (1966, 1975) Return Potential Model (RPM) was used to derive the structural characteristics of behavioral norms regarding consumption in this sequential resource dilemma task. Figure 1 displays the overall mean ratings in the form of a return potential curve, with the behavior dimension on the abscissa and subjects' mean approval/ disapproval ratings on the ordinate. Jackson's (1966, 1975) RPM allows for the measurement of a set of descriptive characteristics of normative systems, including the point of maximum return, the range of tolerable behavior, intensity, crystallization, normative power, and conflict potential. Each of these six characteristics were computed from subjects' ratings of the 11 hypothetical behavioral choices (0 to 10 points) in this resource dilemma situation.

Insert Figure 1 about here

To determine if there were significant differences in the shape of the RPM curves as a function of the experimental manipulations, we performed a 2 (Inequity) X 2 (Cause) X 11 (RPM Ratings) ANOVA (with repeated measures on the last factor) on subjects' ratings. This analysis yielded a main effect for RPM ratings, $F(10, 590) = 77.82$, $p < .0001$. No other effects involving the design variables were found. The main effect obtained for the repeated measures factor indicates that there were significant differences between subjects' ratings of the 11 possible behavioral choices. As Figure 1 clearly shows, subjects' approval ratings increased steadily from 0 points to 5 points, with a sharp decline in approval evident as requests increased to 6 points. Thereafter, ratings became increasingly negative in the range from 7 to 10 points.

Based on Jackson's (1966) conceptualization of the RPM, this pattern of data demonstrates that there was a clearly defined norm for choice behavior in this interaction situation. The characteristic shape of the return potential curve in Figure 1 nicely illustrates what March (1954) described as a preferred-value norm. This type of norm exists when deviations from the norm occur in both directions; group approval can be modeled as a continuous function in which there is a constant increase up to the preferred-value point, and then a constant decrease in approval thereafter.

Point of Maximum Return. The point of maximum return is simply the highest point on the RPM curve, indicating the point along the behavior dimension that receives maximum approval from group members. According to Jackson (1966), this represents the "ideal behavior" in this interaction situation. It is evident from Figure 1 that subjects in all experimental conditions considered 5 points to be the most approved behavior in this resource dilemma task. It should be noted that this amount corresponds exactly to an equal share (one-sixth) of the common pool.

Range of Tolerable Behavior. The range of tolerable behavior refers to that portion of the behavior dimension that is approved by members of the group. This characteristic follows from Sherif and Sherif's (1956) definition of a norm which assumes that there is not a single value of behavior that constitutes the "norm", but rather a range of values that are regarded as acceptable to group members. Figure 1 reveals that, overall, subjects felt that requests in the range from 1 to 5 points were acceptable. Beyond 5 points, however, approval ratings dropped, shown graphically in Figure 1 by the sharp discontinuity in the slope of the curve between 5 and 6 points. Note that evaluations of 6 points were fairly close to the indifference point, suggesting that this behavior represented the upper bound of acceptability for most subjects. Requests greater than 6 points appear to be located outside the range of tolerable behavior in this situation.

Intensity. The intensity of a norm is an index of how strongly the members feel about the behavior in question. This measure is indexed by the mean absolute value of subjects' approval ratings across all positions on the behavior dimension (Jackson, 1966). While the intensity index describes the strength of the norm, it does not specify the direction. An intensity value near zero (represented by a relatively flat RPM curve near the indifference point across the behavior dimension) would suggest the absence of a normative system regulating the behavior.

The shape of the return potential curve in Figure 1 suggests that a normative system was present in this resource dilemma situation. Table 1 provides the mean intensity values in each of the experimental conditions. A 2 (Inequity) X 2 (Cause) ANOVA on subjects' mean intensity scores yielded no significant differences as a function of the experimental conditions. The overall mean intensity index for this study was 1.82, with a maximum possible value of 3.00. It is of interest to note that, while the differences between conditions were not statistically reliable, the highest value of intensity ($M = 2.01$) was observed in the group attribution-high inequity condition. Figure 1 shows that intensity reached its highest values at 5 points and at 10 points on the behavior dimension. These results suggest that group members had rather strong feelings about appropriate and inappropriate consumption behavior in this resource dilemma task. According to Jackson (1966), this relatively high value for intensity would constitute another important indicator that implicit norms exist in this situation to regulate members' behavior.

Insert Table 1 about here

Crystallization. This index represents the degree of consensus among group members about the acceptability of the behavior. This characteristic is central to many conceptual definitions of norms, with its emphasis on the extent of "shared expectations" for behavior among members of a social system. Presumably, the greater the consensus within a group about the appropriateness (or inappropriateness) of a behavior, the more potent the norm will be for controlling members' behavior. One simple statistic that may be used to index crystallization is the variance in group members' ratings at each position on the behavior dimension (Jackson, 1966). Higher values for crystallization imply less consensus among group members.

Table 1 presents the mean crystallization values in each of the experimental conditions. It can be seen from Table 1 that while there was roughly the same degree of agreement in the group attribution conditions (Ms = 2.20, 2.32), there was somewhat greater crystallization among subjects in the environment attribution-high inequity condition (M = 2.06) compared to the environment-low inequity condition (M = 2.67). This finding is inconsistent with the original conflict hypothesis which would predict higher crystallization in the group attribution-high inequity condition compared to the other three experimental conditions. It is important to remember, however, that the crystallization values in Table 1 represent variance scores averaged across the various request sizes along the behavior dimension. It is possible, however, that the predicted differences may emerge when specific behavior points are examined.

<u>Normative Power and Conflict Potential</u>. Jackson (1975) has proposed two additional indices that can be derived when intensity and crystallization are combined. According to Jackson's (1975) input-output model, intensity is regarded as the energy input into a normative system. Crystallization is conceptualized as a system state that determines how this energy input will be converted into an output. One output of this system is normative power. This characteristic refers to the proportion of energy input that is available for regulating members' behavior. For example, if high intensity and high crystallization occur simultaneously, then one can make a stronger inference that a high degree of normative power exists within a social system. In contrast, if members lack strong feelings about the behavior in question (low intensity) and are in disagreement (low crystallization), then it may be concluded that norms are weak or absent and do not regulate members' behavior. Thus, normative power is obtained by multiplying the degree of concern shown by others and the extent of consensus among members. The minimum value of this index is 0 and the maximum value is 1.00 (Jackson, 1975).

A second output of Jackson's (1975) model is conflict potential. This index represents the residual proportion of energy input that exists for generating conflict among members. Conflict potential is obtained by subtracting the normative power index value from the total amount of concern by others (intensity). Thus, the model assumes that energy input that is not used for regulating members' behavior will be potentially available for generating interpersonal conflict within the group. This index can take on values from 0 to a maximum value of 1.00 (Jackson, 1975).

Table 2 presents the normative power (NP) and conflict potential (CP) indices by behavior position (0 to 10 points) in each of the experimental conditions. These values were calculated using formulas provided by Jackson (1975). While the repeated measures ANOVA of the mean RPM ratings did not find significant effects of the experimental manipulations, a more fine-grained inspection of the NP and CP indices in Table 2 reveals several striking differences between experimental conditions. The overall means for the NP and CP indices indicate that the sharpest contrast is between the environment attribution-low inequity condition (NP = .30; CP = .30) and the group attribution-high inequity condition (NP = .41; CP = .26). The highest value for normative power was observed in the condition in which subjects experienced greater variance in members' outcomes and attributed the remaining resource amount less to chance factors. In contrast, the smallest NP value was found in the condition in which outcomes among members were homogeneous and subjects attributed the amount left more to environmental factors. This pattern of results for normative power is consistent with predictions based on interdependence theory (Kelley & Thibaut, 1978; Thibaut & Kelley, 1959).

Insert Table 2 about here

If we look more closely at the NP and CP indices in Table 2 at each behavior position, the major difference between experimental conditions can be traced to the behavior of requesting 5 points. For this behavioral choice, the NP index in the group attribution-high inequity condition is approaching its maximum value (NP = .88) with the CP index close to 0 (CP = .06). The NP values in the environment attribution conditions were identical (NP = .54) and substantially smaller in magnitude; CP values were also larger in these two conditions. The NP index in the group attribution-low inequity condition was intermediate (NP = .62) between these two extremes.

Inspection of the raw data in the group attribution-high inequity condition revealed that 15 of 16 subjects (94%) gave a rating of +3 to the behavior of requesting 5 points. Thus, at least for the behavioral choice of "divide equally", it appears that normative power was strongest and conflict potential at its minimum when subjects witnessed inequities among group members and attributed the remaining amount less to luck or random chance. Other combinations of the independent variables produced decreases in normative power for this behavioral choice. These results for normative power concerning the equal division rule provide suggestive support for the conflict hypothesis.

Subjects' Requests

Thus far, we have focused attention on the RPM expectations data. An important question, however, concerns subjects' actual choice behavior in this resource dilemma task. That is, did subjects' own behavior conform to or violate the behavioral norm displayed in Figure 1? Moreover, did the design variables exert a significant effect on request size?

The first question can be answered most directly by an analysis of subjects' choice behavior in Session 1. In this initial session, subjects were assigned to the first position in the request sequence and did not receive feedback on other members' choices. Moreover, no independent variables were manipulated in this session. This choice situation permits an unambiguous test of the injunctive power of the equality norm. The results showed significant behavioral conformity to the implicit equality norm. Of the 64 subjects, 45 (70%) requested exactly 5 points from the common pool in Session 1. The mean amount requested for all subjects was 5.0 points.[3]

To address the second question, a 2 (Inequity) X 2 (Cause) ANOVA was performed on subjects' requests in Session 2. This analysis found no significant effects due to the inequity and cause manipulations. The mean request sizes in all conditions ranged from 5.35 to 5.69, with an overall mean value of 5.53 points. These choice data suggest that the power of the equality norm was sufficiently strong in this experimental situation to eliminate any effects of the design variables.

Study 2

The results of Study 1 demonstrate that it is possible to obtain independent, quantitative measures of behavioral norms in a resource dilemma. The data collected using Jackson's (1966) Return Potential Model provide clear support for the existence of an equality norm for consumption in this experimental resource dilemma. Moreover, there was some evidence from the analyses of normative power and conflict potential that the structure of this norm differed systematically across experimental conditions. As predicted, normative power was maximized under conditions of high inequity in others' outcomes and when group members attributed the resource amount remaining in the common pool less to luck or random chance.

Study 2 was designed to replicate and extend the findings of Study 1. There were two methodological features of Study 1 that may have magnified the salience of the equality norm. First, the amount of resources remaining (10 points) for the subject and the last group member was sufficiently large to allow the subject to simply divide this amount equally and still receive an outcome equal to the average amount requested by other group members (i.e., 5 points). Thus, in Study 1 we created a situation of moderate resource availability in which the injunctive norm ("divide equally") overlapped with the descriptive norm (i.e., Session 2 feedback). This convergent information probably strengthened the power of the equality norm. Second, a request size of 5 points also happens to coincide with the midpoint of the 0-10 point range permitted in Study 1. If subjects were uncertain about how much to request, they may have simply chosen the midpoint of the range as a reasonable choice, without consideration of the possible approval or disapproval they might receive from other group members. To evaluate the plausibility of these two alternative explanations for the equality norm observed in Study 1, a second experiment was conducted.

As discussed earlier, Rutte et al. (1987) have shown that causal attributions can moderate subjects' harvest behavior when there is a scarcity (or abundance) of the resource available. Specifically, they found that subjects who attributed the scarcity to other members' behavior tended to violate the "share equally" rule by taking more than an equal share of the amount remaining. Environment attribution subjects, however, appeared to simply divide equally whatever amount was left between themselves and the last group member. The opposite effect was observed in their study under conditions of resource abundance: Group attribution subjects actually took less than an equal share, while environment attribution subjects again used the equality heuristic. Based on the results of Rutte et al. (1987), we introduced a manipulation of resource availability in Study 2. Specifically, half of the subjects were informed that there were only 5 points remaining in the common pool from an initial size of 25 points (scarcity condition). The other half of the subjects were told that there were 15 points remaining from an initial pool size of 35 points (abundance). As in Study 1, the inequity and causal attribution manipulations were also operationalized similarly in this new design according to the methodology in Study 1.

The addition of the third factor of resource use permitted an examination of the structural characteristics of the equality norm under different boundary conditions. First, the equal division rule in Study 2 prescribes different request amounts in each resource use condition (4.17 points in scarcity; 5.83 points in abundance). Second, we expanded the range of possible requests in Study 2 such that subjects could request from 0 to 15 points. The midpoint of this range is 7.5 points, a value that does not coincide with the amount required by the equality norm in either resource use condition. Thus, the new parameters of Study 2 allowed us to investigate how resource scarcity or abundance affects the structural characteristics of the equality norm perceived by group members.

Our hypotheses for Study 2 follow directly from the conflict hypothesis (Kelley & Thibaut, 1978; Thibaut & Kelley, 1959) proposed in Study 1. We conceptualized the resource use variable as a manipulation of the degree of conflict of interest among group members. Resource scarcity should increase the perception of conflict within the group, thereby enhancing the necessity for norms to regulate members' consumption behavior. Conversely, resource abundance should decrease the perceived conflict of interest, and lessen subjects' concern about norms as a means of resolving disputes over resource allocation. Combining the hypothesized additive effects of the other two design variables (inequity, causal attribution), we predicted that the highest level of normative power should occur in the scarcity-high inequity-group attribution condition and the lowest level of normative power should be found in the abundance-low inequity-environment attribution condition. While specific predictions for the other cells of the experimental design were speculative, we expected that, in general, normative power indices should be higher under scarcity conditions compared to abundance conditions. Further, the results from Study 1 led us to expect that the high inequity-group attribution conditions should be higher on normative power relative to low inequity-environment attribution conditions.

An additional objective of Study 2 was to perform a systematic replication and extension of Rutte et al.'s (1987) experiment using American subjects. Thus, our prediction for request size involved an interaction between resource use and causal attribution of the same form as reported by Rutte et al. (1987). Moreover, the addition of the inequity manipulation allowed for an assessment of the generality of this interaction effect under conditions of both low and high inequity in others' outcomes.

Method

Subjects

The subjects were 96 undergraduates enrolled in an introductory psychology course at Texas A & M University. All recruitment and scheduling of subjects was conducted as in Study 1. Twelve subjects were randomly assigned to each experimental condition.

Design

The experiment used a 2 (Resource Use) X 2 (Inequity) X 2 (Cause) between-subjects factorial design. Three independent variables were manipulated: (1) resource use (scarcity, abundance), (2) inequity (low, high), and (3) causal attribution for scarcity/abundance (group, environment). The resource use manipulation was introduced in both Sessions 1 and 2. As in Study 1, the inequity and cause manipulations were introduced in Session 2 only.

Apparatus

The experiment was conducted using the same computer laboratory and programming language as in Study 1.

Procedure

Session 1. The procedure used in this experiment was identical to Study 1 with the following exceptions. In Session 1, half of the subjects were told that they were members of a six-person group that would have access to a resource pool of 25 points (scarcity condition). The other half were told that their group would have 35 points in the common pool (abundance condition). The subjects were informed that they could each request from 0 to 15 points from the common pool. All subjects in Session 1 were assigned to the first position in the request sequence.

Session 2. In Session 2, all subjects were assigned to the **fifth** position. The three independent variables manipulated in this session were operationalized as follows. The cause manipulation was very similar to that used in Study 1. Half of the subjects were told that the size of the common resource would be revealed to all members before the decision-making session began (group attribution condition). Group attribution subjects were told at this time that the pool would contain 25 points (or 35 points, depending on resource use condition). The other half of the subjects were instructed that the size of the common pool would not be known until after the first four members had made their requests (environment attribution condition). For these subjects, the instructions stated that the common resource pool could contain any amount between 6 and 35 points. Thus, as in Study 1, environment attribution subjects were led to believe that the group member in the fifth position would be the first to know the initial size of the common pool.

To manipulate resource use, half of the subjects were told that the initial pool size was 25 points (scarcity), while the other half were told that the resource pool contained an initial total of 35 points (abundance). Subjects, however, received this information either just before Session 2 began (group attribution condition) or later when it was their turn to choose in the fifth position (environment attribution condition). All subjects received feedback indicating that the first four members had requested a total of 20 points from the common pool. Thus, resource use was manipulated such that either 5 points remained for the subject and the sixth member (scarcity condition) or 15 points remained for the last two group members (abundance condition). The inequity manipulation was identical to Study 1. Half of the subjects saw the following sequence of feedback about others' choices: 6, 5, 4, 5 (low inequity); the remaining half of the subjects were shown a request sequence with larger variance in members' outcomes: 7, 3, 8, 2 (high inequity).

Following Session 2, a postexperimental questionnaire similar to that used in Study 1 was administered. For the series of questions based on Jackson's (1966) RPM, subjects were told to assume a total resource pool of 25 points (or 35 points, depending on experimental condition) used by a group of six persons, with each member allowed to request between 0 and 15 points. Ratings were obtained for requests ranging from 0 to 15 points. These ratings were then averaged across subjects within each experimental condition to obtain eight RPM curves for the experiment.

Results and Discussion

Responses to several pre-experimental and post-experimental questionnaire items indicated that 91 subjects understood the experimental instructions. Five subjects made errors in answering factual questions about the experimental task and were deleted from the sample.

Manipulation Checks

As in Study 1, the effectiveness of the manipulations was assessed by analyzing subjects' responses to a series of postquestionnaire items. For the first design variable, resource use, the two manipulation checks were: 1) "How many points were left in the resource pool when it was your turn to request points?" (Session 2), and 2) "When your turn came to request points from the common pool, how many points were left for the remaining group members?" (1=very little; 7=very much). The 2 (Resource Use) X 2 (Inequity) X 2 (Cause) ANOVAs found main effects for resource use on both items, $F(1, 83) = 377.05$, $p < .001$, $F(1, 83) = 55.83$, $p < .001$, respectively. Subjects in the scarcity condition ($M = 5.40$) reported significantly fewer resource units left than did subjects in the abundance condition ($M = 14.74$). In addition, scarcity subjects ($M = 2.16$) believed that the amount remaining in the common pool was "very little" compared to abundance subjects ($M = 4.70$).

The same two items used in Study 1 were included to measure the impact of the inequity manipulation. As expected, the 2 (Resource Use) X 2 (Inequity) X 2 (Cause) ANOVAs revealed main effects for inequity on both the fairness and satisfaction items, $F(1, 83) = 9.76$, $p < .01$, $F(1, 83) =$

22.12, $p < .001$, respectively. High inequity subjects (M = 3.11) felt that the differences among members' requests were more unfair than did low inequity subjects (M = 4.04). Moreover, high inequity subjects (M = 3.43) reported less satisfaction with these differences than did low inequity subjects (M = 4.71).

To check the efficacy of the cause manipulation, we included several questions similar to those used in Study 1. In response to the question regarding which group member was the first to know the initial pool size in Session 2, environment attribution subjects (M = 4.80) correctly reported that it was the member in the fifth position while group attribution subjects (M = 1.35) accurately stated that it was the member assigned to the first position, $F(1, 83) = 274.18$, $p < .001$. For the awareness item, a 2 (Resource Use) X 2 (Inequity) X 2 (Cause) ANOVA found the expected cause main effect, $F(1, 83) = 68.32$, $p < .001$, as well as a significant Inequity X Cause interaction, $F(1, 83) = 4.84$, $p < .04$. Overall, group attribution subjects (M = 5.87) reported that the other group members in positions 1-4 were much more aware of the initial pool size compared to environment attribution subjects (M = 3.22). The interaction effect, however, reveals that the magnitude of this effect was larger in the high inequity condition (group attribution, M = 5.96; environment attribution, M = 2.61) compared to the low inequity condition (group attribution, M = 5.78; environment condition, M = 3.86).

Finally, to assess the attributional effects of the cause manipulation, one post-experimental question asked, "To what extent were the choices of the other group members intentional?" (1=not at all intentional; 7=very intentional). A 2 (Resource Use) X 2 (Inequity) X 2 (Cause) ANOVA found a significant Resource Use X Cause interaction, $F(1, 83) = 3.97$, $p < .05$. This effect shows that the attributional effects of the cause manipulation occurred as predicted in the scarcity condition (group attribution, M = 5.65; environment condition, M = 4.82), but were not observed in the abundance condition (group attribution, M = 4.96; environment condition, M = 5.13).[4] Simple effects analysis confirmed that the differences between means were significant only in the scarcity condition, $F(1, 83) = 5.23$, $< .05$.

Thus, while both the resource use and inequity manipulations in Study 2 were successful, it appears that the cause manipulation was effective in altering subjects' attributions for resource scarcity. Under conditions of resource abundance, the cause manipulation did not produce the expected attributional differences.[5]

Structural Characteristics of Norms

Mean Ratings. A 2 (Resource Use) X 2 (Inequity) X 2 (Cause) X 16 (RPM Ratings) ANOVA with repeated measures on the fourth factor found a significant main effect for RPM ratings, $F(15, 1245) = 93.94$, $p < .001$, a Resource Use x RPM Ratings interaction, $F(15, 1245) = 12.26$, $p < .001$, and a Cause x RPM Ratings interaction, $F(15, 1245) = 2.67$, $p < .05$ (Huynh-Feldt adjusted probability). As in Study 1, there were clear differences in subjects' approval/disapproval ratings across the 16 possible behavioral choices. The "preferred value" norm type was again observed, with approval ratings rising sharply to their maximum at the "ideal" value of 4 points (scarcity condition) or 5 points (abundance condition), and then falling off sharply beyond that level. This main effect for RPM Ratings replicates the basic finding in Study 1: subjects perceived that a clear behavioral norm exists in this resource dilemma situation.

The Resource Use x RPM Ratings interaction is displayed graphically in Figure 2. The first aspect evident is the horizontal displacement of the point of maximum return from 4 points in the scarcity condition to 5 points in the abundance condition. Thus, subjects approved most of the behavior of requesting an equal share of the common resource pool, a finding that replicates the results in Figure 1 (Study 1). It is of interest here that abundance subjects preferred to round the equal share request down to 5 points from the exact value of 5.83. While 6 points was still approved of, it received less positive return than a 5 point request. Another notable feature of Figure 2 is the narrower range of tolerable behavior in the scarcity condition (1 to 5 points) compared to the abundance condition (2 to 7 points). Finally, it can be seen from Figure 2 that scarcity subjects gave significantly more positive ratings of behavioral choices in the range from 1 to 4 points and more negative evaluations for requests in the range from 5 to 10 in comparison to subjects in the abundance condition.[6]

Figure 3 displays the means associated with the Cause x RPM Ratings interaction. Overall, the shape of the RPM curve was similar for group attribution and environment attribution subjects. However, the interaction effect indicates that environment attribution subjects, in comparison to group attribution subjects, gave a significantly more positive rating of a request size of 0 points and stronger negative sanctions of behavioral choices in the range from 11 to 15 points.[7]

Insert Figures 2 and 3 about here

In summary, the repeated measures analysis of the RPM data from Study 2 found rather clear evidence for the existence of the equality norm in this resource dilemma task. Moreover, the significant 2-way interactions reveal that subjects' expectations for appropriate and inappropriate behavior in this experimental social dilemma differed systematically as a function of both resource use and causal attribution.

Intensity. A 2 (Resource Use) X 2 (Inequity) X 2 (Cause) ANOVA found a marginally significant main effect for resource use, $F(1, 83) = 3.34$, $p < .08$. Table 3 presents the mean intensity scores in each of the experimental conditions. Overall, scarcity condition subjects ($M = 1.90$) had somewhat stronger feelings of approval/disapproval than abundance condition subjects ($M = 1.70$). The overall mean intensity score in this study was similar to Study 1 with a value ($M = 1.80$) at 60% of its maximum (3.0). Intensity reached its highest peaks at 4 (scarcity condition) or 5 points (abundance condition), and also for requests in the range from 10 to 15 points (see Figures 2 and 3). As expected, subjects who experienced conditions of resource scarcity had stronger feelings about appropriate or inappropriate choice behavior than subjects who witnessed an abundant supply of the resource. This result is consistent with the conflict hypothesis: norms regulating members' behavior are more likely to emerge in interdependence situations where outcomes are of intermediate or low correspondence (Kelley & Thibaut, 1978; Thibaut & Kelley, 1959).

Insert Table 3 about here

Crystallization. Table 3 also presents the values for Jackson's (1966) crystallization index in each of the experimental conditions. Two observations can be made regarding the patterns of consensus among subjects' ratings. First, regardless of resource use condition, the lowest amount of agreement occurred in the low inequity-group attribution conditions (scarcity, $s^2 = 2.77$; abundance, $s^2 = 2.92$). Second, the highest degree of crystallization was observed under environment attribution conditions, but varied somewhat depending on the level of resource use and inequity. In the scarcity condition, high inequity-environment attribution subjects ($s^2 = 1.41$) showed the highest level of consensus; under abundance conditions, low inequity-environment attribution subjects ($s^2 = 1.78$) displayed the highest level of consensus. These results are inconsistent with our predictions based on the conflict hypothesis. The pattern of results in Table 3 for the scarcity conditions, however, does replicate Study 1 (see Table 1), where it was found that crystallization was highest in the high inequity-environment condition and lowest in the low inequity-group attribution condition.

Normative Power and Conflict Potential. Tables 4 and 5 present the NP and CP indices for each position along the behavior dimension in each of the experimental conditions. To aid interpretation of these analyses, Figures 4 and 5 display graphically the mean approval/disapproval ratings in the form of return potential curves for each of the eight experimental conditions. Panels (a)-(d) in Figure 4 present the mean RPM ratings in the scarcity conditions and panels (a)-(d) in Figure 5 present the same data for the abundance conditions.

Insert Tables 4 and 5 about here

Tables 4 and 5 indicate that normative power reached its highest mean value in the scarcity-high inequity-environment attribution condition (NP = .50) and was lowest in the abundance-low inequity-group attribution condition (NP = .23). This result mirrors the general pattern of differences for the crystallization index (see Table 3). Thus, we were correct in our predictions for the effects of two of the three design variables (resource use, inequity) on the RPM measures. Under conditions of resource scarcity, normative power was increased by the combination of resource scarcity and high inequity in others' outcomes. This general pattern, however, was not observed under resource abundance conditions.

Insert Figures 4 and 5 about here

Careful inspection of Table 4 also reveals some interesting systematic patterns in the NP and CP values under scarcity conditions. First, there was partial support for the conflict hypothesis for one specific point along the behavioral continuum. As predicted, normative power was substantially higher in the group attribution-high inequity condition (NP = .74) for the request size of 4 points (i.e., the equal division share) compared to the environment attribution conditions (low inequity, NP = .32; high inequity, NP = .48). The NP index at the equality point for group attribution-low inequity subjects (NP = .74), however, was virtually identical to that of group attribution-high inequity subjects (NP = .77). As expected, the CP values at this behavioral choice (4 points) for these two group attribution conditions (low inequity, CP = .07; high inequity, CP = .07) were also smaller than the environment attribution conditions (low inequity, CP = .23; high inequity (CP = .13) conditions.

A second observation in Table 4 is that the NP values for behavioral choices in the range from 9 to 15 points are considerably higher in the high inequity-environment attribution condition than in the other three experimental conditions. The differences in NP and CP are most striking between the environment attribution-high inequity condition and the group attribution-low inequity condition. The CP values are also substantially lower in the former condition than in the latter. Panel (a) in Figure 4 shows that environment attribution-high inequity subjects gave increasingly negative ratings for requests in the 9-15 point range. Comparison with panels (b), (c), and (d) indicate that this is the only scarcity condition in which this monotonic increase in negative sanctions occurred.

Analysis of Table 5 (abundance conditions) indicates both similarities and differences compared to the effects observed under resource scarcity. One similar result is that normative power is lowest (and conflict potential highest) once again in the group attribution-low inequity condition. Another consistent effect is that the NP value at 6 points (equal share) is highest in the group attribution-high inequity condition (NP = .54) relative to the other three experimental conditions. Perhaps the most striking pattern in Table 5 is that the inequity manipulation, in contrast to Table 4, does not produce a meaningful increase in normative power under either environment or group attribution conditions. Finally, Table 5 shows that normative power is highest and conflict potential is lowest in the environment attribution-low inequity condition (NP = .40; CP = .20). This latter finding is consistent with the differences in the intensity and crystallization indices across abundance conditions in Table 3.

In summary, it is evident that the results of Study 2 provided only mixed support for the predictions based on the conflict hypothesis. There was higher normative power under scarcity conditions and high inequity, but the attributional patterns did not conform to expectations, except for the special case of the equal division choice. It can be concluded that changing the level of resource availability in Study 2 resulted in altering the basic pattern of findings from Study 1. In Study 1, when subjects witnessed only moderate resource use, the combination of high inequity and attributions to other group members' behavior produced higher normative power compared to the other experimental conditions (see Table 3). In Study 2, subjects who experienced scarcity and high inequity in others' outcomes perceived norms to be stronger when they attributed the resource status to factors beyond the control of other group members. Moreover, Table 4 suggests that normative power manifests itself in this experimental resource dilemma differentially depending on the causal attribution for resource scarcity. The conflict hypothesis is supported generally for behaviors that receive strong positive approval such as the equal division point; for environment attribution subjects, normative regulation is expressed more through the use of negative sanctions for inappropriate behavior (see Figure 3).

Subjects' Requests

Subjects' requests from the common pool in Session 1 were analyzed by a 2 (Resource Use) x 2 (Inequity) x 2 (Cause) ANOVA.[8] In the first session, there was a strong main effect for Resource Use, $F(1, 83) = 45.02$, $p < .001$.[9] Scarcity condition subjects ($M = 4.36$) took significantly less from the resource pool than abundance condition subjects ($M = 6.02$). These means are virtually identical to the values prescribed by the equality norm (4.17 in 25-point condition; 5.83 in 35-point condition).

To test the hypothesis regarding subjects' choice behavior in Session 2, a 2 (Resource Use) x 2 (Inequity) x 2 (Cause) ANOVA was conducted on subjects' requests. This analysis found only a main effect for Resource Use, $F(1, 83) = 178.38$, $p < .001$. The direction of this effect was predictable, reflecting the fact that scarcity subjects had less resources remaining (5 points) than abundance subjects (15 points); overall, scarcity condition subjects ($M = 3.16$) requested significantly fewer resources from the common pool than did abundance subjects ($M = 8.46$). The overall mean request in Session 2 was 5.84. When we convert the raw request data to proportions, it should be noted that subjects in Session 2 did not divide the pool equally between themselves and the member choosing in the sixth position. Overall, scarcity subjects took approximately 63% of the remaining resource amount while abundance subjects requested 56%. Contrary to expectations based on previous empirical work by Rutte et al. (1987), the hypothesized interaction between Resource Use and Cause did not occur, nor were any interactions with the inequity manipulation. Thus, Study 2 failed to replicate the interaction effect between resource use and causal attribution reported by Rutte et al. (1987).

Subsequent correlational analysis revealed that the request sizes in Sessions 1 and 2 were in fact positively correlated, $r(89) = .58$, $p < .001$. To ensure that the results obtained in the ANOVA of Session 2 requests were not confounded by differences in Session 1 choice behavior, we also performed a 2 (Resource Use) x 2 (Inequity) x 2 (Cause) analysis of covariance on the Session 2 requests using subjects' Session 1 requests as a covariate (see Footnote 9). The ANCOVA also found a significant main effect for Resource Use, $F(1, 82) = 94.65$, $p < .001$. Consistent with the simple correlational analysis, Session 1 request size was a significant predictor of subjects' Session 2 decisions, F(1,

82) = 4.39, $p < .04$. No other experimental effects were significant ($F < 1$) in this ANCOVA.

General Discussion

This research was designed to investigate the utility of Jackson's (1966) Return Potential Model for analyzing the structural characteristics of norms in a sequential resource dilemma task. Moreover, a second goal was to identify some situational factors that moderate these structural characteristics. The results of both experiments demonstrate clearly that subjects in this resource dilemma situation do perceive an equality norm exists regarding group members'choice behavior. The findings of Study 2 further reveal that the structural characteristics of this equality norm can change substantially with systematic variations in resource availability, inequity, and causal attribution.

One main empirical contribution of the present studies is the independent evidence documenting the salience and injunctive power of the equality norm in this resource dilemma paradigm. The general form of the RPM curves observed in both studies provides a vivid example of what March (1954) described as a "preferred-value" norm. In this type of norm, group approval is represented as a continuous function that increases monotonically up the preferred-value point (i.e., equal share amount), then decreases monotonically beyond that ideal point. March notes, however, that group-approval functions need not always be continuous. For example, the RPM curve in Figure 1 supports this point in that the change in slope beyond 5 points is so dramatic that it suggests a discontinuity in the approval function.

Previous experimental work (Allison & Messick, 1990; Allison et al., 1992; Rutte et al., 1987; Samuelson & Allison, 1994) has shown that the equality heuristic appears to describe well the individual choice behavior of subjects faced with sequential resource allocation tasks. However, none of the studies reached that conclusion based on data independent of subjects' actual behavior in the experimental task. Also, no previous research has examined the consensual aspect of this proposed social decision heuristic. This is an important issue that must be evaluated empirically before we infer post-hoc that a particular behavioral pattern demonstrates the existence of a norm. The present studies thus provide preliminary empirical confirmation of the equality rule as an injunctive norm in this sequential resource dilemma paradigm.

From a theoretical point of view, the results of the two experiments suggest some conditions under which the equality norm is likely to be most powerful in a mixed-motive resource sharing situation. When the group experienced resource scarcity, this environmental condition activated stronger normative expectations for acceptable consumption behavior. When resources were in abundant supply, normative power was attenuated. Increases in the inequity of the distribution of resources among members appeared to increase normative power, but only when the common resource was scarce. Finally, the results of Study 2 suggest that causal attributions for the group's resource shortage can change some of the structural characteristics of the equality norm. In particular, Figure 3 reveals that negative evaluations were more extreme among subjects who attributed the resource scarcity to environmental factors beyond members' control; more positive evaluations were observed as the preferred normative control mechanism for subjects who attributed the scarcity less to environmental factors (i.e., stronger dispositional attribution made to other group members' behavior).

The failure to replicate the resource use X cause interaction effect reported by Rutte et al. (1987) merits some explanation. Our data from a similar experimental design using American subjects did not support their theoretical analysis. Subjects in Study 2 were influenced solely by the amount of resources available to the group, not by the causal attributions for resource availability. There are several possible explanations for the divergence in results between the two studies. First, it may be due to the ineffectiveness of our cause manipulation in the abundance conditions; we may not have created the proper experimental conditions for an adequate test of the interaction hypothesis. Second, the failure to detect the interaction effect could also be due to low statistical power in Study 2, as Rutte et al. (1987) used more subjects per experimental condition (n = 18) than in our expanded design. Third, there may have been other unspecified methodological differences in the conduct of the experiment in the two locations that could account for the conflicting findings. Fourth, it could reflect a genuine cultural difference between The Netherlands and the U.S. (Samuelson, Messick, Rutte, & Wilke, 1984): Dutch students may engage in more attributional processing (or along different dimensions) than American students when confronted with an interdependent, mixed-motive situation where resource scarcity (or abundance) is present. We are presently conducting follow-up research to determine which of the above explanations is correct.

The present studies also represent a methodological contribution to the existing literature on norms. The results of our experiments suggest that Jackson's (1966) Return Potential Model has considerable promise as a method for obtaining specific and accurate measurements of existing norms in small groups working in a laboratory setting. To date, the RPM has not been evaluated in an experimental context. In the sequential resource dilemma paradigm used in the present experiments, the RPM has proven to be useful in investigating how group members perceive the resource sharing situation and the specific conditions under which various experimental manipulations can change these perceptions. The RPM is firmly grounded in group dynamics theory (Cartwright & Zander, 1968) and is extremely flexible in its adaptability to a wide range of social settings, in either the field or the laboratory. We believe that the RPM has not been fully exploited by experimental social psychologists interested in small group processes, despite positive recommendations by prominent group researchers (e.g., Hackman, 1992). In fact, experimental settings may well be ideal for extracting the maximum heuristic value from the RPM because valid comparisons can be made across experimentally created situations that possess a common benchmark.

As in all experimental research, there are several limitations of the present studies that should be noted. First, we have used the individual subject as the unit of analysis, whereas Jackson's (1966) RPM treats the group as the appropriate unit. We are assuming here that our results for individuals will generalize to the group level if we assigned 6-person groups to the same sequential resource dilemma task and allowed members to interact with veridical feedback. The validity of this assumption, of course, is an empirical question that can only be addressed adequately by additional research. We deliberately chose to begin our initial evaluation of Jackson's (1966) RPM with a less subject intensive design and greater experimental control over choice feedback patterns before moving on to examining the method using intact groups. Second, the present studies do not purport to demonstrate that the equality norm mediates (or moderates) subjects' choice behavior. Different research designs with substantially larger number of subjects would be more appropriate to establish such relationships using multiple regression or LISREL. Third, because the RPM data were collected after subjects made their decisions, the structural characteristics of the norms reported here may represent, to some degree, post-hoc rationalization for previous choice behavior. We have considered this possibility and conducted a follow-up experiment using a similar task in which subjects were asked to complete the RPM questionnaire prior to choice (and before receiving feedback about others choices). The results showed that the RPM curves for these "before choice" subjects were very similar in profile to those who completed the RPM questions after their choices (Roch, Miyashiro, and Samuelson, 1993).

In general, the results from the present studies suggest some new directions for future work. We believe that the RPM approach could be used profitably to investigate a number of research questions that have been vigorously pursued in the social dilemmas area. For example, the research programs of Orbell, van de Kragt, and Dawes (1988) and Kerr and Kaufman-Gilliland (1994) that seeks to explain why discussion enhances cooperation have evaluated normative constraint as one plausible hypothesis. The RPM could be easily adapted to a continuous contribution version of the public goods paradigm (Suleiman & Rapoport, 1995) to collect independent evidence on norms in the discussion and no discussion groups. These data could then be used to determine if norms favoring cooperation are in fact activated by group discussion and serve to mediate the communication effect. This research strategy is precisely the one that Kerr (1995) has recently advocated to advance our understanding of how norms affect choice behavior in social dilemmas.

The RPM is also well suited to explore the impact of roles on decision making in social dilemmas (Kerr & McCoun, 1985; Messe, Kerr, & Sattler, 1992; Samuelson & Allison, 1994). For example, Messe et al. (1992) have reported that group roles such as "supervisor" convey an enhanced sense of privilege or entitlement in a social dilemma situation, leading role occupants to exercise their "right" and behave in a self-interested manner. The RPM could be used effectively to assess whether the "supervisor" role is in fact associated with different norms for behavior compared to other roles such as "leader." We are currently conducting a series of experiments that explore both of the research questions discussed above using the RPM method.

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Footnotes

[1] In many group situations, however, it is difficult to separate the impact of descriptive norms from injunctive norms. Both may operate concurrently, particularly in situations where members have the opportunity to directly observe other group members' behaviors. In addition, the two types of norms will sometimes be positively correlated: those behaviors that are typically rewarded with approval from group members will tend to be displayed more often; those that are punished will be observed less frequently. In Study 1, we eliminated this conceptual ambiguity by constructing the behavioral feedback for the inequity manipulation such that the descriptive norm in this situation (i.e., mean amount requested by others = 5 points) matched the injunctive norm (i.e., split the pool of 30 points into 6 equal shares of 5 points each).

[2] Rutte et al. (1987) did not distinguish clearly between descriptive vs. injunctive norms in their interpretation of the results, but it is reasonable to infer from their discussion that the conformity processes under the "group" attribution conditions referred primarily to the descriptive norm established by other group members' harvest choices. Due to methodological features of Study 1 (see Footnote 1), the descriptive norm and injunctive norm in this experimental situation had similar behavioral implications for subjects.

[3] An additional analysis was performed to check for gender differences in conformity to the equality norm. A one-way ANOVA (gender) on subjects' requests in Session 1 found a significant gender effect, $F(1, 62) = 4.46$, $p < .04$. Male

subjects (M = 5.29) requested more resource points, on the average, than did female subjects (M = 4.66). To determine if there were also gender differences in the frequency of subjects conforming to the equality norm, a chi-square analysis was performed by classifying subjects according to gender and whether or not subjects requested 5 points. This analysis showed that males (71%) used the equality rule as frequently as did females (69%), X^2 (1, N = 64) = .046, n.s. Thus, the gender effect in the ANOVA may be interpreted as a difference in the magnitude of subjects' requests and not as a difference in the number of males and females who endorsed the equality rule.

[4] General inspection of the means for this item (all values on "very intentional" side of scale midpoint of 4.0) also suggest that subjects inferred a substantial degree of intent behind other members' choices in all experimental conditions. Thus, the cause manipulation is perhaps best interpreted as varying the plausibility of the "luck or random chance" explanation (i.e., environment attribution) for the resource amount remaining in the pool. A previous study by Samuelson (1991) reported a similar pattern of results for a causal attribution manipulation that was identical conceptually, but operationalized differently.

[5] One must be cautious in interpreting the data in Table 5 substantively because the attributional manipulation was not effective under conditions of resource abundance. We can, however, examine the impact of inequity manipulation on the normative power and conflict potential indices under abundance conditions.

[6] Univariate 2 x 2 x 2 ANOVAs performed on each position on the behavior dimension confirmed that there were significant differences between the ratings of scarcity and abundance condition subjects for the following behavioral choices: 1 point, $F(1, 83) = 7.31$, $p < .01$; 2 points, $F(1, 83) = 4.89$, $p < .03$; 3 points, $F(1, 83) = 10.00$, $p < .01$; 4 points, $F(1, 83) = 8.84$, $p < .01$; 5 points, $F(1, 83) = 31.66$, $p < .001$; 6 points, $F(1, 83) = 54.70$, $p < .001$; 7 points, $F(1, 83) = 39.03$, $p < .001$; 8 points, $F(1, 83) = 23.19$, $p < .001$; 9 points, $F(1, 83) = 10.39$, $p < .01$; 10 points, $F(1, 83) = 4.53$, $p < .04$.

[7] Univariate ANOVAs confirmed the reliability of these differences for these behavioral choices: 0 points, $F(1, 83) = 5.10$, $p < .03$; 11 points, $F(1, 83) = 4.10$, $p < .05$; 12 points, $F(1, 83) = 5.71$, $p < .02$; 13 points, $F(1, 83) = 5.91$, $p < .02$; 14 points, $F(1, 83) = 6.06$, $p < .02$; 15 points, $F(1, 83) = 8.03$, $p < .01$.

[8] Due to the observed gender difference on Session 1 requests in Study 1, 2 (Resource Use) x 2 (Inequity) x 2 (Cause) x 2 (Sex) ANOVAs were conducted to assess whether gender influenced subjects' requests in Study 2. The results indicated no significant gender main effect or interactions involving gender on either Session 1 or Session 2 requests.

[9] The ANOVA also found a significant Inequity X Cause interaction, $F(1, 83) = 4.22$, $p < .05$. Under conditions of high inequity, there were were no differences in request size between environment attribution ($M = 5.17$) and group attribution subjects ($M = 5.17$). However, in the low inequity condition, environment attribution subjects ($M = 5.68$)

requested more than group attribution subjects (M = 4.78) in Session 1. Logically, this effect cannot be attributed to the design variables because neither manipulation had been introduced prior to the Session 1 choice. This unexpected interaction effect may have been due to unspecified subject differences between experimental conditions that occurred by chance despite the use of random assignment.

Table 1. Mean intensity (**I**) and crystallization (**C**) indices in each of the experimental conditions (Study 1).

	Cause			
	Environment		Group	
	I	C	I	C
Inequity				
Low	1.74	2.67	1.80	2.20
High	1.72	2.06	2.01	2.32

Note: Crystallization index is based on sample variance. Lower values represent higher consensus among subjects.

Table 2. Normative Power (**NP**) and Conflict Potential (**CP**) indices by experimental condition and behavior position in Study 1.

	Cause							
Behavior Position (Points)	Environment Low Inequity		Environment High Inequity		Group Low Inequity		Group High Inequity	
	NP	CP	NP	CP	NP	CP	NP	CP
10	.43	.30	.77	.08	.71	.14	.67	.13
9	.56	.13	.55	.18	.57	.17	.62	.13
8	.45	.12	.49	.11	.45	.19	.48	.13
7	.32	.15	.30	.19	.26	.28	.31	.19
6	.16	.25	.12	.19	.14	.31	.12	.17
5	.54	.15	.54	.15	.62	.25	.88	.06
4	.25	.32	.37	.19	.53	.12	.67	.14
3	.26	.33	.26	.18	.32	.22	.44	.23
2	.13	.46	.17	.34	.21	.25	.24	.47
1	.02	.59	.09	.49	.09	.31	.08	.63
0	.13	.48	.11	.42	.04	.45	.02	.56
Mean	.30	.30	.34	.23	.36	.24	.41	.26

Table 3. Mean intensity (**I**) and crystallization (**C**) indices in each of the experimental conditions in Study 2.

<u>Scarcity Condition</u>:

	Cause			
	Environment		Group	
	I	C	I	C
Inequity				
Low	1.81	2.12	1.89	2.77
High	1.97	1.41	1.93	2.01

<u>Abundance Condition</u>:

	Cause			
	Environment		Group	
	I	C	I	C
Inequity				
Low	1.80	1.78	1.65	2.92
High	1.67	2.24	1.67	2.39

<u>Note</u>: Crystallization index is based on sample variance. Lower values represent higher consensus among subjects.

Table 4. Normative Power (**NP**) and Conflict Potential (**CP**) indices in **Scarcity** conditions by behavior position in Study 2.

Behavior Position (Points)	Environment Low Inequity NP	Environment Low Inequity CP	Environment High Inequity NP	Environment High Inequity CP	Group Low Inequity NP	Group Low Inequity CP	Group High Inequity NP	Group High Inequity CP
	Cause							
15	.62	.14	.86	.05	.42	.31	.55	.28
14	.62	.14	.85	.03	.52	.27	.59	.16
13	.62	.14	.80	.05	.27	.52	.59	.16
12	.62	.14	.77	.05	.41	.29	.54	.21
11	.62	.14	.69	.09	.38	.25	.52	.26
10	.49	.21	.71	.05	.35	.32	.52	.26
9	.41	.20	.64	.05	.25	.36	.46	.26
8	.33	.27	.48	.09	.21	.28	.41	.23
7	.30	.15	.31	.11	.22	.27	.29	.23
6	.15	.27	.28	.14	.12	.28	.23	.19
5	.15	.18	.11	.22	.18	.15	.23	.16
4	.32	.23	.48	.13	.77	.07	.74	.07
3	.26	.22	.60	.07	.49	.14	.47	.20
2	.16	.32	.21	.42	.26	.50	.25	.22
1	.15	.45	.10	.54	.09	.51	.24	.32
0	.05	.58	.08	.41	.20	.41	.10	.34
Mean	.37	.24.	.50	.16	.32	.31	.42	.22

Table 5. Normative Power (**NP**) and Conflict Potential (**CP**) indices in **Abundance** conditions by behavior position in Study 2.

	Cause							
Behavior Position (Points)	Environment Low Inequity		Environment High Inequity		Group Low Inequity		Group High Inequity	
	NP	CP	NP	CP	NP	CP	NP	CP
15	.80	.05	.51	.16	.14	.55	.34	.39
14	.72	.07	.74	.07	.26	.49	.35	.32
13	.69	.07	.69	.09	.32	.29	.35	.32
12	.69	.07	.57	.10	.28	.31	.34	.30
11	.60	.10	.53	.08	.33	.31	.34	.30
10	.43	.14	.41	.09	.28	.28	.29	.28
9	.28	.14	.25	.17	.16	.23	.26	.17
8	.17	.07	.20	.19	.10	.15	.11	.17
7	.15	.10	.15	.21	.20	.13	.17	.14
6	.38	.07	.20	.14	.31	.11	.54	.06
5	.77	.05	.39	.11	.47	.17	.64	.11
4	.42	.25	.17	.22	.26	.19	.39	.19
3	.16	.36	.12	.41	.11	.39	.19	.33
2	.08	.50	.06	.55	.14	.39	.14	.32
1	.05	.52	.00	.74	.11	.59	.14	.32
0	.06	.61	.00	.66	.17	.61	.07	.56
Mean	.40	.20	.31	.25	.23	.32	.29	.27

Figure Captions

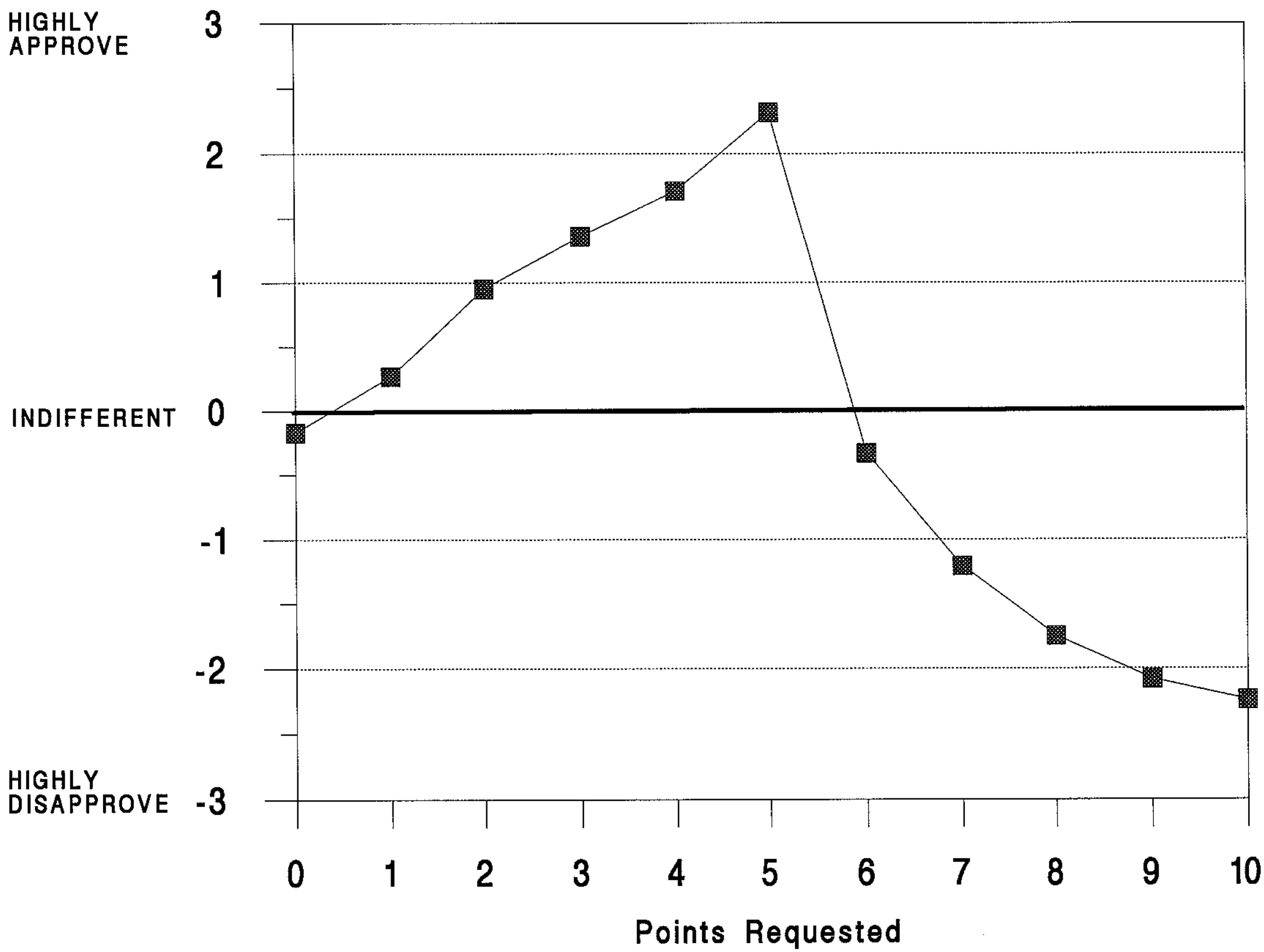
Figure 1. Mean RPM ratings in Study 1.

Figure 2. Mean RPM ratings as a function of Resource Use in Study 2.

Figure 3. Mean RPM ratings as a function of Cause in Study 2.

Figure 4. Mean RPM ratings in scarcity conditions (Study 2).
Panel a: Low inequity-Environment attribution condition.
Panel b: High inequity-Environment attribution condition.
Panel c: Low inequity-Group attribution condition.
Panel d: High inequity-Group attribution condition.

Figure 5. Mean RPM ratings in abundance conditions (Study 2).
Panel a: Low inequity-Environment attribution condition.
Panel b: High inequity-Environment attribution condition.
Panel c: Low inequity-Group attribution condition.
Panel d: High inequity-Group attribution condition.



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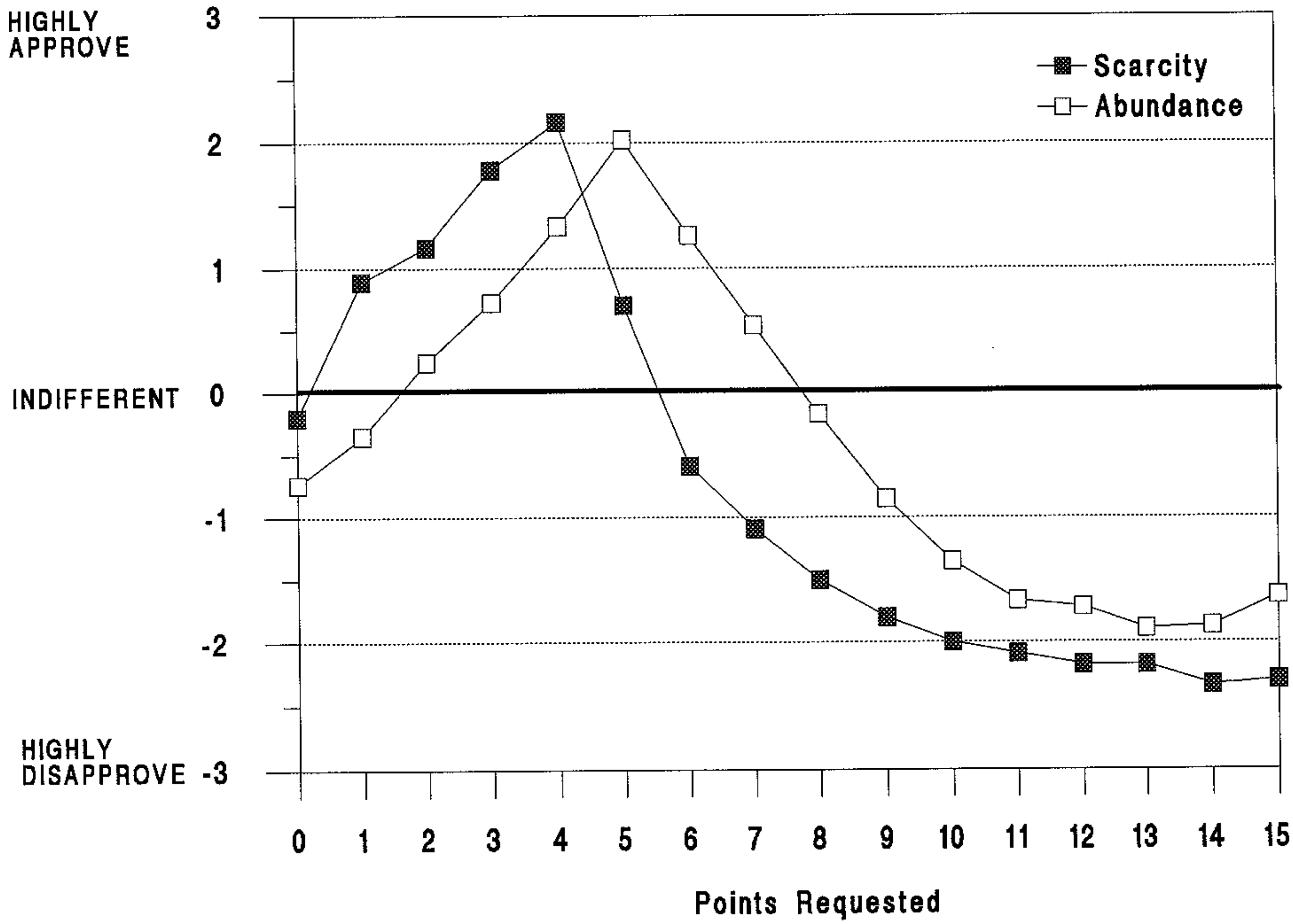
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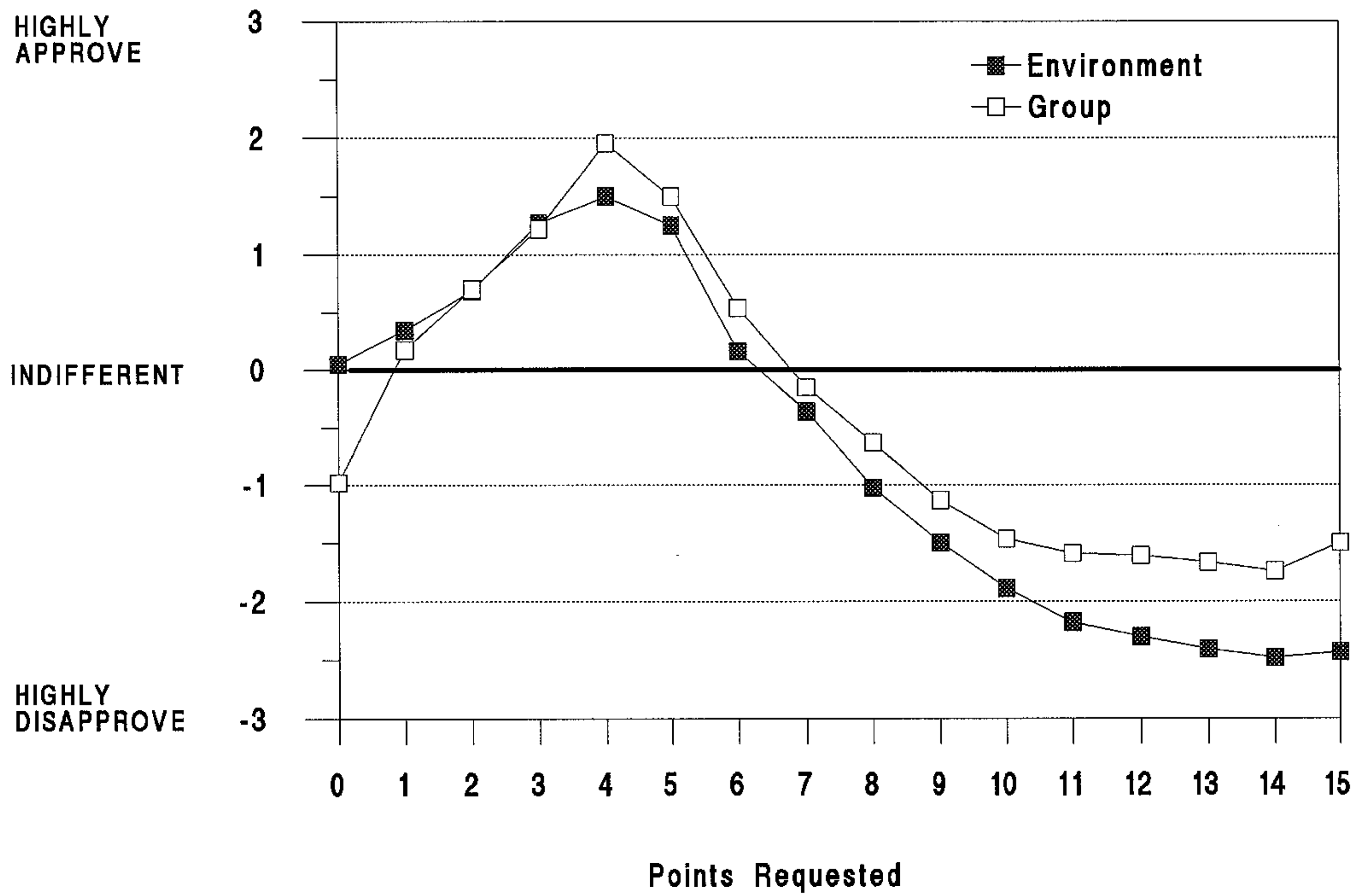
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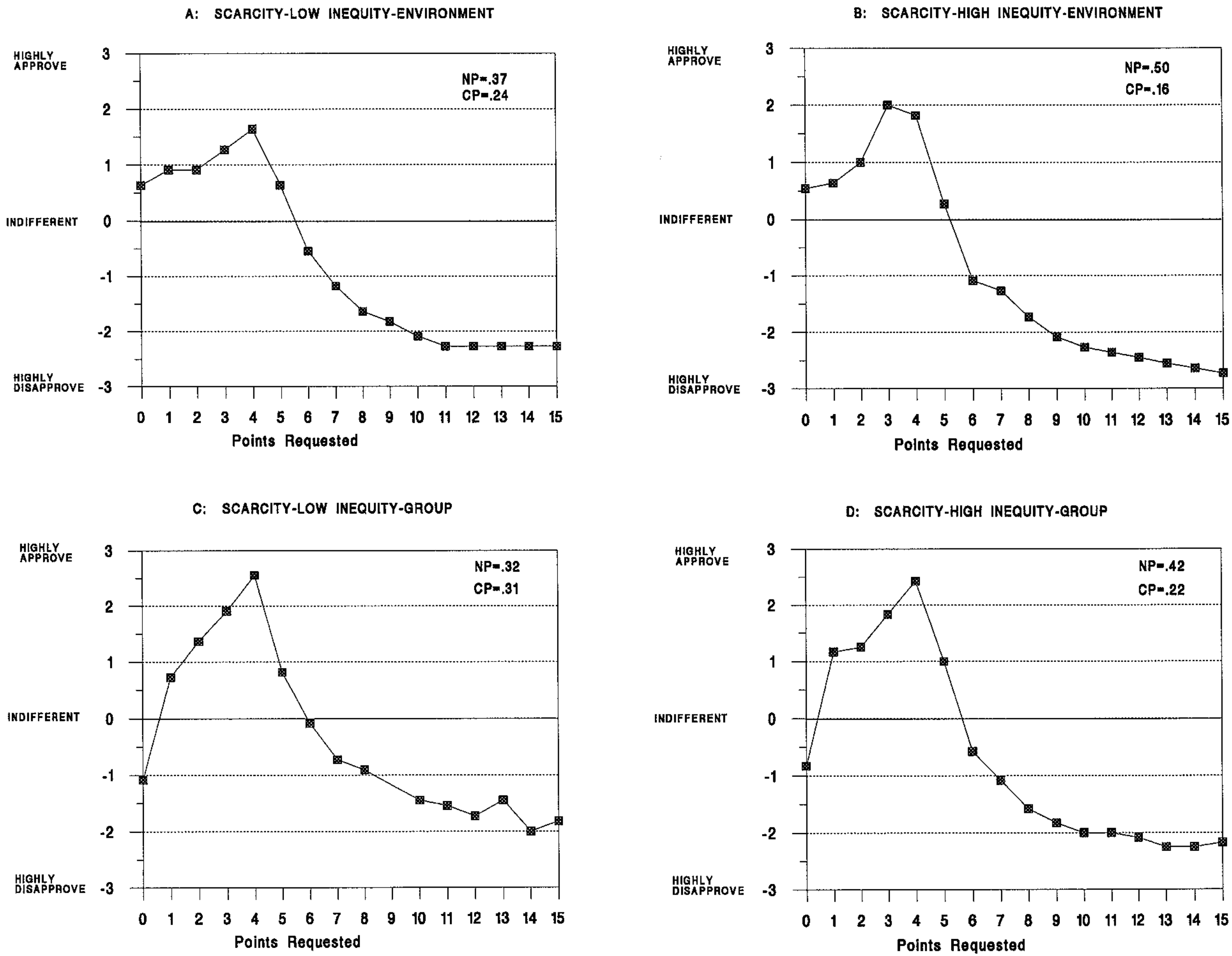
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NP=.37
CP=.24
B: SCARCITY-HIGH INEQUITY-ENVIRONMENT
NP=.50
CP=.16
C: SCARCITY-LOW INEQUITY-GROUP
NP=.32
CP=.31
D: SCARCITY-HIGH INEQUITY-GROUP
NP=.42
CP=.22
HIGHLY APPROVE
INDIFFERENT
HIGHLY DISAPPROVE
Points Requested

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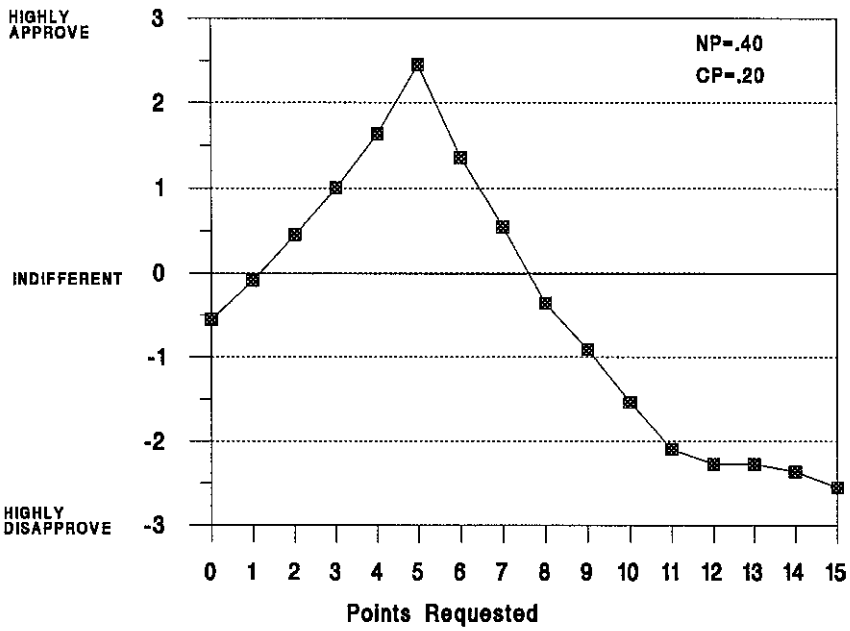

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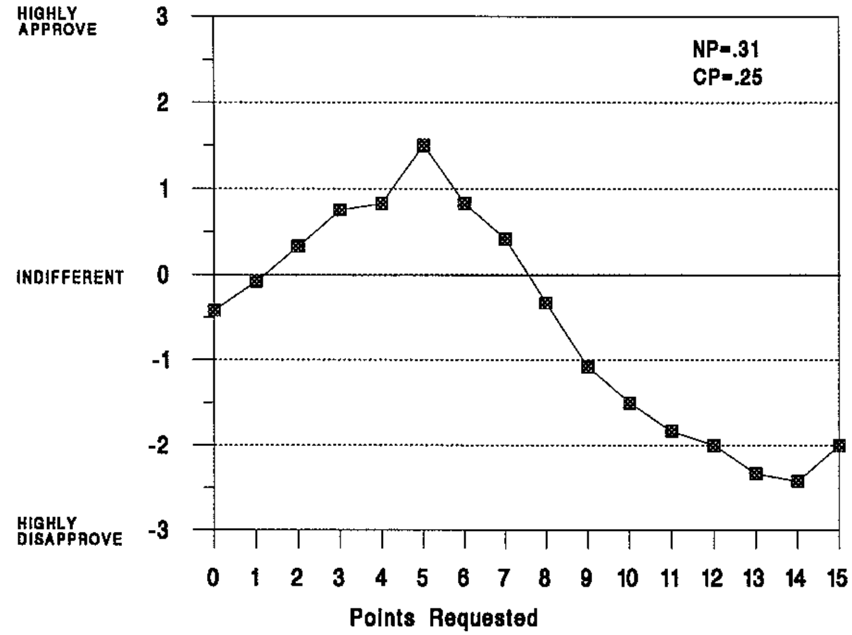

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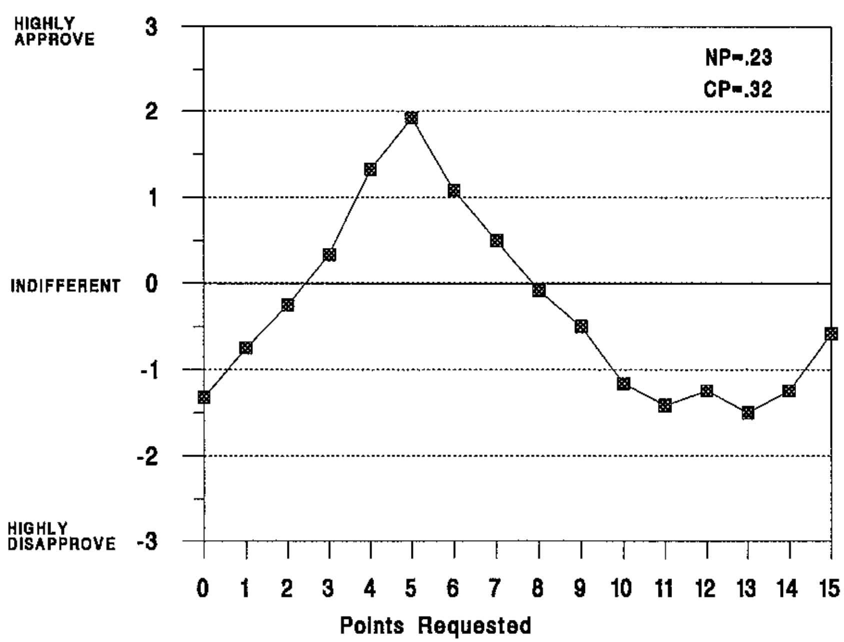

D: ABUNDANCE-HIGH INEQUITY-GROUP