A CROSS-CULTURAL STUDY OF BARGAINING BEHAVIOUR

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by

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A Thesis

Submitted to the School of Graduate Studies

in Partial Fulfilment of the Requirements

for the Degree

Doctor of Philosophy

McMaster University

November 1972

DOCTOR OF PHILOSOPHY (1972) McMASTER UNIVERSITY

(Psychology) Hamilton, Ontario

TITLE: A Cross-Cultural Study of Bargaining Behaviour

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NUMBER OF PAGES: ix, 241

ABSTRACT

Although a large number of studies of co-operation and competition have been carried out through the medium of experimental games, very few of these have been directed at cross-cultural comparisons. This is a very important avenue for research, and the present thesis reports a series of gaming experiments carried out using college students in Canada and India.

This research has focused on two particular concerns. The first was the effect of time-limitation on bargaining behaviour in the two cultures, and the second was the motivational orientation with which students in Canada and India approach a situation in which both co-operation and competition can be rewarding. Since no relevant data on Indian behaviour existed prior to these studies, the research program was exploratory in nature.

The findings with regard to time-limitation indicated that Canadian males reacted to time-limits imposed by one of the bargainers in a manner which was consistent with the way North American males typically react to threats, that is, they became very competitive and resisted yielding. When the time-limits were imposed by the experimenter, however,

this same group reacted in a co-operative manner. Canadian females and Indians, male and female, were all relatively co-operative, regardless of the source of time-limitation. Indian females, however, were more passive than the members of all other groups.

The experiments which were concerned with motivation involved male students only. Canadian males reacted to the various experimental conditions in a manner consistent with the motivation to maximize one's own gain while at the same time making as much or more than the other participant. Indians, however, were more competitive when each participant was ostensibly at an advantage, vis-a-vis the other, than when each was ostensibly at a disadvantage. This is the opposite to the way the Canadians reacted in these two situations. It was suggested that this behaviour on the part of the Indians might reflect a culturally defined mode of reaction to persons of relatively higher or lower "status".

ACKNOWLEDGEMENTS

I would like to thank Dr. D.W. Carment, not only for his support and encouragement throughout this research project, but also for his contagious spirit of adventure which led to the research trip to India upon which this thesis is largely based. My gratitude to him is deep indeed.

I also want to thank Christiane Alcock for all the encouragement and support she has provided during these years of graduate school. Her typing of the manuscript is also greatly appreciated.

Finally, I wish to acknowledge the services of Sri Garisepati Suryanarayana, who served as principal experimenter in the Indian studies. His devotion to duty is very much appreciated.

This research was carried out while the candidate held a Canada Council Doctoral Fellowship and was facilitated by Canada Council Research Grant No. S71-0966 to Dr. D. W. Carment.

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CHAPTER I

INTRODUCTION

Although man's technological capability is increasing at an awesome rate, his understanding of many important social processes has not progressed much beyond the embryonic stage. Recorded history is replete with all manner of social conflicts of a political, ideological, military, economic or familial nature, some of which have had repercussions which have changed not only the society of the day, but have extended to the present time. Yet even today, we seem little more able to avoid the destructive aspects of conflict than were our forebearers generations ago. Today, as in the past, "avoidance" or "conquest" are the usual methods of settling serious disputes. The actions of the United States vis-a-vis Cuba, (and until recently, China) on the one hand, and its actions toward the National Liberation Front of Viet Nam on the other provide contemporary examples of these methods. While international conflicts are more noticeable, the same methods are evident in more mundane interpersonal situations. For example, divorce and wife-beating reflect the avoidance and conquest methods of resolving marital disputes.

Following Boulding (1962), in this thesis conflict shall be considered to occur whenever two or more parties are

aware of the incompatibility of future positions that each wishes to occupy. The definition is deliberately rather general, and this generality leads to the question of whether or not conflict is a unitary concept. As yet, a "general theory of conflict", like the much-sought generalized field theory of physics, is beyond the present state of the art. Conflict theory is so undeveloped that only recently has even an elementary classification of conflict situations been undertaken through the medium of game theory.

Since political and social conflicts appear to be increasing as modern technology and industrialization place more and more strains on basic social relationships, it is not surprising that an increasing number of social scientists are directing their energies to the study of conflict resolution and control. The term "control" is important since not only is it unlikely that conflict could be eliminated from our society, but lack of conflict may be undesirable as well. Dahrendorf (1958) distinguishes various types of social conflict, among which he considers conflict between the "leaders" and the "led" to be not only one of the most important types, but the one most germane for structural analysis. He contends that wherever a division of labour occurs, (as is necessary in any civilization), the very fact that some people are in positions of direction or control, (which is impossible to avoid, since co-ordination of activity is essential), leads unavoidably to a conflict situation as a result of the different interests of the

leaders and the led. The interests of those that give direction are certain to become differentiated from those of the persons who do the work. Thus, he argues that it is not possession of property (as in the Marxist view) that is the basis of fundamental class conflict, but the possession of power, although property generally gives power to its owner. In Dahrendorf's view, then, conflict between classes of people is unavoidable in a society, and since it is unavoidable, it is important to learn how to control it.

But more than just being unavoidable, conflict in some respects is actually useful. Coser (1956) points to the positive functions of conflict which serve to bind societies and groups together, provided that a particular conflict does not align people on the basis of some pre-existing schism, such as religion or race. Conflict also provides an indication that changed circumstances require adjustments in the social structure. If the conflict can be channeled in a constructive way, if the changes required by the conflict can be brought about rationally, then it is likely that the more negative aspects of conflict can be avoided. As Coser says, the dysfunctional aspects of conflict are due to the lack of toleration for it, and the absence of institutionalization of it in the social structure, rather than to the conflict itself.

This thesis is concerned with certain fundamental aspects of conflict and its resolution and control. Since so little is known about conflict, it is necessary that investigation must

first be directed towards the understanding of very simple situations before attempts can be made to unravel the myriad complexities of larger conflicts. Consequently, the research to be reported here deals with highly restricted situations in which almost all the trappings of ordinary social intercourse have been deliberately eliminated in order to expose a limited number of variables that are amenable to systematic study.

A. Approaches to the experimental study of conflict

Theory and research concerned with simple (usually two-person) conflict situations fall into two main categories. One is the "normative" approach, which derives from the classic Theory of Games and Economic Behavior of von Neumann and Morgenstern (1944) and the other is the "descriptive" approach According to the normative approach, a "game" involves at least two "players", each of whom has a choice of at least two alternate behaviours. The players have an objective, (generally considered to be to maximize personal gain), and whether or not a player can realize his objective depends not only on his choice of behaviour, but on the choice made by the other as well. There are two main classes of these games. One, the "zero-sum" (or "constant-sum") game, involves pure competition in that whatever one player gains, the other must necessarily lose. There can be no compromise in this situation, no "sharing of the spoils". A "non-zero-sum" (or "non-constant-sum") game, on the other hand, allows for the operation of both co-operation

and competition. Co-operation is required to avoid mutually undesirable outcomes, while competition arises as each player attempts to maximize his own gains. Games of this type are greatly affected by the presence or absence of communication, whereas communication in zero-sum games is futile since no compromise is possible.

Normative theories possess the abstractness characteristic of mathematics and classical economics. The players are assumed to be fully "rational", that is, they behave in a way consistent with the maximization of individual gain and minimization of individual loss. This definition of rationality sometimes leads to a kind of paradox. For example, in the Prisoner's Dilemma situation (which will be discussed in detail in the next chapter), if both players are rational in the game-theoretical sense, they will each choose a strategy that will result in lower individual and joint gains than are optimally possible. This seems unreasonable to Harsanyi (1961), who contends that,

> "rational pursuit of self-interest by the two players not only requires that they should individually maximize their utilities and should choose efficient individual strategies. It also requires that they should choose individual strategies which taken in conjunction represent an efficient joint strategy. Indeed, self-interest (as contrasted to moral considerations concerning the welfare of others) demands even that the players should suspend independently maximizing their utilities if both can benefit by switching to a more efficient joint strategy (p. 184)".

This "postulate of self-interest", like the "minimax" rule of game theory discussed previously, assumes that players

are concerned only with their own gain. However empirical evidence indicates that the motivation of "beating the other person" is a very important one in game situations.

Although one might question the value of theories that do not predict the behaviour of "real" people, further reflection reveals that normative theories have an important contribution to make. For example, the precise classification of zero-sum and non-zero-sum games provides a way to categorize real conflicts. As Harsanyi (1961) observes, models of "rational" bargaining behaviour are meant to serve three analytical purposes:

1. the prediction or explanation of the outcome of actual bargaining behaviour,
2. conceptual clarification of what sort of behaviour really represents rational behaviour in bargaining situations,
3. to define a theoretical equilibrium point for any bargaining situation which can therefore be regarded as the payoff distribution corresponding to the real balance of power between the two parties.

Thus, knowledge of the normative formulation of a particular bargaining situation can aid in understanding the concepts involved. But Harsanyi goes on to point out the shortcomings of the normative approach;

> "Indeed, what we call bargaining skill largely consists in exploiting the opponent's proclivities to...irrational behavior (p. 193)".

Rapoport (1964),who has done a great deal of work in the area of normative theory, concludes that,

> "...(it) appears inescapable that the non-zero-sum game cannot be treated within the framework of normative, rational decision theory without disregarding some of the most important features of these games (p. 70)".

Bartos (1967a) suggests that while normative theories of bargaining games can guarantee that a hypothetical bargainer will receive at least a certain minimum payoff if he plays an optimal strategy, regardless of what the opponent does, this is insufficient in the real world for at least two reasons:

1. the negotiator may not be satisfied with the minimum, and
2. relatively few conflicts of interest can be conceptualized as games with optimal strategies.

He goes on to argue that in negotiations conceptualized as games with optimal strategies, the behaviour of the opponent cannot be predicted. If two "rational" parties are negotiating, each would depart from rationality to try to take advantage of the other's rational, and hence predictable, behaviour.

And yet another criticism of game-theoretical models of behaviour is voiced by Rapoport (1960):

> "...what is essentially missing from game theory proper is a rigorous analysis of situations where communicative acts are moves of the game, and where effective communication may change the game (p. 232)".

These criticisms have caused more and more consideration to be directed to the "descriptive" approach, which is directed at describing and predicting the way in which real people act in

conflict situations. In many instances, this approach uses the paradigms of game theory, and it is conceivable that, given enough experience in the situation, people may even come to act in the way prescribed by game theory, but even if this were so, the acquisition of this behaviour would be of as much psychological importance as the behaviour itself.

Although game theory allows only for the motivation of self-interest, it is generally observed that three main motivations arise in two-person non-zero-sum games. Deutsch (1958) labelled these as 1), co-operative - the desire to maximize joint gain, regardless of one's own payoffs, 2), competitive - the desire to "beat" the other, regardless of one's own payoffs, and 3), individualistic - the desire to maximize one's own payoffs without concern for the other's payoffs. Usually, of course, these will occur in some combination rather than in pure forms. Other motives, such as the desire to maximize the other's losses could exist, but are not likely to play important roles in most situations. Given a particular set of possible payoffs, the "utility" of a particular outcome pair for a player will depend on whatever combination of the three motives noted above is in effect at that time.[1] It should be noted that game theory assumes that the numerical payoffs for a player correspond to his utilities, again reflecting the assumption of only one motive, that of self-interest.

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1. For discussion of utility, see Bartos, 1967 (b); Marshak, 1964; or Rapoport, 1966.

Assuming that players act to maximize utilities, the players' behaviour can be interpreted so as to provide an indication of the way in which they have assigned utilities to various outcomes. In other words, as Becker and McClintock (1967) note, non-zero-sum games can be used to provide a measure of the extent which subjects value co-operation and competition and can provide a beginning toward the isolation of motives or values that underlie such behaviour.

It is with these motives that this thesis is particularly concerned.

B. Cross-cultural studies of conflict behaviour

This thesis, as well as exploring the usefulness of a new game paradigm, is also concerned with behaviours of students in Canada and India with respect to certain structural and situational variables in the co-operation-competition situation. Only a dozen or so of the numerous game studies have been of a cross-cultural nature, and almost all of these have compared American students with those of Western European countries. Cultures which are quite different from the United States and Western Europe have been almost totally neglected.

This does not mean that the importance of cross-cultural experimentation is not appreciated. Deutsch (1961) pointed out that the way of maintaining self-esteem in the face of attempted intimidation is culturally defined. In North American culture, this leads to attempts to gain supremacy, or at least to resist intimidation. Rapoport (1968) states that,

> "Although some interesting correlations have been obtained between performances and personality profiles...still it would seem that attention would be turned with more profit to obvious differences between populations...such as sex, age, and above all, cultural background (p. 466)".

Cross-cultural studies serve at least two functions. First, they yield information about another culture which may be of considerable interest in itself. But more importantly, such studies can point to the dependence of behaviour observed in our own culture on predominant, culturally-defined variables. As Lambert and Weisbrod (1971) observe, if an experimental finding holds in some cultural settings but not in others, then one must look for the conditions that affect the generalization that one has made, thus expanding the understanding of the social processes involved, while if a finding holds everywhere it is tested, then one can be more confident that it is a generalization about human nature.

However, cross-cultural research is prey to many special dangers. Translation of instructions can lead to subtle changes in meaning. Even the fact that people from one culture are formulating the problem to be studied in another may introduce bias. Other problems, such as those related to sampling and to interpretation of data, have to be treated with care.[2] The use of experimental game situations eliminates or minimizes at least some of these hazards. As McClintock and McNeel (1966a) state,

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[2]. For a discussion of such problems, see Lambert and Weisbrod (1971).

> "the advantage in using games to study the motivational basis of co-operation and competition across societies is that subjects are involved in an interpersonal task at the time of measurement. The task seems to be a relatively universal form of social behavior. Furthermore, the technique has the advantage of being relatively language-free, highly reliable, and readily subject to statistical treatment. The potential difficulties of the game paradigm for cross-societal research parallel those inherent in all such endeavours and include the comparability of interpretation of instructions by subjects, and of rewards, and the intrinsic difficulty of interpreting systematic behavioral differences occurring between members of different societies (p. 412)".

Thus, one must be cautious in the approach to cross-cultural comparisons, but the challenge is an exciting one.

C. An overview of the experimental situation and milieu

The present research, at least in its cross-cultural aspects, is exploratory in nature, since there exists no basis for making precise predictions and hypotheses. Before the plethora of existing game studies in the North American setting had been carried out, thus allowing hypotheses to be formulated on the bases of previous research, the same situation existed here, as Schelling (1961) pointed out:

> "How the participants can interact to teach a shared expectation, how they can invent means of signalling their intentions, what kind of rules and traditions they can perceive and recognize jointly, cannot be arrived at by a priori reasoning, even by ideally rational players. There is an essential element of empirical study involved (p. 318)".

He suggested that one should be looking for rather striking results, rather than findings that can be revealed only by refined statistical analysis. Furthermore, since one eventually hopes to

relate the behaviour observed to some theory of the game, a main effort should be made to learn how to manipulate the variables of the game in order to generate particular results and phenonema. He added,

> "The intent is not, therefore, to pursue to the end a pre-arranged schedule for varying the parameters, and subsequently to analyze the results statistically. Instead there will be fairly continual feedback between the results observed and the further design of the experiments (p. 321)".

Since this research uses a new paradigm, and since much of it is done in a "new" culture, Schelling's advice becomes especially salient. McClintock and McNeel (1966a) were of this mind in their studies carried out in Europe:

> "No specific hypotheses were made regarding the effect of societal membership upon co-operative behavior. We had no a priori basis for predicting more or less co-operative behavior by the students from the two societies. Hence, with regard to the cross-societal variable, the study's aim was exploratory (p. 413)".

What kind of general expectations might one legitimately hold about co-operation and conflict behaviour among Indians? The reputations of Gandhi and Nehru have led many people to view Indians as being peace-loving, altruistic, respectful of nature, and so forth. This might lead one to expect more co-operation among Indians in conflict games. On the other hand, Meade and Whittaker (1967) found, in a comparison of college students of six societies (Americans, Rhodesians, Africans, Chinese, Indians and Brazilians) that the Indians scored the highest on the California F-scale of authoritarianism. (The effect was so

strong that the Indian scores were significantly higher, at the .01 confidence level, than those of all other groups except the Rhodesians). Prior to this, Deutsch (1960) had found that, at least for Americans, F-scores correlated significantly with game behaviour. Low scorers tended to be "trusting" and "trustworthy". This might suggest that Indians would be more competitive in game situations.

Meade (1968), in a level of aspiration study, concluded that Indians produce less realistic levels of aspiration (in terms of what they are likely to achieve) than Americans, since Indians appear to rely more on affective factors whereas Americans rely more on cognitive factors, which usually are better guides.

McClelland (1963) examined children's readers from forty different countries and analyzed them in terms of amount of "achievement imagery", since this may have an important effect on the development of achievement motivation. Indian readers were found to have the second highest national "need-achievement" level, placing them ahead of all countries examined (including Canada, the U.S.A. and Britain) except Turkey. Earlier studies by the same author showed that persons high in need achievement tend to work harder in certain tasks, to learn faster and to do their best work when it "counts for the record", rather than when money and special incentives are involved. This again might lead one to predict differences between Indians and North Americans, assuming that achievement imagery in readers is a good predicter of need achievement in the society.

Another consideration is the concept of the "Protestant Ethic" (Weber, 1904), which is considered to be a strong motivating factor in our society - the notion that a basic value is to work hard and succeed, associated with interpersonal comparisons of behaviour to determine rate of work and to define success. Crowne (1966) observed that the Protestant Ethic exempts economic competition from the domain of aggression, making it not only permissible, but laudable. If this ethic is responsible, in part, for the competitiveness observed in western students, one might expect to find less competitiveness in the Indian setting.

The notion that Indians might be "tough" bargainers since they are used to marketplace haggling is not considered as important by this author, although it is often the first point made by laymen. The structural and situational variables that exist in the markets are different enough from the experimental situation used that it is unlikely that marketplace expertise would transfer to the game. In the game situation, the players must "deal" with each other or not at all, unlike the situation at the market. In fact, no co-operation-competition conflict exists in the market due to the many buyers and many sellers.

There is no other information on which to draw and the earlier contention that this research must be exploratory in nature seems quite justified.

CHAPTER II

REVIEW OF THE LITERATURE

In this chapter, the literature pertaining to two-person non-zero-sum games will be selectively reviewed. The emphasis will naturally be on studies that relate to the research to be reported later. However, additional literature which does not fall directly into this category has also been included in instances where it is felt to contribute to an understanding of the context in which the present research has been conducted.

The most systematic way to approach the literature is in terms of the independent variables that have been manipulated. These variables fall into three main categories:

1) structural and situational variables. These variables include all aspects of the conflict situation, as well as the "environment" in which it occurs. Payoff structure, number of trials, communication capability and so on, are important examples.

2) strategy as a variable. Many studies have focused on the way in which a person responds to a particular pattern of behaviour by the other party. By using a confederate (or a computer) with a pre-programmed strategy, the effects of different kinds of strategies on co-operativeness and competitiveness can be studied.

3) predispositional variables. This category includes relevant aspects of the players' personalities, as well as any other influence the players bring with them to the situation, such as friendship between them, previous experience in similar situations, particular group membership, and so on. Cultural influences properly fall into this category, but due to the central importance of culture to this thesis, they will be dealt with in a separate section. After reviewing the literature in terms of the above classes of variables, a short section will be devoted to current criticisms of the experimental gaming approach to the study of social behaviour. This will make it possible to better assess the paradigm employed in this research.

A. Structural and situational variables

It is variables in this category that have received the most experimental attention. This is partly because there are so many of them, partly because they are somewhat easier to manipulate, and partly because many researchers believe that they have a more important role in conflict situations than either strategic or predispositional variables. Relevant classes of these variables are discussed below.[3]

1) Game task and payoff structure.

Various tasks have been used to create the context of a two-person non-zero-sum game. Siegel and Fouraker (1960), for example, used a situation which resembled a real-life economic

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[3]. For a comprehensive survey of the influence of situational variables, see Druckman (1971).

bargaining situation. Two players exchanged bids in an attempt to reach agreement on the quantity and unit price of a hypothetical commodity that was to be "sold" by one player to the other. Deutsch and Krauss (1960) devised a "trucking game" in which players "operated" trucks on a road map. Each player was charged with moving his truck from his "start" to his "destination". Each player had two roads, a long one that was exclusively his own, but which was unprofitable to use, since it was long, and since the players lost money in proportion to the time it took them to get their trucks to their destination. The shorter road of each player shared a common "one-lane" section through which only one truck could pass at a time. Thus, co-operation was necessary for the efficient co-ordination of traffic through this one-lane stretch. Swingle (1967) used a somewhat conceptually similar situation involving trains and tunnels. Sermat (1970)and Shure, Meeker and Hansford (1965) used tasks in which each player had to insert a device into a common channel. For either player to earn points, he had to occupy the channel to the exclusion of the other. Other studies have employed game tasks that were meant to simulate important real-life conflicts, such as the international armaments race (Pilisuk, Potter, Rapoport & Winter, 1965; Pilisuk & Rapoport, 1964).

Most research, however, has not attempted to couch the conflict situation in a task that seems interesting to the players by virtue of its similarity to real-life situations. Most research has been carried out in the two-person matrix situation suggested by game theory: each of two players

simultaneously chooses one of two choices of action available to him. That is, one player chooses a row of a payoff matrix at the same time that the other chooses a column. The intersection of these choices results in one of four possible payoff outcomes. Usually, several iterations of the game are played consecutively.

Much of the research with 2 x 2 simultaneous-choice matrix games has revolved around manipulations of the payoff matrix; (analogous changes in payoff structure can also be made with the non-matrix games described above). Rapoport and Guyer (1966) and Harris (1969) have constructed taxonomies of 2 x 2 matrix games on the basis of the payoff structure. As Harris points out, numerous families of games have been identified and labelled, such as the Prisoner's Dilemma Game (PDG), Chicken, the Battle of the Sexes, and so on. Yet, the labels are not uniformly applied by all researchers. What one author might label as a distinct type of game, another may consider as simply a variant of another game. Rapoport and Guyer provide a rigorous classification based on strict preference orderings of the four possible outcomes for each player. This results in seventy-eight "different" games, organized on the bases of the number, stability, and desirability of the strategic equilibrium points.

The game that has been researched most extensively is the Prisoner's Dilemma Game. An example of a payoff matrix for this game is shown in Figure 1. The letters a, b, c, d, stand for the potential payoffs of each player, and the subscripts refer to Player One or Player Two. Each player has a choice of

two responses, labelled C and D respectively, and the payoff to each is determined by the "intersection" of their response choices.

Insert Figure 1 about here

This game warrants a short description since so much of the literature is in reference to it.[4] The term "Prisoner's Dilemma" is taken from an apocryphal story about a clever Crown Prosecutor who is faced with the need to elicit confessions from two prisoners accused of having jointly committed a crime. The prisoners are confined separately so as to preclude communication between them. The Crown Prosecutor visits each prisoner and tells him that the situation is as follows. If neither prisoner confesses, each will receive, at worst, a light sentence for vagrancy. If one confesses and turns Crown Witness, he will be set free while the other will receive a very stiff sentence. If both confess, each will receive a moderate sentence. (This situation can be represented by the matrix in Figure 1 by letting 0, the least favourable outcome, correspond to the very stiff sentence, 1 to the moderately heavy sentence, 3 to the light sentence, and 4 to freedom. Then the response alternatives C and D would correspond to not confessing and confessing, respectively).

Since the prisoners cannot communicate, each is faced with a dilemma. By not confessing, one can benefit only if the other chooses not to confess as well, whereas a stiff sentence will result if the other confesses. But by confessing, one will be better off regardless of the other's action. If the other

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4. For a detailed discussion, see Luce and Raiffa, 1957 or Rapoport and Chammah, 1965a.

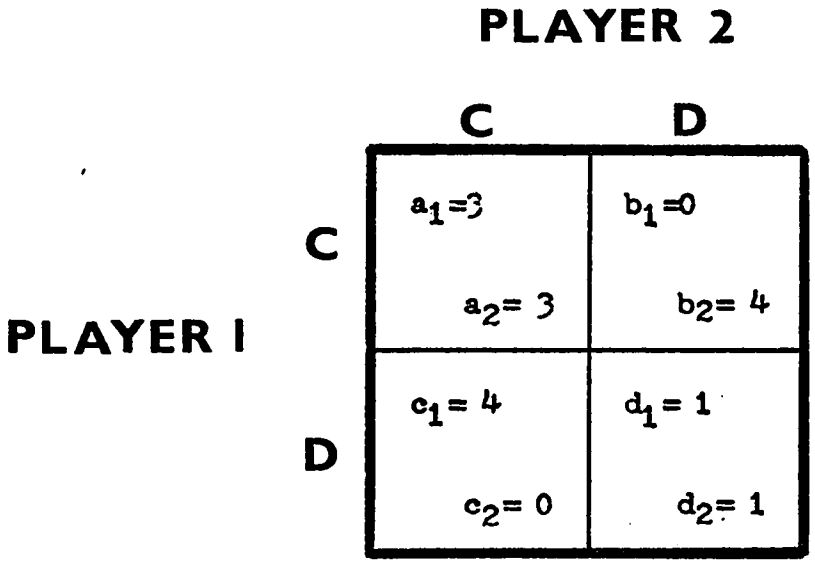

Figure 1. Example of a payoff matrix for the Prisoner's Dilemma Game. The upper left-hand number in each cell refers to the payoff for Player 1.

confesses, one will receive a lighter sentence than by not confessing, and similarly if the other does not confess, one will still do better by confessing than not confessing. Thus one can minimize his potential losses by confessing. But even if each is concerned for the other's welfare, and would be willing to accept the vagrancy charge, each must be able to trust the other not to confess. This means, too, that each must be sure that the other will trust him not to confess and so on. Without communication, neither can be sure of what the other is likely to do. Thus, each prudently decides to confess in order to minimize his potential loss.

As a device for studying co-operation and competition, the Prisoner's Dilemma game is usually played in the following manner. Two subjects, each in a separate cubicle, are shown a matrix similar to that of Figure 1. Each player has two buttons. One player's buttons correspond to the rows of the payoff matrix, while those of the other correspond to its columns. The players are told that on a given signal, each will depress one of his buttons, and the entries in the cell determined by the intersection of their choices will represent their respective "payoffs" (in points or money). Several consecutive iterations of the game are generally played.

The especial interest of this game derives from the fact that if each player consistently chooses the alternative with the maximum possible payoff (D), each loses more or gains less than if he were to choose the other alternative, which could result

in the largest mutual reward. To follow a strategy of mutually rewarding, but not individually maximizing choices, each player must trust that the other will not try to gain as much as possible by well-timed defections from such a co-operative arrangement.

The percentage of mutually co-operative responses in the Prisoner's Dilemma game is typically quite low, (around 40%), and generally declines across trials. This has led several researchers to study the effects of varying the magnitudes of the entries in the four cells of the matrix, subject of course to the constraints imposed on the interrelationships among these entries by the formal definition of the game. A linear transformation of the matrix values seems to have no effect (Jones, Steele, Gahagan & Tedeschi, 1968), except when the points represent monetary payoffs (Ells & Sermat, 1968), in which case changes in matrix values are confounded with changes in amount of reward, another variable. However, changes in the matrix that make "defection" more attractive, (i.e., increasing c_1 and b_2) make it more likely that defection will occur (Komorita & Mechling, 1967), and a large increase in favour of the mutually co-operative response, or a decrease in the values for a mutually competitive response, lead to increases in co-operation (Rapoport & Chammah, 1965a). Becker and McClintock (1967) conclude that this indicates that the relative dominance of actions consistent with the various motives in a game situation can be manipulated by changing the payoff structure. This is certainly the case across families of games. Games such as Chicken (e.g. Swingle,

1967), the Maximizing Difference game (e.g. McClintock & McNeel, 1966a), "power" games (e.g. Solomon, 1960) and others have payoff structures which are ideal for studying particular kinds of motivation.

Not only is the structure of the conflict as defined by the payoff matrix important in determining the kind of behaviour elicited but so is the way in which the matrix is presented. Evans and Crumbaugh (1966) reported that by substituting for the payoff matrix pairs of choices for each player such as "Give him three", or "Give me one", with the combination of the choices of the two players resulting in the same payoffs as shown in the matrix in Figure 1, considerably more co-operative choices resulted. Pruitt, (1967, 1970) used a "decomposed" Prisoner's Dilemma game (i.e., for each of two choices of action by a player, a payoff was specified for him and a payoff was specified for the other. Each player's payoff would be the sum of what he got as a result of his choice and as a result of the other's choice. Again, the four possible pairs of outcomes were the same as those in a matrix form of the game). However, the same matrix can be decomposed into several different versions, and Pruitt found that behaviour varied from version to version. Vinacke (1969) suggests that this shows that the form of the display leads to differences in perceiving comparative advantages of the choices available, and cites a study by Messick and Thorngate (1967) which showed that subjects interpret

available information in terms of maximizing relative gain, accompanied by an avoidance of outcomes in which the subject believes he will receive less than the other.

Orwant and Orwant (1970) showed that by presenting the PDG in the context of a real-life situation, more co-operation was forthcoming.

It is clear that the mode of presentation alone has important effects on the behaviour of the players. This forces one to consider carefully the choice of a research paradigm.

Before leaving the discussion of game tasks, a note is in order about the kinds of bargaining games developed in the realm of classical economics. Some such games have had considerable influence on psychological gaming, and the first studies done by this author (Alcock & Carment, 1969) were inspired by them.

The economists' games place emphasis on the behaviour of "economic" man in the marketplace. Certain of these games are of particular interest since, like the games discussed above, they involve the interplay of the motivations to co-operate and to compete. The "bilateral monopoly", for example, reflects a bargaining situation in which there is only one buyer and only one seller, and they must deal with each other or not at all. The bilateral monopoly lends itself to the laboratory situation, and it was this paradigm that Siegel and Fouraker (1960) used to study the effects of information on negotiated settlements. Since the paradigm involves continual

communicated negotiations, it has a dimension not ordinarily present in matrix games.

In the "duopoly", there are several sellers, each of whom must submit a "bid". If a single seller submits the lowest bid, he obtains all the sales. If several sellers tie for the lowest bid, they share equally in the sales. As well, there is a fixed cost for participation in the bidding, and an additional cost if one's bid is not equal to the lowest bid. It is of interest to note that Guyer (1966) has shown that the classical economic formulation of this situation is formally equivalent to the Prisoner's Dilemma game. Thus, it appears that two different and independent approaches to the same problem have been made. Zeuthen (1930), Nash (1950, 1953) and others have derived theoretical solutions for two-person economic bargaining games, and while at most only occasional reference to these will be made in this thesis, it is felt that they are important enough to deserve this nominal mention.

2) Amount of reward

Several studies have examined the effects of using monetary payoffs as opposed to points-only on behaviour in two-person games. Gallo (1966) replicated the classic Deutsch and Krauss (1960) trucking game experiment which found co-operation to decline as threat capability increased, and reported that the intense conflict found in the mutual threat condition of the original study (which used imaginary money) was not present when real monetary payoffs were used. Gallo proffered two

possible explanations for this. Either the monetary payoffs provide an incentive for subjects to persist in co-operative gestures until a co-operative solution can be worked out, or perhaps the presence of monetary rewards is inhibiting to the competitive motivation since the social consequences of competition may be viewed as more serious by the opponent when one's actions result in a loss of money for him.

Several other studies have also found that monetary payoffs yield more co-operation than do mere points, or that high monetary rewards result in more co-operation than low monetary rewards. This has been found in the Prisoner's Dilemma game (Messé, Bolt & Sawyer, 1971; Radlow, Weidner & Hurst, 1968) and in the Maximizing Difference game (McClintock & McNeel, 1966b, 1966c, 1967). But other studies have found no such effect (Crawford & Sidowski, 1964; Evans, 1964; Oskamp & Kleinke, 1970; Willis & Joseph, 1959; Wrightsman, 1966). Vinacke (1964) found no effect of monetary payoffs on behaviour in triads. One study (Gumpert, Deutsch & Epstein, 1969) actually found that monetary payoffs led to less co-operation in a Prisoner's Dilemma game, but the interpretation of this research is hampered by the fact that the wording of the instructions may have accounted for the increased co-operation in the points-only condition. An interesting study by Bixenstine and O'Reilly (1966) involved electric shocks as (negative) payoffs. One-half of the dyads played the first half of the games with monetary payoffs and the rest of the games with avoidance of

shock as the payoff. The rest of the dyads played the games in the reverse order. No differences were found between the shock and money games, but as compared to games with money only, the level of co-operation was high.

In summary then, the effects of monetary incentive are by no means clear. It appears to interact with other variables, leading to increases in co-operation in some situations and decreases in others. It may be that, as Kelley, Shure, Deutsch, Faucheux, Lanzetta, Moscovici, Nuttin, Rabbie and Thibaut (1970) argued,

> "the effects on conflict resolution of type of incentive, money versus points, are generally consistent with the view that an increase in the value of the commodities facilitates its course, if the relation is one in which co-operative behavior affords a relatively dependable and invulnerable means to attain better outcomes and exploitative or individualistic behavior entails the risk of high costs (p. 433)."

However, Gallo and Sheposh (1971) argue that the effects of monetary incentive are complicated, and that simple generalizations about them are not justified.

3) Threats and promises

In real-life interpersonal conflict situations, one party often attempts to influence the actions of the other, either by threatening to perform a certain action unless the other acts in a certain way, or by promising to reward the other by performing a certain action in response to the desired action by the other. These influence attempts are known as contingent threats and contingent promises respectively. Non-contingent influence attempts are similar except that the contingency is absent.

Deutsch and Krauss (1960), in the previously described trucking game, studied the effects of the presence of threat capability by giving one or both players the ability to close a "gate" at one end of the common path which would prevent passage by the other. Gate-closing was considered as a non-contingent threat by the researchers, and they found that as the amount of threat capability in the situation increased (i.e. from no gates to a gate for one player to a gate for each player), the amount of co-operation decreased. However, various objections have been raised in regard to the operational definition of threat used in this study, for gate-closing was in effect a punishment. There were other methodological problems as well. Borah (1963) pointed to the fact that, in the no-threat condition, increasing competitiveness is unlikely to induce either player to use the unprofitable alternate route, whereas it is likely to be used more in the threat situations. Kelley (1965) added that the gates could be used to punish, exploit, trick, or signal as well as threaten. Shomer, Davis and Kelley (1966) showed that when the alternate route is eliminated from the situation, the subjects learn to co-operate even in the bilateral threat condition.

An experiment by Hornstein (1965) indicated that both high and low threat (defined as such by the severity of the punishments associated with them) are less likely to be used than moderate threat. Whereas the low threat is seen as lacking in effectiveness, the high threat could result in

retaliation that would be costly to the original threatener. The results of an experiment by Swingle (1967) are consistent with this finding.

Various studies of threat have been carried out with two-person matrix games, especially with a modified version of the Prisoner's Dilemma game that allows for the sending of threats. Findings include the following. Threat-sending is deterred when the imposed cost of sending the threat outweighs the potential gain from the other's compliance (Tedeschi, Horai, Lindskold, & Faley, 1970);prior announcement of intended non-compliance by the other deters threat-sending and facilitates co-operative responding (Tedeschi, Bonoma, & Lindskold, 1970); bilateral threat capability leads to more threats carried out, and more threats are carried out when one is assessed a fixed cost for doing so than when the same cost appears to result from the retaliatory action of the other, and males make and carry out more threats than females (Tedeschi, Bonoma, & Novinson, 1970). This last study found, however, that threat capability had no effect on either overall competitiveness or overall joint payoffs.

Other PDG studies have found that compliance to threat depends on how often the threats are carried out (i.e. "credibility") (Horai & Tedeschi, 1969), that threats tend to be beneficial to the establishment of co-operation when the subjects are of "low attraction" (i.e. of perceived attitude dissimilarity), but are detrimental for "high attraction"

players (i.e. of perceived attitude similarity) (Tornatsky & Geiwitz, 1968) and that threats are unsuccessful when there is a strong need to save "face" by the threatened party, (Johnson, 1971).

Froman and Cohen (1969) compared unilateral and no-threat conditions in a buyer-seller paradigm. The threat was to terminate negotiations, which would result in losses for both players. The presence of threat capability was found to be detrimental in that it led to lower joint payoffs, more uneven divisions of the joint payoff, and longer bargaining. Furthermore, the more a player used threat, the lower was his own score at the end. The authors suggested that if threat capability is present, at least some players will attempt to use it to advantage, resulting in a change in the nature of the interaction between the two players.

There is no relevant research on the effect of promises.[5]

In summary, it appears that the presence of threat capability is generally detrimental to the development of co-operative action and that its effects interact to some extent with other variables.

4) Information, communication and feedback

Schelling (1957) reasoned that if one player in a bilateral monopoly knew both his own and the other's payoff structure, and knew that the other player had information about his own payoffs only, then the player with complete information would be at a disadvantage in that he could not

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5. For a review of the extant literature on promises, see Terhune, 1970.

expect the other to recognize a fair division of profits. Thus, he would yield more, and earn less than the relatively benighted player. This is an interesting notion, and although it has not found experimental support (Alcock & Carment, 1969; Siegel & Fouraker, 1960), it has nonetheless pointed to the possibility that information may in some instances be a handicap.

However, Siegel and Fouraker (1960) found that as the amount of information increased (from each player knowing only his own payoff structure to unilateral full information to bilateral full information), the negotiated settlement more equally divided the profits. More information of this kind also leads to more rapid agreement (Alcock & Carment, 1969).

Guyer and Rapoport (1969) found that, at least for particular classes of 2 x 2 matrix games, a player is more co-operative when he is aware of both players' payoffs than when he knows only his own.

Liebert, Smith, Keifer and Hill (1968) used an auto-trading game and found that informed bargainers (i.e. those cognizant of the other's payoff structure) used the opponent's demands to assess the reasonableness of the opponent's goals, whereas the uninformed bargainers used the opponent's demands to set their own goals. Similarly, Porat and Haas (1969) found that more information leads to more accurate goal-setting. Todd, Hammond and Wilkins (1966) found that full versus partial information feedback did not have a marked effect on the

reduction of conflict, but conflict was more likely to be resolved by compromise in the full information condition, whereas there was more capitulation in the partial information condition.

As for communication capability, several studies have shown that it appears to reduce each player's ambiguity about the other's intentions, and as a result, facilitates co-operation. This is the case, at least in terms of increased co-operation, in the Prisoner's Dilemma (Loomis, 1959; Scodel, Minas, Ratoosh & Lipetz, 1959; Swennson, 1967; Terhune, 1968; Voissem & Sistrunk, 1971), in a simulated arms race structurally similar to the PDG (Pilisuk, Winter, Chapman & Haas, 1967) and in a two-person non-zero-sum game involving the exchange of poker chips (Daniels, 1967). Wichman (1970) varied communication across four levels in a modified PD game (subjects could neither see nor hear one another, subjects could see but not hear each other, subjects could hear but not see each other, subjects could both hear and see each other) and found that co-operation increased across these levels. He concluded that the high level of competitiveness typically observed in the PD game may be a function of the isolation imposed on the subjects. But in regard to simply seeing one another, other studies have found no effect (Alcock & Carment, 1969; McClintock, Nuttin & McNeel, 1970).

Deutsch (1958) found that co-operation was fostered by communication only when the instructions provided an

"individualistic" orientation. Since most studies use this kind of orientation, this finding does not differ from those already discussed.

Nemeth (1970) suggested that the higher level of co-operation usually found in multi-choice games is due to the fact that the wider range of choices available to each player allows them to better signal their intentions to each other.

It has been shown that cumulative feedback leads to increased competitiveness in the Maximizing Differences game (Gallo, Irwin & Avery, 1966; McClintock & McNeel, 1966c), and in a triadic bargaining game (Vinacke, 1969). However, Tedeschi, Lesnick and Gahagan (1968) found that the presence or absence of cumulative feedback had no effect in a Prisoner's Dilemma game.

In summary, increases in information about each other's payoff structure, as well as increases in communication capability generally lead to increases in co-operativeness, likely brought about as a result of improving each player's perception of the other's intentions. Cumulative feedback in regard to one's own and the other's score increases competitiveness in some situations, quite possibly due to changes in the perceived demand characteristics (i.e. the players may assume that since the cumulative scores are presented, their behaviour should be based on these scores).

5) The effects of the instructions on motivation

Most game studies have used instructions that encourage

the players to consider only their own best interests, which is a hold-over from the game-theoretical concept of rational behaviour. Yet it is quite possible that such instructions may in fact determine the motivation and consequent behaviour of the players since, as Becker and McClintock (1967) have pointed out, the subjects may rely on the instructions to define what is to be considered rational behaviour in the situation. Nemeth (1970) extended this notion by arguing that an instructional set stressing self-interest tends to disengage norms of the larger society, such as social responsibility and reciprocity, from the experimental situation.

Several studies have deliberately varied the motivational orientation suggested by the instructions, generally comparing those that emphasize co-operation with those that stress either competition or individual self-interest. Deutsch (1958) used three such sets of instructions in a one-trial PD game. He also considered the presence or absence of pre-play communication. The results indicated that co-operative and competitive instructions led to increased co-operation and competition respectively, regardless of pre-play communication while the individualistic instructions led to co-operation in the pre-play communication condition and to competition when there was no such communication.

Mintz (1951), using a task in which subjects had to try to remove paper cones from a narrow-necked jar, found that

when subjects were told that they were competing against another group, they were able to co-ordinate their efforts and remove the cones. However, individualistic instructions resulted in uncoordinated action, and the cones became quickly jammed in the neck of the jar. Similar findings in terms of cooperativeness and competitiveness have been observed in the PD game (Kanouse & Wiest, 1967) and in another type of game (Crawford & Sidowski, 1964). Similarly, Willis and Joseph (1959), using a coordination game, found that competitive instructions fostered competition, but they reported no differences attributable to the co-operative and individualistic instructions. Vinacke (1969) concluded that the orientation given by the instructions affected triadic bargaining behaviour.

The only study that did not report such effects was one by Oskamp and Perlman (1965). However, they only labelled the responses in the PD game as "co-operative" or "competitive", and consequently the motivational impact of this might be expected to be minimal.

In summary, then, the motivational set engendered by the instructions plays an important role in determining the amount of co-operation that will be observed.

6) Pressures to reach agreement

In games in which players negotiate in an attempt to reach an agreement, it is of considerable interest to examine

the effects of pressures to reach agreement. Time plays an important role in real-life negotiations, especially in labour negotiations where contract expiries and the like impose time-limits. It is unfortunate that very little research has been done in this area. Komorita and Barnes (1969), in the context of a buyer-seller game, studied the effects of unilateral and bilateral pressure by imposing costs for each offer-counteroffer pair. In the bilateral condition this led to more concessions, as well as faster agreement. In the unilateral condition, however, the party with the handicap made more concessions and settled for a smaller share of the joint profit. It was also found that a firm bargaining strategy was only effective when the other party was under pressure to reach agreement. This is somewhat in contrast with Bartos' (1966) idea that concession-making as a strategy may be profitable only when the amount of time is considerably limited.

Pruitt and Drews (1969) used a similar paradigm except that the players in fact played against a programmed opponent, although they were led to believe that they were playing against each other. "Time pressure" was varied by ostensibly varying the probability that each trial would be the last. The results indicated that when this probability was presented as being high (i.e. high time pressure), the subjects' goals were lower, as were their levels of demand, and there was less

bluffing than in the condition in which this probability was presented as low. But this was for the first trial only. This kind of "time pressure" did not affect the rate of change in demands across trials.

Pruitt and Johnson (1970), in an experiment that involved two pairs of subjects and a "mediator" in a buyer-seller game, varied time-pressure by announcing at a certain point that either very little time was left to reach agreement (in which case a timer was set in motion), or that a lot of time remained. The subjects were not informed as to exactly how much time remained in either case and in fact negotiations were allowed to continue, in both conditions, until another fifteen trials had been used. More concessions were produced in the high time pressure condition. However, as the authors admitted, the initial stake of two dollars which could be kept in the case of no agreement was rather large in comparison to the additional winnings that would ordinarily result from a negotiated settlement. This may have reduced the motivation to reach agreement in either condition.

Bass (1966), using a game which similated labour-management negotiations, found that when deadlines were imposed by the experimenter, deadlocks occurred most often when the negotiators had been in strategy planning groups before negotiating as individuals. Deadlocks never occurred when individuals planned alone prior to negotiations.

In summary, "time pressure", although defined differently in each of the above experiments, generally led to greater concession rates. But the most realistic kind of time pressure, that of having a specified temporal deadline of some sort, has not been studied. This represents a serious lacuna in the literature, one on which this thesis attempts to focus attention.

B. Strategy as an independent variable

Even in a "simple " 2 x 2 matrix game, certain kinds of important information are obscured as a result of the concomitant variation of the behaviour of the two players. Since it is important to find out how subjects respond to a series of co-operative responses, for example, or to a conditionally co-operative strategy, it is necessary to use experimental situations in which only one player's behaviour varies freely. By simulating the behaviour of the other (through the use of a confederate or computer equipped with a prechosen strategy), it is possible to evaluate the effects of various strategies on the subject's behaviour.

A "strategy" is a plan of action containing instructions on what to do in every contingency (Shubik, 1964). The limited number of possible contingencies in two-person two-choice matrix games makes it relatively easy to construct strategies for these situations, and as a result, most of the strategy studies have used such games, usually the Prisoner's Dilemma game.

One type of strategy study involves a preprogrammed plan in which the simulated choices are randomized, but with one response occurring a fixed percentage of the time. For example, one might compare the behaviour of a subject faced with an opponent who makes a co-operative response ten per cent of the time with that of a subject whose opponent co-operates ninety per cent of the time. Vinacke (1969) concludes that such consistent procedures are generally unsuccessful in influencing the behaviour of the subjects. But it has been found that shifts in strategy during the game, at least in the PD game, are effective (Harford & Solomon, 1967; Sermat, 1967).

Dynamic strategies that take into account the real subject's behaviour have also been employed. An example of this is a delayed matching strategy in which the programmed opponent makes the same response on trial n+1 as the real subject made on trial n (e.g. Crumbaugh and Evans, 1967; Wilson, 1969). Some of these experiments have found increased co-operation as a result of such strategies, but in others there have been no significant effects.

Confederate strategies have also been used in the buyer-seller type of paradigm. The strategy usually consists of a particular opening offer and a predetermined concession rate. Generally, a tough strategy (extreme opening offer and infrequent concessions) has been found to be most successful in terms of getting the larger share of the joint payoff (Chertkoff & Conley, 1967). Komorita and Barnes (1969) found

the real subject's concession rate to be inversely proportional to the concession rate of the confederate, but Pruitt and Drews (1969) reported that the rate of change in demand was not affected by the confederate's concession rate.

Other researchers (e.g. Deutsch, Epstein, Canavan, & Gumpert, 1967; Shure, Meeker & Hansford, 1965) have studied the effects of "pacifist" strategies, "deterrent" strategies and so on. Since these are not directly relevant, they will not be discussed at this point.

In summary, it is evident that the manipulation of strategies is an important area of research, but, at the moment, very few clear findings have emerged.

C. Predispositional variables

A great many studies have been carried out in attempts to find significant correlations between predispositional variables and co-operativeness/competitiveness in games. A brief review of the major variables which have been examined follows.

1) Age

In a "tacit co-ordination" game, in which two players attempt to anticipate each other's responses in a multi-choice situation, Fry (1967) found that college students and eighth graders improved with successive partners, while fourth graders did not. Leventhal and Lane (1970) compared college students and pre-schoolers in a situation in which each subject had to divide a reward between himself and a fictitious partner, after

being informed that his performance on the task which led to the monetary reward was either superior or inferior to that of the partner. Subjects of college age took less than half the reward when they performed more poorly than their co-worker, but subjects of ages 5-1/2 - 6 did not. Subjects of both age groups took more than half the reward when their performance was superior. (There was also a sex difference which will be discussed later). The results suggested, according to the authors, that the manner in which people allocate rewards when they perform more poorly than their partner probably undergoes substantial change after the age of six, in contrast to the way individuals allocate rewards when they do better than their partners, which seems to stabilize at around age six. However, the absence of intermediate age groups makes this latter conclusion tentative.

Vinacke and Gullickson (1964) compared the behaviour of subjects from the age groups 7-8, 12-14, and college age and found that in a triadic coalition-formation situation, females were similarly accommodative at all three age levels, whereas males became steadily more exploitative with age. Sampson and Kardush (1965) found an age trend in the PD game, with older males being more collaborative, and older females less so.

McClintock and Nuttin (1969) using Belgian and American children, found that older children were more competitive than younger children in both cultures.

It appears, then, that age has an important effect, with the trend being toward more competitiveness, at least until adulthood.

2) Sex of subjects

The question of whether or not there are systematic differences in the way males and females behave in game situations has not been resolved, although it does seem that at least in some circumstances such differences do exist. But while many studies have found sex differences, others have found none. Studies in which differences have been found often show females to be more competitive or exploitative (co-ordination task: Marwell, Schmitt & Shotola, 1970; PDG: Bixenstine, Chambers & Wilson, 1964; Oskamp & Perlman, 1965; Rapoport & Chammah, 1965b; Swingle, 1970), while other studies have shown the opposite effect (PDG: Fisher & Smith, 1969; Lindskold & Tedeschi, 1971; Tedeschi, Bonoma & Novinson, 1970; Triads: Vinacke and Gullickson, 1964). Yet other studies have reported no differences at all (Buyer-Seller game: Alcock & Carment, 1969; Tacit co-ordination game: Fry, 1967; PDG: Kanouse & Wiest, 1967; Miller, 1967). Benton (1971) found that with children in a reward-dividing situation, females agreed to an equity solution more often than males, and Tedeschi, Hiester, Lesnick and Gahagan (1968) found that females exhibit more trusting behaviour than males in a PDG. Levanthal and Lane (1970), in the previously mentioned study, found that, whereas males pursued equity to the extent that they took more than

half the reward when their performance was superior and less than half when their performance was inferior, females took approximately half the reward when their performance was superior and much less than half when their performance was inferior. Sibley, Senn and Epanchin (1968) found that white female American adolescents were more co-operative than white males, but no differences were found for black Americans. Thus, the data as a whole appear somewhat equivocal. Part of this may be due to the fact that different situations were used in the various studies. For example, Rapoport (1964) points out that females in the PD game begin more co-operatively than males initially, and tend to become more defensive in later trials. Tedeschi et al (1968), in the study mentioned above, used only 50 trials, and they themselves pointed out that had they used a larger number of trials, they may have overcome the discrepancy between their findings and those of Rapoport and Chammah (1965b). Since different game situations may differ considerably in terms of the demand characteristics, amount of risk, and so on, it may be possible to explain the seeming contradictions in terms of situational variables. Kogan and Wallach (1964) for example, suggested that females may be less inclined toward risk-taking, while Pilisuk, Skolnick and Overstreet (1968) reported that, in the context of a simulated arm race, females were not different from males in terms of co-operation, but they were less accurate in their prediction of the other's behaviour and less sensitive to the other's strategy.

Halpin and Pilisuk (1970) found that in a PD game which involved predicting the other's responses as well as making one's own, females were more co-operative than males. They suggested that this was because females were less able to find or maintain optimal strategies for maximizing their own rewards. Tedeschi, Bonoma and Novinson (1970) found that females sent and carried out fewer threats than males in a threat game and suggested that females are less concerned with winning when message cues are available to indicate that the desirable response is to co-operate and are more concerned with "presentation of self" than are males. In the same vein, Vinacke (1969) suggested that females may be generally more compliant and are more concerned with satisfying the experimenter than are males. Thus,if the demand characteristics of a game seem to call for "competition", females might act competitively in order to "co-operate" with the experimenter.

Phillips and Cole (1970) contend that, at least in the context of coalition-formation situations, males adopt a "play to win" strategy while females strive to "avoid loss". But the attempt to account experimentally for sex differences in terms of a "need hierarchy" was unsuccessful (Phillips, Aronoff & Messé, 1971). Kahn, Hottes and Davis (1971) adduced evidence which suggests that males and females do not have differential motives to co-operate, but that they do respond to different cues.

In a review of the literature, Tedeschi (1970) concluded that sex differences across experiments consistently indicate that females are more responsive to cues to co-operate than are males, while Terhune (1970) summarizes his review of sex differences by emphasizing the nature of the bargaining task. If the task is one which involves strategic coping (such as the PDG), females are less likely than males to recognize the optimal strategy and generally are less co-operative than males in such situations. However, in situations where straightforward conflict of interest is involved, women are more accommodative and tend to be more generous than males. But if "crossed" by the other, women respond with greater retaliation and more apparent vindictiveness than do males.

Thus, it seems evident that the nature of the task is very important in determining what kind and what degree of a sex difference in behaviour will be observed.

3) Affect between subjects

In most experimental game situations, the players have no information about each other at all. However, a few studies have focused on the effects of the relationship (pre-existing, or manipulated) between the subjects on their behaviour in the game situation. The simplest dimension in this respect is simply whether or not one subject even sees the other before the experiment. Oskamp and Perlman (1965) using a PD game found more co-operation when subjects were allowed to meet before the experiment. They used students from a large

university as well as from a small college. Small college non-psychology majors were more co-operative in the anonymous condition. Degree of friendship between subjects had no effect on co-operation. In another study (Oskamp & Perlman, 1966), sociometric ratings were used as a basis for choosing subjects. At one college (a liberal arts college), co-operation varied positively with degree of friendship, whereas at another college (one that emphasizes business and politics), friends were more competitive than non-friends. McClintock, Nuttin and McNeel (1970) found that "strangers" play to maximize the difference more than do non-friends, who do so more than friends. Swingle (1966) reported that an unco-operative partner resulted in a reduction in a subject's level of co-operativeness when the partner was liked or unknown, but the initial level of co-operativeness was maintained when the partner was disliked. Swingle suggested that this supports a cognitive congruity model of social interaction since one might expect someone viewed negatively to act negatively. Kaufman's (1967) findings supported this idea. Swingle and Gillis (1968) exposed subjects in a PD game to either a 95% co-operative or 5% co-operative strategy attributed to a partner for whom they had indicated either liking, disliking, or no specified relationship. After fifty trials, the strategy abruptly shifted to either 5% or 95% co-operativeness respectively. The subjects were found to be initially more co-operative when playing against a liked partner, and also to be more influenced by a liked partner's strategy changes.

Tornatzky and Geiwitz (1968) reported that dyads of high mutual attraction were more co-operative in a PDG than those of low attraction, and high attraction dyads tended to increase their co-operation across trials, while the low attraction dyads tended to decrease their. (This is consistent with the usual finding in PD games, which generally use un-acquainted subjects). Fisher and Smith (1969) found similar results in a PD game. Both of these studies induced high attraction between strangers by making each think that the other's responses to a questionnaire were very similar to his own. Fisher and Smith suggest that pre-existing friendships quite likely include co-operation-relevant norms which would affect game behaviour. From the same point of view, Schoeninger and Wood (1969) used married and ad hoc dyads in a mixed-motive game and found that the married dyads tended to be more co-operative. They suggested that a common history of problem-solving as well as a mutual interest in the joint reward accounted for the married dyads' co-operation.

Thus, it seems that affect and co-operation are positively correlated in most game situations.

4) Personality and attitude measures

Many studies have been carried out in hopes of finding significant relationships between a subject's scores on various personality and attitude scales and his behaviour in a game situation. Terhune (1970), in an extensive review of such studies, lists twenty such scales for which relationships with

game behaviour have been found. These studies suggest that a competitive player, insofar as his competitiveness stems from predispositional variables, will tend toward being authoritarian (Deutsch, 1960; Kelley & Stahelski, 1970), and dogmatic (Druckman, 1967), as well as scoring high on the MMPI dominance scale (Sermat, 1968), appearing isolationist on Lutzker's Internationalism scale (Lutzker, 1960, 1961; McClintock, Harrison, Strand, & Gallo, 1963) and holding "unfavourable" attitudes about human nature (Wrightsman, 1966).

It is noteworthy that risk-taking propensity appears to have little or no relationship to game behaviour (Dolbear & Lave, 1966; Harnett, Cummings & Hughes, 1968).

Wrightsman (1966) concludes that only such variables that are conceptually quite similar to game behaviour, such as scores on the "philosophies of human nature" scale, are significantly related to game behaviour.

Terhune (1970) suggests that unless special measures are taken, such as using one-trial games, confederates, or subjects from known groups, it is quite likely that personality will exert only a minor influence in game behaviour, since not only do the structural and situational constraints of the game limit such influences, but also the behaviour of the other player, which acts as a stimulus for each player, will tend to mask personality effects. The findings by Rapoport and Chammah (1965a) that players in continual interaction in a PD game come to behave alike after many trials supports this contention.

5) Other predispositional variables

Other studies have considered the effects of variables such as family background, previous experience, and so on. Crowne (1966) compared subjects whose parents were classed as "entrepreneurial" with others whose parents were classed as "bureaucratic". The classification was based on occupation. The "entrepreneurs", who might be expected to be more achievement oriented, were more co-operative than the "bureaucrats" in a PD game. Furthermore, entrepreneurial females were more competitive than entrepreneurial males, but no sex differences occurred with the bureaucrats.

Johnson and Cohen (1967) found that even career-aspiration has a relationship to game behaviour. Theology students, for example, acted in a "cut-throat" manner in the game, while business students were co-operative, perhaps indicating that the perception of the possibilities of tacit or spontaneous collusion is a crucial variable.

Finally, past game experience has been examined as a variable. Druckman (1967, 1968) found that pre-negotiation experience facilitated conflict resolution if the experience was that of unstructured discussion between the parties; however, discussion of specific strategies led to increased resistance to resolution. Conrath (1970) found that subjects who had once previously taken part in a PD game were more co-operative than naive subjects in a multi-choice game that involved written communication. Harrison and McClintock (1965) found

that dyads that had been rewarded in a reaction-time game were more co-operative in a PD game than dyads that endured losses in the reaction-time game and that this effect persevered over time.

D. Cross-cultural studies

Although various prominent researchers such as Deutsch (1961), Rapoport (1968) and Pepitone (1971), among others, have noted the importance of culturally-determined variables in game behaviour and the need for cross-cultural research, there has been a serious dearth of cross-cultural experimentation. Of the dozen or so such studies that have been done, almost all of them used the United States and a Western European country as the sources of the two cultures. In addition, a few studies have studied sub-cultures, e.g. comparisons between black and white Americans (Sampson & Kardush, 1965; Sibley, Senn & Epanchin, 1968; Lefcourt & Ladwig, 1965), between Americans of Caucasian or Oriental race (Bartos, 1967a), and between French and English Canadians (Swingle, 1969). Only two studies, one using Israeli and American students (Raven & Leff, 1965), and another which was carried out in Mexico (White,1964) dealt with cultures that might possibly be expected to vary considerably from ours. The Israelis were members of Kibbutzim and although half of them came from an extremely socialistic Kibbutz and the rest from one markedly less so, this factor made no difference to their behaviour. Both groups were more competitive than American Zionist youth who were working in

Israel. (The Mexican study can be completely ignored, except as an example of naïveté and ineptness). The research carried out in Europe does not on the whole indicate very great differences in game behaviour from what is observed in North America. However, McClintock and McNeel (1966a), using a Maximizing Differences game, found cross-cultural differences in motivational orientation. Belgian students were more competitive than Americans. A later study (McClintock & Nuttin, 1969) compared U.S. and Belgian children of various age groups, again using a Maximizing Differences game. Young American children (second grade) were found to be more competitive than young Belgians, but by sixth grade they were equally competitive. Older children were more competitive than younger children in both cultures. Thus, the Belgian children increased in competitiveness more than did the American children over the span of four years.

Rapoport, Guyer and Gordon (1971) compared the behaviour of Danish and American students in a threat game and found that, when given the "underdog" role, Danes were more submissive than Americans, but when in the "top dog" role, the Americans were more fair than Danes.

Kelley, Shure, et al (1970) carried out a study of bargaining behaviour at three sites in Europe and five sites in the United States. The results indicated that different meanings were given to the dimension of co-operation versus competition at different sites. At some sites, this dimension was given an "evaluation" meaning - "good" versus "bad" while

at other sites it was given a "dynamism" meaning - "weak and passive" versus "strong and active". But there were no distinct differences between cultures. That is, differences between sites existed within each culture. Pepitone, Maderna, Caporicci, Tiberi, Iacono, di Majo, Perfetto, Asprea, Villone, Fua and Tonucci (1970) used a PD game to study the role of "justice" with American and Italian students. In this study, an initial recompense was given to one member of the dyad, either arbitrarily (the "unjust" case) or as the apparent result of merit test (the "just" case). Then, the players played the PD game, but each received preprogrammed feedback instead of the other's actual choices. In the unjust condition, both the American and Italian males reacted as though the initial distribution was unfair; their choices in the game reflected a desire for "equity", that is, the initially non-rewarded subject acted to maximize his own gain more than the other subject. However, when the merit test was used, the Italians reacted quite differently than Americans. The Italians reacted in the same way they did to the unjust situation, whereas the Americans maintained the inequality created by the initial recompense.

This is virtually a complete review of the cross-cultural literature on game behaviour. Since some differences were detected between the United States and Europe, one might expect to find even greater differences with two more disparate cultural settings such as Canada and India, the two sources of subjects for the research to be reported in this thesis.

E. Criticisms of game research

More serious than the suggestion that much of the game research literature concerns variables of a picayune nature is the growing concern in some quarters that the behaviour observed in game situations has little to do with real-life behaviour. And since the PD game has been the most popular paradigm, it receives the bulk of the criticism. It is important to review these criticisms in order to more properly evaluate the paradigm and research reported in this thesis.

A major criticism concerns the highly unusual social situation that exists in most game situations. The players are generally strangers and often do not even see each other. In games such as the Prisoner's Dilemma where moves are made simultaneously, there is not even any communication between the players, except in terms of feedback. Marlowe, Gergen and Doob (1966) have shown that such a minor change as leading the subjects to expect further social interaction after the game results in more co-operation in the Prisoner's Dilemma. This suggests that the relative social vacuum which exists in such games is too rarefied, and mitigates against their usefulness as tools for studying interpersonal interactions.

Sermat (1970) studied the same subjects in different mixed-motive games, and concluded that the competitive or co-operative behaviour of an individual in such games is largely situation-specific. He also observed the same subjects in a group discussion concerning the interpretation of some ambiguous

photographs to see whether or not there was any relationship between the way subjects behaved in the game milieu and their way of interacting with others in other situations. The results, though somewhat ambiguous, led him to express discouragement toward the prospect of relating differences in game strategies to gross behavioural differences in other interpersonal situations. He suggests that it would likely be more fruitful to concentrate on demonstrating the generality of mixed-motive game strategies across relatively similar situations while varying only one or a few variables at a time. He adds that unless empirical evidence is forthcoming in regard to the relationship between laboratory games and other situations, the theoretical contribution of game research may have to be stated in terms other than its relevance to interpersonal behaviour in real-life situations.

Alexander and Weil (1969) suggested that the ambiguous goal structure of the PD game leads players to create favourable "identities" (i.e. to behave as good "players" or as good "persons"). When the game task does not provide criteria for determining choices in a meaningful way, the "good subject" who desires to act acceptably, intelligently and rationally is forced to look outside the formally defined task. These authors recommend experimental attention to the meanings subjects attach to the experimental situation:

> "If we pursue the questions of situational meaning . . ., we may discover that people inside and outside the laboratory are responding primarily to the meanings they believe others will attach to their behaviors (p. 141)."

Kahn, Hottes and Davis (1971) take issue with the definition of a "co-operative response" in the PD game. While co-operation usually refers to fairness, equality and sharing, they argue, it refers simply to one of two response choices in the PD game. They suggest that contradictory findings between certain PD studies and experiments involving different paradigms may hinge on the definition of co-operation.

Edwards (1961) argued that it is the absence of communication in the PD game that prevents the equity-seeking motive from operating effectively:

> ". . . people import into bargaining situations a strong desire for equity. Equity-seeking is promoted by effective and free communication and seriously hindered or prevented by severely restricted communication (p. 88)."

By far the most aggressive challenges to the worth of experimental games come from Nemeth (1970)and Knox and Douglas (1971). Nemeth expresses concern that the failure of attempts to raise the level of co-operation in 2 x 2 matrix games by programming one player's play as co-operative suggests an apparent contradiction of the norm of reciprocity, which is postulated as a universal norm.[6] He argues that the apparent contradiction arises, not from a failure of the norm, but because the paradigms usually used in the study of co-operation

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[6]. For a discussion of the norm of reciprocity, see Gouldner (1960).

and competition have variables associated with them that reduce reciprocity and altruism. He makes the following points, for which he marshalls empirical support from the literature.

1) To the extent that the subject cannot be certain of the outcomes of his actions, either for himself or the other person, he may be less inclined to act co-operatively out of a desire to help or return benefits to the other person.

2) Most studies emphasize winning, and instructions usually suggest not taking into account the welfare of the other player. Thus, even if a player felt obligated to co-operate on the basis of reciprocity, he might not do so since it would defy the rules as set out by the experimenter.

3) While the data are weak, real money, as opposed to points, operates in the direction of increasing co-operation.

4) The fact that subjects typically have no specified relationship to one another appears to contribute to fostering competition rather than co-operation and reciprocity.

5) The partner's motives for making a co-operative response in the PD game are quite ambiguous. Not only may co-operation be seen as stemming from a desire to help or co-operate, but it may in fact be interpreted as a strategy on the part of the other person to exploit the subject. Since the possibility of an ulterior motive is present, subjects may not feel it necessary to reciprocate co-operation.

6) The absence of communication in the PD game is a significant factor in increasing competition, since it heightens

the ambiguity already surrounding the partner's intentions.

Knox and Douglas (1971) found that players in a PD game showed no more co-operation, on the average, when playing for dollars than when playing for pennies. But the variability was greater in the high incentive case, as a result of higher amounts of co-operation by some dyads and lower amounts by others. The authors concluded that this indicates that generalizations from PD games using trivial incentives should be limited to parlour games in which players only play to win. Such a strong conclusion is hardly justified by the data.

Kee and Knox (1970) also expressed concern about the meaningfulness of the payoffs in the PD game, and they also contended that acts involving trust and suspicion are usually sequential in nature. They repeated the point that Nemeth made about ambiguity of the motives behind a co-operative response and suggest that games should be used that have sequential moves to reduce this problem.

A reassuring note is sounded by Kelley and Stahelski (1970). Their research, they conclude, provides indirect support for a psychological continuity between the social relationships created in game situations and certain important relationships that the subjects experience in real life. The subjects approach a game, such as the PD game, not in an arbitrary way, they say, but with the orientation (but not necessarily the corresponding behaviour), that they tend to adopt in all such relationships. This argument, they suggest,

> "casts game research in a strong role as a means of discovering and investigating individual dispositions in relation to social life (p. 86)."

Most of the above criticism has been directed at the PD game and other 2 x 2 matrix games. This provides an important incentive for investigating paradigms that are possibly more similar to real-life interaction. The paradigm used in the research to be reported here avoids many of the above criticisms. Following a description of this paradigm in the next chapter, we will briefly review it with respect to the foregoing discussion.

CHAPTER III

METHODOLOGY

The experiments to be reported here used a two-person bargaining situation as a tool for examining dyadic conflict resolution. In considering the paradigm, one should not be misled into thinking that the primary concern of the research is to shed light on institutionalized bargaining processes in the real world, for the situation employed is quite different from real bargaining situations. The main emphasis is on the way in which persons ("players") resolve, or fail to resolve, their conflict-of-interest. They must co-operate to avoid mutual loss, yet they will find themselves in competition if they try to maximize their individual gains. (This contains the essence of many real-life conflict situations).

Prior to carrying out this research, the author conducted some studies using a slightly modified version of the classic buyer-seller paradigm of Siegel and Fouraker (1960). In this paradigm, one player, assigned the role of "seller", attempted to sell a hypothetical commodity to the other player, the "buyer". Depending on the agreed transaction price, each player received profits just as he would in the analogous real-life bilateral monopoly situation (i.e. the situation in which each party could deal only with the other

or not deal at all). Only price was negotiated. Although some interesting results were obtained (Alcock and Carment, 1969), this paradigm was abandoned. The fundamental asymmetry of the roles of buyer and seller and the finding that the final agreement was not different, in a statistical sense, from a point midway between the two opening demands forced consideration of other more versatile kinds of situations.

The paradigm subsequently adopted will be discussed in detail in the next section. Briefly, the game chosen is somewhat similar (at least in terms of payoff structure) to a game used by Joseph and Willis (1963). Two players communicate via written notes in attempts to agree on the selection of one of a number of possible payoff alternatives. This is repeated several times, giving rise to the possibility of systematic alternation of outcomes across the various repetitions. The possibility of deadlock (no agreement) is also present. Either player, or in some cases the experimenter, can initiate a time-limit at the end of which "deadlock" will occur if agreement has not been reached.

Whereas in a typical "buyer-seller" bargaining game, a wide range of possible outcomes is available, the number of possible outcomes was limited to five in this game. The payoff structure was symmetrical vis-a-vis the two players (i.e. both players had the same payoff structure). However, unlike buyer-seller games which use a "linear" (i.e. constant-sum) payoff structure, a non-linear (i.e. non-constant-sum) payoff

structure was employed. Examples of five-alternative linear and non-linear payoff structures are shown in Figure 2.

Insert Figure 2 about here

The joint payoffs for all alternatives in a symmetrical linear payoff structure are equal, thus the only need for co-operation is to reach agreement. That is, if the game is played several times, no particular alternatives or series of alternatives will increase or decrease the total joint profit above that given by any other series of alternatives. So, although the players may compete in order to try to maximize their own gain, the one element of co-operation is to reach agreement.

With a non-linear symmetric payoff structure (Figure 2(b)), on the other hand, over a series of repetitions of the game some alternatives or series of alternatives give rise to a larger total joint payoff than others. This allows for co-operation not only in reaching <u>any</u> agreement, but also in trying to maximize the joint profit of the dyad (while, of course, each individual may attempt to maximize his own payoffs, or maximize his "dominance" in terms of larger payoff than the other). Due to the symmetry of the structure, for each alternative which divides a joint payoff in favour of one player, there is another alternative which, while providing the same joint payoff, will divide it in such a way as to favour the other by an equal amount.

The payoff structure in Figure 2(b) contains an alternative (No. 3) that provides an equal division of the joint profits, but at the same time provides the smallest

		Alternative Outcomes				
		1	2	3	4	5
(a)	Player one's payoffs:	0	15	30	45	60
	Player two's payoffs:	60	45	30	15	0

		Alternative Outcomes				
		1	2	3	4	5
(b)	Player one's payoffs:	0	10	20	40	70
	Player two's payoffs:	70	40	20	10	0

Figure 2: Examples of symmetric payoff structures
(a) linear; (b) non-linear.

joint profit of any of the five alternatives. If the players thought that they would be playing the game only once, it would be "rational" for the two players to agree on the central alternative which gives them each an equal number of points. However, the real interest lies in the repetition of the game a number of times. Then the optimal strategy for maximizing the joint gain (while at the same time equally dividing it) is to alternate between the two extremes (alternatives 1 and 5). But to accomplish this, one player must first accept an alternative that provides zero for himself and a maximum payoff for the other. He must "trust" the other to reciprocate if he wishes to share equally in the total joint payoff. But the other's motivation to equally divide the joint gain (if indeed he had had that motivation) might be weakened once he is "ahead" by a considerable amount. Thus, each player would likely approach alternation between the extremes with caution. Besides being unsure of the other's intentions, a player also cannot be sure that the other is aware of the advantages of the alternation strategy. If the opponent were not cognizant of this strategy, one might run the risk of appearing weak, thus perhaps increasing the other's attempts to be exploitative.

The payoff structure in Figure 3 involves another

Insert Figure 3 about here

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feature of interest. The intermediate alternatives, with joint

	Alternative Outcomes				
	1	2	3	4	5
Player one's payoffs:	0	20	20	35	65
Player two's payoffs:	65	35	20	20	0

Figure 3. Example of a payoff structure

payoffs of fifty-five points, provide a means to observe whether or not a player is disinterested in the other's payoffs. If a player is concerned only about his own gain, he should be indifferent to a choice between the central alternative and the one that gives him twenty and the other thirty-five points, since he gets twenty points either way. This feature also allows the players a way to attempt to communicate the idea of alternation without risking a loss, and also without letting the other get far ahead in points.

In any game, the number of repetitions to be played is important, since the players' strategies are likely to take it into account. In some of the pilot studies to be reported here, only ten repetitions were run, but for the main studies, twenty-one were run with only the first twenty being used in the main data analysis. The last session (i.e. twenty-first) is not included in the data analysis since, as Luce and Raiffa (1957) pointed out, the last session often has its own strategy and deserves to be analysed separately. Bixenstine, Potash and Wilson (1963) note that since no retaliatory responses can be made after the last session, one would expect that if the subjects had been co-operating due to external controls inherent in the situation, they would revert to competitive behaviour on the final session.

A. Subjects and experimenters

The Canadian subjects were male and female first year students at McMaster University. They were selected at random

from the student directory and contacted by telephone and asked to participate. Since participation was forthcoming in virtually every instance, volunteer effects were not a problem. The students were not used in the experiments if they had already taken part in other social psychological experiments. As the result of a pilot study that showed that engineering students act very differently than other students in the game situation used here, engineers were not asked to participate.

In India, the subjects, all of whom were students of ages comparable to those used in Canada, were drawn from three sources, all in the New Delhi area:

Deshbandhu College

Hastinapur College

Ram Lal Anand College

These institutions are secular, co-educational colleges, and both English and Hindi are used in instruction. All are constituent colleges of the University of Delhi.

Since experimental psychology is virtually non-existent in India, all students were experimentally naive beyond question. The subjects were selected through the office of the principal of the institution involved, with the assurance on his part that the selection would be random. To the best of our knowledge, this requirement was met. Students from different classes or different years were used in each dyad to minimize the possibility of familiarity in the instances where it was not always possible to prevent

the subjects from seeing each other as they came to the experimental room. It was impossible to have females come separately to the experimental room, as was done with males in most cases, due to the shyness of the female students.

Students in these schools represented all the major religions, but the vast majority of students were Hindu, (93% of the subjects were Hindu, 6% were Sikh, and 1% were of other religions). There was representation of all the major castes, and this added another important reason for attempting to prevent the subjects from seeing each other beforehand.

In Canada, the author was generally the experimenter. To minimize the fact that the experiments in India were being carried out by foreigners, an Indian experimenter, who remained ignorant of the experimental hypotheses and so on, was used exclusively. A second Indian experimenter was used from time to time and this allowed the author to ensure that the usual experimenter was not systematically affecting the results in some way.

B. Apparatus

The experimental equipment consisted of a set of portable table-top cubicles which shared a common wall, and a pair of "subject consoles" electrically connected to a "control console" (Figure 4). A sliding tray mounted in the

Insert Figure 4 about here

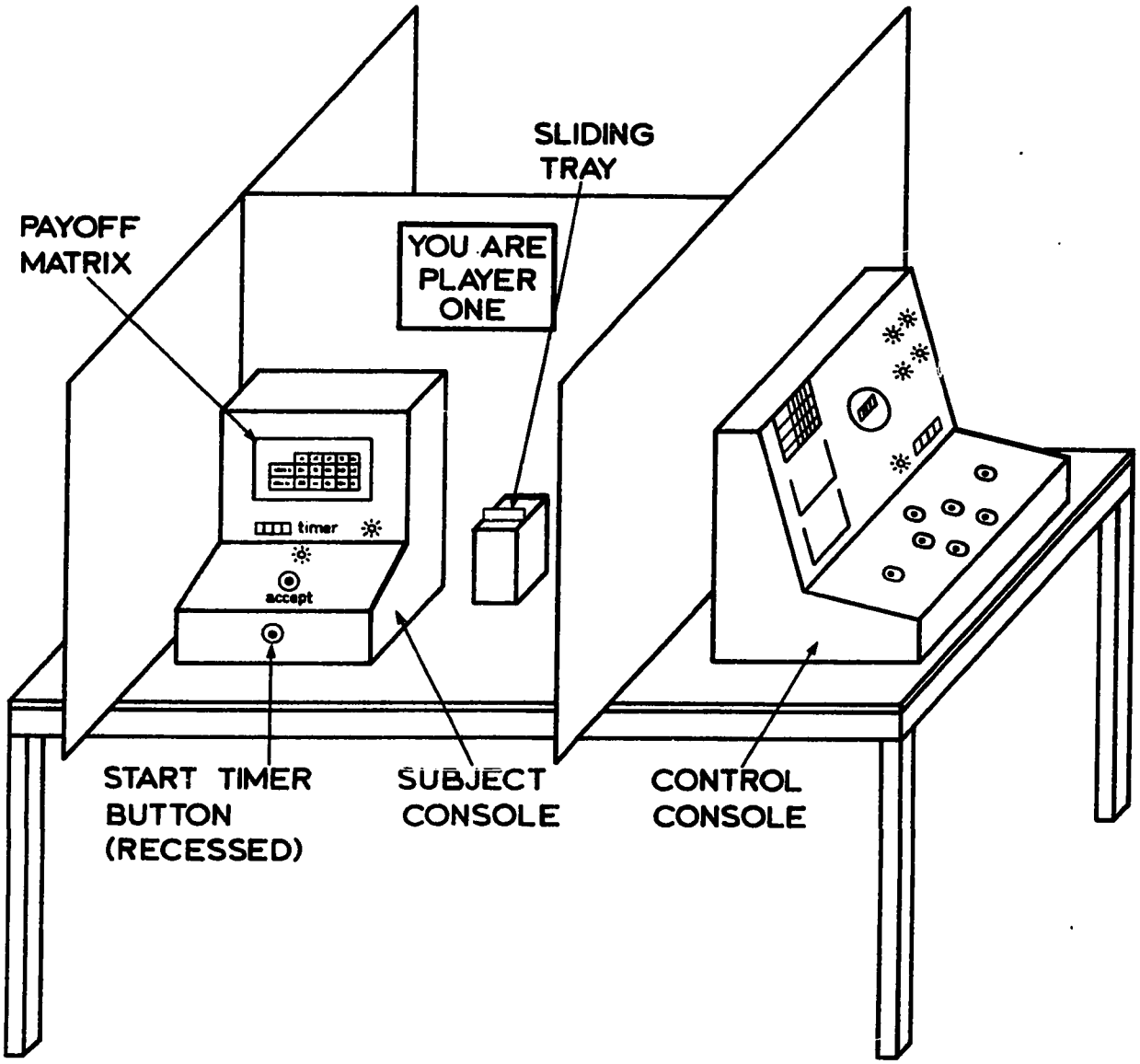

Figure 4: Apparatus.

wall between the cubicles provided a way to pass small slips of paper between the cubicles without allowing the subjects to see each other. (In the studies carried out in India, a narrow slot served in place of the tray. It was one inch above the table, and it was impossible for either subject to observe the other or the other's actions through it).

Each subject console provided a slot for mounting a five inch by eight inch file card upon which the payoff matrix was printed, a button labelled "ACCEPT", a recessed button labelled "START TIMER" which could be concealed, a four-figure digital counter, a red light and a yellow light. The control console contained a similar counter, various control switches and four lights each of which would light up whenever one of the four subject console buttons corresponding to it was depressed.

Depression of one of the "START TIMER" button would activate a timer circuit which caused the counter on each console to count once per second. Simultaneously, the yellow light on each console would blink once per second. This light, plus the loud click made each time the counters moved, served to draw attention to the fact that the time-circuit was in operation. The timer circuit could also be initiated from the control console.

The timer circuit could be switched off by the depression of either subject's "ACCEPT" button, or by a button on the control console. The counters could be electrically reset from the control console. Depression of the "ACCEPT" switch

by a subject caused the red light to come on in each cubicle. These lights could be reset from the control console.

The height of the cubicles was such that when placed on a standard-sized table, the top of the cubicles was six feet from the floor, thus preventing subjects from seeing each other even if standing. The sides of the cubicles extended three feet each way from the interface, so that the subjects, when seated at the table, could not see outside the cubicle unless they looked directly behind themselves. Since the control console and the experimenter remained to one side of the cubicles, they could not be observed by the subjects during the experiment.

Each cubicle bore a large sign on the centre wall stating either "You are Player One" or "You are Player Two" respectively.

C. Procedure

The experiments were always carried out in a room from which all people except the subjects and the experimenter were excluded and in which external noise was insignificant. (In India, such a setting was sometimes obtained only with difficulty, but it was always obtained). Subjects arrived one at a time (unless otherwise indicated in the description of the individual experiments) and the first to arrive was seated in the cubicle away from the door. The next subject could then be seated without either subject seeing the other. (In the Canadian studies, subjects never saw each other before,

during, or after the experiment. In the Indian studies, however, subjects in about twenty percent of the dyads saw each other while entering the experimental room. Despite a considerable effort to avoid such occurrences, they could not be entirely eliminated. However, such dyads were distributed approximately evenly across experimental conditions). The control console was on the side of the cubicle away from the door so that subjects were not able to see it as they came in and sat down. When the subjects were seated, each was given a set of instructions and a "point record sheet" (see Appendices A and B) which was to be used to keep track of points. At the same time, a payoff matrix (Figure 5) was mounted in each cubicle. The payoff matrix for each player was such that his own payoffs were on the top line.

Insert Figure 5 about here

The subjects were instructed to read the instructions carefully and to remain silent. When the subjects had read the instructions, the experimenter read the instructions aloud, asking the subjects to follow along with him and then the experimenter went through a "probe" routine which involved asking a series of questions (Appendix C) about the instructions. The questions were directed alternately to one or the other of the subjects. They answered verbally.

When it was clear that the subjects understood the procedure, the experimenter asked if there were any questions

		A	B	C	D	E
(a)	Your points (Player One)	0	20	20	35	65
	Other's points (Player Two)	65	35	20	20	0

		A	B	C	D	E
(b)	Your points (Player Two)	65	35	20	20	0
	Other's points (Player One)	0	20	20	35	65

Figure 5. Payoff matrices used in the control conditions a) As seen by Player One; b) As seen by Player Two.

and if there were, answered them by reading aloud the appropriate part of the instructions. The instructions made the following points about the methodology:

1) The aim was for the two persons to agree on the selection of one of five alternatives labelled A, B, C, D, and E (see Figure 5) corresponding to the five possible outcomes shown on the payoff matrix. Each outcome would result in specific numbers of points for each person.

2) Negotiation was to be carried out by writing the letter of the alternative one proposed on a special slip of paper (called a "demand slip") and by passing the slip via the sliding tray to the other cubicle. The other person could either agree to the selection of that alternative, in which case he would depress his "ACCEPT" switch, thus ending the "session", or he could make a counter-proposal by striking out the other's demand, writing in his own demand beside it, and passing the slip back to the other, who now could accept or make another proposal, etc.

3) The only limit on the amount of negotiation was a time-limit of two minutes. The counter in each cubicle would begin at the start of each session and would count once per second. If no agreement had occurred by the time the counter reached 120, the session would end in "deadlock" and neither player would get any points for that session. (In some experimental conditions, the instructions stated that there was no time-limit at all, unless either person decided to instigate one by pressing the "start timer" button. Except for such conditions,

the "start timer" buttons were concealed).

4) There would be 21 consecutive sessions.

5) Each point a player accumulated would be worth an unspecified amount of money to him after the last session. This would be his only payment for participation. Therefore, it was in the player's interest to make as many points as possible.

6) Players were to keep track of their own and the other's points on the point record sheet.

(Except for the use of the terms "players", "Player One" and "Player Two", words such as "game" or "opponent" were avoided. The use of the term "player" is unfortunate; it was originally chosen on the basis of certain experiments reported in the literature (e.g. McClintock & McNeel, 1966a) which used the term (while at the same time those authors maintained that the instructions suggested neither co-operation nor competition), and once it had been used in some of the studies, it had to be continued in order not to introduce possible variability). Once each subject expressed satisfaction with his understanding of the instructions, the experimenter withdrew so that he could not be seen by either subject. He announced at the beginning of each session which player was to begin the session. (Player 1 always started the first session; commencement of succeeding sessions alternated between the players).

The experimenter would then say "You may now begin" and except in those conditions in which the experimenter did not start the time-limit, he started the timing-circuit.

At the end of each session, the experimenter asked the subject who ended up with the demand slip to pass it to him; (this was done without face-to-face contact between subject and experimenter; the subject was seated in such a way that by holding out the demand slip the experimenter could easily take it without the subject seeing him. Thus, the possibility of visual cues from the experimenter was eliminated. This is important since visual interaction between the experimenter and the subjects can be an unplanned means of reinforcement (Gallo & Dale, 1968)). The experimenter then recorded the relevant data, reset the circuits and announced who was to start the next session. The inter-session interval was 15 to 20 seconds, quite adequate for the subjects to fill in their point record sheets.

Before the last session, the experimenter announced that it was the last session.

After the last session, the subjects totalled up their points, filled out a questionnaire and then were paid. Before leaving, their assurances that they would not discuss the experiment with other students were elicited. In the Canadian situation, subjects left one at a time and thus never saw each other at all. This was not always the case in the Indian studies but it was maintained whenever payoff matrix deception made it important that subjects did not compare their experiences with each other.

A brief "play by play" description of how the game might typically be played is given in Appendix D. It is

included as an aid to visualizing the dynamics of the game.

D. Response measures

The experimental situation allows not only for the determination of the final decision in each session, but also for the analysis of the negotiation process that led up to that outcome. The demand slips provide a complete record of all communication, and since players are given pens of different colours and are instructed to enter their demands in an orderly manner on the slips, it is an easy matter to follow the order to these demands. Thus, some response measures reflect the negotiation process, while others refer to the outcomes.

The major response measures used in this research are as follows:

1) joint payoff (JP) - this is the sum of the points realized by Player One and the points realized by Player Two.

2) difference in payoff (ΔP) - this refers to the absolute value of the difference in points obtained by each of the two players.

3) number of demands to agreement (DTA) - this is the total number of demands made in a session ending in agreement. The act of "accepting" is not treated as a demand for this measure.

4) number of seconds to agreement (STA) - this refers to the time taken to reach agreement.

5) outcomes - the labels α, β, γ, and δ refer to the outcomes of a given session. α refers to an A or E alternative, β to a B

or D, and γ to a C. δ is the label used to indicate deadlock. A frequency distribution of these outcomes provides an important means of comparing dyads.

6) reciprocation - this term refers to a pair of successive outcomes in which a non (γ,δ) outcome is followed by the outcome symmetric with it in the payoff matrix. The term "α-recip" is a pair of opposite α-outcomes. Further elaboration of this measure is given in Appendix E.

7) asymmetry - the term α-asymmetry refers to the difference between the number of A outcomes and the number of E outcomes over a given number of sessions. Similarly, β-asymmetry refers to the difference in numbers of B-outcomes and D-outcomes. (only the absolute value of the difference is used).

8) number of last ten second agreements (LTSA) - this is an arbitrary measure intended to reflect the number of agreements that are made in the "nick of time", perhaps reflecting the possibility that one player "gave in" in order to avoid deadlock. A low LTSA and a large number of deadlocks could imply that the players are unwilling to be "forced" to accept unwanted outcomes.

9) "credibility" - this term (borrowed from the literature on threats in which it refers to the proportion of times that threats are carried out once they have been made) refers to the proportion of sessions in which the time-limit was used that ended in deadlock.

The above response measures are usually averaged across the first twenty sessions. Measures such as DTA that exist

only for sessions that end in agreement are averaged across the number of such sessions, even though it may be indicated that the measure is averaged across the first twenty sessions.

Certain other ad hoc measures are employed from time to time, and will be described when the appropriate experiment is reported.

E. A methodological note

1) Experimental design

The problems discussed earlier in regard to games in general and cross-cultural research in particular have been minimized in this research in the following ways:

i) The subjects were in direct, but limited, communication at all times. This was pointed out as being important for generalizability to other more natural situations.

ii) The same language and identical instructions were used in both societal situations, since English was a medium of instruction at the various institutions visited.

iii) No reference was made to the cross-cultural aspects of the studies.

iv) The experimenter was always of the same nationality and cultural milieu as the subjects.

v) To minimize monetary exchange and utility problems, subjects were told that points were worth money, but the exact amount per point was not specified. The use of money is directed at the criticism that trivial incentives make game behaviour unrealistic in terms of real-life behaviour.

vi) Studies separated by time or source of subjects were always linked together by the running of a standard control group in each case.

vii) The instructions stated that the subjects should try to make as many points as possible, viz, "After the last session, each of you will receive a certain amount of money for each point you have accumulated. . . . this money will be your only payment for participation, therefore you should try to make as many points as possible". These instructions are not purely "individualistic" since no suggestion is made that the other person's payoffs should be ignored. These instructions would appear to be less likely than those used in most studies to give the subjects an individualistic or competitive set.

viii) The experimental situation appears to be of more intrinsic interest, due to the unpredictability of each negotiation sequence, than the PD game and other 2 x 2 matrix games in which the subject has the opportunity of choosing one of only two possible behaviours.

2) Statistical analysis

The data analyses in the sections that follow have by and large employed non-parametric tests. These tests, while often lacking the power of the parametric procedures based on the normal distribution, were felt to be generally more suitable since the null distribution of the test statistic

is independent of the distribution which underlies the sample observations. This was important for two reasons. In cases where small numbers of observations were involved, non-parametric techniques were the only procedures which could properly be used. Furthermore, in certain other cases, the sample data were of a highly skewed nature, and even when there were n=10 observations in a group, the n is small enough that the skewness of the underlying distribution may contribute a bias to the estimates of the mean and variances which would then prejudice the results of the parametric tests. To avoid this risk, non-parametric statistics, which provide a more conservative test, were used.

The joint payoff did not show signs of much skewness, and so a 1 x n fixed effects analysis of variance was used. It should be noted, however, that the distribution underlying the joint payoff is really multinomial, since on any given session, the contribution to the total joint payoff can be only one of four values, 65, 55, 40 or 0. But since the mean joint payoff for a dyad is averaged across twenty sessions, and since there are usually ten dyads in a group, the multinomial distribution will approximate the normal distribution in this case, and statistics appropriate to the latter can be used with confidence. (Incidentally, before any parametric analyses of variance were carried out, suitable tests were done to make sure that the variances were homogeneous).

In keeping with the tradition in psychological literature, the probability values corresponding to the various test statistics have been reported. However, the only statistically meaningful aspect of the test statistic is whether or not it exceeds the $p < .05$ value, since this is what was chosen as an acceptable confidence level. Except in a very few specifically denoted cases in which directional hypotheses were made, all tests are two-tailed.

In this report, significance levels of $p < .10$ (2-tailed) have sometimes been reported when it was felt that to neglect this level of statistical deviation would be to overlook interesting data trends. Comparisons which were significant only at the .10 level must of course be treated as non-significant since the rejection level of .05 has been chosen. Yet, we have reported such comparisons in terms of a "tendency" for one group to be different from the other, with the view that such results can be treated as "hypothesis generating".

CHAPTER IV

STUDIES OF TIME-LIMITATION

In western societies, time (in the sense of temporal intervals as defined by the hands of a clock) governs virtually all social intercourse. This is as true for informal situations as it is for formal ones. However, westerners are often surprised at the apparent lack of importance with which time is treated in many other parts of the world. In India, for instance, anecdotal evidence is plentiful as to the way punctuality is completely disregarded in many, if not most, instances. Yet, even more curious is the observation that Indians appear quite content to sit and do nothing while waiting for some person or event. In our society, impatience, coupled with attempts to "occupy" our time by reading or "counting the holes in the ceiling tile", is the common response to enforced waiting. Hall (1959) points out that in many Indian sub-cultures what we would call "doing nothing" as time passes is viewed as "doing something". Meade and Singh (1970) studied the effects of progress in a task on the estimation of time duration. They reported that the results differed with the (religious) community examined and went on to state that people from Indian communities where achievement motivation is high value time more than those from communities with lower achievement motivation. Nakamura (1966) describes the notion

of time in India in the following way:

> "The Indian conception of time is very different from what the western mind regards as intuitively obvious. In Indian thought, time like other phenomena is conceived statically rather than dynamically (p. 77)."

He goes on to state that a lack of common-sense time concepts is "built right into the (Hindustani) language of India."

Although the studies that follow do not deal directly with perception of time-duration, they do deal with "time pressure" and the foregoing comments are intended to point out some basic differences in the way in which the passage of time may be viewed by Canadians and Indians. They suggest that Indians may be less affected by time than Canadians. Since the studies in this section involve both of these groups, such observations are important.

Putting cross-cultural considerations aside for the moment, let us consider time pressure as a variable in experimental bargaining games. As discussed briefly in Chapter II, very few studies of time pressure have been carried out and among the few reported, the operational definition of time pressure was generally not in terms of specifically delineated time intervals, but rather in terms of imposing costs per trial, or indicating that a supposedly random event which would end negotiations either was or was not likely to occur soon.

As a beginning to the study of the effects of time pressure in a co-operation-conflict situation, two sets of circumstances might be compared, one in which explicit time-limits exists, and another in which time is unlimited. In the former, failure to reach agreement before the deadline would constitute a "deadlock". But this immediately raises the question of how the equivalent of a deadlock could be expressed in the unlimited time condition. If subjects were allowed, for example, to "declare" a deadlock, either singly or mutually, they would be unlikely to do so, particularly if there were monetary incentives for reaching agreement. Perhaps if so much time passed that the subjects desired to leave the situation altogether, they might declare a deadlock, but this would then be the result of a sort of implicit time-limit. Furthermore, from a practical point of view, as was demonstrated in some pilot work by this author, unlimited time makes it difficult to run successive replications of the interaction, for at least some subjects will use so much time on the first interaction that no time is left for repetitions. Thus, it appears that even in the "no time pressure" situation, a way is needed to prevent bargaining sessions of undue length and to provide for the real possibility of deadlock.

One approach might be to limit the number of demands each player can make. However, this would likely encourage subjects to practice "brinksmanship", that is, to wait until

the last few demands before making any real concessions. Since under such a system the players would (presumably) know who would make the last demand, one player would ultimately be placed in a take-it-or-leave-it situation and the knowledge that this would occur would likely seriously distort the whole negotiation process.

Other possibilities have also been considered but each has serious drawbacks. Thus, it was decided to direct the following studies not simply toward time pressure versus no time pressure, but towards externally imposed time-limits versus the option for either player to impose a mutually binding time-limit. In the latter condition then, subjects themselves have a way of bringing negotiations "to a head". Preliminary research revealed that, in this latter situation, subjects only rarely permit the negotiations to go on for undue lengths of time. Implicit time considerations apparently lead one or the other to impose the time-limit if negotiations "drag on". This raises several questions. If subjects in this "internal control of time-limit" condition initiate the time-limit, is it due to simply wishing to get the negotiations over with, or is one subject attempting to "pressure" the other? Further, if there are substantial differences between the two conditions, is it due to the varying amounts of time pressure or is it partly or totally due to the source of the time pressure? These questions will be dealt with in the following series of studies.

Before describing these experiments, it is of interest to note that in real-life formal bargaining, time often plays a very important explicit part. In labour-management negotiations for example, there is often a temporal deadline imposed by one or the other of the two parties, after which, if agreement has not been reached, some mutually harmful action such as a strike or lock-out will take place. Alternatively, if the industry is an important one, the government may impose a deadline, after which if agreement has not been reached, it will impose compulsory binding arbitration, an action likely to be viewed negatively by both sides. (Although the government is unlikely to set such a deadline until after a strike or lock-out has already occurred, this does not alter the concept we are discussing). These two situations are, in fact, conceptually equivalent to the two experimental conditions we have just described.

The studies

The order in which these studies are reported follows the order in which they were conducted. The first study, done in Canada, was essentially a pilot study, but is included since it provides the only available data for Canadian females. This study involved only ten replications of the bargaining situation, whereas all later studies used twenty-one sessions with the twenty-first being treated apart from the main data analysis in order to minimize the "end" effect, as discussed

in Chapter III. The second study was done in India with both males and females. Whereas in all other studies two minutes were arbitrarily used as the length of the time-limit, various intervals were used in this first Indian study as a check on the arbitrariness of the interval (i.e. if there were no effect with a two minute limit, perhaps there would be if the time-limits were shorter). Comparisons will be made between the data for the first ten sessions of this study and the data of the previous study. (These comparisons with the first study are primarily intended to provide data on possible sex differences).

The last study in this series was done in Canada using males. It was identical to the Indian study, except that a third condition was added to give information about the salience of the "source" of the time-limit and only two minute time-limits were used. A comparison of the second and third studies will be made. This will be somewhat redundant, as the comparison between the first two studies will have preceeded it. Yet, this last comparison is important,since the experiments were identical. However, since females were not used in the third study, comparison can be based only on males.

First Study: Effects of Time-Limitation (Canada)

This study was designed to examine the effects of the two conditions discussed above on the behaviour of males and

females in a bargaining situation. The two conditions were as follows:

Condition 1: internal time-limits (T(int)): subjects may negotiate for as long as they wish in each session. Each has the option of initiating a two minute time-limit by depressing a button in his cubicle. He may do this at any time. In the event of a time-limit being initiated, failure to reach agreement by the end of the time-limit will result in "deadlock" with no payoffs for either party.

Condition 2: external time-limits (T(ext)): subjects are told that each session will last a maximum of two minutes. At the beginning of each session, the experimenter initiates the time-limit. The time-limit initiation buttons in the cubicles are concealed.

The time-limit is not simply an indication of a future point in time where negotiations must end. It has an "active" component as well, for during the period that the time-limit is in effect, the increasing numbers on the counters in each cubicle, the loud clicking sounds, and the flashing lights are indications that time is being used up. These devices are intended to make the passage of time more salient when the time-limit is in effect.

Subjects and procedure

The subjects were forty male and forty female first year university students. They were randomly assigned to like-sexed dyads, and the dyads were randomly assigned to conditions, subject to the restriction that there were to be ten male and ten female dyads in each of the two conditions.

The procedure was slightly different from the standard procedure described in Chapter III. Only these differences will be described here. First of all, as was pointed out earlier, only ten consecutive sessions were run. Due to the pilot nature of this study and lack of equipment flexibility at that time, the T(int) condition was run first and then the T(ext) condition, whereas in all subsequent studies, all conditions were run at the same time. (The Third Study in this series provides a way of checking to make sure that order had no important effect). Another difference is that in this study, subjects were told that each point accrued and would be worth 0.5 cents, whereas all the subsequent studies were deliberately vague as to the compensation rate. The payoff matrices were the standard ones shown in Figure 5 of Chapter III (page 72).

Results and discussion

Table 1 summarizes the results of this study. A discussion of each response measure follows below. (The numbers in parentheses refer to the corresponding entries in Table 1).

Insert Table 1 about here

Joint Payoff (1): A one by four analysis of variance indicated that the mean joint payoffs were not equal ($F=9.4$, 3, 36 df; $p < .001$). Scheffé simultaneous confidence intervals revealed that the male T(int) group had a significantly lower joint payoff than the other three groups. There were no differences among the two female groups and the male T(ext) group.

Difference in Payoff (2): No significant differences were found among the four groups in terms of difference in payoff. In only 7 out of the forty dyads (4 in the male T(int) group and 3 in the female T(ext) group) was the difference in points larger than 65 points (i.e. the difference generated by one α-outcome).

Demands to Agreement (DTA)(3): Because the variances were found to be heterogeneous, a logarithmic transformation ($x' = \log x$) was used to yield homogeneous variances. The subsequent analysis of variance indicated an overall difference ($F=12.4$, 3, 36 df; $p < .001$), and individual Scheffé comparisons revealed that there were no differences based on sex, but that more DTAs were used in the T(int) than in the T(ext) condition, as might be expected.

Outcomes (4, 5, 6): The four groups did not differ significantly in terms of either β- or γ-outcomes. However, as can be seen from Table 1 in regard to α-outcomes, there

Table 1

Data summary for the First Study (group means)

Response Measure	Condition I (Tint)		Condition II (Text)	
	males	females	males	females
1) Joint payoff (points)	350.0	503.0	553.0	507.0
	($\hat{\sigma}$=116.0)	($\hat{\sigma}$=50.5)	($\hat{\sigma}$=85.5)	($\hat{\sigma}$=86.0)
2) Difference in payoff	46.0	12.0	38.0	56.5
3) Number of demands to agreement	8.2	12.8	2.2	3.7
4) Number of α-outcomes	1.3	2.1	4.5	3.0
5) Number of β-outcomes	2.2	2.7	2.7	2.9
6) Number of γ-outcomes	3.7	4.6	2.8	3.3
7) Number of α-recips	0.3	1.3	3.1	1.7
8) Number of β-recips	1.3	1.1	1.0	1.3
9) α-asymmetry	0.5	0.4	0.5	0.8
10) β-asymmetry	1.1	1.1	0.7	0.7
11) Number of deadlocks (δ's)	2.8	0.6	0.0	0.8
12) Proportion of dyads with $\geq 1\,\delta$	9/10	4/10	0/10	5/10
13) Proportion of dyads using time-limits	10/10	7/10	---	---
14) Number of time-limit initiations	6.6	3.0	---	---
15) "Credibility" of time-limits	0.45	0.17	0.0	0.08

was a large increase for males in going from the T(int) to the T(ext) condition. A median test on the four groups yielded an overall χ^2 of 7.5 (3 df, $.05 < p < .10$). Although this was not quite significant at the usual .05 level, the χ^2 table was partitioned by the Brandt and Snedecor method (Castellan, 1965) and the results of this analysis are shown in Table 2.

Insert Table 2 about here

It is obvious that whatever variation in frequency of α-outcomes there is, it exists entirely among the male dyads. The males had more α-outcomes in the T(ext) than in the T(int) condition but the average across both conditions was not different than the average for females. While on the subject of outcomes, it was found that the player who was advantaged by the first non (γ,δ) outcome ended up with total payoff dominance significantly often (Sign Test, $p < .05$, 2-tailed). This was true for both males and females and occurred in 92% of the dyads.

Reciprocations (7, 8) and Asymmetry (9, 10): There was no difference in terms of α-recips for females across conditions. Only four female dyads in either condition had any α-recips at all. However, whereas only two male dyads in the T(int) condition had any α-recips, eight of the ten male dyads in the T(ext) condition had α-recips. This is a significant difference (Fisher Exact Test, $p < .05$, 2-tailed). The average number of α-recips was also higher in the T(ext) than

Table 2

Summary of partitioning of χ^2 for number of a-outcomes, First Study

Source of Variance	df	χ^2	p
within males	1	7.5	<.01
within females	1	0.0	n.s.
males x females	1	0.0	n.s.
total	3	7.5	.05 < p < .10

in the T(int) condition for males, even if only those dyads that had at least one are considered. This however, makes statistical comparisons difficult since there were only two such dyads in the T(int) group.

In the T(ext) condition, the first α-outcome occurred on the average after 3.3 sessions for males and 2.1 sessions for females. (This is significant at the .10 level, 2-tailed Mann Whitney U test, U=19). (This is exclusive of the one male and two female dyads that had no α-outcomes in the T(ext) condition). Four of the nine male dyads and one of the eight female dyads had experienced successful β-alternation before the first α-outcome. In each of these four male dyads, the first α-outcome was reciprocated; this was not the case for the one female dyad. Of those remaining dyads, in three of the male dyads, the first α-outcome was reciprocated, as it was in two of the female dyads. Overall then, in seven of the nine male dyads the first α-outcome was reciprocated on the following session, whereas this was the case in only two out of the eight female dyads. (This sex difference is significant at less than the .10 level, 2-tailed Fisher Exact Test).

Time-limits and Deadlocks (11, 12, 13, 14, 15): All male dyads initiated the time-limit at least once, as did seven out of ten female dyads. Thus the sexes did not differ in this respect. If the average usage of time-limits across all dyads is considered, females used the time-limit significantly less

than males (Mann Whitney U=11.5, $p < .02$, 2-tailed).

It appears that, among the male dyads, there was a strong tendency for one player to utilize the time-limit much more often than the other. The intra-dyadic difference in usage was greater for males (Mann Whitney U=14.5, $p < .02$, 2-tailed) and exists even if only those females who used the time-limit once or more are considered (U=13.5, $p < .05$, 2-tailed). These data can be seen in Table 3.

Insert Table 3 about here

Nine of the ten male dyads in the T(int) condition had one or more deadlocks compared to none of the male dyads in the T(ext) condition. 4/10 and 5/10 of the female dyads had deadlocks in T(int) and T(ext) respectively. A partitioned χ^2 analysis shows that males had significantly more deadlocks in the T(int) condition than in the T(ext) condition ($\chi^2=16.3$, 1 df, $p < .01$), that there was no difference for females and that there was no overall difference between male and females (combining conditions). This reflects the fact that males had no deadlocks in the T(ext) condition. However, in the T(int) condition, there was a tendency for more male dyads than female dyads to have one or more deadlocks (Fisher Exact Test, $p < .10$, 2-tailed) and the average number of deadlocks in T(int) was greater for males than for females (Mann-Whitney U=15, $p < .02$, 2-tailed). This reflects to some extent, of course, the fact that usage of time-limits was higher among males.

Table 3

Initiations of time-limits, First Study

	Dyad	Number of initiations		Total	Difference
		Player 1	Player 2		
Males:	1	0	3	3	3
	2	6	0	6	6
	3	0	3	3	3
	4	2	6	8	4
	5	8	0	8	8
	6	1	9	10	8
	7	3	4	7	1
	8	9	1	10	8
	9	6	0	6	6
	10	1	4	5	3
			Means:	6.6	5.0
Females:	1	4	1	5	3
	2	0	0	0	0
	3	0	0	0	0
	4	0	4	4	4
	5	3	0	3	3
	6	4	2	6	2
	7	1	3	4	2
	8	1	3	4	2
	9	4	2	6	2
	10	0	0	0	0
			Means:	3.2	2.0

If one examines the "credibility" of the implicit threat of deadlock, by examining the number of time-limited sessions in the T(int) condition that ended in deadlock (expressed as %), the average credibility was 45.2% for males (n=10) and 17% for females (n=7). These are significantly different ($U=13.5$, $p < .05$, 2-tailed). Thus females used the time-limit less often and when they did use it, it was not often that deadlock resulted. In the T(ext) condition, the analogue of "credibility" was zero for the males since they had no deadlocks and 8% for females. (Note that in the T(ext) condition, "credibility" is equal to the proportion of sessions ending in deadlock). Thus, it is clear that it was not simply the presence of a time-limit that led to deadlock.

Attempts were made to discover relationships between the usage of the time-limit and other variables but none were found. For example, the player who initiated the time-limit the most often was no more likely to achieve total payoff dominance than the other player. There was no relationship between the use of the time-limit for the first time and the presence or absence of payoff dominance at that point. Furthermore, the data show that using the time-limit did not usually lead to a beneficial outcome for the initiator. Table 4 shows the average proportions of the total uses of the time-limit for which the result was: a) more favourable to the initiator than to the other, b) more favourable to the other than to the initiator, c) the equal payoff y-outcome, or d) deadlock.

Insert Table 4 about here

It was mentioned earlier that the proportion of sessions ending in deadlock was significantly different for males and females. However, it is clear from the table that only about 14% of the times the time-limit was started did the initiator "gain" from it, if that was the goal. Given the earlier data which indicated a preponderance of use of time-limit by one or the other player, these data are very detrimental to the notion that a player continued to initiate the time-limit because he was "reinforced" for doing so. (The 14% of the times that advantage was gained were not concentrated on the first usage).

Table 5 indicates the distribution of dyads in terms of the session in which the time-limit was first used. Males used the time-limit significantly earlier in terms of sessions

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Insert Table 5 about here
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than did females ($U=12$, $p<.05$, 2-tailed). In terms of demands within sessions, 5.7 demands had been made by males at the time the time-limit was initiated, versus an average of 15.8 for females. Here again, females waited considerably longer than males ($U=4$, $p<.002$, 2-tailed).

Since males waited on the average of 5.7 demands before starting the time-limit, they perhaps waited long enough to see how negotiation would go for a session before imposing a

Table 4

Outcomes of time-limited sessions in Condition 1, First Study
(for dyads that made use of time-limits

	Mean proportion of time-limited sessions in which outcome was:			
	more favourable to initiator	less favourable to initiator	γ	δ
Males (n=10)	.12	.04	.40	.44
Females (n=7)	.18	.18	.46	.18
Males and females combined (n=17)	.14	.10	.42	.34

Table 5

Distribution of sessions of first time-limit usage
First Study

	SESSIONS									
	1	2	3	4	5	6	7	8	9	10
Males:	6	2	--	--	2	--	--	--	--	--
Females:	--	2	--	3	--	1	1	--	--	--

time-limit. This argues against the notion that they just wanted to finish as quickly as possible. (If one considers just the session of first usage of time-limit, males had made an average of 5.2 demands and females an average of 16.0 demands before the time-limit was first initiated).

The most noteworthy aspect of these data is the extreme competitivity of males in the T(int) condition, contrasted with their relative co-operativeness in the T(ext) condition. Females were not affected in terms of co-operativeness by either condition, although the fact that they were able to reach just as equitable and beneficial agreements using many fewer demands in the T(ext) condition does point out the efficiency of external time-limitation in hastening agreement.

Males not only avoided deadlocks in the T(ext) condition but their mean joint payoff increased significantly. This was partly due to avoiding deadlocks, of course, but the number of α-outcomes increased and they used the optimal α-reciprocation strategy to a significantly greater degree. Females, except for using fewer demands, did not change between the two conditions.

A fundamental question which arises here is whether or not the "external" time pressure in some way facilitated co-operation over whatever the "normal" level might be, or whether some feature of the T(int) condition was detrimental to co-operation, that is, encouraged competitiveness. A combination of these two is of course possible. Consider first the T(ext) circumstances. Time pressure begins at the start of every

session, without any control on the part of the players. It is possible that (a) the players see the demand characteristics as calling for co-operation in order to "beat the clock", i.e. avoid deadlock, or variously, the players might view the situation as one in which they must tacitly collude to "beat the experimenter". Another possibility is that (b) the temporal constraints of the situation tend to preclude negotiatory "jockeying", that is, neither player feels that there is enough time to "test the other's weaknesses", so to speak. This might be especially true for the first few sessions, when the players are inexperienced with the amount of time available. However, early co-operation might pre-dispose the dyad to continue co-operating throughout the game. This possibility when viewed from the point of view of the T(int) condition would also carry appeal there. When the time-limit was initiated, it might be assumed that competition had already reached a high point and the resulting high number of deadlocks was due not simply to the failure of "time pressure" to facilitate agreement but to heightened conflict at the point of time-limit initiation. However, six of the ten male dyads used the time-limit on the first session with an average of 5.8 demands having been made when the time-limit was initiated. Thus, it hardly seems likely, since no payoff dominance could have existed at that time, and since so few demands had been made, that the time-limit was initiated at a point where conflict

was already high. (Note that no female dyads used the time-limit on the first session).

What appears to be the best explanation at this time is as follows. In the T(ext) condition, co-operation was possibly facilitated by the subjects perceiving the situation as one in which co-operation is called for, since failure to co-operate would definitely lead to deadlock. In the T(int) condition, however, subjects may have viewed the (mutual) ability to initiate a time-limit as a way of attempting to force the other to come to terms. Once the time-limit was begun, resistance was increased as the result of viewing the time-limit as attempted coercion. This is in line with Deutsch's (1961) assumption that,

> "if a person uses threat in an attempt to intimidate another, the threatened person . . . will feel hostility toward the threatener and tend to respond with counter-threat and/or increased resistance to yielding (p. 888)."

Deutsch and Krauss (1962) also suggested that yielding under duress is culturally perceived as a negatively valued form of behaviour, whereas no such evaluation need be placed on the behaviour of one who "gives in" when no threat or duress is a factor. It would seem to follow that "giving in" in the face of externally imposed time-limits would be considered less negative than "giving in" when the other player imposed the time-limit.

This "threat" explanation is also consistent with the findings of Froman and Cohen (1969) who employed a buyer-seller

paradigm and compared unilateral threat and no-threat conditions. In the unilateral threat condition, one player could, if he wished, threaten to terminate negotiations, an action which, if carried out, would result in losses for both parties. Lower joint payoffs and longer bargaining resulted when the threat capability was present. The authors concluded that:

> "Given a situation where co-operative behaviour requires some effort (bidding back and forth in the attempt to find a mutually agreeable solution), and given the possibility to circumvent that expenditure of effort by exercising a threat option, some players employ the circumvention. Once employed, however, the nature of the interaction between the two bidders may change, depending on the threatened player's response to the threat, the threatener's response to the threatened player's response and so on. . . . A side game is created by the introduction of threat and it may be pursued by the player, not necessarily in spite of, but in ignorance of its effects on the original game (p. 153)."

The use of threat in the above study was very similar to the initiation of the time-limit in the present study. In both cases, deadlock would result in mutual losses. However, in the present study, the "threatener" could carry out the "threat" only by passive behaviour whereas active behaviour was required in the above study; that is, the threatener had to actually choose to carry out the threat.

The fact that one player tended to dominate in the initiation of the time-limit, coupled with the failure to find any relationship between time-limit initiation and payoff dominance, or between initiation and outcome, suggests that

one player typically had a lower "threshold" for resorting to use of the time-limit than the other. We cannot definitely specify a player's reasons for using the time-limit, but if the threat interpretation is correct, it could be that one player is more aggressive than the other, or is more easily frustrated. Deutsch and Krauss (1962) pointed to the possibility that the use of threat is a reaction to frustration engendered by the other person.

The observation that females did not use the time-limit as frequently nor as early as males, coupled with the further finding that the "credibility" was the same in both the T(int) and T(ext) conditions, is a strong indication that the females were less competitive and/or less aggressive than males. This is consistent with the finding of Tedeschi, Bonoma and Novinson (1970) that females sent fewer and carried out fewer threats than males in a threat game. It is also in accord with the characterization of the typical masculine strategy as "exploitative" and the typical feminine strategy as "accommodative" made by Uesugi and Vinacke (1963).

Neither males nor females showed much evidence of the optimal α-alternation strategy, although there was a strong tendency for more α-alternation by males than by females in the T(ext) condition. The tendency for establishing β-alternation before the first α-outcome was more evident in males. Although females were somewhat earlier in their agreement on the initial α-outcome than males, they did not usually follow it by

reciprocation, whereas this was usually the case in the male group. This is consistent with Tedeschi's conclusions (Tedeschi, 1970) that females are less likely than males to recognize optimal strategies. This explanation is especially appealing in light of the other evidence that females in this study were not particularly competitive.

To summarize, this study has shown that what has been labelled external time-limitation led to more rapid agreement than when time-limits were imposed only at the option of the players, and that males viewed and used the time-limit initiation in a way consistent with the way in which threat is used in threat games, whereas females did not view it in this way. Males were more responsive to the optimal strategy than were females. As to whether or not the sharp contrast between male behaviour in the two conditions was due to facilitation of co-operation by the external imposition of time-limits from the beginning of each session, or to the exacerbation of conflict as a result of a non-time-limited interaction before the time-limit was used, this must remain in abeyance until the Third Study, which focused on these issues, is discussed.

Second Study: Effects of Time-limitation (India)

The previous study uncovered some interesting reactions of Canadian students to differing time-limitations. The major effect existed only for males and depended on whether or not

all sessions were externally time-limited from the beginning or were time-limited only at the discretion of one of the subjects. The study outlined in this section is an extension and replication of the previous Canadian study and was carried out in India. Unlike the first study, this one employed the full-fledged methodology described in Chapter III (i.e. 21 sessions were run, all conditions were run concurrently, and the exact rate of payment was not specified). Comparisons will be made with the first study and later these data will be used in comparisons with the next study which is an exact replication of this one, using Canadian males.

A preliminary pilot study in India suggested that the effects of time-limitation previously found with Canadian males were weak or non-existent with Indian males; (this assumes that the time-limitation in T(ext) was in some way responsible for the increase in co-operation). Since the period of time used (two minutes) was arbitrary, it was decided to use several different periods of time in this study to determine if lengthening or shortening the interval had any effect.

Subjects and procedure

The subjects were eighty male and thirty-six female undergraduates from Deshbandhu College (University of Delhi). They constituted sixty like-sexed dyads.

The male dyads were randomly assigned to one of four conditions. The female dyads were randomly assigned to one or

the other of treatment groups I and II. The conditions were as follows:

Condition I: Internal time-limitation ($Tint_2$), time-limit - 2 minutes

Condition II: External time-limitation ($Text_2$), time-limit - 2 minutes

Condition III: External time-limitation ($Text_1$), time-limit - 1 minute

Condition IV: External time-limitation ($Text_{0.5}$), time-limit - 0.5 minute

There were ten dyads in each male condition and nine dyads in each female condition. The methodology was as described in Chapter III. For administrative reasons, all the females were run after the males.

Results

The data are summarized in Table 6 with the group means based on sessions 1 to 20. A discussion of each response measure

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Insert Table 6 about here

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follows. The numbers in parentheses refer to the corresponding entries in Table 6.

Joint Payoff (1): A one-way analysis of variance revealed no significant differences among the six groups.

Difference in Payoff (2): Again, a one-way analysis of variance revealed no significant differences among the six groups.

Table 6

Data summary for the Second Study (group means)

Response Measures	Male dyads				Female dyads	
	$T(int_2)$	$T(ext_2)$	$T(ext_1)$	$T(ext_{.5})$	T(int)	$T(ext_2)$
1) Joint Payoff	963.0 ($\hat{\sigma}$=116.6)	981.0 ($\hat{\sigma}$=181.1)	961.5 ($\hat{\sigma}$=151.7)	867.5 ($\hat{\sigma}$=212.1	1016.7 ($\hat{\sigma}$=60.8)	1063.3 ($\hat{\sigma}$=185.5
2) Difference in payoff	81.0	73.0	124.5	87.5	100.0	98.9
3) DTA	8.0	5.2	4.0	3.0	4.5	5.5
4) Number of α-outcomes	3.5	4.9	5.4	4.6	4.2	8.6
5) Number of β-outcomes	8.3	6.8	7.6	5.9	7.4	6.0
6) Number of γ-outcomes	7.1	7.0	4.9	6.1	8.4	4.6
7) Number of α-recips	0.6	2.4	1.9	2.1	1.4	3.0
8) Number of β-recips	1.8	1.8	1.9	1.4	1.8	2.0
9) α-asymmetry	1.2	1.1	---	---	1.2	1.6
10) β-asymmetry	2.5	2.6	---	---	2.1	2.9
11) Number of deadlocks (δ's)	1.1	1.3	2.1	3.4	0.0	0.8
12) Proportion of dyads with $\geq 1\,\delta$	6/10	6/10	7/10	9/10	0/9	5/9
13) Proportion of dyads using time-limit	7/10	-	-	-	1/9	-
14) Number of time-limits initiated	6.1	-	-	-	0.1	-
15) "Credibility" of time-limits	0.18	(0.07)			-	(0.05)
16) Number of LTSA's	0.2	1.3	4.4	7.8	0.0	0.8
17) STA	80.0	47.8	34.6	18.6	53.1	41.8

Number of Demands to Agreement (3): A one-way analysis of variance revealed a significant overall effect ($F=3.31$; 5, 52 df; $p < .025$). However, Scheffé simultaneous comparisons showed that only the $T(int_2)$ and $T(ext_{0.5})$ male groups (conditions I and IV for males) differed significantly. No sex differences were significant, nor was there an overall difference with respect to the $T(int_2)$ and $T(ext_2)$ conditions.

The significant difference between the $T(int_2)$ and $T(ext_{0.5})$ conditions is simply a reflection of the fact that the subjects were able to reach agreement using fewer demands when time restrictions made this necessary. Note that for males the mean DTA decreased as the time-limit decreased. Thus, the subjects did respond to the time-limitation in this gross and rather trivial sense.

Outcomes and Recips (4, 5, 6, 7, 8, 9, 10): There were no significant differences between groups in terms of mean proportions of α-outcomes, β-outcomes or γ-outcomes. As can be seen in Table 6, there were about four or five α-outcomes per dyad, on the average, with very few α-recips. The low α-asymmetry value suggests that neither player in a dyad was willing to let the other get very far ahead in terms of α-outcomes. An analysis of the first α-outcome in the $T(ext_2)$ condition revealed no significant differences between males and females; an average of 3.0 sessions had been completed at the time of the first α.

Five of the 18 dyads (one male dyad had no α-outcomes) did not precede the first α-outcome by β-alternation; (this is

significant only at the .10 level, 2-tailed Sign test). In only about half (8/18) of the dyads was the first α-outcome reciprocated on the following session.

In 78% of the cases, regardless of sex or group, the player who had benefited most from the first non (γ,δ) outcome achieved total payoff dominance at the end of session 20 (Sign test, $p < .05$, 2-tailed). (Analysis of the twenty-first session data revealed that almost never was the payoff dominance that existed after session 20 eliminated or reversed. About half of these outcomes were γ-outcomes. This removes any possibility that payoff dominance at the end of session 20 does not reflect total dominance for the 21 sessions). There were no significant differences in terms of α-or β-asymmetry.

Time-limits and deadlocks (11, 12, 13, 14, 15, 16): There was a significant difference in the numbers of deadlocks among the six groups (Median test, $\chi^2 = 16.8$, 5 df, $p < .005$). The contingency table was partitioned to allow comparison within and between sexes. There were no significant differences among the male groups. However, a significant difference was found between the two female conditions. Females had significantly more deadlocks in the T(ext) than in the T(int) condition ($\chi^2 = 6.9$, 1 df, $p < .01$). On the whole, males had significantly more deadlocks than females ($\chi^2 = 19.1$, 1 df, $p < .001$).

With regard to the proportions of dyads in each group having one or more deadlocks, the findings exactly parallel those reported above, since in the above analysis the median

was found to be 0.5 deadlocks. Thus, dyads with one or more deadlocks would be above the median and those with no deadlocks would be below. Hence, more female dyads were deadlock-free than were male dyads, and more female dyads were deadlock-free in the T(int) condition than in the T(ext) condition.

In the T(int) condition, significantly more male dyads than females used the time-limit at least once (Fisher Exact Test, $p < .05$, 2-tailed). Average usage of time-limits was also greater among males (median and Fisher Exact Tests, $p < .05$, 2-tailed). (This is obvious when one notes that only one female dyad ever used the time-limit and then only once).

In terms of "credibility", deadlocks resulted only 18% of the time when males used the time-limit. This compared to 7% of the time when an external two-minute time-limit was imposed on every session. This difference in "credibility" is not significant, indicating that males tended to have the same rate of occurrence of deadlocks regardless of the source of the time-limit. The rate of deadlock occurrence in the female group in the T(ext) condition was not significantly different from that of the two male groups. Since the time-limits were used only once, (and by only one dyad), in the female T(int) group, the concept of credibility can hardly be applied.

As in the First Study, there was no apparent relationship between payoff dominance on a given session and instigation of a time-limit. That is, the player with the most points was no more likely to start the time-limit than the other. However,

on sessions on which the timer was started, one or the other player was almost always ahead in points by a small margin. But it is difficult to establish a significant relationship between point imbalance and time-limits since for other than γ or δ-outcomes, point imbalance is bound to exist from session to session. The average point differential at the beginning of a session on which the time-limit was initiated was 30.0 points. The first time-limit was begun, on the average, on session "7.6", after an average of 10.0 demands. Of the outcomes of time-limited sessions in the male T(int) group, 22% were in the favour of the initiator, 8% in the favour of the other, while 53% were γ-outcomes and only 17% were deadlocks.

In the $T(int_2)$ and $T(ext_2)$ conditions, there were very few Last Ten Second Agreements for either males or females. The $T(ext_1)$ and $T(ext_{0.5})$ conditions are not very interesting in this context since agreements in the last ten seconds may simply reflect the shorter time period available. For time-limited sessions in the $T(int_2)$ condition, the average proportion of LTSA's was (expressed as percent) 2%, versus 5% in $T(ext_2)$, indicating that in neither case did subjects accept at the last moment in order to avoid deadlocks.

Serial Effects: In an attempt to determine if the subjects become more or less competitive across sessions, the means of some response measures were calculated (for each dyad) separately for sessions 1 to 10 and sessions 11 to 20 and Sign tests were used to check for possible significant-effects: (of the three measures looked at, there were no differences on the

basis of sex of subjects or experimental condition). There was no significant difference in terms of the number of deadlocks on each of the ten-session blocks. However, there was a significant increase in the number of demands used to reach agreement (DTA), (Sign test, $p < .05$, 2-tailed) and there was a decrease in the joint payoff (Sign test, $p < .05$, 2-tailed). Both these findings would support an interpretation of increasing conflict over sessions.

Discussion and comparison of the results of the study with those of the previous study

In order to compare these two studies, it was necessary to restrict the data for the Second Study to that gathered in the first ten sessions. A summary of these data is given in Table 7, along with the corresponding data for the First Study reproduced from Table 1.

Insert Table 7 about here

As discussed earlier, the fact that session ten was known to be the last session in the First Study may "deform" these data in comparison to that from the Second Study. However, the effect can only be minimal since inspection of the data shows no sharp change in behaviour on the tenth session. Only the $T(int_2)$ and $T(ext_2)$ conditions from the Second Study are used here since the $T(ext_1)$ and $T(ext_{0.5})$ conditions were not run in the First Study. In this section, the findings will be contrasted primarily in terms of the cultural dimension.

Table 7

A summary of the data from the First Study and the first ten sessions of the Second Study (group means)

Response Measures	FIRST STUDY (CANADA)				SECOND STUDY (INDIA)			
	T(int)		T(ext)		T(int)		T(ext)	
	Male	Female	Male	Female	Male	Female	Male	Female
1) Joint payoff	350.0 ($\hat{\sigma}$=116.0)	503.0 ($\hat{\sigma}$=50.5)	553.0 ($\hat{\sigma}$=85.5)	507.0 ($\hat{\sigma}$=86.0)	502.5 ($\hat{\sigma}$=52.6)	511.7 ($\hat{\sigma}$=43.2)	507.0 ($\hat{\sigma}$=89.8)	539 ($\hat{\sigma}$=98.8)
2) Difference in payoffs	46.0	12.0	38.0	56.5	58	72.8	56	82.4
3) DTA	8.2	12.8	2.2	3.7	6.0	3.6	3.4	4.1
4) Number of α-outcomes	1.3	2.1	4.5	3.0	2.0	1.8	3.0	4.2
5) Number of β-outcomes	2.2	2.7	2.7	2.9	4.3	4.2	3.3	2.9
6) Number of γ-outcomes	3.7	4.6	2.8	3.3	3.5	4.0	3.1	2.6
7) Number of α-recips	0.3	0.3	3.1	1.7	0.4	0.2	1.5	1.1
8) Number of β-recips	1.3	1.1	1.0	1.3	0.7	1.0	0.6	1.0
9) α-asymmetry	0.5	0.4	0.5	0.8	0.8	1.1	0.6	1.3
10) β-asymmetry	1.1	1.1	0.7	0.7	1.7	1.2	1.8	1.2
11) Number of deadlocks (δ's)	2.8	0.6	0.0	0.8	0.2	0.0	0.6	0.3
12) Proportion of dyads with $\geq 1\,\delta$	9/10	4/10	0/10	5/10	2/10	0/9	4/10	2/9
13) Proportion of dyads using time-limits	10/10	7/10	-	-	6/10	0/10	-	-
14) Number of time-limits initiated	6.6	3.2	-	-	2.7	0.1	-	-
15) "Credibility" of time-limits	0.45	0.17	0.0	0.8	.07	-	.06	.03

Joint Payoff (1): A 1 x 8 analysis of variance indicated a significant overall effect ($F = 5.86$; 7, 70 df, $p < .001$). However, the only significant pairwise comparisons (using the Scheffé technique) were those contrasting the Canadian male T(int) group with any of the other groups. Thus, this particular group had a significantly smaller mean joint payoff than any of the other groups.

Difference in Payoff (2): There was no overall effect in terms of this measure. Scrutiny of the data showed that there was a great deal of variability within all groups in the way in which the joint payoff was divided. Comparison of Tables 6 and 7 revealed that the average differences in payoff after 20 sessions for the Indian groups all increased somewhat from the level at the end of ten sessions. In the previous study, it was found that for the four Canadian groups being considered at the moment, the player who had payoff dominance as the result of the first non (γ,δ) outcome usually had total payoff dominance at the end of the last session (92% of the time). This was also the case for the Indian dyads.

Number of Demands to Agreement (3): In order to produce a homogeneous set of variances, the data was transformed by an $x'=\ln x$ transformation. A 1 x 8 analysis of variance showed a significant effect across the groups ($F = 7.9$; 7, 70 df, $p < .001$). Scheffé simultaneous comparisons indicated that Canadians in the T(int) condition, male and female alike (the comparison was significant for each sex separately), used more demands to reach

agreement than Canadians in the T(ext) situation or than Indians in either situation. There were no significant differences among the Indian groups. This supports the notion that Canadians in the T(int) condition, particularly males, experienced more conflict than did the Indians in that condition and that Indians were invariant under the two conditions.

The fact that Canadians required fewer demands to reach agreement in the T(ext) condition than they did in the T(int) carries a dual explanation. First of all, if one examines only the non-deadlocked sessions in the T(int) condition, Canadians used more than 120 seconds to reach agreement on an average of 3.2 sessions per dyad (versus a figure of 1.1 for the Indian dyads; the difference is significant, Mann-Whitney $U = 61$, $p < .002$, 2-tailed). Thus the smaller number of demands on the part of Canadians in the T(ext) condition, as compared to the T(int) condition, reflects the time restriction. However, the fact that the dyads could still reach agreement using fewer demands and obtain as high a joint payoff (and even higher, in the case of males) in the T(ext) condition, indicates that time constraints were not detrimental in any way to co-operative action. Since there was no difference in this regard for Indian dyads, such considerations do not apply.

Outcomes (4, 5, 6, 7, 8, 9, 10): The α-outcomes are of special interest since one player must forego points while

allowing the other to obtain a relatively large number of points. Partly because many dyads had no α-outcomes, particularly those in the T(int) condition, the α-outcomes were far from being normally distributed. The numbers of zero scores mitigated against transformations. Thus, after examining various statistical techniques, a non-parametric method was chosen.

A 1 x 8 Kruskal-Wallis analysis of variance revealed a significant overall effect (χ^2 = 15.3, 7 df, $p < .05$). No pairwise comparisons were significant however. In the absence of a technique for comparing combinations of groups (such as the Scheffé method in parametric statistics) and since by inspection (See Table 7) it is clear that there was at least a tendency for groups in the T(ext) condition to have more α-outcomes than their T(int) counterparts (whereas no apparent difference exist on the basis of sex or nationality), the data were collapsed into T(int) and T(ext) groups and a Mann-Whitney U-test on the data revealed significantly more α-outcomes in the T(ext) condition (U = 472; z = 2.88, $p < .01$, 2-tailed). (Such an a-posteriori decision on how to divide the data is hazardous however. Incidentally, a 1 x 8 parametric analysis of variance combined with Scheffé tests results in the same conclusion).

Insofar as β-outcomes are concerned, the distribution is not as skewed as was the α-outcome distribution and there were virtually no zeroes in the distribution. A 1 x 8 analysis

of variance revealed a significant overall effect ($F = 3.6$; 7, 70 df; $p < .01$) and a Scheffé test showed that Indians, on the whole, chose β-outcomes more frequently than Canadians.

In terms of α-reciprocation and α-asymmetry, there were no overall effects. However, as noted in the First Study, Canadian males in the T(ext) condition were more likely to reciprocate the first α-outcome than were Canadian females. There was also a slight tendency for more males than females to establish β-alternation before agreeing on an α-outcome. The Indian males and females did not differ in this respect and an overall comparison of these groups with Canadian males and females yielded no significant findings. Overall, in only about 50% of the dyads was the first α-outcome reciprocated on the following session. Only about 30% of the dyads achieved a β-alternation before agreeing to the first α-outcome.

Time-limits and Deadlocks (11, 12, 13, 14, 15): A partitioned χ^2 analysis of the numbers of dyads that used the time-limit one or more times in the T(int) condition revealed that Canadian and Indian males did not differ; in both groups the majority of dyads used the time-limit at some point. However, there was a significant difference between Canadian and Indian females, ($\chi^2 = 6.4$, 1 df, $p < .05$) and a significant interaction between sex and nationality ($\chi^2 = 7.5$, 1 df, $p < .01$). This is made clear by reference to Table 7. Indian females made virtually no use of the time-limit, whereas the majority of

Canadian female dyads, like the males from both countries, used it at least once.

When one examines the number of times the time-limit was used, a significant overall effect is found (Kruskal-Wallis, $\chi^2 = 16.1$, 3 df, $p < .01$), and simultaneous comparisons indicate that Canadian males used the time-limit to a greater extent that Indian males and Canadian females, the latter two groups not being different. All three groups used the timer more than the Indian females, where only one dyad made use of the time-limit, and then only once.

Canadians, as well as using the time-limit more, tended to use it for the first time on an earlier session than did Indians (Mann-Whitney U test, $p < .10$, 2-tailed). It was established in the First Study that Canadian males used the time-limit for the first time earlier, on the average, than did females. The one Indian female dyad that used the time-limit suggests the same trend for Indians.

Insofar as deadlocks are concerned, it was seen in the First Study that Canadian males had significantly more deadlocks in the T(int) condition than did females, or than did either sex in the T(ext) condition. A glance at the relevant data in Table 7 indicates that this was clearly not the case for Indian males.

The notable features of the deadlock data are, firstly, that there appears to be no salient differences among any of the groups, excluding the Canadian male T(int) group, which

had considerably more deadlocks, and secondly, that the Canadian males had no deadlocks in the T(ext) condition. The fact that Indian females had no deadlocks in the T(int) condition is also of interest, but this was forshadowed by the knowledge that only a total of one time-limit was ever initiated.

In terms of the proportion of time-limited sessions in the T(int) condition for which the outcome was to the advantage of the initiator, there was no significant difference between the Indians and the Canadians (14% for Canadians, 19.3% for Indians) in this regard.

The "credibility" of the time-limit set by Canadian males in the T(int) condition was certainly significantly higher than for any of the other groups. (There was no significant difference between the .17 credibility for Canadian females in T(int) and the 0.7 for the Indian males in T(int)). Thus, except for Canadian males, the rate of deadlock given a time-limit did not vary with condition, sex or nationality.

Discussion

A glance at Table 7 reveals an interesting coincidence: Canadian females in the T(int) condition had numerically almost the same mean joint payoff as the Indian males. (Furthermore in the T(ext) condition, the mean joint payoffs of these two groups were numerically identical). One also notes that in

the T(int) condition the Canadian male group had a mean joint payoff numerically smaller than the above two groups, while that of the Indian females was numerically the largest Although only the Canadian male data for T(int) differed in a statistically significant way from any of the other groups, an examination of the various response measures in the T(int) condition indicates that they all follow the pattern pointed out above. To repeat, in the T(int) circumstances, Canadian males were more competitive (i.e. less successful in maximizing joint outcomes) than the other three groups. Measures such as those reflecting the usage of time-limits and the number of deadlocked sessions point to a strong similarity between the behaviour of Canadian females and Indian males and both these groups were apparently more competitive than Indian females.

The behaviour of Indian females appears to be in a class by itself. Although they did not differ from Indian males in terms of joint payoff, outcomes, etc., they virtually never used the time-limit in T(int), and yet they used no more demands to reach agreement, on the average, than other groups. This may in part reflect the fact that Indian female dyads, an mentioned earlier, usually came to the experiment together. (This was, unfortunately, the only way they would come). However, they certainly did not follow an optimal pattern in their outcomes, which might be expected of friends. Their

average number of α-outcomes was not significantly higher than those of other groups. This is consistent with the evidence discussed in Chapter II which suggested that females are less strategically oriented than males, at least in Western society.

In the T(ext) condition, there were virtually no significant differences among the sex-nationality categories. Again, in no category did dyads show much evidence of optimal bargaining behaviour (α-reciprocation). This was not simply because the subjects did not see this strategy; a study in Part II will illustrate that under certain payoff circumstances, considerably more α-reciprocation occurs. In all groups, the player who benefited most from the first non (γ,δ) outcome ended up significantly often with total payoff dominance. This could be as a result of the player who initially gains dominance being careful not to relinquish his lead, or perhaps the person who benefited from the first non (γ,δ) outcome was of a more aggressive nature to begin with. That cannot be determined with the present data.

The T(ext) condition produced much more co-operation from Canadian males and to some extent this was true for the other categories as well. For example, there were significantly more α-outcomes in the T(ext) condition than in the T(int) condition for all categories combined, and, while much of the increase was due to the Canadian males, Table 7 shows that

considerable increases occurred in the other subject categories as well. The most radical change took place in the Canadian male category and this was discussed in the First Study. The factors that affected these dyads probably worked to a somewhat lesser extent on the other dyads as well.

The fact that Indian women showed the least conflict and least "aggressiveness" of all groups in that they virtually never used the time-limit in the T(int) condition and only two of 18 dyads had any deadlocks in either condition is consistent with the picture often painted of Indian womenhood. Raj Bhatia (1970), for instance, states in reference to Indian females that

> "Among Hindus and Moslems women are submissive, responsive and co-operative; the traits prized most among them are obedience, loyalty, devotion, service and self-effacement (p. 159)."

Insofar as Siegel (1957) found a direct relationship between level of aspiration and competitivity, a cross-cultural study of level of aspiration by Meade (1968) discussed earlier in Chapter I is relevant here. Meade concluded that in setting one's level of aspiration, Indians pay more attention to affective factors, which leads to less realistic levels of aspiration, than do Americans, who rely more on cognitive factors. Deutsch's (1960) finding that in American students, F scores correlated directly with authoritarianism, and Meade and Whittaker's (1967) report of high F scores on Indian samples would suggest greater competitivity. This is not supported by the experiments reported in this section. This may be due to different values and lifestyles which underlie

the high authoritarianism of Indians in general and the high authoritarianism of certain segments of western society. Thus, the reported high authoritarianism among Indians may lead to somewhat different overt behaviour than that of "high authoritarianism" in the west.

Morris and Jones (1955) in a factor analytic study of values reported that "social restraint and self-control" and "receptivity and sympathetic concern" were high among male college students in India, whereas the "enjoyment in action" factor predominated in the United States. Those values underlying "social restraint" may also lead to a disdain for trying to gain competitive advantage over a fellow student. In fact, "self-restraint and self-control", if valued highly, could quite possibly lead one to score highly on the California F scale without necessarily having a personality fitting the "high authoritarian" syndrome.

Sundberg, Rohila and Tyler (1970) discuss the literature on individuality and conformity as related to Indians and Americans. They cite various studies which apparently confirm that,

> ". . .self in the Indian society has little meaning except in relation to the family and in serving that family. . . For Americans, on the other hand, individualism and self-reliance are believed to be one of the basic values (p. 376)."

However, these authors,using Q-sort techniques, found evidence of greater deference and conformity among Indians, but did not find support for less individuality relative to

Americans. They also found that Indians scored more highly than Americans in terms of "external control"; that is, Indians were more apt to believe that they could not effect change through their own actions. Some evidence was also given to support earlier findings that Indians score lower on the Need: Dominance scale of the Edwards Personal Preference Schedule and it was reported that Indians were more given to "intellectualizing" than Americans were.

Carment (1972a) has found that Indians are more likely to show altruism in a 2 x 2 matrix game situation than are Canadians.

These findings are all consistent with the results of this Second Study. They suggest that due to the cultural values of Indian society, competitivity (which reflects achievement motivation and a need for dominance, etc.) is lower than in the achievement oriented West. The differences between male and female Canadians are most likely due to the same factors insofar as the values imparted to males in our society are strongly achievement and dominance-oriented. Margaret Mead (1949) has discussed at some length the ways in which male children in this society are taught to be competitive, while at the same time females are encouraged to be passive and submissive. The findings of Vinacke and Gullickson (1964) are in line with this. They found, using a triadic paradigm, that whereas American females were similarly accommodative at all age levels, American males became more exploitative with age. It is

differences in upbringing which most likely lead to the sex differences found here.

In the introduction to this chapter, anecdotal evidence was advanced which supported the view that time-limits and time pressure might be expected to be less salient to Indian subjects than to subjects drawn from western societies. As it turns out, the explanation we have given for the differences between the behaviours of the Canadian and Indian subjects has been in terms of competitivity and threat. We have argued that Canadians are more competitive as a result of western social values and have also suggested that this competitivity was manifested more in the T(int) condition because the initiation of the time-limit by one party was viewed as an aggressive or threatening act by the other and that the culturally defined reaction to threat in western society is to resist yielding.

This leaves one important question unanswered. Did the Indians not show high competitivity in the T(int) condition because of a different cultural reaction to threat, or was it a matter of the time-limit not being viewed as a threat? We have shown that Canadians and Indians do in fact react differently to time-limits imposed by a member of the dyad, but since no studies of Indian reactions to threat are available for comparison, the foregoing question must remain as an avenue of future research. The question is an interesting one given the literary stereotype which often depicts Indians,

and Orientals in general, as being particularly concerned about not "losing face".

Third Study: A further study of effects of time-limitation (Canada)

As a result of the previous two studies, it is clear that Canadian males distinguish themselves from the other subjects in that in the T(int) situation they are extremely competitive, whereas their level of co-operativeness is equal to that of the other subjects in the T(ext) condition. The other groups show only minor differences in their behaviour across the two experimental conditions. As has been pointed out, this finding with regard to the T(int) condition is in line with the general notion that males in our society are brought up to be more competitive than females (i.e. that this sex difference is due to specific cultural values). The fact that these same males became very co-operative in the T(ext) condition was given various possible ad hoc explanations. It is with these that this Third Study is concerned.

The first two conditions in this study are identical to the T(int) and $T(ext_2)$ conditions, respectively, of the Second Study. The same instructions and procedure that were used in the Second Study were employed here. A third condition was added to separate the possible effects of "time pressure" per se from the "source" of the time pressure. It will be recalled that it was argued that in the T(int) condition, the time pressure may not have had the effect it had in the T(ext)

condition for various reasons such as a) the time-limit in the T(ext) condition began at the start of every session, whereas in the T(int) condition, it is possible that a considerable conflict had built up by the time it was initiated; furthermore, all sessions were time-limited in the T(ext) case whereas this was not so in the T(int) condition; b) the time-limit in T(int) was initiated by one of the players and this may have appeared as a threatening action to one or both players, leading to increased tenacity. In fact, it may have been intended as a threat. The third condition in this study (labelled T') was designed to differentiate between source and amount of time pressure. The subjects were given exactly the same instructions as in the T(int) condition. There was no mention of the possibility of the time-limit ever being initiated by the experimenter. In fact, however, the experimenter initiated the time-limit on the very first session as the demand slip was being passed from one player to the other for the first time. On subsequent sessions, the experimenter initiated the timer after a randomly determined interval of time following the beginning of the session, (average 11 seconds, range 7 to 15 seconds), unless one of the players had already initiated it, or a rapid agreement had been reached. Thus, it would appear to each player that the other was initiating the timer very early in every session. If the source of that time-limit is not important, then the behaviour should be like that of the T(ext) condition, since the players are under virtually the same time-limit restraints. If the source is important, we

should expect even more conflict than in the T(int) condition, since, first of all, virtually all sessions will be time-limited, and, secondly, each player will see the other as the initiator (unless subjects themselves start initiating the timer before the experimenter does). Furthermore, in the T(int) condition in Study One, it was usually the case that some negotiations had taken place before a player initiated the time-limit. In this third condition, it would appear to each player that the other was making a first demand and simultaneously initiating a time-limit. This could be perceived as being even more aggressive than the time-limit initiation in the T(int) condition, if in fact time-limit initiation is viewed as aggressive or coercive.

Subjects and Procedure

Since the phenomenon under scrutiny is present only among males, this study was restricted to the use of male Canadian first year university students. The students were randomly selected from the student directory and their participation was solicited by telephone. Since pilot studies had shown strong effects of previous participation in some 2 x 2 matrix games that were being carried on in the same building, students were only used if they had not been in other social psychological experiments. Due to the high "rate of consumption" of these other experiments, it was difficult to find experimentally naive subjects and this accounts for the attenuated sample sizes used in this study.

The procedure was identical to that of the Second Study. Subjects came separately and left separately. The deception in the third condition was not explained until after the experiment was over when participants were sent a "debriefing" by mail. Questionnaire data designed to elicit suspicion about possible deception did not, in any case, reveal such suspicion. As in all the studies, subjects gave their assurances that they would not discuss the experiment with anyone. They were also asked at the end of the experiment and after having been paid if they had heard about the experiment from anyone. The data from the few subjects who gave some indication of having received such information were excluded.

Results

The data of this experiment are summarized in Table 8. All data refers to sessions 1-20 only unless otherwise specified. (The numbers in parentheses refer to the corresponding entries

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Insert Table 8 about here

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in Table 8).

Joint Payoff (1): A 1 x 3 analysis of variance revealed a significant overall effect ($F = 6.7$; 2, 22 df; $p < .01$). Pairwise Scheffé comparisons showed no difference between the T(int) and T' conditions but the joint payoff in each of these conditions was significantly smaller than that in the T(ext) condition.

Table 8

Data Summary for the Third Study (group means)

Response Measures	Condition 1 T(int) (n=7)	Condition 2 T(ext) (n=9)	Condition 3 T' (n=9)
1) Joint Payoff	787.9	985.0	704.0
	(σ= 164.3)	($\hat{\sigma}$=170.9)	($\hat{\sigma}$= 162.8)
2) Difference in payoff	66.4	33.0	57.2
3) DTA	6.1	4.2	10.0
4) Number of α-outcomes	1.1	6.6	1.7
5) Number of β-outcomes	7.6	6.3	6.2
6) Number of γ-outcomes	7.6	5.2	6.3
7) Number of α-recips	0.0	4.7	0.6
8) Number of β-recips	2.9	2.4	1.6
9) α-asymmetry	0.9	0.6	1.1
10) β-asymmetry	2.1	0.8	2.3
11) Number of deadlocks (δ's)	3.7	1.9	5.8
12) Proportion of dyads with $\geq 1\ \delta$	6/7	7/9	9/9
13) Proportion of dyads using time-limit	6/7	-	-
14) Number of time-limits	10.3	(20)	19.2 (10.7)*
15) "Credibility" of time-limits	.40	0.09	0.30
16) Number of LTSA's	1.7	1.4	4.6

*The first number is the average total number of time-limits per dyad; the number in parentheses is the average number of time-limit initiations by the players themselves.

Difference in Payoff (2): As in the previous studies, there were no significant differences in terms of this variable.

Demands to Agreement (3): An overall Kruskal-Wallis one-way analysis of variance indicated a significant overall effect (χ^2 = 10.2, 2 df; $p < .01$). Unlike the first study, no significant difference was found in terms of demands to agreement between the T(int) and T(ext) conditions, although the results were in the same direction as before. Neither was the T(int) condition significantly different from the T' condition. However, there was a significantly larger DTA in the T' than in the T(ext) condition. (The order of means was T' > T(int) > T(ext)).

Outcomes and Recips (4, 5, 6, 7, 8, 9, 10): There were no differences in terms of proportion of outcomes that were β- or γ-outcomes. In terms of α-outcomes, however, there was a significant effect. The data for the T(int) and T' conditions, which were virtually identical, were pooled and a median test showed that there were significantly more α-outcomes in the T(ext) condition than in the other two conditions (χ^2 = 5.07, 1 df; $p < .05$).

In terms of α-recips, no dyads in the T(int) condition and only one dyad in the T' condition had any of these. A median test was used, due to the large number of zeros, and the T(int) and T' conditions were combined since obviously they were not different and pooling was necessary because a small expected value in the χ^2-table. The results of this analysis

showed that there were significantly more α-recips in the T(ext) condition than in the T(int) and T' conditions (χ^2 = 7.4, 1 df; $p < .02$).

Time-limits and Deadlocks (11, 12, 13, 14, 15, 16): The time-limit was used on average of 10.3 sessions per dyad in the T(int) condition. In the T' condition, an average of 19.2 of the twenty sessions per dyad were time-limited. The players themselves initiated the time-limit an average of 10.7 times per dyad, not different from the rate in the T(int) condition.

With respect to deadlocks, there was a significant overall effect of condition (Kruskal-Wallis, χ^2 = 10.3, 2 df; $p < .01$). Simultaneous comparisons indicated that T(ext) and T' were significantly different, with more deadlocks in the T' condition. The T(int) condition fell midway between the other two conditions and was not significantly different from either.

In terms of "credibility", there was no significant difference between the T(int) and T' conditions, and both had significantly higher "credibilities" than the T(ext) condition. Furthermore, in the T' condition, there was no difference in credibility between sessions in which the time-limit was started by the experimenter and those in which the subjects initiated the time-limit.

There were significantly more LTSA's in the T' condition than in either of the other two conditions (Kruskal-Wallis,

χ^2 = 12.6, 2 df; $p < .01$). It is interesting to note that, on the average, 10.4 sessions per dyad in the T' condition either ended in deadlock or were resolved in the last ten seconds.

Serial Effects: There were no significant differences between sessions 1 to 10 and 11 to 20 in terms of DTA, joint payoff or number of deadlocks in any of the conditions.

Comparison with the Second Study

For purposes of the cross-cultural comparison, the T(int) and T(ext) conditions of the third study were compared with the male T(int) and T(ext_2) conditions of the Second Study using a one-way analysis of variance. There was a significant overall effect ($F = 2.9$; 3, 32 df; $p < .05$) and using the Scheffé technique, it was shown that the mean joint payoff in the Canadian male T(int) condition was significantly less than that in the other three groups. Thus, just as was found in comparing sessions 1-10 of the Second Study with the First Study, the Canadian males differed from the Indians in both the T(int) and T(ext) conditions and from Canadian males in the T(ext) condition; this latter group was not different from either of the Indian groups.

Other response measures were also compared, and the results of these comparisons confirm those of the comparisons made and discussed at the end of the Second Study. The Canadian males tended to effect more α-reciprocation than did the Indian males. This suggests better strategic coping on the part of the Canadians.

In addition, it is noteworthy that conflict increased across sessions among Indians but did not change for Canadians. However, the average level of conflict within the Indian dyads never reached the same level as that found among the Canadian dyads.

Discussion

First of all, the comparisons made between the First and Second Studies have been given additional support since in this study the experimental procedures were identical to those used in the Second Study. Data for 21 sessions was available instead of only for 10 as in the First Study and the conditions were run at the same time instead of consecutively as in the First Study. The same results appeared thus increasing the confidence with which the comparison of the First and Second Studies can be accepted.

Cross-cultural considerations aside, this Third Study has yielded rather convincing evidence of the importance of the perceived "source" of the time-limitation. The competitiveness seen before in the T(int) condition was even greater (but not to a statistically significant amount) in the T' condition. The co-operativeness of the T(ext) condition (as exemplified by the largest joint payoff, smallest DTA, greatest number of α-outcomes and α-recips, and smallest number of deadlocks) was not due simply to the time "pressure" per se, since the dyads in the T' condition were exposed to virtually the same time pressure. The greatest co-operation among the three groups

was in the T(ext) condition; the maximum conflict was in the T' condition and all that differed between these two conditions was the perceived source. It is logical that the T(int) group should fall between these two groups on the co-operation-competition dimension since not as many sessions were time-limited as in the T' condition. Furthermore, it may be that there is differential tenacity on the part of the initiator (threatener) and the other player (threatened) in the T(int) condition. Since in the T' condition, both players are in the "threatened" position, and if this "role" leads to greater resistance to yielding, then this too would lead one to expect more conflict in the T' than in the T(int) condition. The fact that these two conditions were generally not significantly different in terms of most response measures shows that these factors are not very strong.

The earlier discussion which suggested that in the T(int) condition conflict had already become strong by the time the time-limit was initiated becomes rather irrelevant since we now see that the time-limit, even if started at the very beginning of each session, leads to a large number of deadlocks provided the players perceive that it was initiated by one of them. The concept of not "backing down" and the parallel notion of "saving face" appear to play a principal role here.

Johnson (1971) found that threats were unsuccessful when there was a strong need to save face. However, whether

one speaks of a need to save face or a need for dominance, the two can hardly be distinguished in the particular experiment under discussion here. It suffices to say that Canadian males exhibited a failure to co-operate in the T(int) and T' conditions in which the source of the time-limit was apparently within the dyad. Initiation of the time-limit in these conditions apparently increased the resistance to yielding and compromise.

Deutsch and Krauss (1962) suggested that the culturally defined evaluation of "giving in" when threat is not involved is one of "reasonableness" or "maturity". The reason they proposed this is that when no threat or duress is involved the cause of the individual's behaviour is perceived to lie within the individual. "Giving in" in the T(ext) condition would presumably be perceived in this way.

It will be recalled that Komorita and Barnes (1969) found that imposing costs for making each demand, (their form of "time pressure"), led to decreased conflict. Pruitt and Drews (1969) reported that "acute" time pressure led to less conflict than "mild" time pressure (with time pressure being operationally defined as the high or low probability of each offer being the last).

Although "time pressure" apparently increased co-operation in the above studies, one notes that, quite apart from the criticism of their operational definition of time pressure, the source of time pressure was external. Thus,

these findings are not at all inconsistent with what was found in this study. However, although it is not possible to decide whether the externally imposed time pressure had some effect other than changing the demand characteristics of the experiment, (i,e., the question as to whether the presence of external time pressure had any effect apart from the fact that internally imposed time-limits were absent cannot be answered here), one can emphatically state that time pressure alone is not sufficient to reduce conflict. The conflict is exacerbated if the time pressure is imposed by one of the parties to the conflict.

If one dares to extropolate from the laboratory to the larger world, these results would appear to indicate that, in the Canadian context, the mere setting of a time-limit by one party or another in a dispute is likely to exacerbate the conflict since either side will be concerned with not "backing down".

In the Indian samples of the Second Study, "face-saving" did not seem so important, as evidenced by the much lower "credibility" associated with usage of the time-limit. The source of the time-limit had no effect among the Indians - the rate of deadlock was the same regardless of whether the experimenter or the players themselves initiated the time-limit. The time-limitations did in fact tend to "speed up" negotiations, leading to earlier agreements without any apparent effect on the nature of these agreements. As discussed in the Second Study, whether the Indian reaction was typical of their reaction

to threats in general, or whether the time-limit was not regarded as a threat is a matter which can only be resolved by further research.

Summary of findings: Studies of time-limitation

The main findings of the first three studies were as follows:

1) Canadian males responded to time-limits initiated by their bargaining opponents in the same way that they have been found in other studies to react to threat and attempted coercion. That is, they increased their resistance to yielding and compromise and, as a result, co-operation declined. When time-limits were externally imposed from the beginning of each session, Canadian males were just as co-operative as Canadian females or Indians, and the Canadian males tended to use α-reciprocation more than the other groups. It was suggested that this was an indication of better strategic ability.

2) Canadian females and Indians of both sexes showed no difference in co-operation as a function of source of time-limits. The Canadian females and Indian males initiated time-limits with equal frequency, but less often than Canadian males.

3) Indian females almost entirely avoided time-limit initiation. Just as the difference between Canadian males and females was judged to be due to socialization processes which stress achievement and dominance for males, the lack of a sex difference in terms of overall co-operation and outcomes among Indians, coupled with the failure of Indian females to

use the time-limit, and the fact that Canadian males in the T(int) condition were more competitive than Indians of either sex, was taken as evidence that neither Indian males nor females are brought up to possess the competitiveness characteristic of North American males, and that the socialization process encourages passiveness and submissiveness among Indian females.

4) The impossibility of determining from these data whether the lack of Indian reaction to internally imposed time-limits was due to a failure to regard time-limit initiation as a threatening act, or due to an overall mode of responding passively to threats was pointed out, and further research in this direction was suggested.

CHAPTER V

STUDIES OF MOTIVATION THROUGH VARIATIONS OF THE PAYOFF MATRIX

In 2 x 2 matrix games, various matrices have been devised from which the motivation of the players can be inferred. In the studies that follow, variations of the payoff matrix that was used in the previous section are employed in a similar attempt to highlight cross-cultural differences in motivation associated with bargaining games. Since there was no a priori basis for predicting differences in motivation between the Canadian and Indian cultures, except insofar as we have already learned that Canadian males are, in certain situations, more competitive and perhaps more strategically oriented than their Indian counterparts, these studies, like the ones reported earlier, were of an exploratory nature. Each study follows from its predecessor. Because Canadians and Indians behaved similarly in the T(ext) condition in the previous experiments, a two-minute externally imposed time-limit was used in all the following investigations.

These experiments involved only male students. Although the Indian studies were carried out before the Canadian studies, they are reported in an order which forms a logical pattern. With minor exceptions, each study done in India was repeated with Canadian students.

Fourth Study: Increased incentives for reciprocation (India)

In the analyses of the preceeding studies, considerable attention was paid to α-alternation as a measure of the highest level of co-operation. Although significant differences were found among groups in this respect, even the highest average rate of α-alternation was rather low. The present study was prompted by that observation.

Reference to the standard payoff matrix (Figure 5, page 72) which shall be referred to in this section as the "α=(0,65) matrix", shows that while the average joint payoff per session for two successive γ's (i.e. C, C) is 40 points, and for two successive β's (eg. B, D) is 55 points, the joint payoff for two successive α's (e.g. A, E) is only 65 points. Thus, the "premium" for going from β-reciprocation to α-reciprocation is not as large as that for going from γ's to β-reciprocation. Yet, in the α-reciprocation case, the risk of no reciprocation has more serious implications, since not only does one player let the other get significantly "ahead" when an α-outcome is agreed upon, but in fact one player also loses in terms of his own payoffs for that outcome (relative to a β-or γ-outcome).

The question that comes to mind immediately, then, is whether or not more α-reciprocation would result if α was made more attractive in the joint payoff sense. That is, suppose one uses the payoff matrix shown in Figure 6 (which shall be labelled the "α=(0.90) matrix").

Insert Figure 6 about here

Will the presumably increased incentive for α-outcomes result in more α-outcomes and more α-alternation? That is one possibility. But there are other possibilities as well. If, for example, one's motives consist of both a desire to make as many points as possible and a desire to make more than the other person, or at least make no less than the other person, then there would be a certain "risk" attached to accepting an α-or β-outcome. The risk would depend on the differential in payoffs between the players for that given outcome, as well as the differential in points between one's own payoffs and the payoffs associated with "some comparison level" (to use the terminology of Thibaut & Kelley (1959)) such as γ. Those two things reflect the amounts of "loss" possible. However, if reciprocation were guaranteed, obviously there would be no risk involved. Thus, it is presumed that risk reflects not only the payoff structure, but also the subjective probability of reciprocation.

If it is assumed that players are neither wholly co-operative, wholly competitive nor wholly individualistic in their motivation, then it must be realized that by making $\alpha = (0,90)$, not only on the one hand is the incentive increased for choosing α-outcomes, but the possible margin by which one player can "win" over the other also increases. Thus, by agreeing on an α-outcome, one player has allowed the other to gain greater dominance in the $\alpha = (0,90)$ case than in the

	A	B	C	D	E
Player 1	0	20	20	35	90
Player 2	90	35	20	20	0

Figure 6. α =(0,90) payoff matrix.

α = (0,65) case (assuming no dominance before this agreement). This might make each player more hesitant to agree to an α-outcome which favours the other, unless he is reasonably certain that the other will reciprocate. Also, once a single α has been agreed on, the player with the resulting dominance may in fact be less willing to reciprocate in the α = (0,90) case than in the α = (0,65) case.

To reiterate, the player who receives 0 points for an α-outcome in the α = (0,90) case has lost no more in terms of his own points than in the α = (0,65) case. The only difference is that the difference in points is larger in the α = (0,90) case and the subjective probability of reciprocation may also be different. It is tempting to describe an α-outcome in the α = (0,90) case as being more "risky" (for the player who receives zero points) than in the α = (0,65) case.

Let us now consider the payoff matrices in Figure 7.

Insert Figure 7 about here

Here each player has the same payoff structure as in the α = (0,65) case, but he is led to believe that the other player has the payoff structure of the α = (0,90) case.

In terms of "riskiness", agreeing to an α-outcome which gives oneself zero points not only allows the other a larger differential gain than in the α = (0,65) case, but the opportunity of "catching up" if the other reciprocates is no longer available. Thus, if players are desirous of maximizing the difference in

	A	B	C	D	E
Player 1	0	20	20	35	65
Player 2	90	35	20	20	0

(b)

	A	B	C	D	E
Player 2	65	35	20	20	0
Player 1	0	20	20	35	90

(b)

Figure 7: Asymmetric payoff matrices, (a) as seen by Player One, and (b) as seen by Player Two.

points, or at least in not "losing" relative to the other, then fewer α-outcomes would be expected than in either of the two previous cases. However, if a player is most concerned with his <u>own</u> gain, his subjective probability of α-reciprocation by the other may be larger than in either the α = (0,65) case or the α = (0,90) case, since the other can reciprocate while maintaining a point lead. (Note that this only applies to the situation where each player is interested primarily in his own gain, but thinks the other to be competitively oriented).

This experiment was designed to gain information about these possibilities. It should be viewed as a hypothesis-generating experiment.

<u>Subjects and Procedure</u>

The subjects were all male university students from Hastinapur College (University of Delhi) and were randomly assigned to dyads in one of three conditions. Each member of a given dyad was drawn from a different class in order to minimize acquaintanceship. In keeping with the wishes of the principal of the college, no mention of monetary rewards was made in the instructions and none was given. The three conditions, all of which followed the same procedure as that of the $T(ext_2)$ condition of the Second Study, differed only in terms of the payoff matrices used:

Condition 1: standard α = (0,65) matrix (control)

Condition 2: α = (0,90) matrix (Figure 6)

Condition 3: a different matrix for each player (Figure 7)

Results

Due to unforseen circumstances, it was not possible to run ten dyads in each condition as originally planned. Only 7, 7, and 5 dyads were run in conditions 1, 2 and 3 respectively. The data for session 1-20 are summarized in Table 9.

Insert Table 9 about here

Because the lack of monetary incentive was of some concern in this study, a comparison between the control condition and the $T(ext_2)$ condition of the Second Study was made first. The results indicated that there was a lower level of co-operation in the present study than in the Second Study. The mean joint payoff was lower (Mann-Whitney $U = 12.5$, $p < .05$, 2-tailed), but there was no significant difference in the number of α's ($p > .10$) or deadlocks ($p > .10$). Whether this decrease in joint payoff, which was apparently not due to sharpened conflict (as would be indicated by more deadlocks), was due to the lack of monetary incentive or not cannot be determined. A later study, not reported in this thesis, failed to find any significant difference between groups given monetary incentives and groups given points only. However, since all three conditions here were subject to the same lack of monetary incentive, the comparison between the conditions is still proper and valid. Whether the difference would be enhanced or attenuated by the presence of monetary incentive cannot be determined except by repeating the study. Since the study

Table 9

Data summary for the Fourth Study (group means)

Response Measures	Condition 1 (Control) (n=7)	Condition 2 (n=7)	Condition 3 (n=5)
1) Joint Payoff	801.4	734.3(706.4)	807.0
2) Difference in payoff	63.0	95.7	51.0
3) DTA	11.2	9.4	8.4
4) Number of α-outcomes	1.3	1.1	1.4
5) Number of β-outcomes	3.7	3.3	4.2
6) Number of γ-outcomes	13.4	10.7	12.2
7) Number of α-recips	0	0	0.4
8) Number of β-recips	0.3	0.7	0.4
9) Number of deadlocks (δ's)	1.3	4.4	2.2
10) Number of LTSA's	3.9	3.3	1.2

is used primarily to generate hypotheses, and since all the following studies employed the same monetary incentives as the previous ones, there is little reason for concern about the ultimate impact of the lack of monetary incentive in this study. If the findings are not applicable when monetary incentive is involved, this will show up in studies to be reported later. A discussion of the response measures for the three conditions follows.

Joint Payoff (1): There were no significant differences in joint payoff among the three groups. However, in condition 2, the larger value of a would lead to a larger joint payoff than in the other conditions given identical sequences of outcomes with at least one a-outcome. Therefore, a more meaningful comparison can be made by substituting a value of 65 for a a-outcome in condition 2. This gives the value of mean joint payoff shown in parentheses, 706.4. On this basis, there is an overall difference among the three groups (Kruskal-Wallis one-way analysis of variance, $H = 4.9$, $p < .10$); the usual standard of significance has been relaxed. (Since this is a hypothesis-generating experiment, such an action appears warranted in an overall test). Individual comparisons show that the mean joint payoff for condition 1 was significantly larger than that for condition 2 (Mann-Whitney $U = 8$, $p < .05$, 2-tailed), the mean joint payoff for condition 3 was significantly larger than that for condition 2 (Mann-Whitney $U = 4$, $p < .05$, 2-tailed), but there was no significant difference

between the mean joint payoffs for conditions 1 and 3.

Difference in Points (2): The figures shown in the table refer to actual point differences. (In condition 3, the point differences as perceived by the players are not necessarily the actual ones). There were no significant differences between the point differences for the three groups (whether one considers perceived or actual differences). The range and variability for each group was large and approximately equal.

Deadlocks (9): There was a significant overall difference in numbers of deadlocks (Kruskal-Wallis one-way analysis of variance, $H = 6.0$, $p < .05$). Individual comparisons revealed that condition 2 had more deadlocks than condition 1 (Mann-Whitney $U = 5.5$, $p < .02$, 2-tailed), or condition 3 (Mann-Whitney $U = 7$, $p < .10$, 2-tailed), but that conditions 1 and 3 were not different ($p > .10$).

Other Response Measures: No significant differences were found in terms of number of α-outcomes, number of β-outcomes, number of γ-outcomes, numbers of recips or number of LTSA's. However, several aspects of the interaction were examined in an attempt to glean more information. These shall be introduced in the discussion section.

Discussion

The $\alpha = (0,90)$ matrix was apparently detrimental in terms of effects on the joint payoff and number of deadlocks. It is interesting that no difference was found between conditions

1 and 3. Why should the α = (0,90) matrix lead to more deadlocks than the other two matrices? One possible answer is that the level of aspiration was enhanced in the former case, and that in trying to get more α-outcomes, more deadlocks resulted. This possibility was examined by looking at the average ratio of α-demands to total demands for conditions 1 and 2. (This provides only a rough index however). There was an indication that relatively more α-demands were made in condition 1, the opposite of what might be expected;(the average ratio of α-demands to total demands was .41 for condition 1 and .33 for condition 2. A Mann-Whitney U test shows that this difference would only occur by chance with $p < .10$, 2-tailed, $U = 11$). This was for sessions 1-20. Analysis of the first few sessions (1-5) showed no effect at all.

The following discussion about dominance refers to conditions 1 and 2 only since the misinformation about other's payoffs in condition 3 makes it possible for each player at the same time to believe that the other has dominance.

It was found that in the 5 dyads of condition 1 and the 5 dyads of condition 2 that had at least one α-outcome, the player who benefited from the first α-outcome was in <u>every case</u> the player who had payoff dominance at the end of session 20. (This is in line with the findings in the studies in Chapter IV). In only one of the 5 experimental dyads having at least 1α, and 2 of the 5 control dyads having at least one α, did the player who gained from the first α have payoff dominance at the beginning

of that session. This information does not point to a difference between the groups. It does, however, hint that the player who gained from the first *a*-outcome managed to never let the other player "catch up" in terms of points.

The average payoff dominance after the first *a* was, as would be expected, much higher in condition 2 (only if there were a particular difference between the two groups in terms of dominance before the first *a* could we expect otherwise).

In condition 2, of the 5 dyads that had at least 1*a*, 2 had more than 1*a*, and in each of these cases, all the *a*'s were in favour of the same player.

In the control group, of the 5 dyads that had at least 1*a*, again 2 had more than 1*a*. In one of the two cases, the succeeding *a*'s were all in favour of the player who was dominant after the first.

It is clear that the two groups were not different in terms of unwillingness to reciprocate by a player who has benefited by an *a*-outcome. There appears to have been equal unwillingness to reciprocate in the two groups. However, in the condition 2 group, the loss by the non-dominant player was greater than in the control group, in terms of the differential in points between the two players. Since the pre-*a* dominance did not differ between the two groups, and since the session of first *a* was, on average, the same (3.4 for experimental group, 3.8 for the control), it may be that

either the dominant, or non-dominant, or both players were more insistent in their demands following the first α. However, the small number of dyads in each group mitigates against answering the question with any degree of confidence. Such measures as number of deadlocks after first α-outcome, average dominance at session of deadlock, mean demands on session of deadlock, etc., show interesting trends, but no statistically significant effects.

The fact that condition 3 did not lead to results different from those of condition 1 cannot at this point be explained; again we are hampered by the small number of dyads involved. However, each player may have been more willing to accept non-dominance since, in terms of an "equitable" division of points[7] the "other" player ostensibly had an advantage in terms of his payoff matrix, and hence "warranted" a larger payoff.

The same average number of α-outcomes was recorded, so it was not simply a matter of mutual co-operation in the avoidance of α-outcomes. Yet, no more α-reciprocations resulted either.

Summary

We have found that making the payoff for an α-outcome larger did not lead to an increase in either the number of

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7. For a discussion of equity, see Adams, 1963 and Morgan & Sawyer, 1967.

α -outcomes nor the number of α -recips, but in fact led to more frequent deadlocks. Thus, it is apparently not the magnitude of α (alone) which determines the frequency of α as an outcome. The increase in deadlocks did not appear to be due to increased pressure for α-outcomes by each player. The first α-outcome, which was not usually reciprocated in either the α = (0,65) or the α = (0,90) group, created a larger payoff disparity in the latter case which may have resulted in increased competitiveness. An ostensible increase in the value of α-outcomes to the "other" player alone had no apparent effect.

Further analysis is unfruitful due to the small number of dyads in each group. However, the fact that significant differences in the numbers of deadlocks were found in spite of the small number of dyads is impressive. This problem shall be examined in more detail in the Sixth Study.

Fifth Study: Increased incentives for reciprocation (Canada)

This study was really only a mini-study; it involved only a few subjects and consisted of only the second condition of the Fourth Study, that is, the condition that used the α = (0,90) matrix.

The results were to be compared with those for the α = (0,65) matrix in the Third Study, which happened to be run at the same time using the same subject population. This was intended as a check to see if Canadians, like Indians,

would respond less co-operatively when confronted with the α = (0,90) matrix than with the α = (0,65) matrix.

Subjects and procedure

The subjects were twelve first year Canadian male university students, all experimentally naive. They were assigned randomly to six dyads, and as usual, did not see each other.

The procedure was the standard T(ext) procedure as used in the Second, Third and Fourth Studies.

Results and discussion

The mean joint payoff for this group of six dyads was 779.2 points, significantly smaller than the 985 points of the T(ext) condition of the Third Study (Mann-Whitney $U = 10$, $p < .05$, 2-tailed). Furthermore, there was an average of only 1.5 α-outcomes in this group versus the average of 6.6 in the α = (0,65) group. This difference is significant at less than the .10 level, 2-tailed. In terms of deadlocks, there were an average of 1.9 deadlocks per dyad in the (0,65) case as compared to an average of 3.9 in the present (0,90) case. This difference is suggestive, but not statistically significant.

The session on which the first α-outcome occurred did not differ significantly between the two groups, and in only a minority of dyads in each group was the first α-outcome

reciprocated on the following session. The payoff disparity following an unreciprocated α-outcome is greater in the $\alpha = (0,90)$ case, and this likely accounts for the increased competitiveness in that situation.

Summary

This small study provides evidence that the findings of the Fourth Study with respect to the effects of the $\alpha = (0,65)$ and $\alpha = (0,90)$ matrices upon co-operation among Indian dyads also pertain to Canadian dyads. In each group, increasing the value of the α-outcome did not lead to more α-outcomes, but instead exacerbated the conflict which resulted in lower joint payoff, and more deadlocks. Thus, it would seem safe to say that the low rates of α-reciprocation noted in the Second and Third Studies were not simply due to the value of an α-outcome not being attractive enough.

Sixth Study: Asymmetrical Payoff Matrices (India)

This study follows from the curious results of the Fourth Study. It was seen that changing α from (0,65) to (0,90) resulted in more deadlocks but no more α-outcomes. We also saw that by ostensibly making $\alpha = (0,90)$ for the "other" player but actually leaving it unchanged at (0,65) for each player, the number of deadlocks was no more than in the control condition. Therefore, it would seem that it was not so much the change in the other player's payoff structure that led to the increased number of deadlocks in the $\alpha = (0,90)$

condition, but rather the increase in each player's own range of payoffs. Thus, such concepts as increased level of aspiration, which has been shown to exacerbate conflict in buyer-seller bargaining paradigms (Siegel, 1957) appear to be involved.

Perhaps two relatively independent levels of aspiration should be postulated, one in terms of "own points" and the other in terms of "difference in points" between the two players. In the α = (0,90) case of the Fourth Study, the payoff matrix may have led to higher levels of aspiration in terms of own points than in the α = (0,65) case but the levels of aspiration in terms of difference in points may also have been higher since the point differential for an unreciprocated α-outcome was higher. Thus, the player who benefited from the first α-outcome would gain more, relative to the other, in the α = (0,90) case than in the (0,65) case. Compare this situation to condition 3 (Fourth Study) where neither player could,through an α-outcome, achieve any more dominance than in the α = (0,65) case.

Another possible explanation of the relative lack of conflict in condition 3 of the Fourth Study is that players desire an "equitable" outcome; the payoff matrix appears to each player to favour the other and therefore each is relatively resigned to allowing the other a larger payoff. However, if equity were the key variable, this would not explain the increased conflict in the α = (0,90) case.

Consider the pairs of payoff matrices shown in Figure 8. In each of the two pairs, each player's payoff structure as seen

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Insert Figure 8 about here

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by himself is the same as in the standard $\alpha = (0,65)$ case. However, each player, in the first situation, sees a payoff structure which appears to be biased in favour of the other, whereas in the second case, each sees a payoff structure which appears to be biased in his own favour.

Level of aspiration, in terms of own points, should be the same in the two cases (except to the possible extent that players forsee greater or lesser amounts of conflict in the various cases). However, in terms of maximizing "difference", a greater level of aspiration would be predicted in the second case, and a smaller level of aspiration in the first case, both relative to the standard $\alpha = (0,65)$ case.

If, then, it is level of aspiration that is the crucial variable, a decrease in the amount of co-operation in going from case 1 to case 2 (assuming co-operation to be inversely related to level of aspiration of maximizing difference) would be anticipated. (In terms of an "equity" explanation, the same outcome should occur. The other player "deserves" a larger relative payoff in case 1 than in case 2 by virtue of the payoff structure).

Note that this prediction, which is consonant with the

Case 1:

	A	B	C	D	E
Player 1	0	20	20	35	65
Player 2	75	40	20	20	0

(a)

	A	B	C	D	E
Player 2	65	35	20	20	0
Player 1	0	20	20	40	75

(b)

Case 2:

	A	B	C	D	E
Player 1	0	20	20	35	65
Player 2	55	30	20	20	0

(a)

	A	B	C	D	E
Player 2	65	35	20	20	0
Player 1	0	20	20	30	55

(b)

Figure 8: Payoff matrices for the Sixth Study: (a) as seen by Player One, and (b) as seen by Player Two.

results of the Fourth Study, goes against what one might expect by simple inspection of the matrices: in case 2, each player can, through α-alternation, increase his dominance over the other while at the same time "co-operate and maximize the joint payoff". In case 1, α-reciprocation gives each player a loss of dominance, so that one would not expect as many α's as in the $\alpha = (0,65)$ case. Thus, if maximizing difference motivation is constant (i.e. no differential levels of maximizing difference aspiration across conditions) for all three conditions, we should expect more co-operation in case 2 and less in case 1, relative to each other and to the standard $\alpha = (0,65)$ condition.

The level of co-operation in the standard $\alpha = (0,65)$ case would, if either of the above lines of reasoning is correct, fall between the two levels discussed ablve. Note however that the differences among the three matrices are quite minor and the kind of effect suggested by the previous study, which used matrices that differed more greatly, may not be found.

In this study, subjects were run in two conditions, one using the payoff matrix of case 1, the other that of case 2. It would have been desirable to rerun a condition using the standard $\alpha = (0,65)$ matrix at the same time, but once again, the availability of subjects precluded this. However, such a condition was run earlier at the same college and the results of that group, reported as the "$T(ext_2)$" condition of the Second Study will be referred to.

This is the first occasion in this report upon which a specific hypothesis can be stated. Based on the findings of the Fourth Study, and the above conjecture, the hypothesis is that there will be more co-operation, (in terms of larger joint payoff, more α-outcomes, more α-recips and fewer deadlocks), in the condition using the matrices of case 1 than in the condition using the case 2 matrices. If this hypothesis is correct, the level of co-operation in the $T(ext_2)$ condition of the Second Study would be expected to fall between the levels found for these two conditions.

Subjects and procedure

All subjects were experimentally naive male university students from Deshbandhu College of the University of Delhi. Students were assigned randomly to dyads in one of the two conditions. Each student in a given dyad was drawn from a different class to minimize acquaintanceship.

The standard $T(ext_2)$ procedure and instructions were used. Condition 1 and condition 2 employed the matrix sets labelled case 1 and case 2 respectively in Figure 8. Condition 1 will be denoted as the "65/75" condition, and condition 2 as the "65/55" condition, while the standard $\alpha = (0,65)$ condition used for comparison will be referred to as the "65/65" condition. Ten dyads were run in condition 1 and eleven in condition 2. (The experimenter ran eleven instead of ten dyads in condition 2 by error).

Results

The data for this study for sessions 1-20 are summarized in Table 10. The group means from the T(ext_2) condition of the Second Study have been included for comparison. (Note:

Insert Table 10 about here

Although a specific directional hypothesis has been given, two-tailed tests will be used throughout. It should be kept in mind that one-tailed tests could be legitimately used here). The numbers in parentheses refer to the corresponding entries in Table 10.

Joint Payoff (1): The joint payoff in condition 1 was significantly larger than that in condition 2 ($t = 2.2$, 19 df, $p < .05$, 2-tailed). One notes that the mean joint payoff for the T(ext_2) group from the Second Study falls almost midway between the means of conditions 1 and 2. A statistical test of the ordered hypothesis that the joint payoff in condition 1 was greater than that of the T(ext_2) condition of the Second Study, and that the latter in turn was greater than that for condition 2 was significant (Jonkheere k-sample test[8], $z = 2.1$, $p < .05$, 2-tailed).

Difference in Payoff (2): There was no significant difference in terms of actual difference of payoff, but due to the nature of the situation, this means very little, since the subjects had no knowledge of each other's actual payoffs.

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8. This test is preferable to an analysis of variance when one is dealing with predicted order effects. See Jonkheere, 1954.

Table 10

Data summary for the Sixth Study (group means)

Response Measures	Condition 1 (n=10) (65/75)	Condition 2 (n=11) (65/55)	$Text_2$ group (65/65 Second Study (n=10
1) Joint Payoff	1073.0	918.0	981.0
	($\hat{\sigma}$=145.8)	($\hat{\sigma}$= 174.1)	($\hat{\sigma}$= 181.1)
2) Difference in payoff (actual)	140.0	122.7	73.0
3) DTA	6.1	7.4	5.2
4) DTA (session 1)	1.7	3.0	1.3
5) Number of α-outcomes	8.1	3.5	4.9
6) Number of β-outcomes	6.9	7.5	6.3
7) Number of γ-outcomes	4.2	6.7	7.0
8) Number of α-recips	3.2	0.6	2.4
9) Number of β-recips	1.4	1.9	1.6
10) α-asymmetry	1.9	1.5	1.1
11) β-asymmetry	2.4	2.3	2.7
12) Number of deadlocks (δ's)	0.8	2.3	1.3
13) Proportion of dyads having $\geq 1\delta$	.40	.64	.60
14) Number of LTSA's	1.1	2.4	1.3

It is more meaningful to look at the ostensible differences in payoff as viewed by the subjects. In condition 1, in all but one dyad, one player was ostensibly ahead of the other in points at the end of 20 sessions, while the other was ostensibly behind. In the remaining dyad, both players were ostensibly behind, one by a considerably larger amount than the other. The player who was ostensibly behind trailed by an average of 268.3 points (or 254 points if the player with the larger ostensible loss in the exceptional dyad is included). The corresponding figure for condition 2 was 62.7 points and for the $T(ext_2)$ condition of the Second Study, 71.0 points. (One of the two players thought he had made fewer points than the other in six of the eleven dyads in condition 2. In the other five dyads, each ostensibly made more than the other. The value of zero was used for these five dyads in calculating the dominance).

The interesting comparison here is not between conditions 1 and 2 since in the second condition both players could ostensibly win (although this happened in fewer than half the dyads), but between condition 1 and the $T(ext_2)$ condition of the Second Study. The difference between the maximum ostensible loss in condition 1 by one player and the actual loss in the $T(ext_2)$ condition by one player is significant (Mann-Whitney $U = 7$, $p < .002$, 2-tailed). Thus, one player was either willing, or was forced, to accept a larger relative loss in the 65/75 condition than in the standard $\alpha = (0,65)$ case.

In the 65/75 condition, in seven of the nine dyads in which there was an ostensible "winner", the winner was the same player who benefited most from the first non (γ,δ) outcome, which occurred on the first session. In fact, the first outcome in all ten dyads was either an α or β. In the 65/55 condition, the first outcome was an α or β in only seven of the eleven dyads. (The corresponding proportion for the $T(ext_2)$ condition was 8 out of 10).

Demands to Agreement (DTA) (3, 4): Although there was no difference between conditions 1 and 2 in the mean DTA for sessions 1-20, the mean DTA for session 1 of condition 1 was was significantly smaller than that for condition 2. (Mann-Whitney U = 23, $p < .05$, 2-tailed). (Comparison with the first session DTA from the $T(ext_2)$ condition of the Second Study showed that this condition differed significantly from condition 2 but not from condition 1, Kruskal-Wallis, $\chi^2 = 9.8$, $p < .01$).

Outcomes (5, 6, 7, 8, 9, 10, 11): There were significantly more α-outcomes in condition 1 than in condition 2 (non-parametric Randomization test, $t = 2.6$, 19 df, $p < .05$). (Again one notes that the mean number of α's for the $T(ext_2)$ group of the Second Study falls between the values for conditions 1 and 2, and the ordered hypothesis suggested in the introduction can again be shown to be supported in terms of this response measure (Jonkheere k-test, $p < .05$).

If the outcome of the very first session only is considered, it is found that whereas 70% of the outcomes were

α-outcomes in condition 1, (not unlike the 60% in the T(ext_2) group), the corresponding figure was only 18% in the second condition. The difference between the two conditions is significant (Fisher Exact test, $p < .05$, 2-tailed). Considering the first two sessions, 9/10 of the dyads in condition 1 had one or more α-outcomes, versus only 3/11 in condition 2 and 7/10 in the T(ext_2) condition of the Second Study). This difference between conditions 1 and 2 is significant (Fisher Exact test, $p < .02$, 2-tailed).

Examination of the first two non (γ,δ) outcomes shows that they were in favour of the same player in seven of the ten dyads in condition 1. This was the case for only two of the eleven dyads in condition 2. (The corresponding proportion for the T(ext_2) condition of the Second Study was four out of ten). This difference between conditions 1 and 2 is significant (Sign test, $p < .05$, 2-tailed).

There were no significant differences with respect to β- or γ-outcomes. Insofar as α-recips are concerned, there were more α-recips in condition 1 than in condition 2 (non-parametric Randomization test, $p < .05$, 2-tailed). (Note that the number of α-recips in the T(ext_2) group falls between the values for these two conditions, although it is rather closer to that for condition 1). There were no significant differences either in β-recips or in terms of α-asymmetry or β-asymmetry.

Deadlocks: There were numerically more deadlocks in condition 2 than in condition 1. The difference was significant only at the $p = .06$ level, 2-tailed (non-parametric Randomization

test t = 1.64, 19 df). (Note that one could consider this significant at the .05 level if a one-tailed test were used as would be permissible in light of the hypothesis made before the data was gathered).

Again, the mean number of deadlocks in the $T(ext_2)$ condition of the Second Study fell in the predicted sequence, about midway between the values for the two conditions in this study.

Discussion

The effects that have been observed in this study came about as a result of relatively minor changes in the payoff matrices. There was more co-operation, as evidenced by a larger payoff, more α-outcomes and α-recips, and fewer deadlocks, in the first condition (in which each α-recip would ostensibly result in each player making 10 points fewer than the other and each β-recip would ostensibly result in each making 5 points fewer than the other), than in the second condition (in which an α-recip would ostensibly result in each player making 10 points more than the other and each β-recip would ostensibly result in each making 5 points more than the other). Thus, the hypothesis stated earlier was confirmed. This obviously goes against what would have been expected if the results of the Fourth Study had not been available. More co-operation resulted when each player was ostensibly at a disadvantage than when each was ostensibly at an advantage. The $T(ext_2)$ group, where players were on a par, fell about halfway between these groups in terms of most of the measures of co-

operation. Striking, too, is the finding that the difference between conditions 1 and 2 was apparent on the very first session. Significantly more demands to reach agreement on the first session were required in the case of condition 2 than in condition 1 and when agreement was reached, there were significantly fewer α-outcomes in condition 2 than in condition 1. There was no difference at all with regard to the first demand on session 1. In six of the ten dyads in condition 1, the first demand on the first session was immediately accepted and in only half of these cases did the demand favour the acceptor. In only three of the eleven dyads in condition 2 did this occur and of these three, 2 were γ-outcomes and the third was an α-outcome in the favour of the acceptor. It can be concluded that after the first demand of the first session, there was a divergence in the behaviour of dyads in the two conditions, with those in condition 2 having displayed enhanced competitiveness.

Various studies have been reported (Ells & Sermat 1968, Minas, Scodel, Marlowe & Rawson, 1960) based on American students and a 2 x 2 matrix game which have shown that both the motives of maximizing one's own gains and of obtaining a differential advantage over the other were operating. Messick and Thorngate (1967), also with a 2 x 2 matrix game, found that the predominant component of the gain maximization motivation was associated with avoiding outcomes in which one receives less than the other. These findings with American students in a somewhat

different game context are not consistent with the present findings. In fact, they would lead to the prediction, if Indians and Americans were presumed to behave similarly, that there would be more co-operation in condition 2, where each α-recip allows each player to view himself as being ahead of the other, than in condition 1 where each would see himself as being behind the other.

As already mentioned, the present results are not inconsistent with what was found in the third condition of the Fourth Study when the payoff structure was such that each player saw an α-recip as giving him 65 points and the other 90; although the level of co-operation was not greater than in the $\alpha = (0,65)$ case, neither was it smaller. (In the present study, the enhancement in co-operation is most evident relative to the 65/55 matrix, and not in comparison to the $\alpha = (0,65)$ case which, while lying about midway between condition 1 and 2 in terms of co-operation-conflict, did not, for most response measures, differ significantly from either).

Why was there more co-operation and especially more α-recips in the condition in which such behaviour would ostensibly result in a differential loss to each player, than in the condition where such behaviour (i.e., reciprocation) would ostensibly maximize the joint gain, maximize own gain, and maximize the other's gain while at the same time allowing each player to believe that he is "ahead" of the other in terms of points? Since this effect is evident even before the first

outcome in the interaction, it must involve the motivational outlooks of the players, their aspirations and their expectations of each other.

Since in each condition one's own opportunities to make points are the same (i.e. the actual payoff structure in each case is the same as in the standard α = (0,65) case), the explanation for the difference in behaviour would seem to involve either the expectation of differential gains (i.e., "winning") or the expectation of increased or decreased co-operativeness on the part of the other. Clearly, "winning or breaking even" is not the important motivation since this would lead to behaviour opposite to what was observed. However, it is possible that in the 65/55 condition, (as was discussed in the introduction to this study), each player had a higher aspiration of differential gain (i.e. he expected to "win"). This in itself is not incompatible with co-operation however, since each player could ostensibly "win" while at the same time maximize his own and the joint payoff. Perhaps each was prompted to want to win by a very large margin, which would preclude allowing the other player many favourable α-outcomes. This is not inconsistent with the low number of α-outcomes on the first session in the 65/55 condition compared to the other conditions. Perhaps the "fortuitous" bestowal of payoff advantage (to each player, ostensibly) led each to feel that the first α-outcome should be in his favour, in keeping with the advantage bestowed upon him.

The second possibility is in terms of each player's expectation of the other. In the 65/75 condition, each player may have more readily expected α-reciprocation if he agreed to an α-outcome favourable to the other since the other could maintain payoff dominance while at the same time being co-operative. In the 65/55 condition, however, it is conceivable that each player might have considered it unlikely that the other would reciprocate an α-outcome since that would apparently put the other in a position of payoff "non-dominance". This is the same as saying that a lack of mutual trust existed. If these expectations existed, this could well account for the behaviour observed. In fact, however, there was no difference in the actual reciprocation of the first α-outcome among the two conditions of this study and the $T(ext_2)$ condition of the Second Study. In only about 25% of the dyads was the first α-outcome reciprocated on the following session. But, it is clear from what was said previously that α-outcomes occured earlier in the 65/75 condition (6/10 on the first session) than in the 65/55 condition (2/11 on the first session). By the end of the second session 9/10 of the dyads in condition 1 (65/75) had had an α-outcome, compared to 4 out of 11 in condition 2 (65/55). Of the nine such dyads in condition 1, only 3 had 2 α-outcomes, and of these, 2 of the three had an α-reciprocation.

It would seem then that α-outcomes were being avoided in condition 2. Examination of the negotiation data, in terms of the ratio of the number of demands for α-outcomes to the

total number of demands, revealed that *a*'s were just as often demanded in one condition as in the other. But they were not being "accepted" in condition 2. This supports the notion that, in this condition, there was a lack of "trust". Each participant was possibly afraid that the other would not reciprocate, since to do so the other would incur a loss of points relative to the first person.

Whether the earlier notion that in the 65/75 condition each player submits to the fortuitous "superiority" of the other, thus resulting in co-operation, while in the 65/55 each insists on "submission" from the other, is the explanation, (note that this is simply a rephrasing of the level of aspiration of "maximizing difference" idea mentioned earlier), or whether a better explanation is given by the notion of mutual distrust is a question which will be more amenable to discussion following the Seventh and Eighth Studies.

The Eighth Study is devoted to the question of whether or not Indian subjects prefer equity or equality in bargaining outcomes. The "dominance-submissiveness" notion mentioned above would lead to an expectation of outcomes based on equity considerations. Whether or not this is the case is germane to the present discussion and will be taken up again following the Eighth Study.

Seventh Study: Asymmetrical Payoff Matrices (Canada)

This study is an exact replication of the Sixth Study using Canadian male subjects. Unlike the previous study conducted

in India, no preliminary experiment was carried out in Canada and hence there was no experimental basis for making predictions as to what the results would be. (The reference here is to condition 3 of the Fourth Study). We do know from the studies in Chapter IV, however, that Canadian males, in certain instances at least, are more competitively oriented than their Indian counterparts.

In Chapter II, various studies were cited which supported the idea that western males play to "win" or at least not to "lose" relative to the other. In the 65/75 condition of these investigations, each appears destined to lose, unless α-outcomes favourable to the other are avoided. Thus, reciprocation of an α would appear to be as unlikely as it would be for one player to agree to an initial α-outcome which favours the other. In the 65/55 case however, each can ostensibly "win" while at the same time pursuing the optimal joint strategy of α-alternation.

Thus, on the basis of what is already known about the motivation of western males in game situations, it seemed very likely that there would be more co-operation in the 65/55 condition than in the 65/75 condition. The T(ext) condition of the Third Study, which was run using the same subject population and at virtually the same point in time was used as a comparison group, and it was expected that the level of co-operation in that group would lie about midway between the levels of condition 1 and condition 2.

Subjects and procedure

The subjects were male undergraduates from the same population described in the Third Study. The procedure and instructions were those of the T(ext) condition of the Third Study; the only change was in the payoff matrices. Condition 1 and condition 2 used the same payoff matrices as condition 1 and 2 respectively of the Sixth Study, that is, those labelled case 1 and case 2 respectively in Figure 8.

Results

The results are summarized in Table 11 with the results from the T(ext) condition of the Third Study, which used the a = (0,65) matrix, included for reference. The numbers in

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Insert Table 11 about here

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parentheses refer to the corresponding entries in Table 11.

Joint Payoff (1): The two distributions of joint payoff barely overlap. The joint payoff for condition 2 was much larger than that for condition 1 ($t = 5.4$, 18 df, $p < .001$). The joint payoff for the T(ext) condition of the Third Study lies almost midway between those of conditions 1 and 2, and a one-way analysis of variance shows that it is not significantly different from either of the mean values for conditions 1 and 2.

Difference in Payoff (2): There was no significant difference in terms of difference in actual payoffs. However, as pointed out in the Sixth Study, this measure is not meaningful since the players do not know each other's true payoffs.

Table 11

Data summary for the Seventh Study (group means)

Response Measures	Condition 1 (n=10) (65/75)	Condition 2 (n=10) (65/55)	T(ext) (65/65) of Third Study (n=9)
1) Joint Payoff	775.5	1119.0	985.0
	($\hat{\sigma}$= 149.1)	($\hat{\sigma}$= 135.6)	($\hat{\sigma}$= 170.9)
2) Difference in payoff (actual)	30.5	63.0	32.8
3) DTA	6.5	3.5	4.7
4) DTA, Session 1	3.0	3.1	2.8
5) Number of α-outcomes	1.6	10.5	6.6
6) Number of β-outcomes	3.6	5.9	6.3
7) Number of γ-outcomes	11.7	2.8	5.2
8) Number of α-recips	0.9	8.3	4.7
9) Number of β-recips	0.6	1.5	2.4
10) α- asymmetry	0.6	0.8	0.6
11) β-asymmetry	1.3	2.5	0.8
12) Number of deadlocks (δ's)	3.1	0.8	1.9
13) Proportion of dyads with $\geq 1\delta$	8/10	5/10	7/9
14) Number of LTSA's	2.7	1.4	1.4

In terms of ostensible payoffs, in every dyad of condition 1 one or both players was ostensibly behind at the end of twenty sessions. The corresponding proportion for condition 2 was three dyads out of ten. In the other seven dyads, both players thought they were ahead. This is larger, but not significantly so, than the corresponding proportion of 3 out of 11 Indian dyads in which both players thought they were ahead in condition 2 of the Sixth Study.

The average of the ostensible loss which one player suffered relative to the other in condition 1 (or the larger loss when both ostensibly trailed) was 55 points. This is not significantly different from the average difference in payoff of 32.8 points in the T(ext) condition of the Third Study.

Demands to Agreement (DTA)(3, 4): There were significantly more demands to reach agreement in condition 1 than in condition 2 ($t = 2.8$; 18 df; $p < .02$, 2-tailed). Again, the mean value for the T(ext) condition of the Third Study fell about midway between those two values. There was no significant difference in terms of DTA on the first session.

Outcomes (5, 6, 7, 8, 9, 10, 11): There were so many more α-outcomes in condition 2 than in condition 1 that the two distributions barely overlapped (Mann-Whitney $U = 2.5$, $p < .001$, 2-tailed). Again, the value for the T(ext) condition of the Third Study is about midway between the two means, and is not significantly different from either.

There were no significant differences in terms of β-outcomes. However, there was a substantially greater number of γ-outcomes in condition 1 compared to condition 2 (Mann-Whitney U = 2, $p < .001$, 2-tailed). (The value for the T(ext) condition of the Third Study lies between these two values).

Of the first two non (γ,δ) outcomes, both were in favour of the same player in only one of the dyads in condition 2, and this never occurred in condition 1 (nor in the T(ext) condition of the Third Study). A comparison with the corresponding Indian data in the Sixth Study shows that not only did the Indians react differently as a function of condition in this regard, they were, regardless of condition, much more likely to concede the first two non (γ,δ) outcomes to the same player than were Canadians ($\chi^2 = 12.3$, 1 df, $p < .001$). This tendency was observed among Indians in the T(ext) condition of the Second Study as well.

Eight of the ten dyads in condition 2 had α-recips versus only two of ten in condition 1. (This in itself is significant, Fisher Exact Test, $p < .05$, 2-tailed). The difference in the number of α-recips also was obviously significant at least at this level. Again, the value for the T(ext) condition of the Third Study falls about midway between the values for the two conditions in this study. There was no significant difference in terms of either α-asymmetry or β-asymmetry between conditions 1 and 2.

Deadlocks: There were significantly more deadlocks in condition 1 than condition 2 (Mann-Whitney test, $z = 2.06$,

$p < .05$, 2-tailed). The value for the T(ext) condition of the Third Study falls midway between these two values.

Discussion

It is obvious that there was more co-operation in condition 2 than in condition 1. There was a larger joint payoff, fewer demands to agreement, more α-outcomes, more α-recips and fewer deadlocks. And on each of these measures, the corresponding value for the T(ext) group for the Third Study fell about midway between these two. The Canadian males were more "co-operative" when co-operation allowed each player to "win". They were less co-operative when co-operation entailed a relative loss. Although the results of neither condition differed significantly from those of the $\alpha = (0,65)$ condition, this is not surprising given that the differences in the matrices among the three groups are so small and given the large size of the variances typically associated with the data in these studies. However, since the response measures for the $\alpha = (0,65)$ condition almost always fell midway between the values for the other two conditions, this certainly supports the notion that there was decreasing co-operation as the matrix changed from 65/55 to the standard $\alpha = (0,65)$ to 65/75, even though the "own" payoffs for each player were always (0,65). The graph in Figure 9 illustrates these changes in terms of mean joint payoff and provides a comparison between the effect found here and that found with the Indian subjects in the Sixth Study.

Insert Figure 9 about here

The average amount by which one player ostensibly "lost" in the 65/75 condition was not significantly different from the average amount by which one player actually "lost" in the T(ext) condition of the Third Study. This is in contrast to the findings for Indians in the Sixth Study, where the average ostensible loss by one player in the 65/75 condition was significantly greater than in the $T(ext_2)$ condition.

From the discussion in the Third Study, we know that the two $\alpha = (0,65)$ conditions (i.e. for Canadians and Indians respectively) were not significantly different. The effects of the small changes in the payoff matrix were not only more substantial in the case of the Canadian males, they were in the opposite direction to the changes found in the Indian data. The Canadian data are consistent with the explanation of competitivity discussed earlier. But in the Indian case, competitiveness apparently increased when each one appeared to have an advantage bestowed on him by the structure of the situation, and apparently decreased when the advantage ostensibly lay with the other.

Further discussion of this matter will follow the Eighth Study, which focuses on "equity".

Eighth Study: Equity

In the Sixth Study, it was observed that Indian subjects were more co-operative when the payoff matrix placed each at

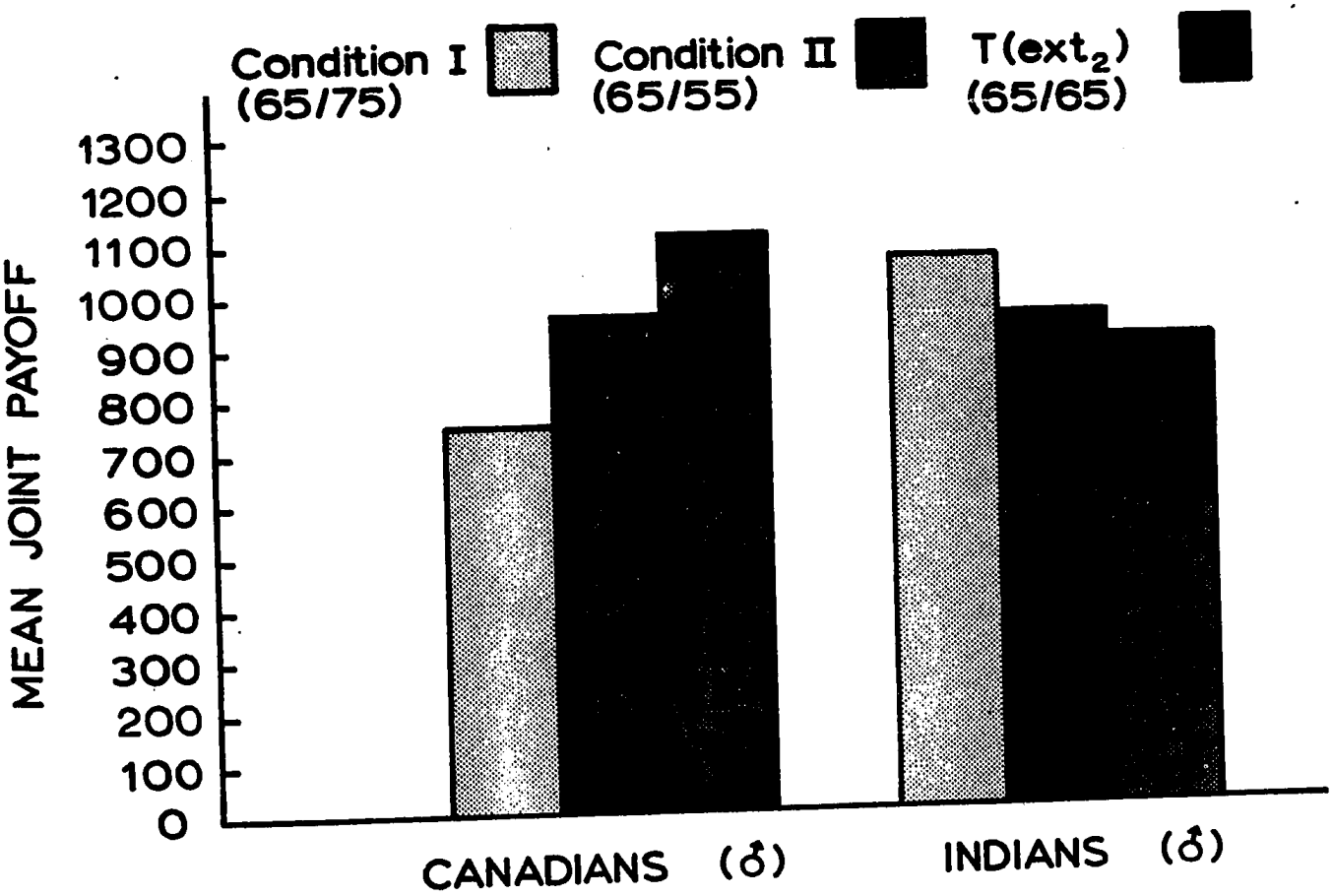

Figure 9. Mean joint payoff, Sixth and Seventh Studies, and the $T(ext_2)$ conditions of the Second and Third Studies.

an ostensible disadvantage vis-a-vis the other than when each appeared to be at a relative advantage. In the former case, the subjects chose the very behaviour pattern (i.e. *a*-reciprocation) that would create the payoff imbalance significantly more often than in the latter situation. The Canadian subjects, on the other hand, behaved in a way consistent with the joint motivation of maximizing one's own gains while at the same time making at least as many points as the "opponent".

By way of explanation of the Indian behaviour, it was suggested that the apparent endowment of the "other" player with a payoff advantage was enough to cause each player to become somewhat "subservient" and as a result, co-operative, whereas the endowment of each player, himself, with an apparent advantage led him to feel "dominant" and to feel that he deserved to dominate the other in terms of points. Even though the payoff set-up made this possible even while co-operating, it was conjectured that the feelings of dominance were strong enough on each side so that the small apparent advantage accorded to each by the matrix was not enough and that each player attempted to "win" by a larger margin than was compatible with co-operative responding. In other words, if the payoff structure aroused motivations associated with dominance, it is possible that these motivations precluded co-operative responding by the exclusion of co-operative motivation.

Another explanation for the Indian behaviour can be based on the notion of "equity". Morgan & Sawyer (1967) stated:

> "Since the outcomes on which bargaining eventually focuses may be ordered so that the more one person gets, the less the other gets, there are just two directions in which information [about the other's expectations] can move the outcome. The two directions may be identified by two prominent outcomes among the ordered set: toward <u>equality</u>, where the two get absolutely the same amount, and toward <u>equity</u>, where the two get proportionately the same, each relative to the possibilities he has (so that the person with the stronger position gets more) (p. 140)."

Game theoretical principles (Nash, 1950, 1953, as cited by Morgan & Sawyer, 1967) specify an "equitable" outcome proportional to the opportunities each player possesses. Thus, one could argue that the Indian behaviour in the Sixth Study reflects an equity-seeking rationale: the player given the initial advantage "deserves" more.

This Eighth Study was designed to assess the importance of the equity principle, as defined above, to the Indian behaviour. Whereas in the Sixth and Seventh Studies, the series of outcomes which would maximize one player's outcomes (i.e. a series of A's or a series of E's) served at the same time to minimize the opponent's outcomes, and to maximize the payoff dominance of the former, in this experiment, the payoff structure was such that the series of outcomes which maximized one player's outcomes, (a series of E's), also maximized the other player's outcomes, and ostensibly maximized the amount by which each player "lost" relative to the other. The question to be answered was whether or not the Indians would agree to such a series of outcomes, as would be predicted if they were acting according to the equity rationale. It would not be

expected that Canadian subjects would allow the other to make more points, even if they had to make sacrifices in terms of their own payoffs to prevent this. This follows from the findings of the Sixth Study as well as other matrix studies that have involved asymmetric payoff structures (e.g. Morgan & Sawyer, 1967; Schellenberg, 1964).

Consider, then, the matrices in Figure 10(a). The actual payoff structures of the two players are identical; the

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Insert Figure 10 about here

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most beneficial outcome for each, in terms of two payoff, is E, and the least beneficial is A. Furthermore, each player is given to believe that the other's payoff structure, while being aligned with his own (that is, A being the least desirable and E the most desirable outcome) is different to the extent that the most desirable outcomes (D and E) give the other person a larger payoff. (Note, incidentally, that as in the standard α = (0,65) matrix, an α-recip or a β-recip results in equal payoffs for the two players (in terms of ostensible as well as actual payoffs) and these payoffs are the same as in the α=(0,65) case).

If both players' motivations were purely individualistic purely co-operative, or based wholly on principles of equity, or any mixture of these three things, then the only outcome to be expected would be a series of E's. The only reason a player might not agree on E would be because of concern with

(a)

As seen by Player One	A	B	C	D	E
Player 1	0	20	20	35	65
Player 2	-25	10	20	45	90

As seen by Player Two	A	B	C	D	E
Player 2	0	20	20	35	65
Player 1	-25	10	20	45	90

(b)

	A	B	C	D	E
Player 1	0	20	20	35	65
Player 2	-25	10	20	45	90

	A	B	C	D	E
Player 2	-25	10	20	45	90
Player 1	0	20	20	35	65.

Figure 10: Payoff matrices for the Eighth Study, (a) for the "primary" condition; (b) for the "no deception" condition.

the size of the other's payoffs relative to his own; that is, if he were competitively motivated. The evidence from the studies in Chapter IV revealed that Indian subjects were not nearly so competitive as Canadian males who, in certain circumstances at least, were highly competitive. Again, it might be anticipated that if Indian subjects were confronted with these matrices they would choose a series of E-outcomes.

In this study, a group of Canadian males are included for comparison. In the foregoing section, the Canadian and Indian studies were separated since each was run as a self-contained experiment. But in this case, a small group of Canadian males was run using the matrix of Figure 10(a), strictly as a comparison for the Indian group.

A possible problem with the matrix in Figure 10(a) is this: should either player demand A or B, it will appear to the other than he is deliberately asking to take a loss relative to the other. Similarly, if one player demands E and the other refuses to accept it, it would appear that the other is unwilling to take advantage of his superior position in terms of the payoff matrix. Although this drawback is serious, it must be remembered that only if difference-in-payoff (i.e. competitive motivation) is important will the problem arise. That is, the basic information of interest is in whether or not the series of outcomes is a series of E's. If this is not the case, then the answer will be obvious and the problems posed by the matrix are not important since they involve behaviour that we do not need to analyze.

However, as a precaution, a group of Indian subjects was run using the matrix set of Figure 10(b). (This was labelled the "no deception" condition to distinguish it from the "primary" condition described above.) Here, there is no payoff deception. Player One has the same payoff matrix as in Figure 10(a); Player Two sees the same payoff structure that Player One sees. Player Two has a real payoff advantage, and unless he is interested in strict equality of payoffs, he should always prefer E, since that outcome is consistent with the principles of equity, as well as the motivation to maximize own payoff, maximize joint payoff, and maximize the difference in payoffs. Thus, the greater variation of behaviour, if any, would be expected from Player One, who, if motivated by maximizing difference (i.e. competitive) considerations, would be disposed to avoid E outcomes to some extent.

Subjects and procedure

The Indian subjects were experimentally naive male university undergraduate students from Hastinapur College (University of Delhi). The Canadian subjects were experimentally naive male undergraduates from McMaster University.

Six Indian dyads and five Canadian dyads were run in the "primary" condition in which the procedure was the standard $T(ext_2)$ procedure, using the matrix set of Figure 10(a).

In the "no deception" condition, seven Indian dyads were run. Canadian dyads were not run in this condition, since

it was designed as a verification of whatever effects might be found in the primary condition and it was the Indian behaviour that was of primary interest here since it was to be expected that the Canadians would behave competitively. The procedure was the same as in the "primary" condition and the payoff matrices were those of Figure 10(b).

Results and discussion

The results for sessions 1-20 are summarized in Table 12. (The numbers in parentheses refer to the corresponding entries in the table).

Insert Table 12 about here

Payoffs (1, 2): a) "Primary" condition - the maximum possible payoff per player was 1300 points. Canadians and Indians alike averaged less than half this amount. There was a tendency for Canadian dyads to realize larger payoffs than Indians (Mann-Whitney $U = 5.5$, $p < .10$, 2-tailed). The Canadians tended to "allow" the other more points (in terms of the ostensible payoffs) than did Indians (Mann-Whitney $U = 5$, $p < .10$, 2-tailed). There was no difference between Canadians and Indians in terms of difference in payoff for either actual or ostensible payoffs. b) "No deception" condition (Indians) - the payoff achieved by Player One was no different than in the "primary" condition: Player Two did not make significantly more points than the "ostensible other" in the "primary" condition ($p > .10$). The difference in points between Players One and Two was not

Table 12

Data summary for the Eighth Study (group means)

Response Measure	"primary" condition Indians (n=6)	"primary" condition Canadians (n=5)	"no deception" condition Indians (n=7)
1) Payoffs - each player	509.0	587.0	Player One 508.0
1) Payoffs - ostensible other	378.3	638.0	Player Two 567.0
2) Difference in payoff (ostensible)	130.7	65.0	(actual) 77.0
3) DTA (sessions 1-20)	4.1	3.7	7.2
4) DTA (session 1)	1.2	1.8	2.1
5) Number of A-outcomes	2.7	1.6	0.4
6) Number of B-outcomes	7.7	6.0	3.3
7) Number of C-outcomes	5.7	4.8	7.7
8) Number of D-outcomes	1.2	2.8	2.1
9) Number of E-outcomes	2.2	4.2	3.3
10) Number of deadlocks (δ's)	0.6	0.6	3.1
11) Number of LTSA's	1.5	1.4	3.0

significantly greater than zero.

Demands to Agreement (3, 4): There were no significant differences in terms of DTA on the first session; neither were the Indians and Canadians different in the "primary" condition for the overall DTA. However, Indians used more demands to reach agreement in the "no deception" condition than in the "primary" condition (Mann-Whitney U = 5, $p < .025$, 2-tailed).

Outcomes (5, 6, 7, 8, 9, 10, 11): a) "Primary" condition - four of the six Indian dyads and two of the five Canadian dyads had no E-outcomes at all. Of the other two Indian dyads, one had two E's and the other had eleven. There were not many more D's: three of the six Indian dyads had no D's. So, it is clear that the Indians, like the Canadians, were generally avoiding E-outcomes. (There was no significant difference between Canadians and Indians in terms of E-outcomes, $p > .10$).

Indian dyads had an average of 10.4 A or B outcomes per dyad compared to 7.6 for Canadians. The two groups were not significantly different. Very few deadlocks occurred in either groups.

b) "No deception" condition (Indians) - there was a tendency for more E-outcomes in this condition than in the Indian group in the "primary" condition (Sign test, $p < .10$, 2-tailed), and there were significantly fewer A and B outcomes in this condition (Mann-Whitney U = 3, $p < .01$, 2-tailed). Furthermore, there were significantly more deadlocks (Sign test, $p < .05$, 2-tailed). It

is worth noting that Player One, who was at a disadvantage, demanded D or E only 4% of the time. Player Two demanded A or B only 3% of the time but this is more to be expected since Player Two could only lose by an A or B outcome. But Player One would make more points by a D or E outcome than by any other outcome. Yet, he rarely demanded D or E and few D and E outcomes were agreed on. Obviously then, in the "no deception" condition, Player One was more motivated by the relative payoffs than by the absolute payoffs just as both players were in the "primary" condition. But the fact that the player in the "no deception" condition could maximize both his own gain and his relative gain through D or E outcomes led to more conflict since he would have nothing to gain by an A or B outcome. (In the "primary" condition, D and E demands accounted for 30% of the total demands but only 17% of the outcomes were D's or E's).

The whole point of this study was to see whether or not Indians would choose an "equitable" solution (which would allow the "other" player to make more points since the payoff structure endowed him with an advantage). Clearly, the Indians, like the Canadians, were more concerned with equality than equity in payoffs in this situation. Their strongly competitive behaviour in this study stands in sharp contrast with the behaviour observed in the Fourth and Sixth Studies, however, the structure of the conflict here is very different than in those previous studies. The payoff matrices in this study do not allow for reciprocity, yet reciprocity was the optimal

strategy in the earlier studies. Thus, the findings of this study cannot be taken to contradict the earlier findings. Further discussion of this follows in the next section.

General Discussion of the Fourth, Fifth, Sixth, Seventh and Eighth Studies

The question remains as to why the Indian subjects reacted so differently from the Canadian subjects to the matrices used in the Sixth and Seventh Studies. The notion that the subjects might view the 65/75 situation as one where the "other" deserves more since the payoff structure has put him in a favourable position must be re-examined in light of the results of the Eighth Study. Let us summarize the more pertinent points:

1) Regardless of experimental condition (exclusive of the Eighth Study), Canadians virtually never allowed the first two non (γ,δ) outcomes (i.e. the first two outcomes that unequally divided the total points for the outcome) to favour the same player. Thus, Canadians insisted on some sort of reciprocity. Indians, on the other hand, were prone to allow the same player the advantage in the first two non (γ,δ) outcomes.

2) In the 65/75 condition, the first two non (γ,δ) outcomes went to the same player in seven of the ten Indian dyads, a proportion significantly larger than the three out of eleven dyads in which this occurred in the 65/55 condition.

3) The average apparent "loss" by a Canadian player in the 65/75 condition was not significantly different from the average "loss" by a player in the T(ext) condition of the Third Study. Among the Indian dyads, however, the average apparent "loss" by one player was substantially larger in the 65/75 condition than in the $T(ext_2)$ condition that was used for comparison (254.0 and 74.0 points respectively).

4) Whereas there were no significant differences in terms of behaviour on the first session among the Canadian conditions, the Indians in the 65/55 condition evinced significantly more conflict on the first session than did dyads in the 65/75 condition or in the $T(ext_2)$ condition. This was manifested by significantly more demands to agreement and by significantly fewer α-outcomes.

The fact that increased conflict was observed from the very beginning on the part of the Indians in the 65/55 condition is strong evidence that the heightened competitiveness in this condition was due, at least in part, to the subjects' initial reaction to the apparent payoff structure, and not simply to apparent payoff disparities that developed during the course of the twenty sessions. The players were obviously being "tougher" bargainers. Point (2) above supports this. Yet, in the 65/75 condition, which saw increased competitivity among the Canadian dyads, the Indians responded in a relatively co-operative manner. In nine of the ten dyads in that condition, one player ostensibly trailed the other in points at the end

of twenty sessions, while both players were ostensibly in this position in the tenth dyad. Thus, it appears that a dominance-submission axis formed in the majority of dyads, with one player being the "loser" and the other the "winner" and with little argument about it. The finding that the average "loss"was much greater than the average difference in points in the $T(ext_2)$ condition is supportive to the idea that one player rather stoically accepted the "role" of "loser". The "winner" ostensibly led by an average of 143 points, which indicates that it is unlikely that he was concerned with equality in outcomes. The player who was in the lead after the first non (γ,δ) outcome was the player who was typically the "winner", so the dominance "hierarchy" apparently was established early and without a struggle, since the bargaining which led to the first non (γ,δ) was no different than the corresponding behaviour in the $T(ext_2)$ condition. (In all ten dyads of the 65/75 condition, the first session resulted in an α- or β-outcome. This occurred in eight of the ten dyads in the $T(ext_2)$ condition). Seventy per cent of the outcomes of the first session were α-outcomes, not different from the sixty per cent in the $T(ext_2)$ condition (and significantly greater than the eighteen per cent in the 65/55 condition).

It is important to stress that in the Indian 65/75 condition, only one player was the "loser" (in 9 out of the ten dyads). Perfect reciprocation would have left each player with an ostensible loss relative to the other. But this did not

happen. Rather, one player effectively exploited the other's seeming willingness to suffer a relative loss. Since this occurred in nine of the ten dyads, it is a strong effect.

The overall picture that emerges is as follows. The Canadians reacted in all the studies in a manner consistent with earlier findings that North American males are motivated to achieve as much as or more than their opponent. (Recall that only males are under discussion in this chapter). Indians, as was discussed in Chapter IV, appear to be less competitively oriented and less concerned with their relative payoffs in situations where they are given equal opportunities to earn payoffs. (A recent finding by Carment and Hodkin, 1972, that Indian students typically end up with significantly larger intra-dyadic point disparities in a co-action situation than do Canadian students, regardless of the presence or absence of competitive motivation, is an independent source of support for this contention). However, it is quite a different matter when the payoff structure is asymmetrical. A statement by Deutsch (1961) in reference to his research with American students is relevant here:

> ". . . whenever bargainers are unable to reach agreement despite the clear existence of a potential agreement that would leave the bargainers in a better position than no agreement - one may suspect that at least one of the bargainers feels that his face has been threatened and that an agreement would lead to a loss of face. Hence, although manifestly directed at the substantive issues, the bargaining behaviour may merely be using these issues as face symbols. . . 'Face' is one of the individual's most sacred possessions (p. 896)."

Perhaps Indians do not attach much "face" to "losing" in a bargaining game. Or, perhaps Indians are not nearly so high in "face" (or, equivalently, in self-esteem) as North Americans. A study by Pepitone, Faucheux, Moscovici, Cesa-Bianchi, Magistretti, Iacono, Asprea, and Villone (1967) is pertinent in this regard. Evidence was adduced that suggested that the tendency to compete is directly a function of the individual's self-esteem. Furthermore, a measure of self-esteem indicated that American students possess higher levels of self-esteem than do French or Italian students. (Caution in the acceptance of this latter finding was suggested since it is possible that semantic differences were involved).

There are no data available regarding the average level of self-esteem among Indian students, so whether Indians are generally lower in self-esteem or simply do not attach it to bargaining games cannot be established.

However, it is interesting to speculate about the form self-esteem might take in a society such as India where the social stratum into which one is born has an important effect upon one's interpersonal relationships with people from other strata. The fact that Indians have historically accepted that they were born into a certain immutable position in the social status hierarchy, which to a very large extent is still the case today, leads to the following conjecture about the observed behaviour in the Sixth Study. In the 65/75 condition, the payoff structure had apparently endowed

the "other" player with the opportunity to make more points. This may have led to relatively little self-esteem being attached to "losing", and it may even have caused both players to react deferentially at first. Such deference could have led to the observed behaviour of one player accepting the first demand of the other on the first session;(in only one of the ten dyads did either player make more than one demand on the first session). The player who found himself in the lead at the beginning then was motivated to continue to increase his payoff dominance, since his early "success" overcame his deference, while the other player continued to accept subordination in terms of payoffs. In the 65/55 condition, however, "losing" may have involved a greater loss of self-esteem since each apparently was favoured by the payoff structure. The fact that each player could "win" while at the same time co-operating to maximize the joint payoff through α-reciprocation apparently had little effect. Perhaps the "status" differential implied by the ostensible asymmetry of the payoff structure led each player to expect that the other should be submissive, and the lack of submissiveness was detrimental to the establishment of any form of co-operation. The comment by Deutsch mentioned in the present discussion is again salient at this point. (However, since Indian dyads even in the $T(ext_2)$ condition did not show a very high level of α-reciprocation, it may be that Indians are less strategically oriented than Canadians. If this is so, the competitiveness

of the Indians in the 65/55 condition was possibly exacerbated by the failure of the players to co-ordinate their behaviour in such a way as to achieve ostensible payoff dominance while at the same time working together to maximize the joint payoff. It is important to note, however, that in some studies not reported in this thesis, Indian dyads showed high levels of α -reciprocation. This argues against the notion that Indians would have co-operated in the 65/55 condition had they been aware of the proper strategy.)

The above conjecture accounts for the findings of the Sixth Study, but not the results of the Eighth Study. This conjecture would lead one to predict that Indians would show little hesitation in accepting a relative loss while at the same time maximizing their own payoffs, since as in the 65/75 condition, the "other" player is ostensibly given a much greater opportunity to earn points. Yet, much of the behaviour was directed at attempting to keep the "other" player from achieving payoff superiority. In fact, there was no difference between Indians and Canadians in this regard. The Eighth Study clearly shows that, while Indians may be less competitive than Canadians under certain circumstances, there are limits to their co-operativeness. Had the "no deception" condition not been run, the results of the "primary" condition could be reconciled with the above conjecture. One could have argued that whereas in the 65/75 condition, one player became dominant and the other submissive, at least in terms of outcomes,

neither player could assume the dominant "role" in the "primary" condition since the payoff structure was such that for a D or E outcome, both players would appear simultaneously to each other to have made more points on that single session. This was very different from the situation in the 65/75 condition where players correctly perceived the direction (but not the true amount) of the payoff disparity for a given outcome. Perhaps, it could have been argued, it is just too unlikely that two players would simultaneously agree on a single outcome that ostensibly puts both at a disadvantage. But the results of the "no deception" condition destroy this line of argument, since in this condition, one player was in fact assigned a dominant position and the other an inferior one in terms of the payoff structure. However, there was no more tendency to maximize the joint payoff than in the "primary" condition. In fact, there was more conflict than in the "primary" condition. That this was not simply due to the fact that one player's advantage was larger than the ostensible advantage in the 65/75 condition is indicated by reference to the results of the third condition of the Fourth Study, in which an α-reciprocation would lead to an ostensible relative loss of 35 points for each player (the same as for an E outcome in the "primary" condition of the Eighth Study) and yet no increase in conflict occurred relative to the standard $\alpha = (0,65)$ condition. (But at the same time, it must be recalled that there were very few α-outcomes in any conditions of the Fourth

Study). Furthermore, as well as the small number of E-outcomes, the number of D-outcomes was also small, and here the difference in points was only ten points.

The difference in behaviour as demonstrated by Indians in the Sixth and Eighth Studies may quite likely have been due to the fact that in the Sixth Study, some kind of reciprocation of outcomes (even if not in the immediate sense defined by the α-recip and β-recip measures) was necessary if either player was to make more than a minimum profit. Since the player's interests ran in opposite directions (in terms of the set of alternatives), any outcome other than the γ-outcome, which gave only twenty points to each player, resulted in a point differential which could, if the players reciprocated, be eliminated on a subsequent session. Thus, point differentials were necessary from session to session and a player certainly had the opportunity to make up the deficit on subsequent sessions. Thus, the first non (γ,δ) outcome may have been viewed by one or both players as a co-operative gesture on the part of the player who received the smaller outcome, whether or not it was originally intended as such. Various studies (e.g. Boyle and Bonacich, 1970, Sermat, 1967; Terhune, 1968) have shown the importance of early co-operation and co-operative gestures on the subsequent overall level of co-operation. Thus, compared to the structure of the Eighth Study, the structure of the earlier studies would be more likely to elicit co-operation of some sort or at least outcomes which would appear to be based

on co-operative motives. In the Eighth Study, once a player fell behind in points, the payoff structure was such that it was very unlikely that he would be able to regain even approximate payoff equality.

The self-esteem explanation suggested to explain the differences between conditions in the Sixth Study is not weakened by the above conjecture since what we have been discussing is really directed at a comparison of the standard α = (0,65) payoff structure and that of the Eighth Study. The effects of the different matrices used in the Sixth Study could be viewed as being superimposed on the underlying situation described above.

In fact, the explanation given above could itself be restated in terms of self-esteem. With the α = (0,65) and related matrices, allowing the other player to get more points on a given outcome does not signal a capitulation or "giving in" (i.e. a loss of self-esteem) on that session, since it is a necessary action if the players are to make more than minimal payoffs. (If players are concerned about the experimenter's evaluation, again this could be viewed as "co-operative" or "a strategic move", etc.). In the Eighth Study, agreeing to a D or E outcome may more likely involve a potential loss in self-esteem since it is a clear sign that one is prepared to let the other player "win". (It is quite possible that the demand characteristics of the situation lead the player to believe that the experimenter is in this case primarily

interested in whether or not he "gives in" to the other. This would augment the competitive motivation).

The self-esteem explanation used in the Sixth and Eighth Studies highlight an avenue for further research, an avenue which is particularly appealing because of the unique caste hierarchy which governs social life in India. The study of self-esteem in India could be done, at least in part, through the medium of experimental games. Brown (1968) studied face-saving among American students by giving them feedback using an audience which told them that they looked "foolish and weak", or that they looked "good", to increase the salience of the game outcome. Studies along a similar line, varying the composition of the audience (e.g. persons of status higher, equal to, or lower than the status of the player) and using a confederate of perceived higher, equal, or lower status as the "other" person, could provide data which would perhaps allow a more refined explanation of the effects observed in the present research.

A final note about Indian bargaining behaviour is in order. Carment (1972b) has carried out a cross-cultural study using Canadian and Indian students, which focused on risk-taking. His data show that, in situations where chance but not skill was involved,the Indian students were significantly less willing to take risks than Canadians. This finding is germane to the present research since a certain amount of risk

is involved when one agrees to an α-outcome which favours the other, especially when the first α-outcome is involved. Yet, the preceding series of studies demonstrated that in an equal-opportunity payoff structure, Indian dyads were more likely than Canadians to agree to an α-outcome on the very first session. This implies either a greater willingness to take risks in this situation, which does not involve chance, or a greater expectation of reciprocal co-operation from the other. Here, again, is a worthy avenue for further research.

Summary of Findings: Studies of Motivation

The main findings of the experiments of the Fourth to Eighth Studies inclusive, (which dealt with only male subjects), were as follows:

1) Increasing the incentives for α-reciprocation by increasing the values of α-outcomes did not lead to increased α-reciprocation in either culture. Instead, the joint payoff actually decreased and the number of deadlocks increased. Thus, the low rates of α-reciprocation noted in the earlier studies were not simply due to the value of an α-outcome not being attractive enough.

2) When Canadians thought the other player had an advantage, in terms of the payoff structure, they became very competitive. (Co-operation would have served to increase each player's apparent "loss" relative to the other). On the other hand, when each player was at an ostensible disadvantage, Canadian males were very co-operative. (Each player could

co-operate while at the same time apparently making more points than his opponent).

3) Indian males behaved in an exactly opposite manner in the situations described in (2) above. When each Indian thought he had an advantage in terms of the payoff structure, there was more competitiveness than when each player thought he was at a disadvantage. Furthermore, whereas the average payoff disparity was invariant across conditions for Canadian males, it was much larger for Indians in the "mutual disadvantage" condition than in either the "mutual advantage" condition or the "equal opportunity" (i.e. the standard $T(ext_2)$ condition). These findings were interpreted as reflecting a desire for dominance among Indians when a person is apparently in a "superior" position, and a willingness to accept a submissive role when one is in an inferior position. Another possible explanation could be based on the principle of equity which, in the game theoretic sense of the principle, would lead to a larger share of the joint payoff for the player who was given an advantage.

4) When the payoff alternatives were exactly aligned, (i.e. the preference orderings of the alternatives, in terms of "own payoffs", were the same for Player One and Player Two), both Canadians and Indians were willing to accept smaller individual payoffs rather than maximizing their payoffs at the "expense" of allowing the other player to maximize his payoff dominance. This was taken to indicate that neither Canadians nor Indians are willing to bargain according to the

equity principle. This argues against the equity principle as an explanation for the Indian behaviour as described in (3) above.

CHAPTER VI

CONCLUDING COMMENTS

The studies reported in this thesis have focused on differences in the ways that Indians and Canadians react in a mixed-motive situation. A summary and overview of the series of experiments follows below, with references to the relevant studies given in parentheses.

It was found, in what came to be viewed as the "control" condition, (the $T(ext_2)$ condition in which each bargaining session was limited to two minutes from the outset), that there were practically no differences in the ways that Canadians and Indians, male and female alike, responded. Some minor differences suggested by the data were: (a) Canadian males appeared to be more adept at grasping the optimal strategy (α-reciprocation) than were the other groups, and (b) Indian females were somewhat more passive and co-operative than any of the other groups. (First and Second Studies). The first point fits well with the findings by other researchers that North American males are generally better than females at "strategic coping", and the second point is in line with many literary descriptions of Indian women.

The provision for unlimited time for negotiations, with either player being allowed to initiate a two-minute time-limit

at his whim, led to a rather dramatic contrast in the case of Canadian males, while no substantial effects were noted in the other groups. The Canadian males displayed much more competitiveness in this situation, as indicated by lower joint payoffs and a higher frequency of deadlocks. It was confirmed that it was the fact that the time-limit was initiated from within the dyad that led to the decreased co-operation (Third Study). The behaviour of Canadian males was similar to that observed by other investigators when North American males have been confronted by threats from their opponents; that is, they "dig in their heels" and resist yielding.

It was also found that Canadian males initiated the time-limit more frequently than subjects from any other group, and one player in each dyad tended to monopolize in this respect. Indian males and Canadian females were about equal in their rates of time-limit initiation, while Indian females virtually never used the time-limit. (First and Second Studies). Furthermore, given that the time-limit was initiated, the probability of a deadlock was much higher among Canadian males when the initiation was made by one of the players themselves rather than by the experimenter. (First and Third Studies). For the other groups, the probability of a deadlock in a time-limited session was relatively low, and was the same regardless of the source of the time-limit. The fact that the Canadian males reacted to internally-imposed time-limits in the manner they did is consistent with the view that they

considered them as threats or as attempts at coercion. Males in the North American milieu are brought up to view yielding in the face of perceived threats as a very negatively-valued behaviour. The greater incidence of internally-imposed time-limits among Canadian males may reflect greater aggressiveness. Since one player tended to dominate in this regard, the greater number of initiations is not likely due to a form of retaliation or the "threat-counter threat spiral". Rather, it is more likely that in general Canadian males are somewhat more aggressive, and more cognizant of the possible usefulness of initiating a time-limit, and that one player usually has a slightly lower threshold for "aggression" than the other. More research is needed to clarify this matter.

At any rate, it is worth noting that extropolation from these findings to the male-dominated world of labour-management negotiations would suggest that the mere setting of a deadline by one side or the other is likely to exacerbate the conflict and increase the probability of mutually undesirable outcomes, such as strikes or lock-outs.

From the data that have been presented, it is not possible to decide whether the other groups (Canadian females and Indians of both sexes) are simply less concerned with the need to resist yielding in the face of attempted coercion in order to avoid losing face, or whether they did not view the setting of a time-limit by the opponent as a coercion attempt. The first explanation is more likely correct (and will be assumed so in the remainder of this discussion), since it

is difficult to imagine why Canadian males and females would react differently to time pressure, if it were the case that they share common reactions to coercion attempts in general. Further research is needed, however, to give a definite explanation for the differential behaviour of the various groups.

It comes as no surprise that there were both sexual and cultural differences observed in these studies. In western culture, it is generally accepted that males are brought up to be more competitive and aggressive than females, and the need to save face especially when confronted with an intimidator is also well-inculcated. A girl can cry when hit by a friend, but a boy is not only expected to withhold his tears, but to "be a man" and "teach the other fellow a lesson". In North America, to back down is to lose face.

The apparent lack of face-saving motivation in the internally-imposed time-limit situation by Indians of both sexes not only speaks to the lack of sex differences in this particular area of behaviour in that culture, but also is consonant with the stereotypical description of Indians as unaggressive and peace-loving, going out of their way to avoid interpersonal conflict, etc. If the stereotype has any truth, it might be expected to be most true among members of a given group rather than between groups. Recall that these studies involved university students, and that, even though they usually did not see their opponents before hand, (subjects were from two different classes at any rate), it is likely

that whatever norms of this type exist in the real world, they would be more likely to manifest themselves when each knows that his opponent is from the same (relatively-small) group that he is.

The situation is somewhat complicated by the observation that certain structural changes in the situation caused Indians to become more competitive. The studies discussed up until now dealt with payoff structures in which each player initially had the same opportunities as the other. But the studies in Chapter V (which involved males only) showed that very minor changes in the payoff structure, changes which could not affect a player's own outcomes directly, led to important changes in behaviour. When the payoff structure appeared, to each player, to favour the other slightly, there was more co-operation among the Indian males than when the payoff structure appeared to give each player a slight advantage. (Sixth Study). In the former case, a dominance-submission axis formed in each dyad, and as a result the intra-dyadic total point differential was much larger than in the latter case, or than in the "control" condition. In the situation where each saw himself at a slight advantage, however, there was increased competitiveness which resulted in lower payoffs and more deadlocks. These findings are exactly the opposite to those found with Canadian males: they became very competitive when each was the apparent "underdog", but very co-operative when each had an apparent advantage. (Seventh Study).

While the Canadian behaviour was not surprising, since it fits findings by others that North American males strive to maximize their own gains while making as much as or more than the other player, the Indian behaviour was unexpected. Two explanations, not really dissimilar from one another, were advanced. The first was based on the notion that whatever face-saving norms exist in India, they may very likely take into account the initial "status" of the protagonists. It seems reasonable that to give in to the demands of a person of higher caste, for example, may involve little or no loss of face, whereas a serious loss of face may result if one gives in to a person of lower caste than oneself. The norms resulting from "caste-ism" may quite well have spread to inter-relationships based on other dimensions as well, such as socio-economic status, educational level, power, etc. When, in the context of the bargaining game, the payoff matrix puts each player at an ostensible disadvantage to begin with, it may be that no face is lost by "losing" relative to the other, whereas losing when one has an initial advantage may entail a serious loss of face.

The second explanation is somewhat similar to the first, (in that both involve self-esteem). It suggests that when each player views the other as being at a disadvantage, (an "underdog"), he expects submission from the other. Since each expects submission, conflict results. When each sees himself as an underdog, however, this line of reasoning would

suggest that he is willingly submissive, viewing it to be legitimate for the opponent to realize a larger share of the joint payoff. When each player initially submits, (since each sees himself as the underdog), the role of the dominant party is unfilled, and presumably one or the other player moves to fill the vacancy. This would explain the relative co-operativeness observed in this situation, as well as the much larger than usual intra-dyadic difference in total points that was noted earlier. It also suggests that Indians take into account the other person's relative status (at least in the narrow sense defined by relative opportunities) in determining what is a fair division of the joint payoff.

The mention of relative status above immediately brings the equity principle to mind. This principle, at least in its game-theoretical form, suggests that rational players should consider the relative opportunities of themselves and the opponents, and should divide the joint gain in proportion to their initial opportunities. The final experiment (Eighth Study) showed that this principle was not manifested by either Indians or Canadians in the particular situation used in that study. The Indians were as insistent as the Canadians in making sure that the other player did not achieve any substantial payoff dominance, even though the player's "own payoffs" suffered as a result of such action. This was taken as evidence that the equity principle could not provide a satisfactory explanation of the Indians' behaviour in the earlier (Fourth and Sixth) Studies.

It was suggested that the structure of the payoff matrix in the Eighth Study, which did not call for reciprocation as did the matrices in the earlier studies, accounted for the fact that in this case Indians were no more willing than Canadians to allow the player who had the ostensible advantage to "win". In this particular case, the alternative which yielded the maximum outcome was the same for both players and hence the possibility for the kind of co-operative gestures which existed in the earlier studies was non-existent.

In summary then, these experiments have shown that Canadian males react to time-limits set by the opponent by increasing their resistance to yielding. The presence of the capability to initiate time-limits predisposed this group to greater conflict, since not only did they react in the above way to such time-limits, but they were also more likely than the other groups to use the time-limit option. In general, the behaviour of Canadian males was consonant with the motivation to maximize one's own gain while making as much or more than the other. Canadian females, and Indian males and females, were not affected by the source of time-limits. Indian males, who were somewhat less co-operative than Indian females, apparently used the payoff structure as a determinant for adopting either a dominant or submissive attitude. Submissiveness was never observed among Canadian males.

More research is needed to clarify the issues raised by these studies. It is hoped, however, that this thesis has

succeeded not only in highlighting the importance of cross-cultural research, but also in conveying to the reader a sense of the intrinsic interest such studies hold for the student of human behaviour.

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APPENDICES

APPENDIX A:

POINT RECORD SHEET

(Use this sheet to keep a record of the points you and the other person make on each session.)

Session		Put an X in the appropriate column to indicate which alternative was agreed on						Your Points	Other's Points
		A	B	C	D	E	Dead-lock		
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
							Total Points:		

You are participating in a study of small-group behaviour. You will be involved in a situation that is similar in many ways to many real-life situations in that what you gain or lose will be determined both by your behaviour and by the behaviour of the other participant.

One of you will be known as Player 1, the other as Player 2 as indicated by the sign posted on the wall in front of you.

BASIC SITUATION

Both of you have an opportunity to earn some money. The amount you earn will be based on the agreements reached between the two of you. We shall run twenty-one sessions, one after the other. In each session the two of you will negotiate and attempt to reach an agreement to select one of five alternatives. The alternatives are called A, B, C. D., and E. The chart in front of you indicates the number of points each of you will receive depending on the alternative agreed upon (these points will be translated into money after the last session). For example, if you agree to select alternative C, you each would receive 20 points.

In each of the sessions, you will be required to attempt to agree on a selection of one of the alternatives A, B, C, D, or E. The division of points corresponding to A, B, C, D, and E will stay the same for all sessions.

After the last session, each of you will receive a certain amount of money for each point that you have accumulated. The more points you have, the more money you will be paid. (I cannot tell you how much each point is worth until after the last session.) This money will be your only payment for participation, therefore, you should try to make as many points as possible.

NEGOTIATION

Beside you are some slips of paper, each divided into small squares. These are called Demand-slips. These will be your only method of communication with each other. One person will be told to begin negotiations. He will take a demand-slip and write in his "demand" in the top left-most square (that is, he will put down one of the letters A, B, C, D, or E which corresponds to the alternative that he is willing to accept). He will then pass the demand-slip to the other person by means of the small slot in the wall to the other person. The other person now has two courses of action open:

(1) If this person wishes to accept the particular alternative written on the demand-slip, he will simply press the switch labelled ACCEPT. This will terminate the session, and each of you will be credited with your respective points corresponding to the alternative just agreed upon. (When one person presses his ACCEPT switch, a red light comes on in front of each of you to indicate that agreement has been reached.)

(2) If this person does not wish to accept this particular alternative, he will put a line through the letter the other person wrote, and in the square immediately to the right, he will write the letter of the alternative that he wants to be agreed upon. He will then pass the slip back to the other person, who will now have the same two courses of action open: To accept, or to strike out the demand and write in another.

(Enter your demands on the demand-slip from left to right on each line; start on the top line, when it is used up, start on the next line, etc. Please print clearly.)

Thus, each person, if the other's demand is not acceptable, will strike out that demand and write in his own demand. You may change your demand to any other alternative whenever you wish. For example, you could demand C, then A, then C again, if you wish. ..

(continued over)

Time Limit

At the beginning of each session, I will start a timer which will cause the time-counter in front of each of you to count once every second, and the light by the counter will blink once each second. You will have a maximum of 120 seconds (ie. 2 minutes) in which to reach agreement, and unless agreement has been reached by the end of this time (ie. one of you has pressed your ACCEPT switch), the session will end and neither of you will receive any points for that session. (This situation is called Deadlock.)

NOTE: Only when it is your turn (that is, when the demand-slip is on your side) may you press the ACCEPT switch.

Sessions

A "session" ends either when agreement is reached (one of you presses his ACCEPT switch) or when Deadlock occurs. As mentioned earlier, there will be twenty-one consecutive sessions. I will tell you at the beginning of each session who is to make the first demand for that session.

Point Record Sheet

Use the Point Record Sheet to keep a record of the alternatives selected on each session, and the number of points you each receive on that session.

REMEMBER: Nothing other than one of the five letters, A, B, C, D, or E is to be written on the demand-slip.

You should try to make as many points as possible. These will be translated into money, which will be your payment for participating, after the last session.

It is important that you do not talk to each other at any time.

If you have any questions at any time, knock on the desk. [redacted] But, before asking any questions right now, wait until I have reviewed the instructions with you, which I will do in a few minutes.

You are participating in a study of small-group behaviour. You will be involved in a situation that is similar in many ways to many real-life situations in that what you gain or lose will be determined both by your behaviour and by the behaviour of the other participant.

One of you will be known as Player 1, the other as Player 2 as indicated by the sign posted on the wall in front of you.

BASIC SITUATION

Both of you have an opportunity to earn some money. The amount you earn will be based on the agreements reached between the two of you. We shall run twenty-one sessions, one after the other. In each session the two of you will negotiate and attempt to reach an agreement to select one of five alternatives. The alternatives are called A, B, C. D., and E. The chart in front of you indicates the number of points each of you will receive depending on the alternative agreed upon (these points will be translated into money after the last session). For example, if you agree to select alternative C, you each would receive 20 points.

In each of the sessions, you will be required to attempt to agree on a selection of one of the alternatives A, B, C, D, or E. The division of points corresponding to A, B, C, D, and E will stay the same for all sessions.

After the last session, each of you will receive a certain amount of money for each point that you have accumulated. The more points you have, the more money you will be paid. (I cannot tell you how much each point is worth until after the last session.) This money will be your only payment for participation, therefore, you should try to make as many points as possible.

NEGOTIATION

Beside you are some slips of paper, each divided into small squares. These are called Demand-slips. These will be your only method of communication with each other. One person will be told to begin negotiations. He will take a demand-slip and write in his "demand" in the top left-most square (that is, he will put down one of the letters A, B, C, D, or E which corresponds to the alternative that he is willing to accept). He will then pass the demand-slip to the other person by means of the small slot in the wall to the other person. The other person now has two courses of action open:

(1) If this person wishes to accept the particular alternative written on the demand-slip, he will simply press the switch labelled ACCEPT. This will terminate the session, and each of you will be credited with your respective points corresponding to the alternative just agreed upon. (When one person presses his ACCEPT switch, a red light comes on in front of each of you to indicate that agreement has been reached.)

(2) If this person does not wish to accept this particular alternative, he will put a line through the letter the other person wrote, and in the square immediately to the right, he will write the letter of the alternative that he wants to be agreed upon. He will then pass the slip back to the other person, who will now have the same two courses of action open: To accept, or to strike out the demand and write in another.

(Enter your demands on the demand-slip from left to right on each line; start on the top line, when it is used up, start on the next line, etc. Please print clearly.)

Thus, each person, if the other's demand is not acceptable, will strike out that demand and write in his own demand. You may change your demand to any other alternative whenever you wish. For example, you could demand C, then A, then C again, if you wished.

(continued over)

You may negotiate for as long as you wish (ie. as many demands as you wish; if one demand-slip gets filled up, put it aside and use another one). There are two ways negotiations can end:

(1) One of you accepts the other's demands by pressing the Accept switch;

(2) One of you institutes a time-limit by pressing the Timer switch. This will activate a clock and start the timer-counter in front of each of you. The counter will count once every second, and the light by the counter will blink once each second. The counter will count up to 120 (ie. 2 minutes) and unless agreement has been reached by the end of this time (ie. one of you has pressed your ACCEPT switch), the session will end and neither of you will receive any points for that session; (this situation is called Deadlock). Either of you may start the timer at any time you wish. But remember, you may press the ACCEPT switch only when it is your turn (ie. when the demand-slip is on your side.

Sessions

A "session" ends either when agreement is reached (one of you presses his ACCEPT switch) or when Deadlock occurs. As mentioned earlier, there will be 21 consecutive sessions. I will tell you at the beginning of each session who is to make the first demand for that session.

Point Record Sheet

Use the Point Record Sheet to keep a record of the alternatives agreed on in each session, and the number of points you each receive on that session.

REMEMBER: Nothing other than one of the five letters, A, B, C, D, or E is to be written on the demand-slip.

You should try to make as many points as possible. These will be translated into money, which will be your payment for participating, after the last session.

It is important that you do not talk to each other at any time.

If you have any questions at any time, knock on the desk. [redacted]. But, before asking any questions right now, wait until I have reviewed the instructions with you, which I will do in a few minutes.

PROBE

Now that you have read the instructions and before you ask any questions, I am going to ask you a few questions to make sure that you understand the instructions.

Player 1, what are the two of you to attempt to agree on? (ans. One of the five alternatives, A, B, C, D, or E).

Player 2, how many points do you get if C is agreed on? (ans. 20 points). How many for Player 1? (ans. 20 points).

Player 1, how many sessions will there be? (ans. 21).

Player 2, what do you do if you want to accept Player 1's demand? (ans. Press accept button).

Player 1, what do you do if you don't want to accept Player 2'd demand? (ans. Put a line through it, write in a new demand beside it and pass it back).

(T(int) only):

Player 2, what does it mean when the timer is started? (ans. 120 seconds left to negotiate. Neither player gets any points if agreement not reached by the end of that time).

Player 1, who may start the timer and when? (ans. Either player, whenever he wishes).

(T(ext) only):

Player 2, how long do you have to negotiate?
(ans. 120 seconds).

Player 1, what happens if no agreement has been reached by the end of 120 seconds?
(ans. session ends, zero points for each player).

All conditions:

Player 2, what is the point record sheet for?
(ans. to keep a record of your own points and the other player's points on each session.)

At the end of the last session, you each will be paid a certain amount of money for each point you have made individually.

Any questions? (All questions answered by reading from appropriate section of instructions).

We will begin in a moment. Player 1 will begin the first session. Do not begin until I tell you to do so.

Appendix D: A description of how the game is played.

(This example uses the T(int) situation. The game is played in the same way in the T(ext) situation, except that the time-limit is always initiated by the experimenter at the onset of each session in that case).

After the subjects have read the instructions, and the experimenter has carried out the "probe" routine and dealt with any questions, Player One is told that he can begin the first session. A typical sequence might be as follows:

Player One takes a "demand slip" and writes down the letter E, which is the alternative that he has chosen to demand (see Figure 5). He then passes the slip through the dividing wall to Player Two. The latter doesn't wish to accept E, and so he strikes out the E and enters an A, his choice of alternative, beside it. He then passes the slip back to Player One. Player One strikes out the A, re-enters an E, and passes the slip back. Player Two decides to concede a bit, and strikes out the E and writes in a B. As he passes the slip back, he presses a button to start the time-limit, perhaps in the hope that this will encourage the other to make concessions. Now the counter in front of each player is increasing at the rate of 1 per second, and a blinking light and a loud clicking sound serve to draw attention to the passage of time.

After a few more demands and counter-demands, Player One demands a C, with only seconds left before the 120 seconds

is up. He passes the slip to Player Two, who decides to agree to this alternative and presses his ACCEPT button. The timer stops, and a red light lights up in each cubicle to indicate that agreement has been reached. Player Two then passes the used demand slip to the experimenter, and each player makes an entry on his point record sheet indicating that the outcome on the first session was a C, and that each player got 20 points.

The game continues in this way for 21 sessions. If a player starts the time-limit, and neither player presses his ACCEPT button, (he can depress it only when he has the demand-slip), before the 120 seconds is up, the experimenter presses a button which deactivates the ACCEPT buttons and stops the timer circuitry. Each player is then told that a deadlock has occurred, and that neither player receives any points for that session.

APPENDIX E: Note on "recips"

A "recip" refers to a pair of opposite (in terms of the symmetry of the payoff matrix) outcomes occurring on consecutive sessions. An "α-recip" is defined, then, as one alternation between opposite α-outcomes, (eg. an A followed by an E), on two successive sessions. Consider the following strings of outcomes:

i) A E A E

ii) A E E A

iii) A C E C

Example (i) would be considered as having 3 α-recips whereas example (ii) contains only two, and example (iii) has none.

A β-recip is defined similarly, but for B and D outcomes.