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SELF-ESTEEM AND FAMILY INTERACTION PATTERNS

AN EXPERIMENTAL APPROACH

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Thesis submitted to the Graduate Faculty
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy

University of Massachusetts, Amherst.

August 6, 1970

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SELF-ESTEEM AND FAMILY INTERACTION PATTERN

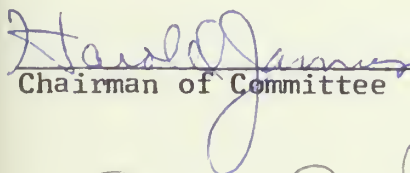
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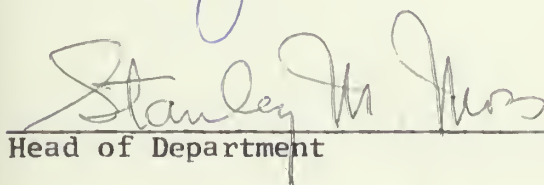
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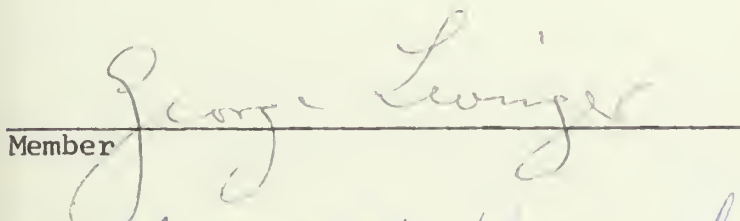
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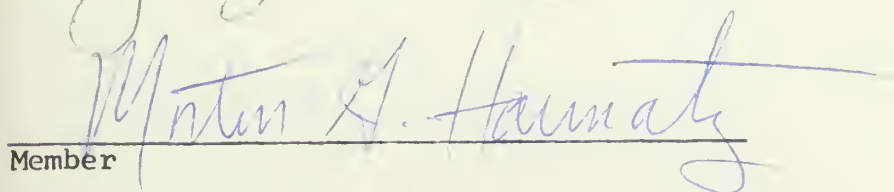
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CHAPTER I

INTRODUCTION

The purpose of this study was to explore the notion, and demonstrate that current patterns of family interaction are related to different levels of adjustment in childhood. On the operational level, differences in patterns of interaction on the prisoner's dilemma game (Rapoport & Chammah, 1965) were studied in families with children who had varying degrees of self-esteem (Coopersmith, 1967). Self-esteem was viewed as an important index of psychological adjustment. The prisoner's dilemma game is a laboratory interaction task which was used to simulate a naturalistic, interpersonal situation. It was believed that this method would allow us to draw inferences about differences in patterns of family interaction which are related to the development of emotional disturbance in childhood.

a) GENERAL THEORETICAL CONSIDERATIONS.

The orientation of much of the recent literature dealing with interaction patterns within the family has been directed towards understanding the development of childhood psychopathology. Bermann (1966) sketches the evolution of this interest from its roots in early psychoanalytic writings to the present, where the influence of learning theory, communication theory, sociology and sophisticated research techniques have become joined together. The present study has two major roots; a dissatisfaction with previous research and conceptualizations of the etiology of emotional disturbance, and the advent of new approaches to treatment revolving around the family.

The traditional conceptual and research model that has been applied to childhood psychopathology is one in which the child's present (aberrant) behavior is viewed as a function of past parental behavior. Ross (1964) points to the general acceptance of conceptualizations relating infantile and childhood experiences to later personality formation in spite of the fact that this relationship has never been established unequivocally by controlled studies. Similarly, studies of the relation-

ship of parental attitudes and emotional disturbance (Ross, 1964; Frank, 1965) have not been able to discriminate among different diagnostic groups. It has become increasingly apparent (Ross, 1964; Handel, 1965; Hobbs, 1966) that the traditional theoretical approach in which the child's psychopathology is related in a unidirectional, linear fashion to a particular causal event, such as a parental behavior or attitude, has not been fruitful. The lack of specific empirical validation for hypotheses describing the relationship between parental events, including those resulting from attitudinal states, and childhood behavior, may be seen as one source of the impetus to the development of new, family-centered, behaviorally oriented models.

The conceptual and research model that would be derived from a family-centered view of the etiology of childhood psychopathology conceives of the child's present (aberrant) behavior as a function of the present intrafamilial interactions; that is current behavioral events within the family system. Jackson (1965) believes that only "when we attend to the transactions between people as primary data that a qualitative shift in conceptual framework (from individual to family theory) can be achieved." Concepts such as symptoms, defenses

and character structure, are seen as terms describing the individuals's typical interactions which occur in response to particular interpersonal contexts. The stress on studying interactional as opposed to intra-individual processes is one of the basic differences between the traditional viewpoint and family theory. This emphasis on present interactions in the family would seem to be closely allied with the behavior modification point of view (Ullman & Krasner, 1965); both assume that the present behavior of an individual is supported by other individuals' present behavior.

From the viewpoint of this model of family interaction process, the basic unit of data must consist of a measurement of an interaction between at least two family members. In addition, Haley (1962) notes the following as the basic assumptions of family research; "a) family members deal differently with each other than they do with other people, b) the millions of responses that family members meet over time within the family fall into patterns, c) these patterns persist within a family for many years and will influence a child's expectations of, and behavior with, other people when he leaves the family, and d) the child is not a passive recipient of what his parents do to him but an active

co-creator of family relations." An additional assumption of this model (Meisner, 1964; Ross, 1964; Handel, 1965) is that the family must be conceived of as a functioning unit, and that the functioning of the individual members of the family can only be understood in reference to the overall structure of the family system.

b) THERAPY RELATED CONSIDERATIONS.

These theoretical considerations have paralleled the development of family therapy in which the focus of attention has moved from the individual patient to the entire family unit. Family therapy (Mottola, 1967) is based upon the notion that the interaction between family members are both the cause of and affected by the primary patient's "apparent symptomatology". Although the theoretical and conceptual foundations for family therapy appear to be intuitively quite palatable to many clinicians, they have not, thus far, been substantiated by empirical data.

Perhaps the best known hypothesis which utilizes this model to explain the family's influence on the development of emotional disturbance in childhood is Vogel and Bell's (1960) notion of scapegoating. They

suggest that through scapegoating the child the parents are able to resolve indirectly tensions which they have previously been unable to resolve through direct communication. The child is seen as the appropriate family member to deal with family tensions because: a) he is relatively powerless, b) his personality is still quite flexible so that it can readily be molded to accept the particular role which the family assigns, and c) he has relatively few tasks to perform in the family compared with the parents, and his disturbance will ordinarily interfere least with the successful performance of the necessary family tasks. At the present time no explanation has been offered as to which of several children will be chosen to be the family scapegoat. Most theorists view the family as an efficient system so that it may be expected that the choice would be influenced by several variables such as parental jealousy, a child's lack of ability in an area that is important to one of the parents, or possibly because of an unfortunate identification of the child with one of the family's prevalent myths.

Murrell and Stachowiak (1965) similarly point to the underlying sources of tension between family members. These authors agree with Vogel and Bell (1960) on the function that the disturbed child serves in the

family. By focusing on one child the disturbed family is able to encapsulate problems which could potentially disrupt the stable family structure. Therefore, the primary pupose that the distrubed child serves is that he permits the family to maintain its solidarity, or in other words allows for the maintenance of a relatively comfortable homeostasis within the family in spite of existent interpersonal conflicts.

c) RESEARCH ON FAMILY THEORY.

Haley (1962) states that the major problem in family research is "to measure how a small group with a history typically respond to each other, while attempting to elliminate as much as possible the effect of that particular setting on their performance." The research design that has been used most often to study family processes is to bring the family group together and study the way they interact in interviews where the members are asked standard questions or exposed jointly to a task. Two sorts of measurements have frequently been used; a tabulation of the responses to the task by frequency or time and a categorization of the verbal interchanges of the family.

In the recent literature several studies (Haley;

1964, 1967a, 1967b; Ferreira & Winter, 1966; Murrell & Stachowiak, 1966) have addressed themselves to the problem of whether it can be demonstrated that the family is an organized group, and if so do the patterns of interaction in families with a disturbed child differ from those in normal families. The measure used in these studies was a tabulation of the frequency within dyads; i.e. mother speaks to father, mother speaks to child, child speaks to mother, et cetera. Organization was thought to be a departure from a random distribution of the frequencies in these dyads.

In Haley's (1964) initial study, the family group was made up of a mother, father and one sibling. The results of this study indicated that the patterns of interaction within the family were organized, (i.e. the sequences of who spoke to whom and after whom were not random.) The more disturbed families showed a more limited organization in their patterns of interaction than did the normal families.

Haley found that in the normal group the mother-child interchange was most frequent, while in the abnormal group the mother-father interchange was most frequent. In a later study he (Haley, 1967a) investigated the hypothesis that if a "family contains a problem child that person will have a different frequency of

interchange with the parents than will the non-problem child." This hypothesis was confirmed, indicating that the parents spoke before and after the identified patient a great deal less than before and after his healthy sibling. Although Haley does not consider these results in terms of reinforcement contingencies, it would seem that such conditions would lead to the child's learning the general conception that what he has to contribute to the family (and to the world) has less value than what his sibling has to contribute. Both studies seem to indicate that in the abnormal families, the disturbed child is more isolated from family interaction than his own healthy sibling or the child in the non-disturbed family. It would appear that the interactions in the disturbed family, in effect, may be excluding the disturbed child from an active association with the family group.

In these two studies the family was present as a group and there was a considerable amount of non-verbal communication which could not be taken into consideration. Haley (1967b) attempted to eliminate the uncontrolled non-verbal sources of communication by separating family triads in individual rooms. This experimental situation allowed family members to talk in pairs through a telephone-like apparatus. In this study, the hypothesis

that the normal group of families would participate more equally in their activity together than the abnormal group was not confirmed. In interpreting the results of this study it is difficult to assess the influence of the artificial experimental situation on the families' typical communication patterns.

Murrell and Stachowiak (1966) found that the pattern of verbal interaction in both disturbed and normal families were consistent in the four tasks used in their experiment and over a period of time. These authors had thought on the basis of Haley's (1964) earlier research and because of their own theoretical conceptions (Murrell & Stachowiak, 1965) that there would be a greater degree of "rigidity" or organization in their clinic (disturbed) families. However, they found that their normal family groups demonstrated a significantly greater degree of organization (rigidity) in their interactions than did the disturbed families. The authors explained these results by noting that in the non-clinic families the mothers held a central power position and were thus able to control and limit their families' interactions. They propose that this situation had positive consequences for adaptation which were missing in the clinic families in which they found a "power vacuum." This

explanation, although consistent with their data, seems to represent a post hoc explanation which does not reconcile the differences between theory, earlier findings and their own data.

Ferreira and Winter (1966) report that abnormal families when contrasted with normal ones differed on three variables related to family decision making. They found that when the families contained a child diagnosed as abnormal it had less "spontaneous agreement," took longer to make decisions and derived less individual fulfillment from family decisions. They set up a test-retest situation using the same families six months later to test the stability and validity of these variables. There were no changes evident for the means of any of the groups on the three variables studied over this period of time. This study would appear to offer support for the stability of family interaction variables as well as for the differences in patterns of communication in normal and abnormal groups. The above studies were concerned with the patterns of verbal communication within different groups of families.

Bermann (1967), reports on a methodological departure from the previous studies that have been reviewed. He used an experimental button pushing task to study family interaction. He found that the control families

were able to shift adaptively their usual mode of family decision making, while in the reading problem families, their unsuccessful method of decision making became entrenched and rigid. This would seem to lend support to Murrell and Stachowiak (1965) in their suggestion that patterns of interaction in families with a disturbed child tend to be more rigid than in families without such a child. In comparing the performance of the family dyads, he found that in the reading problem families, the mother-father dyads did the poorest while in the control families, this dyad did the best. This finding may be taken as offering support for the notion that in addition to the disturbance in the problem child, there is also a disturbance between the parental dyad in such families. Typically, the child's disturbance has been seen as necessary to maintain the family equilibrium in spite of intra-parental conflicts.

d) METHODOLOGICAL CONSIDERATIONS.

The studies cited above confirm the basic assumptions that: (1) interactions within families do follow an organized, repetitive pattern, (2) the patterns are different in families with emotionally disturbed children (Haley, 1964; Murrell & Stachowiak, 1966; Ferreira &

Winter, 1966), and (3) the disturbed child is dealt with differently from a non-disturbed child. (Haley, 1967a). In addition to this, it would appear that the parental interaction in families with a disturbed child is less effective and, perhaps, more disturbed than that dyad in families without a disturbed child (Bermann, 1967).

At the present time, we do not have a clear understanding of the specific differences in the patterns of interaction in these families which would result in a child manifesting signs of emotional disturbance. Perhaps the reason for this is that research efforts are still in a neonatal stage. Bermann (1966, 1967), in tracing the history of such research points out that many of the initial investigations grew out of intensive clinical studies which were directed towards the testing of general hypotheses rather than specific ones. This clinical methodology can be seen reflected in the research design in which the family is brought together to discuss something and then observations are made in this therapy-like situation.

Bermann's (1967) research, as well as several other studies (Clemes & Terrill, 1968; Bean & Kerckhoff, 1969; Ravich, 1969) in which experimental or simulation techniques have been used to study family interactional processes, suggest that these methods may have several

potential advantages over the more naturalistic paradigm (Haley, 1964; Murrell & Stachowiak, 1966; Ferreira & Winter, 1966). Simulation techniques lend themselves to greater standardization and control in the experimental situation. They avoid problems associated with the accuracy of informants' statements, as well as subjects' inhibition or censorship of their expressive behavior because of the presence of an observer. The simulation technique or experimental game is highly structured and involves the subject in a simplified interpersonal situation which is seen as reflecting a conflict such as that between cooperation and competition. Each family group is, therefore, confronted with a similar task and their responses would seem to reflect the way that they would typically resolve the interpersonal conflict which is embodied in the game.

In the present study, the prisoner's dilemma game (Rapoport & Orwant, 1962), a simulation technique, was used with the intent of exploring its value in the study of family dynamics, as well as to further understand differences in the patterns of interaction of families with children who are at different levels of adjustment. The prisoner's dilemma game has the advantages of focusing on the basic conflict of cooperation versus competition as well as having had its parameters previously studied.

A further discussion of the prisoner's dilemma game will be presented in a later section of this paper.

In most of the research on family process, the experimental group has been taken from a clinic population and has been considered abnormal. The control group has been a matched non-clinic sample. The criteria for abnormality or emotional disturbance has thus been whether or not a particular family has referred itself or been referred for treatment.

This procedure does not allow us to deal with clearly defined independent variables. Does the fact that a family refers its child to a clinical setting define this child as emotionally disturbed? There are certainly many factors which enter into the phenomena of referring someone to a mental health setting which have little to do with the level of emotional adjustment. Such selection procedures lead to highly heterogeneous samples which are contaminated by uncontrolled variables. In addition, this procedure would appear to be naive in that the distinction between clinic versus non-clinic or normal versus abnormal family is an extremely gross classification scheme which does not allow us to draw finer quantitative and qualitative distinctions between the subjects within the various groups.

A specific factor which may contaminate data obtained from populations defined in this way is that family members who have been accepted by a clinical setting and asked to participate in research there may consequently perceive themselves as "sick" and have a variety of non-specific reactions based on this self-perception. There would be no way to tell whether the obtained differences were due to the underlying system of interactions which brought the family to a place where they could obtain help or to a secondary process of redefinition due to their new status.

It would seem more fruitful to select the sample by defining a quality which would be associated with emotional disturbance in childhood and then to establish groups that varied quantitatively along this dimension. Using such a dimension would not only provide clearly delineated groups, but the independent variable would then be minimally contaminated by uncontrolled and extraneous variables. In addition, defining groups along such a dimension should enable one to look at the relationship between the individual characteristic operationally defined by this measure and the intra-familial interaction process that is thought to be related to this characteristic.

There are different assumptions involved in the two

methods of selecting subjects. In classifying people dichotomously as "abnormal" or "normal," the emphasis is on abnormality, involving the assumption that there are factors present in the abnormal group which are absent in the normal group. This classification scheme is clearly related to a disease model of psychological difficulties. The alternative selection procedure would imply that the concept of adjustment is not dichotomous, but rather a continuum, and that different factors or processes are associated with the different points along the continuum. Good adjustment may not only be a result of the absence of pathological processes, but may also be related to the presence of factors which do not exist in average or poor adjustment.

e) SELF-ESTEEM: THE INDEPENDENT VARIABLE.

In the present study, families will be selected according to their children's level of self-esteem. Self-esteem is centrally associated with the concept of emotional adjustment and, in turn, quite relevant to the behavioral manifestations of emotional disturbance in childhood. Recent research (Coopersmith, 1959, 1967; Rosenberg, 1965) has pointed out the utility of using the concept of self-esteem in research on personality

development and functioning. This concept is typically seen as referring to an individual's personal satisfaction with his life, the effectiveness of his functioning, and an evaluative attitude of approval or disapproval that an individual holds toward himself. Such evaluative attitudes would seem to indicate "the extent to which the individual believes himself to be capable, significant and worthy" (Coopersmith, 1967).

In the present study the operational definition of self-esteem will be the measure developed by Coopersmith (1959, 1967). Coopersmith (1967) reported that after a three year interval ($N = 56$) the reliability of this measure was .70. He concludes that for children (ages 8 through 10), self-esteem has become a fairly stable factor. To the degree that this factor is thought to have motivational and behavioral consequences, it would then appear to be a fairly good predictor of future adjustment. Coopersmith (personal communication, 1969) reports that further research with this measure has indicated that it is consistently reliable with male and female subjects through college age.

The Self-Esteem Inventory (Coopersmith, 1967) is clearly related to many aspects of adjustment in childhood. To summarize the findings, low levels of self-esteem are significantly related to: poor academic

performance, poor social relations, less assertiveness and independence in peer relations, greater sensitivity to criticism, higher levels of anxiety, and these children are perceived by their mothers as being more destructive and as having "marked frequent problems." In addition, medium self-esteem children tend to be midway between the high and low self-esteem children on many of these measures.

f) THE PRISONER'S DILEMMA GAME: THE DEPENDENT VARIABLE.

The prisoner's dilemma game is a fairly complex interactional task that results in eleven dependent measures. Although it has received considerable attention in the literature, it will be discussed in detail.

The P.D. game (Rapoport & Orwant, 1962) is a two-person, mixed-motive, non-zero sum game. Gallo and McClintock (1965) define a game as "a situation in which the persons involved are attempting to attain some goal(s) and in which their success or failure is dependent not only on their strategy but also on the strategy choices of the other individual(s) in the situation." Mixed motive refers to the idea that the goals of the players are partially coincidental and partially in conflict. The P.D. game (Osikamp & Perlman, 1965) is called a non-zero

sum game because the payoffs of the two players do not sum to zero; "both may win on any given trial, or both may lose, or one may win and the other lose." This is in contrast to a zero sum game such as chess or dice.

Gallo and McClintock (1965) believe that one reason that the prisoner's dilemma (P.D.) game has enjoyed considerable popularity in research is that it "answers the long-felt need for a well controlled interaction situation with an easily quantifiable and unambiguous dependent variable, the number of cooperative responses made by each subject." They also point out that another reason that interest has developed in the P.D. game is that simulation has been recognized as an important means of studying human behavior. Clemes and Terrill (1968) strongly agree with the use of games in research on human behavior. They suggest that much "of human interaction has the characteristics of a game with predictable moves and definite, if not always obvious, outcomes."

In a pilot study it was found that family members had little difficulty in learning to play this game. The mean ages of the ten children that participated in this study was 11.3 years; the range was from 9 to 15 years. The game appears to be quite simple as well as having a great deal of inherent interest for the

participants. The concepts that have been used to describe behavior on the P.D. game are trust, cooperation, competition and defection. These concepts seem to have a great deal of relevance for interpersonal and especially intrafamilial behavior.

The P.D. two-person game is represented by the following payoff matrix (Rapoport & Orwant, 1962).

	B ₁	B ₂
A ₁	(X ₁ , X ₁)	(X ₂ , X ₃)
A ₂	(X ₃ , X ₂)	(X ₄ , X ₄)

Each X represents a specific payoff value. The first value in each cell is player "A's" payoff, the second is player "B's." The payoff matrix in the P.D. game is subject to and defined by the following conditions:

1. $2X_1 - X_2 + X_3 - 2X_4$
2. $X_3 - X_4$
3. $X_3 - X_2$
4. $X_4 - X_2$

The actual numerical values in the matrix can be varied and in fact are important independent variables in the game. The following is a common numerical payoff matrix used (Gallo & McClintock, 1965) in studies with the P.D.:

	B_1	B_2
A_1	(+5, +5)	(-4, +6)
A_2	(+6, -4)	(-3, -3)

On each trial of the game each player has a choice between position 1 and position 2. The principle feature of this type of game is that for both players strategy 2 dominates over strategy 1. Gallo and McClintock (1965) describe the situation as follows: "Player A realizes that his A_2 strategy will give him a larger payoff regardless of which strategy player B selects. Similarly, player B realizes that his B_2 strategy dominates his B_1 strategy. Each player therefore selects his second strategy, which places them in the A_2B_2 cell and results in a payoff of X_4 (-3) for each player." This has been described as the only rational solution to the game when we assume that each player wants to do the best for himself.

It may be expected that over a series of trials a tacit agreement would develop between the players so that they would remain in the A_1B_1 cell. However, such an agreement is quite unstable because any unilateral defection from this agreement will for that trial

increase the payoff of the player who defected. Because of these features Deutsch (1968, 1960) believes that the essential psychological feature of the P.D. game is that there is no possibility for rational individual behavior unless the conditions of mutual trust exist. He believes (Deutsch, 1958) that if:

"each player chooses to obtain either maximum gain or minimum loss for himself, each will lose. But it makes no sense to choose the other alternative, which would result in maximum loss, unless one can trust the other player. If one can not trust, it is of course safer to choose so as to suffer minimum rather than maximum loss, but it is even better not to play the game. If one can not trust there may be no reasonable alternative except to choose the lesser of two evils and/or attempt to develop the conditions which will permit mutual trust."

Behavior on the P.D. game is thought to be a function of personality factors which may be induced by giving subjects motivational sets (expectations) or by utilizing sets inherent in the individual (Deutsch, 1958, 1960; McClintock, 1965). In addition to these subject variables, there is a second group of factors which influence a subject's performance on the game, which may be called situational variables because they involve manipulations of the experimental situation.

The overall results of studies with the P.D. game (Gallo & McClintock, 1965; Oskamp & Perlman, 1965)

have indicated that the percentage of cooperative or trusting responses obtained tends to be just below 50% and to decrease over a series of trials. Rapoport and Chammah (1965) found an initial decrement in their subjects' level of cooperation and a shift toward greater cooperation between the twentieth and thirtieth trial. They found that their subjects' reached an asymptote of 50% cooperation at approximately the fiftieth trial. The regular quadratic nature of the distribution of cooperative responses would indicate that one should utilize a sufficient number of trials to account for this phenomena.

The most frequent as well as the most natural way of dealing with this data is to look at the total relative frequency of the cooperative responses for the groups which are being studied (Rapoport & Orwant, 1962). However, because this index is strongly influenced by the interaction effects of the paired players (Rapoport & Chammah, 1965), it would be difficult to state whether the characteristic was inherent in the individuals that made up the different groups or in the way these individuals interact. Therefore the overall measure of the frequency of cooperative response (C) is a poor measure of individual propensity.

Rapoport and Chammah (1965) developed a series of indices of performance on the P.D. game which were less influenced by statistical interaction effects. That is, the measures for each player were correlated less than the two subjects' C. They believe that these measures are more suitable indicators of personal propensities. Our discussion of these measures follows Rapoport and Chammah (1965). The gross index of cooperative response is a simple frequency count, while the following indices are measures of the subject's probability of responding cooperatively after certain specified events have occurred. Not only are these indices less correlated with each other, but they also allow us to look at more specific determinants of a subject's propensity to respond cooperatively. The probability indices would seem to be informative analogues of the interactional strategies within family groups.

The following payoff matrix may be a helpful reference for the discussion of the probability indices:

	B ₁	B ₂
A ₁	C, C (+5, +5)	C, D (-10, +10)
A ₂	D, C (+10, -10)	D, D (-5, -5)

The first letter and value in each cell represents player A's response and payoff, the second letter and value in each cell represents player B's. C represents a cooperative choice, while D represents a non-cooperative choice.

A is the probability that the subject responds cooperatively following the other subject's cooperative response on the preceeding trial. This can be thought of as the propensity to respond cooperatively to the other's cooperative choice. It would perhaps indicate an attempt to establish a mutually cooperative arrangement with the other player or a willingness to cooperate as long as the other continues to respond similarly.

B is the probability that the subject responds cooperatively following his own cooperative response on the preceeding trial. It is the subject's propensity to continue to respond cooperatively or to persist in the cooperative response.

E is similar to this and is defined as the probability that the subject responds non-cooperatively following his own non-cooperative response on the preceeding trial. It is his propensity to continue or persist in the non-cooperative response.

F is the probability that the subject responds

cooperatively following the other subject's non-cooperative response on the preceeding trial. A low probability may be thought of as representing a vengeful attitude, while a high probability may indicate an attempt by the subject to convert the other player to a more cooperative agreement.

\underline{X} is the probability that the subject will respond cooperatively following a trial in which both he and the other player chose cooperatively; following a trial, in which they each received an equal, positive payoff (+5, +5). According to Rapoport and Chammah (1965) this measure indicates "a willingness to continue the tacit collusion of mutual cooperation implied by definition to have been achieved on the previous trial. This willingness is associated with a willingness to resist the temptation to defect which is always present.

\underline{Y} is the probability that the subject will respond cooperatively following a trial in which he responded cooperatively and the other subject responded non-cooperatively; following a trial in which he was the lone cooperator. He would therefore receive the largest negative payoff (-10) which has been called the "sucker's" payoff, while the player who defected receives the largest positive payoff (+10) which has been called the "temptation". \underline{Y} has been thought to indicate a

"willingness to persist in cooperating even though one has been betrayed. It therefore suggests either forgiveness or martyrdom, or a strong faith in teaching by example, or perhaps stupidity, depending on the ethical values of whoever evaluates this behavior."

\underline{Z} is the probability that a subject will respond cooperatively following a trial in which he defected and the other player responded cooperatively; following a trial on which he received the bonus or "temptation" payoff (+10), while the other player received the "sucker's" payoff (-10). This has been seen as indicating a "willingness to stop defecting in response to the other's cooperative choice. It may indicate repentance or responsiveness." If we view the P.D. game as a learning situation, this response tendency would be an extremely difficult choice in that the subject would have been highly rewarded for his previous non-cooperative response and would, therefore, be more likely to again respond non-cooperatively. \underline{Z} would seem to indicate whether the subject views the game in terms of gaining maximal individual gain, in which case \underline{Z} will be low and the subject will act in terms of the reinforcement contingencies, or whether he considers the other player's gain as well as his own, in which case \underline{Z} will be high and the subject will be able to resist the temptation of the bonus payoff.

W is the probability that a subject will respond cooperatively following a trial on which both he and the other player responded non-cooperatively; following a trial on which they each received equal negative payoffs (-5, -5). This is thought of as indicating a "willingness to try cooperating as a way to break out of a mutually defecting (DD) trap. Clearly this action is justifiable only if a certain amount of trust in the responsiveness of the other exists in the initiator of cooperation. Hence, W suggests trust." The subject who contemplates responding cooperatively after both subjects have responded non-cooperatively is probably aware that if the other subject is not willing to respond cooperatively then he will receive the "sucker's" payoff (-10), while the non-cooperative subject receives the bonus payoff (+10).

The gross cooperative frequency (C) must be a result of any combination of these propensities. For example, it may be a result of a high probability of B, the subject's persistence in the cooperative response, with low probabilities in the other probability measures. It is, therefore, important to note that these probability measures are components of the gross relative frequency of cooperation (C) and also allow us to differentiate more specific determinants of a subject's propensity to respond cooperatively. They would, therefore, appear

to be potentially more useful measures.

One of the interesting aspects of the P.D. game is that the subjects quickly become aware that their responses influence the responses of the other player. A response or a series of responses may be thought of as an attempt at communication or negotiation. This would be especially important when there is no other means of communication allowed in the game. For example, take measure W; if a subject was attempting to cooperate as a way out of the DD trap, he would probably recognize that in order for his intentions to be clear and for the other subject to have the time necessary to change his response, he would have to respond cooperatively for at least two trials. When we look at these probability indices over a relatively long period of trials, they would appear to be good indicators of the dynamic interactional processes that exist in the P.D. game.

As stated earlier (Deutsch, 1958), trust is thought to be one of the central psychological attributes involved in interpretations of the P.D. game. Rapoport and Chammah (1965) succinctly state that "the choice in the P.D. game appears to be the choice between competing and cooperating, between conflict and conflict resolution, between trust and suspicion and between loyalty and betrayal." If we accept the assumption that game behavior is indicative

of or reveals non-game, real life behavior and attitudes, then it would seem that the P.D. game can be seen as an excellent methodology for studying patterns of interaction within families in order to learn whether different patterns of interaction are related to attributes of individual family members such as the child's level of adjustment.

Nine ways in which the data obtained from the P.D. game can be viewed have been discussed. The question arises of how differences between groups that emerge on some of the measures and not others will be dealt with. Most research with the P.D. game (for example: Bean & Kerckhoff, 1969; Deutsch, 1960; Gallo & McClintock, 1965) has only used the measure of total relative frequency of cooperative response (C) and have, therefore, not had to come to terms with this inferential problem.

Rapoport and Chammah (1965) in presenting this alternative method of dealing with the data obtained from the P.D. game did so in order to explore finer differences in subjects' individual propensities of responding cooperatively. Because of the nature of their study, they also did not have to come to terms with the inferential problem that is involved in obtaining several indices of the same behavior.

This problem would seem to go beyond the present methodology and appears rather to be one which touches the underlying assumptions of the philosophy of science. Breger (1969), in discussing several issues in the philosophy of science as they apply to contemporary psychology, points out the distinction between two separate but intertwined models of science which are the context of discovery and the context of verification. The latter is the model for a hypothesis testing experiment in which we are interested in confirming a specific assumption about the effects of a particular variable on behavior. However, before this stage of hypothesis verification is arrived at, there would have to be in existence not only a specific theory from which the hypotheses were derived, but also a valid method which may be thought of as one of the substructures of the theory.

It is quite obvious that family theory has not reached this stage of development either in terms of its theory or method. The present study may be viewed, in Breger's (1969) terms, as being in the context of discovery. It is an empirical, exploratory study which will hopefully lead to additional methodological knowledge as well as more specific hypotheses about the relationship between the intrafamilial interactional

process and different levels of adjustment in children.

The measurement technique that was used in this study is relatively new and must be viewed in an exploratory way. An analogy from the field of physiology appears to be somewhat appropriate. In studying a particular sample of tissue we may not know which of several dyes would illuminate that sample best; we would, therefore, use many dyes to see what aspects of the structure each illuminates. The indices that have been discussed are thought of as similar to the dyes used in physiology in that each may illuminate a different aspect of the structure of the relationships within the family.

g) THE PRESENT STUDY.

The purpose of the present study was to explore the relationship between current interactional behavior within a child's family and his (her) level of self-esteem. Self-esteem, as measured by the Self-Esteem Inventory (Coopersmith, 1967), is of interest because of its strong conceptual and empirical relationship to adjustment in childhood. On a more general level this study was thought of as a demonstration that a child's level of adjustment is related to the current interaction patterns in his family (Jakson, 1965; Ross, 1964;

Handel, 1965).

In the present study, in contrast to previous investigations of current family interaction patterns, rather than using an abnormal sample drawn from a clinic population and a normal (non-clinic) sample, the sample was drawn from a regular school setting. We would, therefore, expect to be able to establish the relationship between the level of a child's self-esteem and family interactions more clearly than if more heterogeneous and less well defined groups were used.

The prisoner's dilemma game has been thought of (Deutsch, 1958; Rapoport and Chammah, 1965) as an experimental analogue of a conflict between the following psychological states: trust and mistrust, cooperation and competition, conflict resolution and conflict, and loyalty and betrayal. It would seem unnecessary to document the point that most clinically oriented theorists would suggest that the family relationships of poorly adjusted children would be described by the second state of each of the above word pairs. Conversely, (and perhaps naively,) the interactions in families with well adjusted children have been described as having the following characteristics; trust, cooperation, ability to resolve conflict and loyalty.

The basic assumption in using a simulation technique such as the prisoner's dilemma game, is that behavior in the game is analogous to behavior of the players in their real life situations. We would, therefore, expect that the members of the low self-esteem children's families to be less cooperative in their choices on the prisoner's dilemma game than will the members of the medium and high self-esteem children's families. This would reflect the less satisfactory, less cooperative and less trusting relationships within the families of the low self-esteem children.

Several indices of cooperation that can be derived from the P.D. game have been discussed. The first set of measures are based on the total relative frequency of cooperative response by the subject. The second set of measures were based on specific probability measures. In addition to this, one can ask whether the members of one group, for example the low self-esteem children's families, become less likely to respond cooperatively over time than do the members of the medium and high self-esteem children's families. These three approaches to the question of differences in the rates of cooperation in the families of high, medium

and low self-esteem children are the basis of the first three hypotheses.

Most family theorists seem to agree that the emotionally disturbed child's problems are a function of the parents scapegoating him. It was expected that there would be less cooperation and greater conflict in the interactions between the parents in the families of the low self-esteem children as opposed to the parental interactions in the families of the medium and high self-esteem children. This relationship was tested in the fourth hypothesis.

Heatherington and Frankie (1967) point out that there is considerable evidence "indicating that identification and appropriate sex-role typing are facilitated for both sex children by warmth in the same sex parent." It would seem that positive identification and sex-role typing are involved in the development of high levels of self-esteem and self acceptance. We would therefore expect that in the members of the high self-esteem families, the interactions between the child and the same sex parent would be more cooperative and less likely to maintain conflict than in those interactions in the medium and low self-esteem children's families. This relationship will be tested in the fifth hypothesis.

Previous research which used dichotomous groupings, such as abnormal and normal, has not attempted to use a medium group. Coopersmith (1967) was not explicit in his rationale for using a medium self-esteem group. There is a serious lack of consideration in the literature of the characteristics of medium self-esteem families as well as differences between this group and high or low self-esteem families. In this study the medium self-esteem group was included in order to investigate empirically differences between it and the high and low self-esteem groups.

h) HYPOTHESES.

In summary the present research will test the following specific hypotheses.

1. The members of the families of the low self-esteem children will be less cooperative and will have a greater incidence of the mutually non-cooperative response than will the members of the medium and high self-esteem children's families.

2. Members of the families of the low self-esteem children will be characterized by a lower probability of responding cooperatively, or a higher probability of responding non-cooperatively, than will members of families of medium and high self-esteem

children.

3. As the prisoner's dilemma game proceeds over fifty trials the probability that the members of the medium and high self-esteem children's families will respond cooperatively, will increase, while that of the members of the low self-esteem children's families will decrease.

4. In the interactions between the parents of the low self-esteem children there will be lower probabilities of responding cooperatively and lower probabilities of responses that would resolve conflict or increase cooperation than in the interactions of the parents of the medium and high self-esteem children.

5. a) The interactions between the fathers and sons of the high self-esteem families will be characterized by greater probabilities of cooperative responses and higher probabilities of responses that would reduce conflict than in the interactions between the medium and low self-esteem boys and their fathers.

b) The interactions between the mothers and daughters of the high self-esteem families will be characterized by greater probabilities of cooperative responses and higher probabilities of responses that would reduce conflict than in the interactions between the medium and low self-esteem girls and their mothers.

CHAPTER II

METHOD

Subjects.

Sixty, three-member family groups participated in this study. Each "family" consisted of two parents and one child who was not an only child. All of the children were in the seventh grade of a suburban school district in the New York metropolitan area. The community that the families lived in was middle to upper middle class. The sample was extremely homogeneous on all of the demographic indices examined. This demographic information is summarized in Table 1. The "father's occupation index" is based on Hollingshead and Redlich's (1968) presentation; the criteria used can be found in Appendix A.

The families who participated in this study were selected from a sample of families of high, medium and low self-esteem children. The upper quartile, middle half of the interquartile range and lowest quartile, of the Self-Esteem Inventory, were computed separately for the male and female children. The high, medium and low

Table 1: Demographic Information For Sample.

MEAN	HIGH S-E		MEDIUM S-E		LOW S-E	
	Male	Female	Male	Female	Male	Female
Child's level of S-E	52.0	49.0	41.5	42.1	32.4	28.0
Child's Age	12.4	12.9	12.5	12.6	12.8	12.6
Child's IQ	120	115	120	114	119	119
Mother's Age	40	39	39	39	41	39
Father's Age	44	42	42	42	44	42
Number of Siblings	1.9	2.5	2.1	2.0	1.8	2.6
Number of Years Married	18	18	17	18	17	18
Mother's Education In Years	14	13	15	15	13	15
Father's Education In Years	16	15	16	16	14	16
Father's Occupational Index *	2.4	2.5	2.3	2.0	2.6	2.2
% Mothers Employed Part Time	10	10	0	50	10	20
Family Income In Thousands						
% \$10 - 15	30	30	0	10	30	30
% \$15 - 20	20	30	30	50	20	20
% above \$20	50	40	70	40	50	50

* This socioeconomic index has five levels, with "1" the highest and "5" the lowest.

self-esteem groups were defined by the upper, middle and lowest quartile of the Self-Esteem Inventory.

In evaluating the differences between the scores of the high, medium and low self-esteem (S-E) groups, non-parametric statistics were used because Self-Esteem Inventory scores can be viewed as having the characteristics of ordinal measurement. A Kruskal-Wallace, One-Way Analysis of Variance by Ranks (McNemar, 1962) was performed to determine if these groups were significantly different on this measure. The results of this analysis ($H = 464.4$) indicated that the probability of obtaining these scores from the same population is .001. It would, therefore, appear that the high, medium and low S-E groups were drawn from different populations. There were no significant sex differences within the S-E groups.

Table A in Appendix A shows the percent of subjects in each S-E group who checked "like me" for the statements on the Self-Esteem Inventory. These percentages were based on a sample of twenty-five subjects in each cell.

The six, S-E by sex, groups were compared on eleven demographic variables in addition to S-E. It is important to note that on all but one the groups were extremely homogeneous. The one demographic variable on which the groups did differ significantly was the "percent of mothers employed part time." $\chi^2 = 10.80$ ($df = 5$), which indicated

that the difference between the "percentage of mothers employed part time" was significant ($p .05$). This difference would appear to be due to the 50% of the mothers of the medium S-E girls working while only 10% of the other subjects' mothers were employed part time.

Apparatus and Materials.

The prisoner's dilemma game used in this study is a modification of the one described by Oskamp and Perlman (1965). There were two subject panels which were connected to a control panel which was operated by the experimenter. Each subject panel was a white, $7\frac{1}{2}$ " X 7" X 2", aluminum box which had four differently colored feedback lights mounted in a 4" X 4" square. Directly below each feedback light was a color coded indication of the payoff for each subject for that cell of the payoff matrix. For example, beneath the light in the upper left hand corner of the square written on green plastic tape was "green wins 5" and in red plastic tape "red wins 5." At the bottom and center of each subject's panel, mounted 2" apart, were two push button switches which were used by the subjects to make either a cooperative or a non-cooperative response. These buttons were labelled "1" and "2" in either green or red plastic tape. Below the response buttons each panel was labelled in the corresponding

color either "green" or "red."

The two subject panels were connected to the control panel, which was operated by E. Lights on this panel indicated whether the subjects had chosen the "1" or "2" response. There were a series of switches on this panel which allowed E to activate the appropriate feedback lights on the S's panels as well as on the control panel. A partition was set up which obscured the subject's view of each other as well as their view of the control panel.

The following payoff matrix was used in this study. The first value in each cell represents the red player's payoff and the second value represents the green player's payoff. The particular values in the payoff matrix were chosen so as to maximize clarity to the S's. It was thought that a symmetrical payoff matrix with clear, easily manipulated differences would facilitate the S's (especially the children's) understanding of the utilities involved in the P.D. game.

		Green Player	
		1	2
Red Player	1	(+5, +5)	(-10, +10)
	2	(+10, -10)	(-5, -5)

The child's level of self-esteem (S-E) was determined

by the Self-Esteem Inventory (S.E.I.) described by Cooper-smith (1967). The S.E.I., which can be found in Appendix A, is a series of statements that the subject checks as to whether it is "like me" or "not like me." The scoring procedure that was used for the S.E.I. was based on the criteria supplied by Coopersmith in which the total number of right answers are summed to form a self-esteem score. Blanks, double checks and checks on the midline were scored as if wrong.

Summary of P.D. Game Scoring Procedure.

The data obtained from the P.D. game was initially in the format of a game protocol; fifty pairs of either cooperative or non-cooperative responses. The frequency measures used to analyze this data were the absolute relative frequency of cooperative choice (C), the percentage of frequency of mutually cooperative choice (CC) and the percentage or frequency of mutually non-cooperative choice (DD). The latter two are indices of the level of cooperation within the dyad.

In addition to these frequency measures, the following probability indices were obtained from the P.D. game.

1. A, the probability that the subject responds cooperatively following the other player's cooperative response on the preceeding trial.
2. B, the probability that the subject responds

cooperatively following his own cooperative response on the preceeding trial; his persistence in the cooperative response.

3. E, the probability that the subject responds non-cooperatively following his own non-cooperative response on the preceeding trial; his persistence in the non-cooperative response.
4. F, the probability that the subject responds cooperatively following the other player's non-cooperative response on the preceeding trial.
5. X, the probability that the subject will respond cooperatively following a trial on which both he and the other player responded cooperatively.
6. Y, the probability that the subject will respond cooperatively following a trial on which he responded cooperatively and the other player responded non-cooperatively.
7. Z, the probability that the subject will respond cooperatively following a trial on which he responded non-cooperatively and the other player responded cooperatively.
8. W, the probability that the subject will respond cooperatively following a trial on which both he and the other player responded non-cooperatively.

The calculations involved in scoring these probability measures are fairly tedious. When this research was undertaken there were no computer programs available for scoring these measures. Consequently, it was necessary to develop a series of Fortran programs to do this job. These programs are available from the author.

Procedure.

Obtaining the Sample: The cooperating school district

had requested that permission from the parents be obtained before the Self-Esteem Inventory was administered to their children. Three days before the inventory was to be administered, a letter which partially explained the purpose of the study and requested the parents' permission to allow their child's participation, was given to students in all seventh grade classes by teachers from the social studies department. A copy of this letter is included in Appendix A. On the day that the inventory was to be administered to those students who returned a permission slip, there was a high rate of absenteeism due to the day of mourning for Dwight Eisenhower. As a result of this, only 60% of the seventh grade students were available for the preliminary testing.

A high, medium, and low S-E group was obtained for both the male and female S's as previously described. A letter was then sent to the parents of these students requesting their further cooperation and briefly explaining the nature of the study. A copy of this letter is included in Appendix A.

A week after these letters were mailed to the potential participants, the E called the families and attempted to arrange a suitable time. It had been decided that ten families in each cell would be adequate, and families were contacted until the required number agreed to

participate. The order in which the families were contacted was alphabetical. When a family agreed to participate, an appointment was set up, usually in the evening or on a weekend afternoon. All necessary precautions were taken so that the E did not know what group the family was in until the conclusion of the experiment. All S's were seen in their own home.

Sixty-four percent of the families contacted by phone agreed to participate in this study. The number of families contacted and the percentage participating can be found in Table in Appendix A. The number of families that agreed to participate was relatively high.

Experimental Procedure.

The order in which the family dyads would play the P.D. game had been randomized before the E arrived at the subjects' home. After setting up the equipment, most typically in the kitchen or diningroom, the first dyad was asked to be seated and the following instructions were then read. These instructions are a modified version of those presented by Rapoport and Chammah (1965).

You will be playing a game using these two boxes. Let me explain to you how to play. The idea of this game is to win as many points for yourself as possible...it does not matter how many points the person who you are playing with gets...the winner is the person who ends up with the most points.

As I explain the game you will see that the number of points that you get depends on what both you and the person that you are playing with does. This is how it works.

One of you will be the red player and one the green player. (E points out how each S panel is marked "red player" and "green player"). Why don't you be "green." On each trial of the game you will each make one of two choices by pushing either one of these two buttons. If you both push the first button (E asks S's to push this button), then this light comes on and as you can see (points to the points indicated beneath the light), you will both win 5 points. If the red player chooses the first button and the green player chooses the second button, then the green player wins 10 and the red player loses 10. If the red player chooses the second button and the green player chooses the first button, then green loses 10 and red wins 10.

I am going to give you a sheet of paper on which you can record your wins and losses; we will total them up after each 10 trials. I will read off, after each trial, the number of points each one of you has won or lost. I would like you to write it in the appropriate column.

Remember, it is important to try and get as many points as you can to win. Once the game starts you cannot talk to each other. Are there any questions? Let's try it 5 times to see if everything is clear.

After the five practice trials any misunderstandings were clarified and the actual 50-trial game was begun. After each block of ten trials the game was stopped so that the players could tally their scores. Any S's who had difficulty with the arithmetic were helped by E.

After the first pair of players had completed their game, one person was asked to leave and the third family

member was seated. The instructions and procedure were repeated. For the third game, the instructions were not repeated unless there were questions about it. At the conclusion of the third game, the E thanked the family for participating and asked them not to discuss the game with other friends who may yet be participating in the study. It took approximately $1\frac{1}{2}$ to 2 hours to complete the experiment with each family.

CHAPTER III

RESULTS

The first two hypotheses predicted that in their overall performance on the P.D. game, the members of the low S-E families would be less cooperative and more competitive than the members of the high and medium S-E families. The first hypothesis, which utilized the frequency measures (C, CC, DD), was not confirmed. The second hypothesis, which utilized the probability data, also was not confirmed; however, in the latter case, there were significant and unexpected sex differences in the data for the high, medium, and low S-E children.

The third hypothesis predicted that there would be differences in the temporal pattern of cooperative behavior for the members of the three self-esteem groups, with the members of the low S-E children's families becoming progressively less cooperative while the members of the medium, and high S-E children's families would become more likely to respond cooperatively as the P.D. game proceeded over time. This hypothesis was confirmed.

The fourth hypothesis predicted that there would be less cooperation and greater conflict in the interactions between the parents of the low S-E children than in the interactions of the parents of the high and medium S-E children. This hypothesis was also confirmed.

The fifth hypothesis predicted that there would be a greater probability of responding cooperatively in the interactions between the high S-E child and the like sex parent than for the low S-E child and his (her) same sex parent. This hypothesis was partially supported; the data for the interaction of the boys and their fathers conformed to the prediction while the data for the girls and their mothers did not.

To review briefly, the following variables were analyzed:

1. Self-Esteem: High, Medium, and Low.
2. Sex: This refers to the sex of the child.
3. Role: This refers to the three intrafamilial roles of mother, father, and child.
4. Trial Block: In each game there are five blocks of ten trials each.
5. Dyadic Partner: This refers to the other player in the P.D. game; each subject played the P.D. game twice, once with each of the remaining family members.
6. Subjects: There are ten individuals

at each level of self-esteem by sex by role; this results in a total sample of 180 subjects.

The detailed analyses of these variables will follow the order of the proposed hypotheses.

A Friedman Two-Way Analysis of Variance by Ranks (McNemar, 1962), a non-parametric statistic for the mixed model design, was performed on the frequency data used to evaluate hypothesis 1. The Frequency data (C, CC, DD) were evaluated with non-parametric statistics because they tend to be distributed binomially and the correlation of subjects playing with each other tend to be high.

The remaining hypotheses (2 through 5) were evaluated with the Analysis of Variance (ANOVA). The Analysis of Variance design that was used is a mixed design (Chapter 8, Myers, 1966) with three between and two within variables. Each of the remaining hypotheses focus on different terms in the analysis of variance. A separate analysis of variance was computed for each of the eight probability measures described previously; the completed ANOVA tables are included in Appendix B.

a) HYPOTHESIS 1.

Hypothesis 1 stated that: The members of the families of low self-esteem children will be less

cooperative and will have a greater incidence of the mutually non-cooperative response than will the members of the medium and high self-esteem families.

On the basis of chance or random play C would have been expected to be 50.0 percent. The mean percentage of cooperation (C) for the members of the high, medium, and low S-E groups is 36.2, 35.6, and 33.3 respectively. The Friedman Two-Way Analysis of Variance by Ranks resulted in $\chi^2_r = 0$. This outcome indicated that there was no significant difference between the groups for measure C.

Similar analyses of variance by ranks were performed on the sex by role by dyadic partner by level of self-esteem interactions. The mean levels of percent C and the χ^2_r for each is found in Table 2. This analysis compares differences in the way each family member played with each of his two partners for the three S-E groups of the male and female subjects.

The results of this analysis indicates that there were no significant differences in the levels of cooperation for the members of the three self-esteem groups. Only one set of comparisons was significantly different at the .05 level and that was in the girl-mother dyad. Since twelve comparisons were made and only one was significant, this raises the possibility that the observed

Table 2: Mean Percentage of Cooperative Response and Chi^2_r For The Male and Female Children and Their Parents.

ROLE	DYADIC PARTNER	MEANS			CHI ² _r
		HIGH S-E	MEDIUM S-E	LOW S-E	
<u>Male Ss</u>					
CHILD	MOTHER	31.8	43.6	37.2	1.4
	FATHER	29.6	40.6	25.8	-2.6
MOTHER	CHILD	40.0	40.8	43.8	-1.4
	FATHER	37.6	26.4	33.0	-3.6
FATHER	CHILD	36.6	34.2	25.8	-0.6
	MOTHER	30.8	32.2	19.6	2.4
<u>Female Ss</u>					
CHILD	MOTHER	48.4	28.4	35.8	7.3*
	FATHER	39.6	38.0	32.0	-2.6
MOTHER	CHILD	42.0	39.6	38.4	0.2
	FATHER	33.2	37.4	31.4	0.8
FATHER	CHILD	33.2	38.0	32.0	-3.8
	MOTHER	31.6	30.2	41.2	0.8
<u>Total</u>		36.2	35.6	33.3	

* $p < .05$

significance was a result of chance. When the twelve χ^2 s were combined (McNemar, 1962) the resulting $\chi^2 = -1.7$ ($df = 24$), which was not significant. Thus, the observed significant difference between the high, medium, and low S-E girls playing with their mothers was not great enough to rule out the possibility that this difference was a result of chance variability. The result of this and the previous analysis would seem to indicate that there was no difference in the frequency of cooperative choice (C) for the members of the high, medium, and low self-esteem families.

It was suggested that members of the high self-esteem families would have more experiences of mutual satisfaction and fewer experiences of mutual dissatisfaction. The measures that reflect these tendencies in the P.D. game are the percentage of mutual cooperation (CC) and the percentage of mutual defection or non-cooperation (DD). These frequencies are not based on the performance of an individual subject but rather on the performance of the dyad.

The mean percentages of mutual cooperation (CC) for the high, medium, and low self-esteem groups were: 14.6, 13.6, and 13.8 respectively. For this analysis $\chi^2_r = 12$, which was not significant. The mean percentages of mutual defection (DD) for the high, medium,

and low self-esteem groups was: 42.3, 44.2, and 45.4. For this analysis the $\chi^2_r = 0$; this indicates that there was also no significant difference in the rate of mutual defection for the three self-esteem groups. If the subjects were playing randomly it would have been expected that both CC and DD would be equal to 25 percent. The data from these two measures as well as the data from the C measure indicated that all S's in the study tended to play a fairly non-cooperative game.

The CC and DD data were analyzed further; the sex by dyad (child-mother, child-father, mother-father) by level of self-esteem interaction was compared. The mean percentages of CC and DD and the χ^2_r for these analyses are presented in Tables 3 and 4 below. These analyses indicate that there was no significant difference between the members of the high, medium, and low-self esteem families in their frequency of mutually cooperative (CC) or mutually non-cooperative (DD) responses.

b) HYPOTHESIS 2.

Hypothesis 2 stated that: Members of families of low self-esteem children will be characterized by lower probabilities of responding cooperatively and higher probabilities of responding non-cooperatively than will

Table 3: Mean percentage of mutually cooperative responses and χ^2_r for each dyad of the male and female subjects.

DYAD	HIGH S-E	MED S-E	LOW S-E	χ^2_r
<u>MALE SUBJECTS</u>				
child-mother	13.8	21.8	20.4	3.8
child-father	13.8	19.8	7.6	-0.4
mother-father	13.8	8.2	7.2	-2.2
<u>FEMALE SUBJECTS</u>				
child-mother	22.0	10.4	13.0	2.2
child-father	12.0	9.8	10.8	0.6
mother-father	12.4	11.6	14.0	0.8
<u>TOTAL</u>	14.6	13.6	13.8	

Table 4: Mean percentage of mutually non-cooperative responses and χ^2_r for each dyad of the male and female subjects.

DYAD	HIGH S-E	MED S-E	LOW S-E	χ^2_r
<u>MALE SUBJECTS</u>				
child-mother	42.7	36.2	37.0	-2.8
child-father	47.4	45.2	56.6	-0.6
mother-father	45.8	53.0	55.2	-3.4
<u>FEMALE SUBJECTS</u>				
child-mother	30.8	43.0	38.8	-2.6
child-father	40.6	44.8	47.8	0.8
mother-father	46.6	42.6	37.4	-3.7
<u>TOTAL</u>	42.3	44.1	45.4	

the members of families of medium and high self-esteem children. Table 5 summarizes the findings of the analysis of variance for the eight probability measures. The terms in the analysis of variance which are relevant to this hypothesis are self-esteem (S-E) and the interactions between self-esteem, sex (S) and role (R).

The main effect of the level of S-E was not significant for any of the eight probability measures. The sex by self-esteem interaction for measure E (i.e., the probability that the subject will respond non-cooperatively following a trial on which he responded non-cooperatively) was significant at the .025 level. This is a measure of the subject's persistence in the non-cooperative response. Figure 1 shows the sex by self-esteem interaction for this measure.

There was no consistent pattern for the members of the high and medium S-E children's families to be less likely to respond non-cooperatively following a trial on which they responded non-cooperatively than for the members of the low S-E families. A Tukey test (Myers, 1966) of the difference between the medium S-E male and female groups indicated that the members of the female subjects' families approached the usual level of significance ($p < .10$) in their persistence in the non-cooperative choice as compared to the medium

Table 5: Summary of the significant findings for the Analyses of Variance of the eight probability measures: A, B, E, F, X, Y, Z, W.

	<u>A</u>	<u>B</u>	<u>E</u>	<u>F</u>	<u>X</u>	<u>Y</u>	<u>Z</u>	<u>W</u>
1. Total								
2. Between subjects								
3. Sex (S)								.08
4. Self-esteem (S-E)								
5. Role		.001			.005	.001		
6. S X S-E			.025					
7. S X R								
8. S-E X R								
9. S X S-E X R		.07		.09				
10. Error (N/SS-ER)								
11. Within subjects								
12. Dyadic partner (DP)	.001	.005	.05	.005	.005	.08	.025	
13. DP X S	.025							
14. DP X E						.05		
15. DP X R				.08				
16. DP X S X S-E								
17. DP X S X R								

	<u>A</u>	<u>B</u>	<u>E</u>	<u>F</u>	<u>X</u>	<u>Y</u>	<u>Z</u>	<u>W</u>
18. DP X S-E X R								
19. DP X S X S-E X R				.09		.03		
20. Error (N X DP/S-ER)								
21. Trial Block (T)	.001	.001	.001	.001	.01	.001	.001	.005
22. T X S								
23. T X S-E	.001						.025	
24. T X R								
25. T X S X S-E	.025							
26. T X S X R		.05			.05	.05		
27. T X S-E X R				.10				
28. T X S X S-E X R								
29. Error (T X N/SS-ER)								
30. DP X T								
31. DP X T X S	.10	.05	.005					
32. DP X T X S-E	.025							
33. DP X T X R								
34. DP X T X S X S-E	.005			.05	.025			
35. DP X T X S X R						.08		

A B E F X Y Z W

36. DP X T X
S-E X R

37. DP X T X S
X S-E X R .05 .10 .10

38. Error
(N X DP X
T/SS-ER)

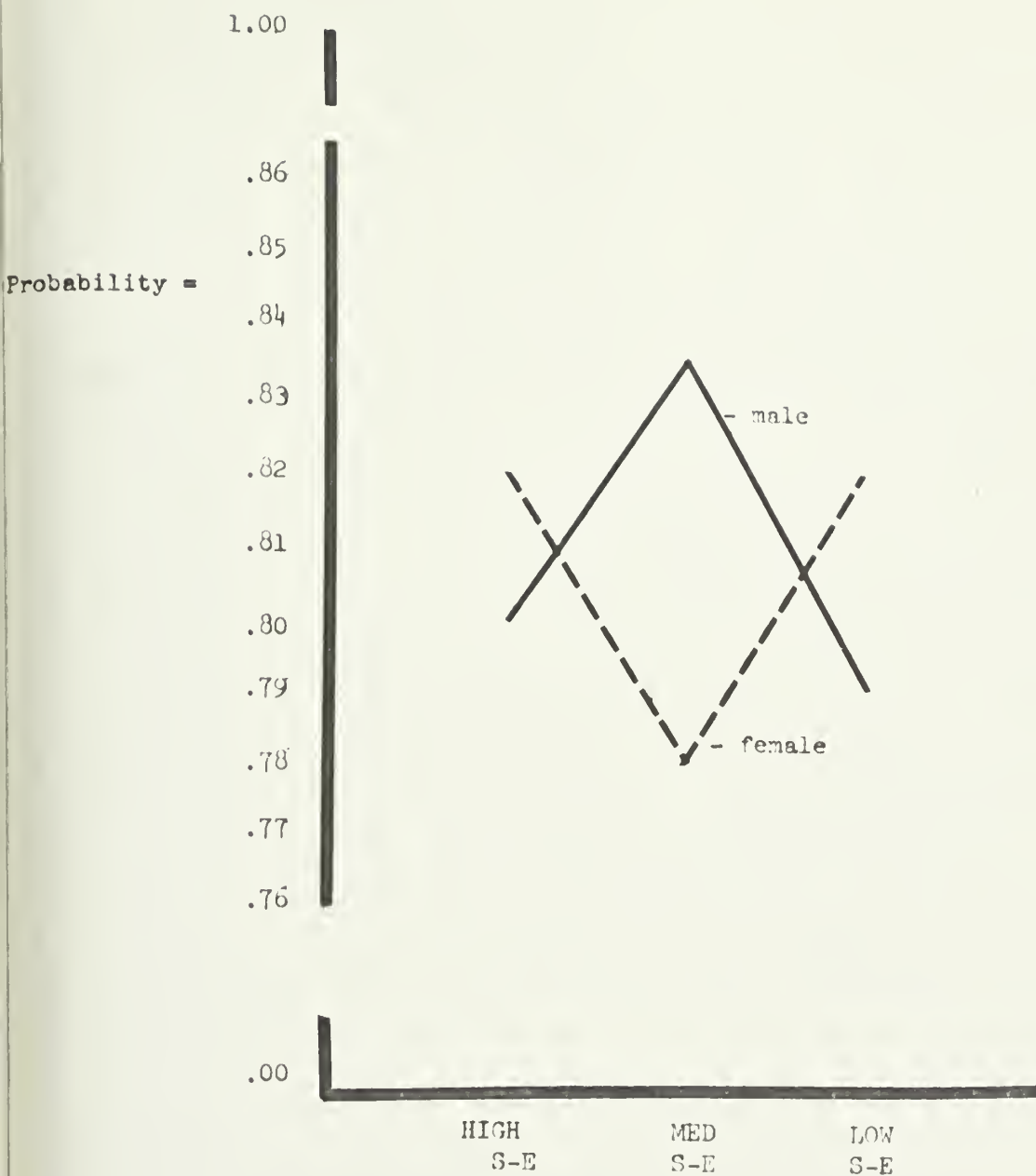


Figure 1: The interaction between sex and level of self-esteem (S-E) for measure E: the probability that the subject responds non-cooperatively following his own non-cooperative response.

S-E male subjects' families. This sex by S-E difference had not been predicted. The S-E by sex interaction was not significant for any of the remaining probability measures. The S-E by role interaction was not significant for any of the eight probability measures.

The sex by self-esteem by role interaction approached the usual level of significance for the measure of the probability that the subject will respond cooperatively following his own cooperative response on the preceeding trial (B), and for the measure of the probability that the subject will respond cooperatively following the other subject's non-cooperative response on the preceeding trial (F). Table 6 presents the mean probabilities for the sex by S-E by role interaction for measure B.

The interaction of sex by S-E by role for the measure of the subjects' persistence in the cooperative response, B, approached the usual level of significance ($p .07$). The most striking differences occurred among the children and are presented in Figure 2.

Comparisons of the means for the different groups using the Tukey method (Myers, 1966) yielded the following significant findings. The high S-E girls were significantly ($p < .05$) more likely to respond cooperatively than were the high S-E boys. The probabilities here indicated that after the high S-E girl responded cooperatively there was a one out of three chance that her

Table 6: The sex by self-esteem by role interaction for measure B, the probability that the subject will respond cooperatively following his own cooperative response on the preceeding trial. (F = .07)

ROLE	MALE			FEMALE		
	High S-E	Medium S-E	Low S-E	High S-E	Medium S-E	Low S-E
Child	.17	.35	.21	.32	.19	.20
Mother	.32	.36	.43	.34	.35	.37
Father	.27	.30	.21	.27	.30	.29

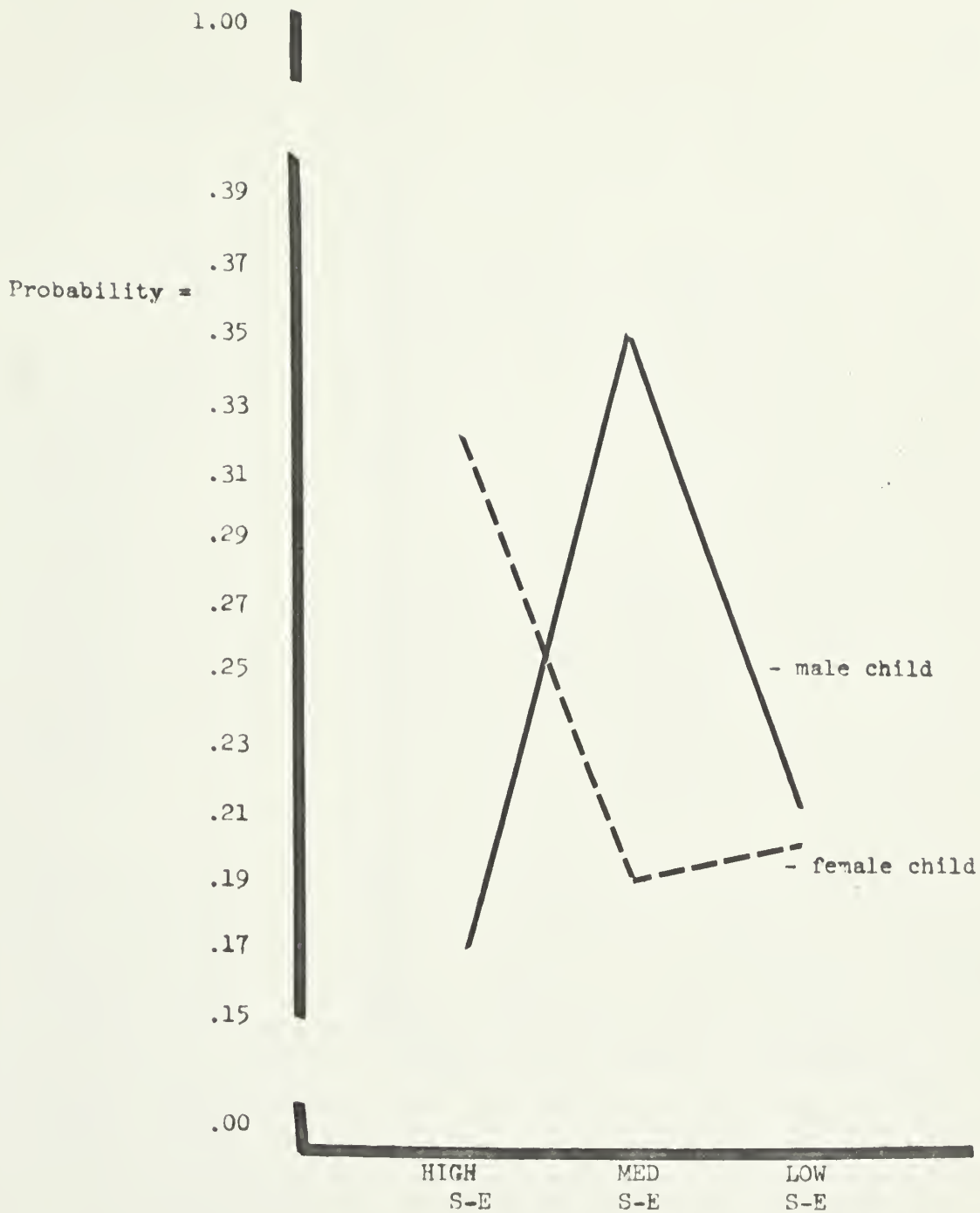


Figure 2: The interaction between sex, level of self-esteem (S-E) and role for measure B: the probability that the subject will respond cooperatively following his own cooperative response.

next response would be cooperative, while for the high S-E boy, the probability that his next response would be cooperative was less than one out of five. The situation described above changes radically for the medium S-E children. The boys were significantly ($p < .05$) more likely to respond cooperatively after their own cooperative responses on the preceeding trial than were the girls. In fact, the actual probabilities were approximately the same as for the high S-E children, but here the boys had a probability of persisting in the cooperative response of .35 and the girls' probability was .19. It should also be noted that the high S-E girls were significantly ($p < .05$) more likely to persist in their cooperative response than were the medium S-E girls; whereas, the high S-E boys were significantly ($p < .05$) less likely to follow a cooperative response with another cooperative response than were the medium S-E boys. Both the low S-E boys and girls had relatively low probabilities of continuing to respond cooperatively after a preceeding cooperative response. The low S-E girls were similar to the medium S-E girls; both were significantly ($p < .05$) less persistent in the cooperative response than were the high S-E girls.

The high, medium, and low S-E boys and girls' mothers' probability of responding cooperatively following their

own cooperative responses on the preceeding trial (B) were quite similar. Comparison of pairs of means for these groups with the Tukey test indicated that there was no significant difference, between the groups of mothers, in their persistence in the cooperative response. Similarly, it was found that there was no significant difference between the high, medium, and low S-E boys and girls' fathers in their performance on measure B.

The sex by self-esteem by role interaction for measure F, the probability that the subject will respond cooperatively following the other player's non-cooperative response on the preceeding trial, approached the usual level of significance ($p < .09$). Comparison by means of the Tukey method of the high, medium, and low S-E boys in their probability of responding cooperatively following their parents' non-cooperative response indicated that there was no significant difference between the groups. The high S-E girls were significantly ($p < .05$) more likely to respond cooperatively than were the medium S-E girls, but not significantly more likely to respond cooperatively than the low S-E girls. There was a tendency for the high S-E girls to be significantly ($p .10$) more likely to respond cooperatively than were the high S-E boys following a non-cooperative response by their parent. The data for this interaction is included

in Table 7.

Overall, there was little support for the hypothesis that the members of the low S-E children's families will be characterized by a lower probability of responding cooperatively and a higher probability of responding non-cooperatively than will the members of the families of medium and high S-E children.

c) HYPOTHESIS 3.

Hypothesis 3 stated that : As the P.D. game proceeds over 50 trials the probability that the members of the medium and high self-esteem families will respond cooperatively will increase, while that of the members of the low self-esteem families will decrease. In this study trials were grouped into five blocks of ten trials each. This hypothesis refers to the interactions of level of self-esteem with trial blocks (T).

The interaction of trial block by level of self-esteem for measure A, the probability that the subject responds cooperatively following a trial in which the other **player** responded cooperatively, was highly significant ($p < .001$). Figure 3 presents the interaction of trial block by level of self-esteem for this measure. The mean probabilities for the high, medium, and low

Table 7: The sex by self-esteem by role interaction for measure \bar{F} , the probability that the subject will respond cooperatively following the other subject's non-cooperative response on the preceeding trial. ($F = .09$)

ROLE	MALE			FEMALE		
	High S-E	Medium S-E	Low S-E	High S-E	Medium S-E	Low S-E
Child	.31	.32	.27	.43	.26	.34
Mother	.35	.34	.40	.35	.37	.32
Father	.31	.27	.19	.33	.31	.39

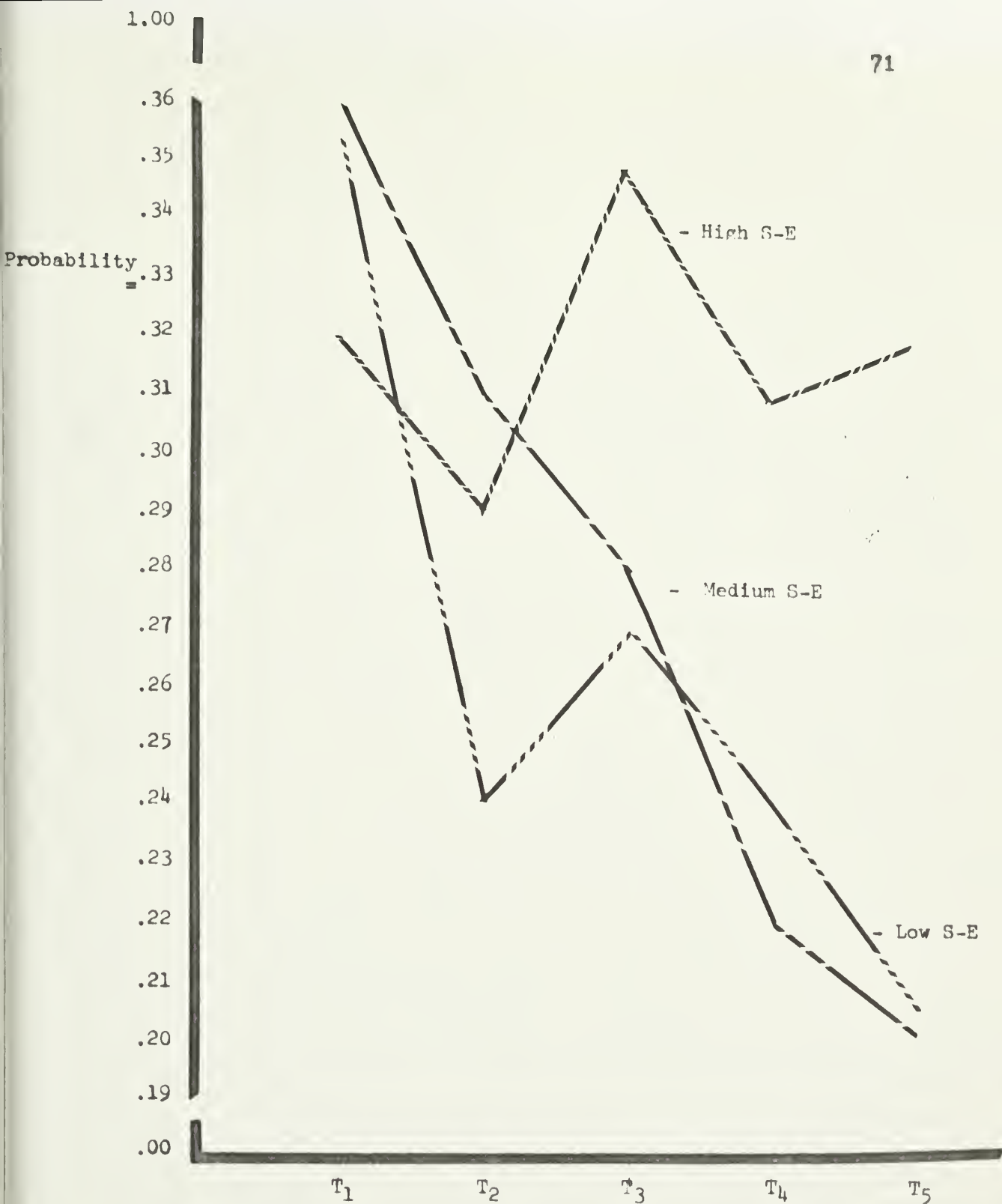


Figure 3: The interaction between trial block (T) and level of self-esteem (S-E) for measure A: the probability that the subject will respond cooperatively following a cooperative response by the other player.

S-E groups at each level of trials for measure A is presented in Table 8.

The interaction presented in Figure 3 is quite clear. It became progressively less likely that the members of the medium and low self-esteem families would respond cooperatively following the cooperative response of the other player. For the members of the high self-esteem families, the probability that they would respond cooperatively to the cooperative response of the other player remained fairly constant.

A comparison, using the Tukey method, of the mean probability for the first trial block and each subsequent trial block for the S-E by trial block interaction led to the following significant findings. There was no significant difference for the members of the high S-E families in the probability that they responded cooperatively in the first block of ten trials and each of the subsequent trial blocks. However, the members of the medium and low S-E families were significantly ($p < .05$) less likely to respond cooperatively following the other subject's cooperative response on the preceding trials (A) on each block of trials subsequent to the first.

The interaction of trial block by S-E by sex for measure A was significant ($p .025$). Table 9 presents

Table 8: Trial Block by Self-Esteem Interaction for Measure A: The Probability That The Subject Responds Cooperatively Following A Trial In Which The Other Player Responded Cooperatively.

Self-Esteem	Trial Block				
	T ₁	T ₂	T ₃	T ₄	T ₅
High S-E	.32	.29	.35	.31	.32
Medium S-E	.36	.31	.28	.22	.20
Low S-E	.36	.24	.27	.24	.21

Table 9: The trial block by S-E by sex interaction for measure A, the probability that the subject responds cooperatively following a trial on which the other subject responded cooperatively ($F = .025$)

		T ₁	T ₂	T ₃	T ₄	T ₅
HIGH S-E	Male	.32	.32	.31	.29	.35
	Female	.31	.27	.39	.34	.31
MEDIUM S-E	Male	.37	.31	.31	.31	.31
	Female	.35	.31	.24	.13	.09
LOW S-E	Male	.36	.25	.30	.25	.20
	Female	.36	.24	.26	.24	.20

the mean probabilities for this interaction. The response curves for the high and low S-E groups appear to be similar to each other and to those previously discussed for the S-E by trial block interaction. However, there were significant ($p < .05$) differences between the means for the medium S-E male and female groups. Figure 4 presents the S-E by trial block by sex interaction for measure A.

For both the male and female high S-E groups the probability of responding cooperatively after the other person responded cooperatively remains fairly stable. The members of the low S-E male and female families became increasingly less likely to respond cooperatively to the other person's cooperative response on the preceeding trial as the game progressed. There was a difference between the response patterns of the families of the medium S-E male and female subjects. The members of the medium S-E boys' families tended to respond like the members of the high S-E boys' families. That is, their probability of responding cooperatively after the other player responds cooperatively remained constant over the fifty trials. The members of the medium S-E girls' families became increasingly less likely to respond cooperatively after the other person responded cooperatively. Their behavior on the P.D. game was similar

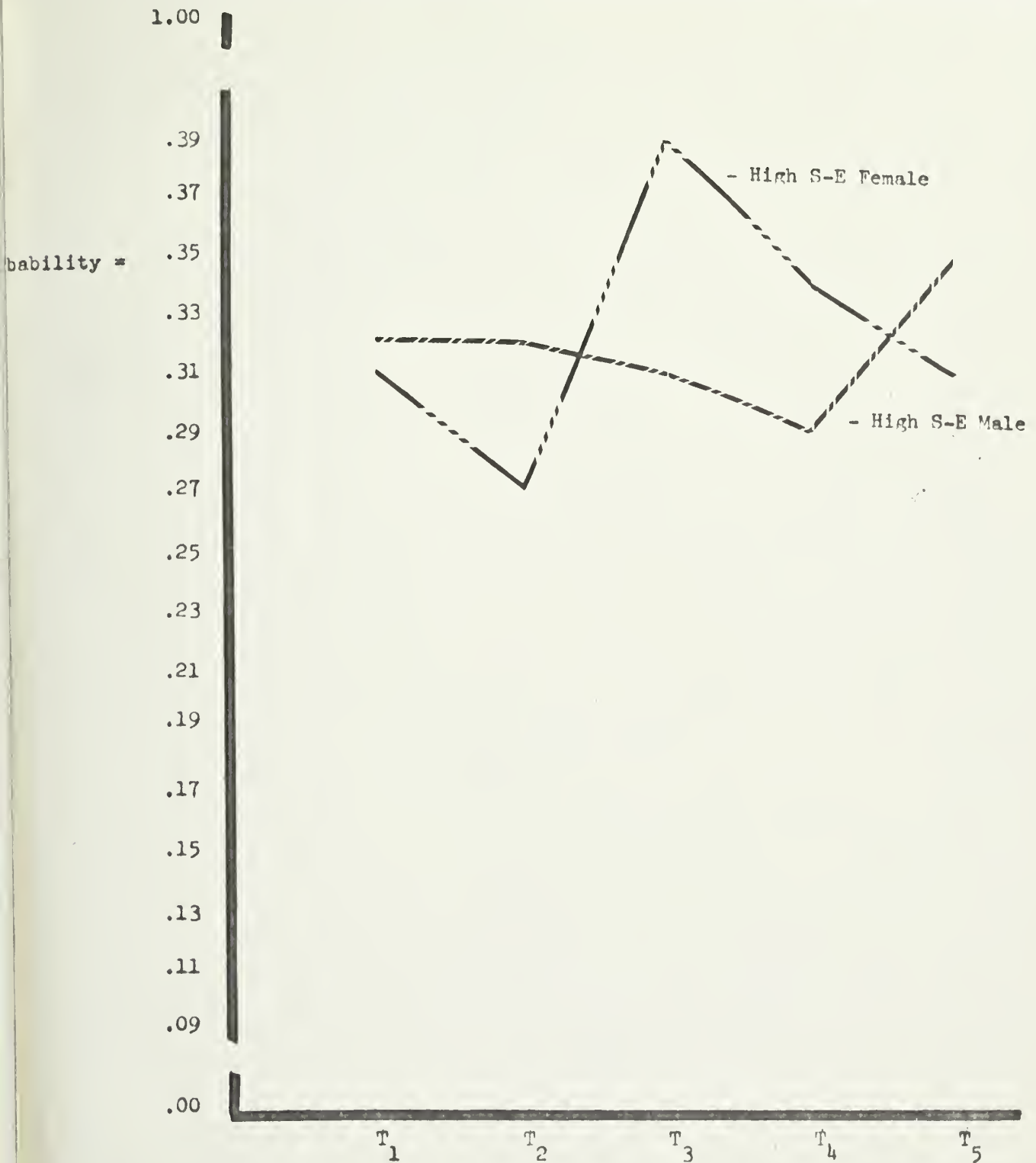


Figure 4.1: The interaction between sex, trial block (T) and self-esteem (S-E) for measure A: the probability that the subject will respond cooperatively following a cooperative response by the other player.

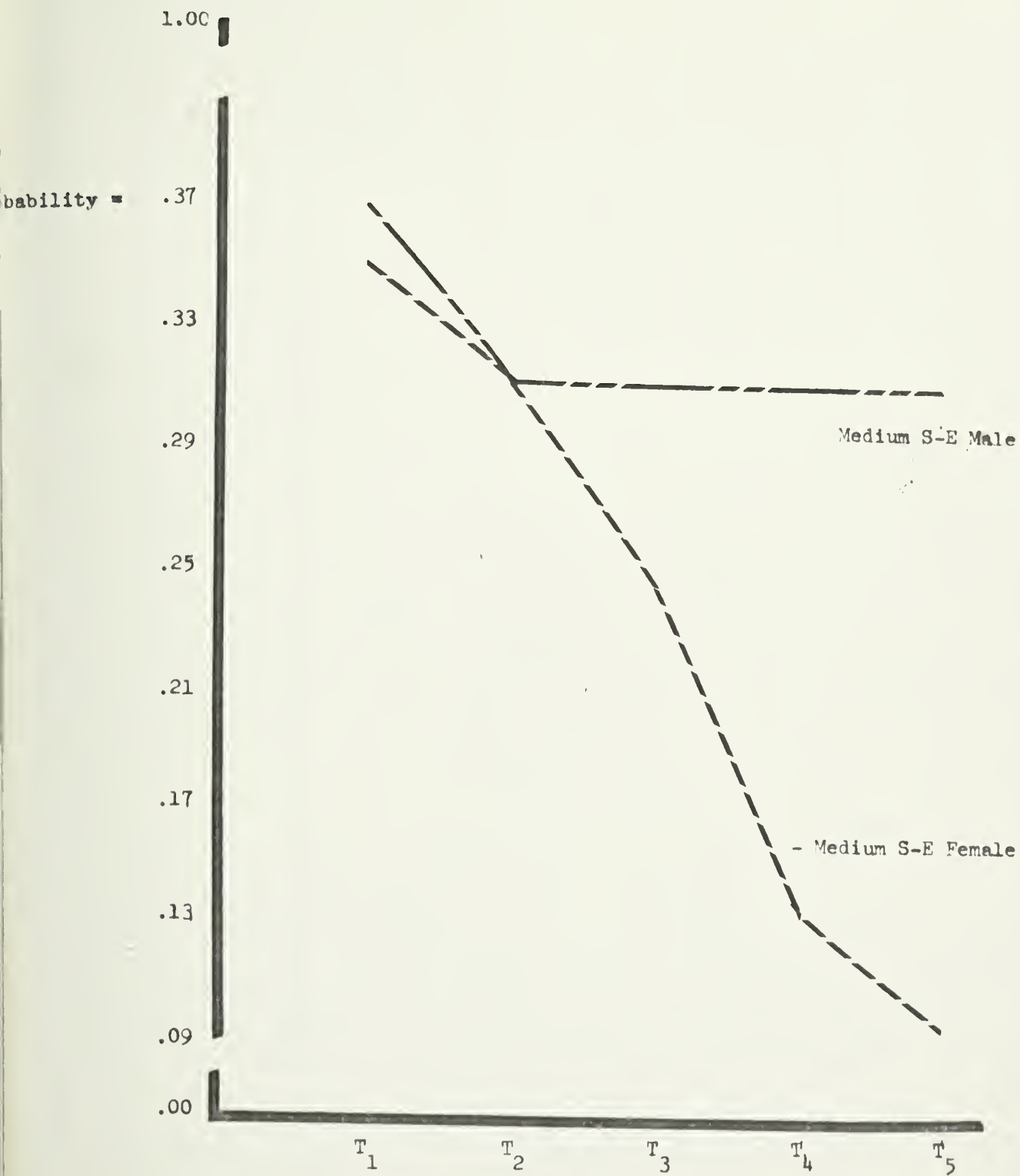


Figure 4.2: (continued)

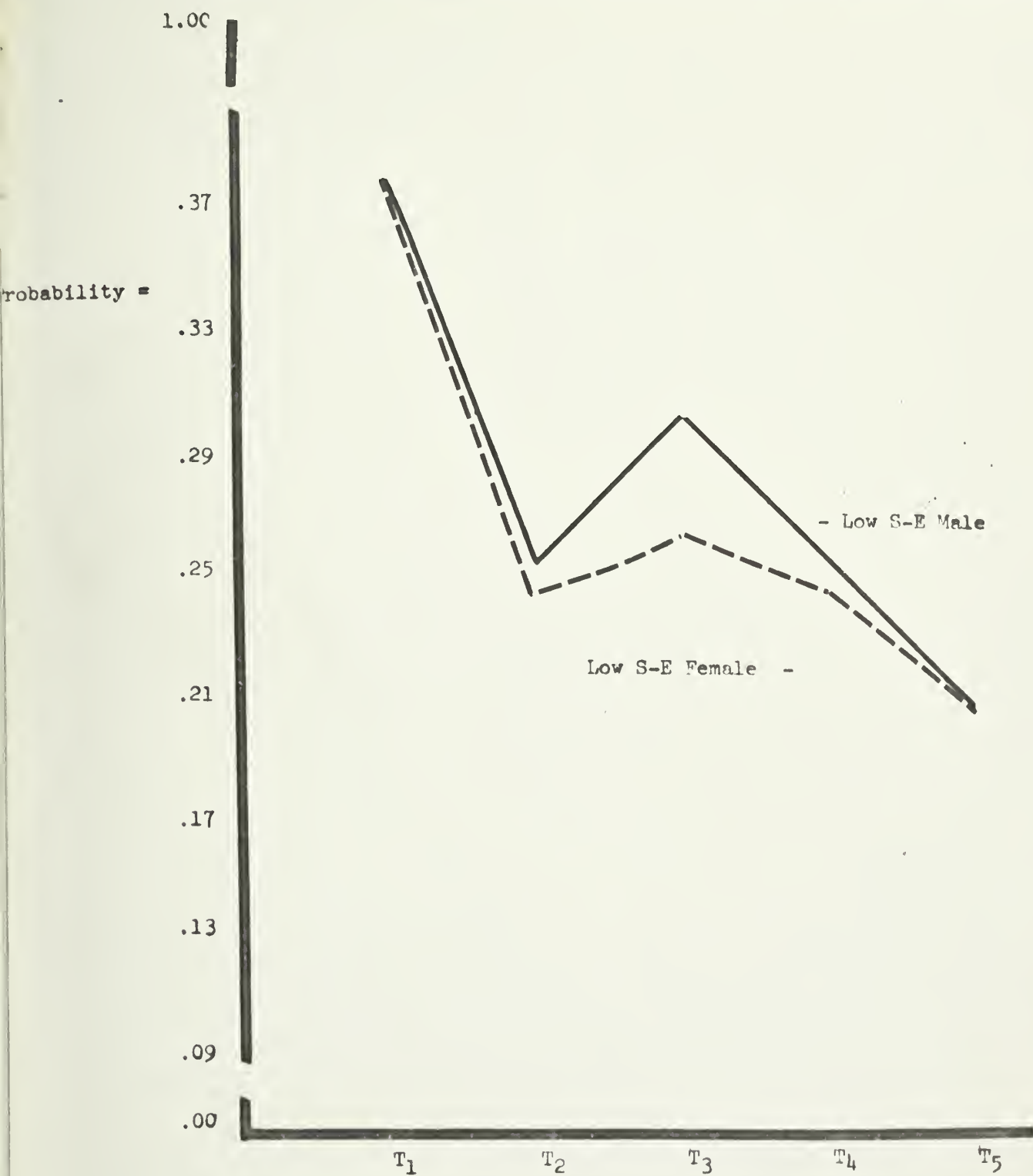


Figure 4.3: (continued)

to the members of the low S-E female subjects' families; with the exception that they became less cooperative than the members of the low S-E families. In comparing the two groups of medium S-E families in this interaction by means of the Tukey method, it was found that for the third, fourth, and fifth trial blocks the members of the female subjects' families were significantly ($p < .05$) less cooperative than the members of the male subjects' families.

The interaction between self-esteem and trial block for measure \underline{Z} , the probability that the subject will respond cooperatively following a trial on which he responded non-cooperatively and the other player responded cooperatively, following a trial on which he received a bonus payoff for not cooperating, was significant ($p < .025$). Choosing a cooperative response after having been rewarded for a non-cooperative response would appear to be the most difficult choice that the P.D. game offers. In this game situation, there would appear to be considerable pressure supporting a non-cooperative response. The mean probabilities for this interaction are presented in Table 10; Figure 5 presents this interaction in graphic form.

The data for this interaction was further studied using the Tukey method (Myers, 1966). The members of

Table 10: The trial block by self-esteem (S-E) interaction for measure \bar{Z} : the probability that the subject will respond cooperatively following a trial on which he responded non-cooperatively and the other player responded cooperatively.

SELF-ESTEEM	TRIAL BLOCK				
	T ₁	T ₂	T ₃	T ₄	T ₅
High S-E	.43	.45	.63	.32	.48
Medium S-E	.48	.59	.46	.28	.25
Low S-E	.55	.40	.29	.25	.26

1.00

.61

.57

.53

.49

.45

.41

.37

.33

.29

.25

.00

Probability =

- High S-E

- Medium S-E

Low S-E -

 T_1 T_2 T_3 T_4 T_5

Figure 5: The interaction between trial block (T) and self-esteem (S-E) for measure Z : the probability that the subject will respond cooperatively following a response in which he responded non-cooperatively and the other subject responded cooperatively.

the low S-E group initially switched from a non-cooperative response after having been rewarded for not cooperating over 50 percent of the time. During the second block of ten trials they switched to a cooperative response 40 percent of the time; this decrement was significant ($p < .05$). In the next block of ten trials, the probability that the members of the low S-E families responded cooperatively after having responded non-cooperatively and been rewarded drops to .29; again this was a significant ($p < .05$) decrement. During the remaining two trial blocks there was again a slight decrement and the probability of switching to a cooperative response remains at about .25.

The members of the medium S-E families responded somewhat differently to being rewarded for the non-cooperative response. During the first block of ten trials, the probability that these subjects would switch from a non-cooperative response to a cooperative response was .48. During the second block of ten trials the probability that the medium self-esteem subjects would switch from a non-cooperative to a cooperative response after receiving the bonus increases to .59, which was a significant ($p < .05$) increment. However, at this point, the curve sharply changes direction and during the next two blocks of ten trials, there were significant ($p < .05$) decrements to .46 and to .28. This curve then

seems to level off at .25.

The members of the high S-E families have an initial non-significant increase in the probability that they will switch to a cooperative from a non-cooperative response after receiving the bonus. During the third block of trials, there was a sharp increment in the probability that they would switch to a cooperative response from .45 to .63. This increment was significant ($p < .05$). During the fourth block of trials, the members of the high self-esteem families became significantly ($p < .05$) less likely to switch their response to a cooperative one, with the probability dropping to .32. However, in the last block of trials, the members of the high self-esteem families seemed to recover and again became more prone to switching to the cooperative from the non-cooperative response. The probability of making a cooperative response shifted from .32 to .48; this shift was significant ($p < .05$).

d) HYPOTHESIS 4.

Hypothesis 4 stated that: In the interactions between the parents of the low S-E children there will be lower probabilities of responding cooperatively and lower probabilities of responses which would resolve conflict than in the interactions between the parents

of the medium and high S-E children. Referring back to Table 5, the following terms were used to evaluate this hypothesis: S-E by Role of Dyadic Partner, and S-E by Role by Dyadic Partner by Sex.

There were no significant findings on any of the eight probability measures for the S-E by Role by Dyadic Partner interaction. However, significant differences in the way that the parents behaved with each other emerged for the S-E by Role by Dyadic Partner by Sex interaction.

Measure F, the probability that the subject will respond cooperatively following the other player's non-cooperative response on the preceeding trial is both a measure of the likelihood that the subject will respond cooperatively as well as an index of the subject's ability to resolve conflict. The difference between means for the dyadic partner by role by self-esteem by sex interaction for this measure approached the usual level of significance ($p < .09$) and is presented in Table 11. In evaluating this hypothesis only the portion of the interaction which involves the parents is of interest. This part of the interaction is presented in Figure 6.

The mothers' and fathers' probability that they would respond cooperatively following a non-cooperative response on the preceeding trial by their spouse (Measure F)

Table 11: The mean probabilities for the sex by self-esteem by role by dyadic partner interaction for measure F, the probability that the subject will respond cooperatively following the other subject's non-cooperative response on the preceeding trial. ($F = .09$)

	MALE			FEMALE		
	High S-E	Medium S-E	Low S-E	High S-E	Medium S-E	Low S-E
Mother	.37	.41	.44	.37	.39	.36
Child	.33	.40	.33	.49	.25	.33
Father	.35	.23	.21	.35	.33	.32
Child	.30	.23	.21	.37	.26	.34
Mother	.32	.27	.35	.33	.35	.27
Father	.27	.31	.17	.30	.29	.45

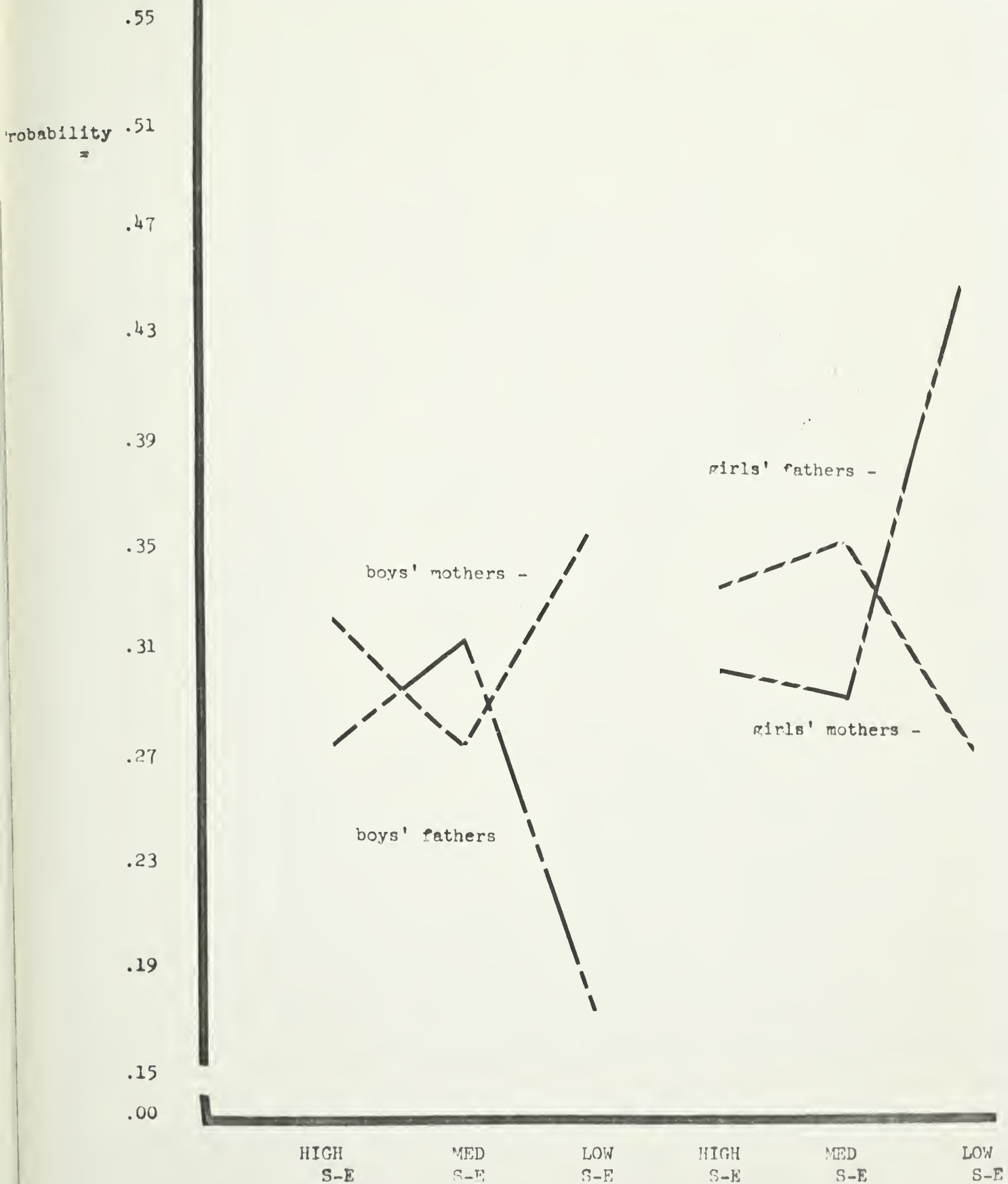


Figure 6: The interaction between self-esteem (S-E), sex and role for measure F: the probability that the subject will respond cooperatively following the other player's non-cooperative response on the preceding trial.

was compared for each S-E group by means of the Tukey method (Myers, 1966). There were no significant differences found between the high and medium S-E male and female subjects' mothers' and fathers' performance on this measure. However, the probabilities were significantly ($p < .05$) different for the parents of the low S-E male and female subjects. The low S-E boys' mother had a probability of responding cooperatively after her husband's non-cooperative response of .35 while her husband's probability of responding cooperatively after she responded non-cooperatively was .17. The low S-E girls' fathers' probability of responding cooperatively after his wife responds non-cooperatively is .45, while his wife's probability of responding cooperatively after he responds non-cooperatively was .27.

There was a tendency for the low S-E boys' mothers to be significantly ($p < .10$) more cooperative than were the mothers of the medium S-E boys, not significantly different, however, from the high S-E boys' mothers when playing the P.D. game with their husbands. The fathers of the low S-E boys were significantly ($p < .05$) less likely to respond cooperatively after their wives responded non-cooperatively than were the fathers of the medium and high S-E boys.

The mothers of the low S-E girls tended to be significantly ($p < .10$) less likely to respond cooperatively

after their husbands responded non-cooperatively than were the mothers of the medium S-E girls. The difference between the low and high S-E mothers was not significant. The fathers of the low S-E girls were significantly ($p < .05$) more likely to respond cooperatively after their wives responded non-cooperatively than were the fathers of the medium and high S-E girls.

Measure Y is the probability that the subject will respond cooperatively following a trial in which he responded cooperatively and the other subject responded non-cooperatively; following a trial in which he received the "sucker's" payoff (-10) and the other subject received the bonus payoff (+10). The dyadic partner by role by sex by self-esteem interaction for this measure was significant ($p < .03$) and is presented in Table 12. In evaluating this hypothesis, the interaction between the parents which is presented in Figure 7 is relevant.

The mean probabilities for measure Y were compared using the Tukey test (Myers, 1966). There was no significant difference in the probability that the mother or father of the high and medium S-E male and female subjects would respond cooperatively following a response in which they responded cooperatively and their spouse responded non-cooperatively. However, among the parents of the low S-E children, there was a significant difference

Table 12: The mean probabilities for the sex by self-esteem by dyadic partner by role interaction of measure \bar{Y} ; the probability that the subject will respond cooperatively following a trial in which he responded cooperatively and the other subject responded non-cooperatively. ($F = .03$)

	MALE			FEMALE		
	High S-E	Medium S-E	Low S-E	High S-E	Medium S-E	Low S-E
Mother	.25	.42	.42	.39	.27	.42
Child	.17	.44	.34	.45	.22	.15
Father	.34	.33	.27	.38	.42	.25
Child	.16	.20	.17	.28	.20	.20
Mother	.24	.30	.49	.26	.32	.30
Father	.20	.31	.16	.24	.26	.56

probability =

.55

.51

.47

.43

.39

.35

.31

.27

.23

.19

.15

.00

boys' mothers -

girls' fathers -

girls' mothers -

boys' fathers -

HIGH
S-E

MED
S-E

LOW
S-E

HIGH
S-E

MED
S-E

LOW
S-E

Figure 7: The interaction between self-esteem (S-E), sex and role for measure Y: the probability that the subject will respond cooperatively following a response in which he responded cooperatively and the other player responded non-cooperatively.

($p < .05$) in the parents' probabilities that the one would respond cooperatively following a trial in which he (she) cooperated and his (her) spouse did not.

The mothers of the low S-E boys were significantly ($p < .05$) more likely to respond cooperatively after having received the "sucker's" payoff in a game with their husbands than were the mothers of the medium and high self-esteem boys. The mean probabilities for the high, medium, and low S-E groups of mothers of male subjects were: .24, .30, and .49. There was no significant difference between the mothers of the high and medium S-E boys in the likelihood that they would respond cooperatively after receiving the sucker's" payoff.

The fathers of the low S-E boys were significantly ($p < .05$) less cooperative than the fathers of the medium S-E boys after they responded cooperatively and their wives responded non-cooperatively. However, there was no significant difference in the probability that the low S-E boys' fathers would respond cooperatively after receiving the "sucker's" payoff as compared to the high S-E boys' fathers; the probabilities for the fathers of the high and medium S-E boys did not differ for this measure.

There was no significant difference in the probability that the mothers of the high, medium, and low

S-E girls would respond cooperatively after they had received the "sucker's" payoff.

The fathers of the low S-E girls were significantly ($p < .05$) more likely to respond cooperatively after receiving the "sucker's" payoff than were either the medium or high S-E girls' fathers. There was no significant difference between the fathers of the high and medium S-E girls for this measure. The mean probabilities for the fathers of the high, medium, and low S-E girls were: .24, .27, and .56.

e) HYPOTHESIS 5.

Hypothesis 5 stated that: a) The interactions between the father and son of the high self-esteem boys will be characterized by greater probabilities of cooperative responses and high probabilities of responses that would reduce conflict than in the interactions between the medium and low self-esteem boys and his father. b) The interactions between the mother and daughter of the high self-esteem girls will be characterized by greater probabilities of cooperative response and higher probabilities of responses that would reduce conflict than in the interactions between the medium and low self-esteem girl and her mother. This hypothesis predicts a more cooperative, less conflictual pattern of interaction on the P.D. game between the high self-esteem

child and the same sex parent as compared to the pattern of interaction between the same sex parent and the medium and low self-esteem child. In evaluating this hypothesis we are again interested in the interaction of the dyadic partner by level of self-esteem by role and by sex.

The DP X S-E X R X S interaction for the \bar{F} index, the measure of the probability that the subject will respond cooperatively following the other player's non-cooperative response on the preceeding play, approached the usual level of significance ($p < .09$). This interaction was presented in Table 11. Figure 8 presents the mean probabilities for the interaction between the parent and the same sex child.

The mean probabilities on the \bar{F} measure for the high, medium, and low S-E boys' fathers respectively are: .35, .23, and .21. Tukey tests applied to this data showed that the fathers of the high S-E boys were significantly ($p < .05$) higher on the \bar{F} measure than were the fathers of the medium and low S-E boys. The difference between the fathers of the medium and low S-E boys was not significant.

The high S-E boy tended to be significantly ($p < .10$) more likely to respond cooperatively following a non-cooperative response by his father than was the medium self-esteem boy; he was also significantly

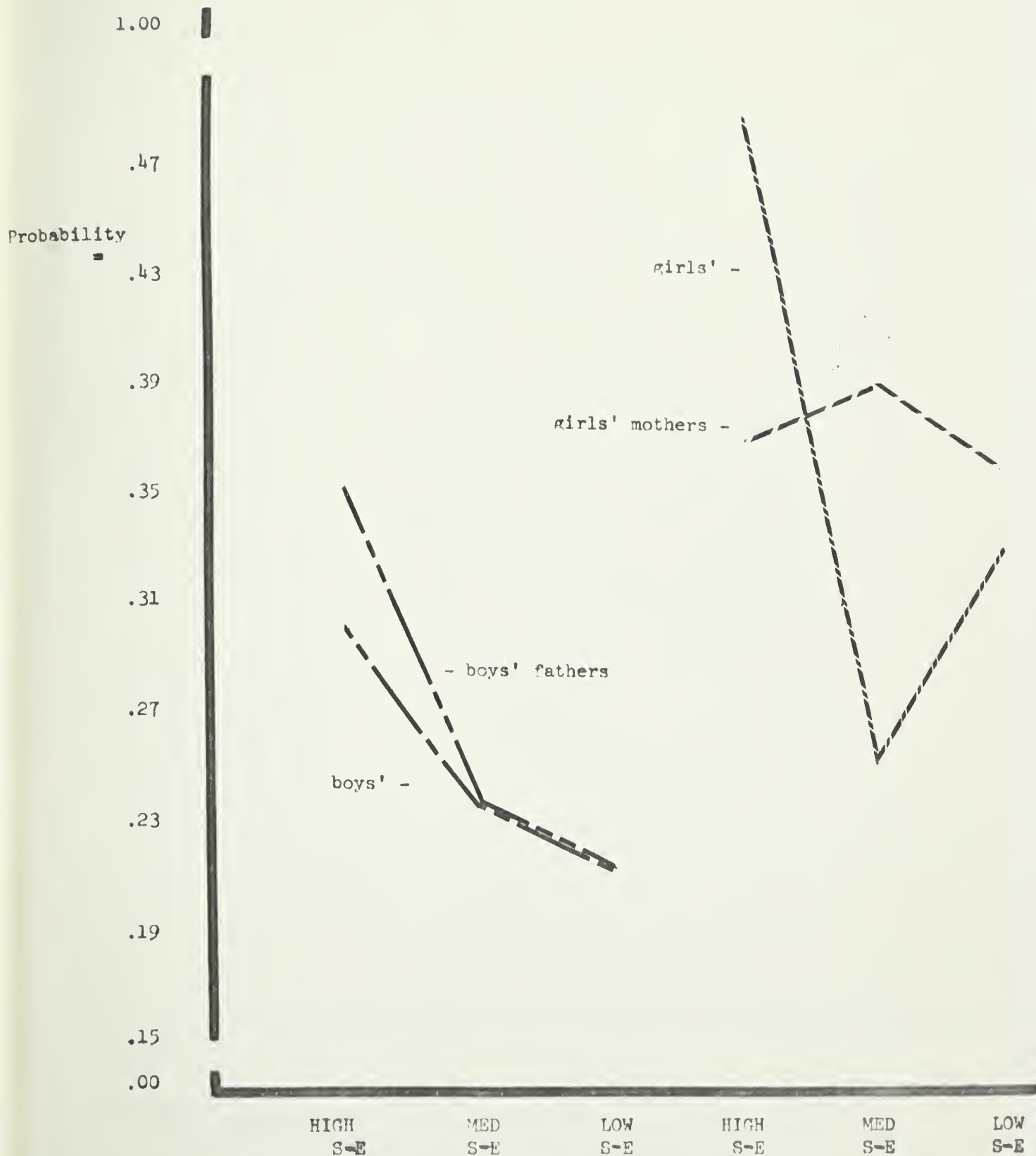


Figure 8: The interaction between self-esteem (S-E), sex and role for measure F: the probability that the subject will respond cooperatively following the other player's non-cooperative response on the preceding trial.

($p < .05$) more likely to respond cooperatively to his father's non-cooperative response than was the low self-esteem boy. The mean probabilities that the high, medium and low self-esteem boys would respond cooperatively following a non-cooperative response by their fathers were: .30, .23, and .21. The differences between the medium and low self-esteem boy on this measure was not significant.

There were no significant differences between the high S-E son and his father, the medium self-esteem son and his father, and the low self-esteem son and his father on the \underline{F} measure.

The interaction between dyadic partner, self-esteem, role, and sex for measure \underline{Y} , the probability that the subject will respond cooperatively after he had responded cooperatively and the other player had responded non-cooperatively, was significant ($p < .03$). This interaction was presented in Table 12. The interaction between the child and the same sex parent is presented in Figure 9.

Further analysis of this data with the Tukey method appears to support partially this hypothesis. The fathers of the high S-E boys were significantly ($p < .05$) more likely to respond cooperatively after receiving the "sucker's" payoff in a game with their sons than were the high S-E boys in the equivalent situation with their

Probability

= .41

.45

.37

.33

.29

.25

.21

.17

.13

.00

HIGH
S-EMED
S-ELOW
S-EHIGH
S-EMED
S-ELOW
S-E

girls' mothers -

boys' fathers -

boys -

girls -

Figure 9: The interaction between self-esteem (S-E), sex and role for measure Y: the probability that a subject will respond cooperatively following a response in which he responded cooperatively and the other player responded non-cooperatively.

fathers. The fathers of the medium S-E boys tended to be significantly ($p < .10$) more likely to respond cooperatively after receiving the "sucker's" payoff in a game with their son than were the medium S-E boys in a game with their fathers. However, the fathers of the low S-E boys were not significantly more likely to respond cooperatively after receiving the "sucker's" payoff than were their sons.

In relation to the mother-daughter interaction (Figure 8), there was no significant difference in the probability that the mothers of the high, medium, and low self-esteem girls would respond cooperatively following a response in which their daughters responded non-cooperatively (F). The high self-esteem girls were significantly ($p < .05$) more likely to respond cooperatively on measure F than were the medium and low self-esteem girls. The medium S-E girls were significantly ($p < .05$) less likely to respond cooperatively on this measure than were the low S-E girls.

The high self-esteem girls were significantly ($p < .05$) more likely to respond cooperatively following a non-cooperative response than were their mothers. The medium S-E girls were significantly ($p < .05$) less likely to respond cooperatively for this measure (F) than were their mothers. There was no significant difference between the low self-esteem girls and their mothers in

in the probability that one would respond cooperatively following the other's non-cooperative response on the preceeding play.

The high S-E girl was significantly ($p < .05$) more likely (Y, Figure 9) to respond cooperatively after she had responded cooperatively and her mother had responded non-cooperatively than were the medium and low S-E girls. There was no significant difference between the medium and low self-esteem girls on this measure. The mothers of the medium S-E girls tended to be significantly ($p < .10$) less likely to respond cooperatively after they had responded cooperatively and their daughters responded non-cooperatively than were the mothers of the high and low S-E girls. There was no significant difference between the high and low self-esteem mothers on this measure.

There was no significant difference in the mothers' and daughters' probability of responding cooperatively for measure Y for the high and medium S-E subjects. However, for this measure, the mothers of the low S-E girls were significantly ($p < .05$) more likely to respond cooperatively than were their daughters.

f) ADDITIONAL FINDINGS.

The following results apply to the S-E by role of

dyadic partner by sex interaction for measure \underline{F} (i.e., the probability that the subject will respond cooperatively following a non-cooperative response by the other subject) and measure \underline{Y} (i.e., the probability that the subject will respond cooperatively following a response in which he responded cooperatively and the other subject responded non-cooperatively). The high S-E boy responded with the same probability of cooperation to both his father and mother. However, the low and medium S-E boys were significantly ($p < .05$) more likely to respond cooperatively to their mothers' non-cooperative response than to their fathers'. There was no significant difference in the probability that the medium and low S-E girls would respond cooperatively to either parent's non-cooperative response. However, the high S-E girls were significantly ($p < .05$) more likely to respond cooperatively to their mothers' non-cooperative response than to their fathers'.

The fathers of the low self-esteem girls were significantly ($p < .05$) more likely to respond cooperatively to their wives' non-cooperative response than they were to their daughters' non-cooperative response. The fathers of the high S-E girls tended to be significantly ($p < .10$) more likely to respond cooperatively to their daughters after receiving the "sucker's" payoff (measure \underline{Y}) than to their wives". The fathers of the medium S-E girls were significantly ($p < .05$) more likely to respond

cooperatively to their daughters than to their wives on this measure (Y).

There was no significant difference in the probability that the fathers of the low S-E boys would respond cooperatively to their sons or wives when either one of them had responded non-cooperatively. However, the fathers of the high S-E boys were significantly ($p < .05$) more likely to respond cooperatively following their sons' non-cooperative response as opposed to their wives'.

There was no significant difference in the probability that the mothers of the high S-E boys would respond cooperatively following their sons' or husbands' non-cooperative response. The mothers of the medium S-E boys were significantly ($p < .05$) more likely to respond cooperatively following their sons' non-cooperative response as opposed to their husbands'. The mothers of the low S-E boys were quite cooperative following both their husbands' and sons' non-cooperative response.

The mothers of the low S-E girls were significantly ($p < .05$) less likely to respond cooperatively following their husbands' non-cooperative response as opposed to their daughters'. There was no significant difference in the probability that the mothers of the medium S-E girls would respond cooperatively following a non-cooperative response by either their husbands or daughters.

The mothers of the high self-esteem girls were significantly ($p < .05$) more likely to respond cooperatively after receiving the "sucker's" payoff (measure Y) when playing with their daughters as opposed to their husbands.

The effect of role, that is whether the subject was a child, mother, or father, appeared to be a significant determinant of the probability that the subject would respond cooperatively. Table 13 presents the mean probabilities and the level of significance for the main effect of role for: B (i.e., the subject's persistence in the cooperative response), X (i.e., the probability that the subject will respond cooperatively following a trial on which both he and the other subject responded cooperatively), and Y (i.e., the probability that the subject will respond cooperatively following a trial on which he responded cooperatively and the other subject responded non-cooperatively).

On the three measures cited above the mother is most likely to respond cooperatively, the father is second, and the child is least likely to respond cooperatively. A Friedman Two-Way Analysis of Variance by Ranks was performed on these nine means. The non-parametric statistic was used to compare this data, which was not necessarily based on the same scale and which may have been correlated. The result of this analysis ($\chi^2_r = 30$) was significant ($p < .001$). Although this

Table 13: The mean probabilities and level of significance for the main effect of role for three probability measures.

PROBABILITY MEASURE	CHILD	MOTHER	FATHER	
<u>B</u>	.24	.36	.27	***
<u>X</u>	.26	.40	.32	**
<u>Y</u>	.32	.34	.31	***
<hr/>				
** p	.005			
*** p	.001			

finding is not surprising, it is extremely reliable.

The main effect of the dyadic partner variable was significant for six of the probability (A, B, E, F, X, Z) and a seventh (Y) approached significance. Table 14 presents the mean probabilities and the level of significance for the main effect of dyadic partner.

Each of the three family members played the P.D. game twice, once with each of the remaining family members. The dyadic partner term refers to the "other player" or to the two games played. However, in order to know which family member the game was being played with, it is necessary to know which role (R) the other player had. There are six possible dyadic partner by role combinations which are psychologically meaningful. There are only two levels of dyadic partner; schematically, this is represented by the following matrix:

<u>D.P.1</u>	<u>D.P.2</u>
C	M
C	F
M	F

The significant dyadic partner effect indicates that those subjects grouped in D.P.1 are more cooperative than those subjects grouped in D.P.2. Since many of the important variables (i.e., self-esteem, sex, role) are collapsed in this measure, it would seem to offer minimal information about family interaction patterns.

Table 14: The mean probabilities and level of significance for the main effect of dyadic partner (DP) for seven probability measures.

PROBABILITY MEASURES	DP ₁	DP ₂	
<u>A</u>	.32	.25	***
<u>B</u>	.32	.27	**
<u>E</u>	.80	.82	++
<u>F</u>	.35	.30	**
<u>X</u>	.37	.28	**
<u>Y</u>	.32	.27	+
<u>Z</u>	.46	.36	+++
<hr/>			
+ p	.08	** p	.005
++ p	.05	*** p	.001
+++ p	.025		

The dyadic partner term may be meaningfully viewed as an intermediate statistical step necessary to derive the psychologically meaningful dyadic partner by role term, which indicates how a specific individual in the family interacts with either of the two remaining family members.

The main effect of trial block (T) was significant for the eight probability measures (A, B, E, F, X, Y, Z, W). The mean probabilities for each trial block and the level of significance for the main effect on the ANOVA is presented in Table 15. There was a significant decrease in the subjects' probability of responding cooperatively as a function of time.

Table 15. The mean probabilities and level of significance for the main effect of trial block for the eight probability measures.

PROBABILITY MEASURE	TRIAL BLOCK					
	T ₁	T ₂	T ₃	T ₄	T ₅	
<u>A</u>	.35	.28	.30	.26	.24	***
<u>B</u>	.34	.30	.31	.27	.25	***
<u>E</u>	.79	.80	.81	.82	.81	***
<u>F</u>	.37	.33	.33	.29	.29	***
<u>X</u>	.38	.30	.36	.29	.28	*
<u>Y</u>	.36	.32	.31	.24	.24	***
<u>Z</u>	.49	.48	.46	.28	.33	***
<u>W</u>	.71	.54	.61	.60	.49	**
<hr/>						
* p	.01					
** p	.005					
*** p	.001					

CHAPTER IV

DISCUSSION

The major findings of the present study may be organized in terms of the following questions. "Did the members of the high, medium, and low S-E children's families differ in their cooperative behavior on the P.D. game?" "Did the interaction patterns within the family dyads differ in relation to the child's level of self-esteem?"

In answer to the first question, significant differences did emerge in the temporal pattern of cooperation for the high, medium, and low S-E groups. The most important finding was that the members of the high S-E families remained relatively constant in their probabilities of responding cooperatively, while the members of the low S-E families became less cooperative. In answer to the second question, the child's level of S-E was related to significant differences in the intraparental relationship as well as the relationship between the male children and their fathers. These, as well as less important findings, will be discussed in greater

detail, after which a more theoretical discussion of the relationship between the present findings and family process will be presented.

a) RESULTS.

Method: The sample of 60 families of seventh grade students represented approximately 12% of the seventh grade class of a suburban junior high school. The single dimension within which the groups in the sample differed significantly was that of the child's level of self-esteem; with this exception it was an extremely homogeneous sample.

One of the assumptions underlying the use of the P.D. game in psychological research is that the subjects' game behavior is representative of or analogous to their real life behavior in specific situations. If the P.D. game is to be considered valid it must be demonstrated that the game was played in a systematic or non-random way. There is a good deal of evidence that the P.D. game was not played randomly. If it had been, then the expected overall percent of cooperative choice (C) would have been 50% and the percent of mutually cooperative choice (CC) or percent of mutually non-cooperative choice (DD) would have been 25%. The obtained frequencies for these measures were: C = 35%, CC = 13.7%, and DD = 43.9%,

indicating that the family members did not respond randomly and that they had a non-cooperative or competitive orientation.

The expected probability that a subject will respond non-cooperatively following his own non-cooperative response on the preceeding trial (E) if the subject is choosing randomly is .25. For the six self-esteem by sex, groups of subjects, the obtained probability that a subject will persist in the non-cooperative response was above .75. This finding also supports the notion that the subjects played the game with a strong non-cooperative orientation.

There are several possible explanations for this relatively non-cooperative or competitive bias in the present study. The family members may have interpreted the experimental procedure as a "zero sum" as opposed to a "non-zero sum" game (Rapoport, 1966). The goal that was suggested in the instructions of this study was to get as many points for yourself as possible; it was further suggested that the number of points the other player received that not important. Possibly the instructions did not clearly establish the situation as a non-zero sum game, an unintended bias that could be easily corrected in future research.

A second explanation for the competitive orientation of the subjects may be that the payoff matrix was skewed

towards a competitive game and the subjects responded to this implicit competitive definition. Rapoport and Orwant (1962) suggest that an index of competitive advantage can be obtained by subtracting the X_2 payoff from the X_3 payoff. Gallo and McClintock (1965) report that the effect of enlarging this index is to produce a large number of competitive responses. The competitive index for the matrix used in the present study would be 20, while the competitive index for the frequently used matrix cited earlier (Gallo and McClintock, 1965) would be 10.

A third possible explanation for the subjects competitive orientation may be that this represents the actual situation within these families. The families in the study were all upper middle class and may prize competition (Crowne, 1966). In addition, recent studies (Swingle & Gillis, 1968; Vinacke, 1969) suggest that under some conditions the degree of friendship or closeness "can have two different implications in game, either signifying freedom to play competitively (so long as the basic relation is not violated), or constraint against offending each other." In any case, this competitive orientation probably limited the amount of information available since the cooperative motive was not as salient as the competitive motive.

Cooperative Behavior: The interaction patterns on the P.D. game can be viewed as experimental analogues of the subject's typical ways of responding to the other members of the family. One of the problems in using this game to study the present problem is that it could not be determined a priori which of the many measures available would be the most productive for viewing the patterns of interaction within families. The P.D. game provides two broad classes of data, frequency and probability measures. The first two hypotheses predicted that members of the low S-E families would be less cooperative in the P.D. game than members of high and medium S-E families. The first hypothesis refers to the frequency measures and states that: the members of the families of the low S-E children will be less cooperative and have a greater incidence of the mutually non-cooperative response than will the members of the medium and high S-E families. This hypothesis refers to the measures of the percentage of cooperative response (C), mutually cooperative response (CC), and mutually non-cooperative response (DD). The second hypothesis refers to the probability measures and states that: Members of families of low S-E children will be characterized by a lower probability of responding cooperatively, or a higher probability of responding non-cooperatively than will members of families of medium

and high S-E children.

The findings did not support the first hypothesis; there were no significant differences between the members of the high, medium, and low S-E groups in their percentages of cooperative (D), mutually cooperative (CC), and mutually non-cooperative (DD) responses. It may be that these measures were not sensitive enough to pick up the subtle differences in the patterns of interaction between the members of the three different S-E groups. Apparently, behavior on the P.D. game is very complex and requires more sensitive measurement than can be achieved with percentages or frequencies.

The second hypothesis was based on the assumption that there would be a direct, linear relationship between the child's level of S-E and the probabilities of responding cooperatively within the family. It was predicted that: Members of families of low S-E children will be characterized by a lower probability of responding cooperatively and a higher probability of responding non-cooperatively, than will the members of families of medium and high S-E children. The data did not support this hypothesis.

One assumption that was implied in hypothesis₂ was that there would be no difference in the interactions of the male and female subjects. The literature has not been specific in pointing to differences that might

be expected from the interaction of variables such as self-esteem and sex role. Coopersmith's (1967) extensive study of self-esteem in children was conducted entirely with boys. The interaction of sex by level of S-E by role for measure B, the probability that the subject will respond cooperatively following his own cooperative response on the preceeding trial, approached the usual level of significance. In looking at the child's persistence in the cooperative response, it was evident that there was not a linear relationship between S-E without consideration of the influence of the child's sex on this variable.

The high S-E boys were significantly less likely to respond cooperatively than were the high S-E girls or the medium S-E boys. The medium S-E boys were significantly more likely to respond cooperatively on this measure than were the medium S-E girls who had a comparatively low probability of responding cooperatively. Both the low S-E boys and girls had a relatively low probability of continuing to respond cooperatively. The assumption that the children's probability of responding cooperatively was a linear, positive function of their level of S-E was not supported. It would appear that the sex-role of the child is an important mediating factor in the probability that he would have responded cooperatively. Carlson (1970) has called attention to previously ignored

sex differences in the behavior of individuals at similar levels of S-E.

The lack of support for the hypotheses that the members of the low S-E families would have lower probabilities of responding cooperatively and high probabilities of responding non-cooperatively than the members of the high and medium S-E families may in part be a function of summing the probabilities over the fifty trials that made up each P.D. game. The lack of support for both hypothesis 1 and 2 may be a function of the statistical treatment of the data.

It was predicted in the third hypothesis that: As the P.D. game proceeds over 50 trials the probability that the members of the high and medium S-E families will respond cooperatively will increase while that of the members of the low S-E families will decrease. This hypothesis is similar to the previous two: it was predicted that as the family members interact over time the performance of the members of the low S-E families would have become progressively less cooperative while the members of the other groups would have become more cooperative. This has a great deal of significance for family theory since one of the essential features (Haley, 1962) of family relations is that they continue over time and that most of the issues that arise in a family are worked out over periods of time.

The data seems to offer clear support for this hypothesis. The interaction of trial block by level of S-E for the measure of the subject's probability of responding cooperatively following a cooperative response was found to be significant. This measure would seem to be an analogue of a type of process that is quite frequent in interpersonal interactions. It indicates a subject's responsiveness to the other person's positive behaviors. That is, if "A" cooperates with "B", then "A" will expect "B" to cooperate with him. Without this, fundamental expectation that an individual's positive behavior would induce positive behavior in another, there would be little chance that a mutually beneficial outcome can be reached. Members of the high S-E families probability of responding cooperatively following the other person's cooperative response remained fairly constant over the 50 trials, perhaps even increasing slightly. However, the members of the low S-E families became significantly less likely, on each successive block of ten trials, to respond cooperatively following the other player's cooperative response on the preceeding trial.

If these interactions are thought of not as responses to the P.D. game, but rather as positions in an argument, the relationship implications are quite clear. The members of the high S-E families remain at least as likely

to cooperate with each other in the middle and end of the argument as they were at the beginning. However, since the members of the low S-E families would become progressively less likely to cooperate over time, it would seem that the longer the argument went on, the less likely that it would be for the members of these families to find a mutually satisfactory solution. Because the members of the low S-E families became less influenced by positive responses of other members of the family, it would seem that their disputes would be doomed to end in frustrating deadlocks.'

The members of the medium S-E boys' families functioned differently on the P.D. game than did the members of the medium S-E girls' families. The members of the male medium S-E families functioned similarly to the members of the high S-E families; that is, their probability of responding cooperatively after the other person responded cooperatively remained constant over time. The members of the medium S-E female subjects' families became less likely to respond cooperatively after the other person responded cooperatively as the P.D. game continued.

The trial block by level of S-E interaction for index Z, the probability that the subject will respond cooperatively after a response in which he defected (responded non-cooperatively) and the other person responded cooperatively, which resulted in his receiving the bonus

payoff, was significant. Rapoport and Chammah (1965) believe that this measure "indicates a willingness to stop defecting in response to the other persons' cooperative choice. It may indicate repentance or responsiveness." The reward structure of the P.D. game would lead to reinforcement of the defecting response, so that switching from the non-cooperative to the cooperative response at this point would indicate a strong desire to not take advantage of the other player or to show one's willingness to enter into a more cooperative alliance.

In the present study, each S-E group seemed to have a different pattern of response over time. The members of the low S-E group became progressively less likely to switch from the defecting to the cooperative response. This pattern seems to indicate an orientation in which the members of the low S-E families were progressively less responsive to the other person and primarily concerned with obtaining the maximum benefit for themselves with little consideration for the other family member with whom they were playing.

The members of the medium S-E families initially became more likely to respond cooperatively after they had defected and received the bonus payoff. However, after the second block of ten trials, they also became increasingly less likely to cooperate after receiving

the bonus payoff as a result of their non-cooperative response. The members of the medium S-E families seem to quickly fall into a pattern of placing their own advantage above that of the other person. In terms of a learning model, it would seem that the members of the medium and low S-E families quickly learn not to cooperate with the other members of their families in order to obtain the maximum individual gain.

The members of the high S-E families became increasingly more cooperative during the first thirty trials. During the next ten trials they became less likely to respond cooperatively after they had defected and in the last ten trials, they again became much more likely to cooperate after receiving the bonus for defecting. Their response over time seems to be considerably more variable than were the response curves for the medium and low S-E family members. It would seem that the members of the high S-E families learned to resist the temptation of the bonus in points for themselves and rather responded to the potential for a mutually cooperative, mutually beneficial interaction that can be arrived at if each player is willing to put aside his own "selfish" wish to achieve a maximum score while the other person receives a minimum score.

Patterns of Intrafamilial Interaction: One of the

assumptions made by almost all family theorists (Vogel & Bell, 1960; Murrell & Stachowiak, 1965; Handel, 1965) is that the child's emotional problems or lack of adjustment is a function of a problem in the larger family group, most typically in the relationship between the parents. The most specific statement of this aspect of family theory is that the problem between the parents is displaced upon the child, that is, the child becomes the scapegoat (Vogel & Bell, 1960). The function of this process of scapegoating is that it allows the family structure to continue and avoids the stress associated with open conflict between the parents. It was, therefore, expected that the parents of the low S-E children would have more conflict in their interactions than the parents of the medium and high S-E children. Hypothesis 4 stated that: In the interactions between the parents of the low S-E children there will be lower probabilities of responding cooperatively and lower probabilities of responses which would resolve conflict or increase cooperation, than in the interactions between the parents of the medium and high S-E children.

On the F and Y indices, the interaction which contains the parental dyad's game was significant. F is a measure of the probability that the subject will respond cooperatively following the other player, the spouse's non-cooperative response on the preceeding trial. Y is a

measure of the probability that the subject will respond cooperatively following a play in which he chose cooperatively and the other player chose non-cooperatively; that is, following a play in which he received the "sucker's" payoff. Measure F is the more inclusive measure since it takes into account trials in which both the subject and the other player chose non-cooperatively. Both measures reflect the way one parent responds to the other parent's non-cooperative response. Low probabilities on either measure may be thought of as reflecting vengefulness or retaliation as a way of responding to the other's non-cooperative response. High probabilities on these measures may be thought of as reflecting according to Rapoport and Chammah (1965), "either forgiveness or martyrdom, or a strong faith in teaching by example, or perhaps stupidity, depending on the ethical values of whoever evaluates this behavior."

The fathers of the low S-E boys were significantly less likely to respond cooperatively after their wives responded non-cooperatively (F) than were the fathers of the high and medium S-E boys. The mothers of the low S-E boys were significantly more cooperative than the mothers of the medium self-esteem boys, but about as likely to respond cooperatively after their husbands' non-cooperative response as the mothers of the high S-E boys. The mothers of the low self-esteem boys were

significantly more likely to respond cooperatively after receiving the "sucker's" payoff (Y) when playing with their husbands than were the mothers of the medium and high S-E boys. This is exactly opposite of what was predicted. The fathers of the low self-esteem boys were significantly less cooperative than the fathers of the medium S-E boys but not of the high self-esteem boys on this measure (Y).

The fathers of the low S-E girls were significantly more likely to respond cooperatively after their spouse responded non-cooperatively than were the fathers of the high and medium S-E girls. This would also appear to directly contradict the prediction in hypothesis 4. There was little difference between the probability that the mothers of the high, medium and low S-E girls would respond cooperatively following their husband's non-cooperative response on the preceeding trial.

If conflict was defined in terms of non-cooperation, there would be relatively weak support for the notion that there is greater conflict within the parental dyad of low S-E children as compared to that of the medium and high S-E children. It would appear that the data does support the hypothesis; however, the measure of conflict that seems appropriate is not the simple measure of non-cooperation.

Watzlawick, Beavin and Jackson (1967) believe that

all communicational interchanges and, therefore, all relationships can be divided into two categories; they are either symmetrical or complementary. These authors state that: "They can be described as relationships based on either equality or difference. In the first case, the partners tend to mirror each other's behavior, and thus, their behavior can be termed symmetrical. Weakness or strength, goodness or badness are not relevant here, for equality can be maintained in any of these areas. In the second case, one partner's behavior complements that of the other, forming a different sort of behavioral Gestalt, and is called complementary. Symmetrical interaction, then, is characterized by equality and the minimization of difference, while complementary interaction is based on the maximization of difference." Applying this framework to the relationships between the parents in the P.D. game, it would not be the absolute probability of cooperation that would be important, but rather the difference between each partner's probability of responding cooperatively which would define their relationship as either symmetrical or complementary.

There was no significant difference between the mothers' and fathers' probability of responding cooperatively following a non-cooperative response by their spouse in the male and female high and medium S-E groups. This relationship existed for both measure F and measure

Y. The parents of the medium and high S-E children would then have a symmetrical relationship, that is, a relationship between equals.

However, there was a significant difference between the mothers' and fathers' probability of responding cooperatively following a non-cooperative response by their spouse in the male and female low S-E groups. This relationship existed for both measure F and measure Y. According to the way the parents of the low S-E children played the P.D. game, this parental relationship may be described as complementary or as one based on differences or an inequality.

In any complementary relationship there are two different positions which have been described (Watzlawick, Beavin & Jackson, 1967) as the "superior, primary or "one-up" position and the other corresponding inferior, secondary, or "one-down" position." It is important to recognize that these descriptive terms do not connote concepts like good and bad, or strong and weak. These relationship patterns or roles typically are thought of as fitting with each other in a homeostatic way. For example, in the present study, one member of the parental dyad of the low S-E children was significantly less cooperative than the other; it would be simplistic to assume that the one that was less cooperative is the

"bad" or "strong" member of the dyad. The less cooperative member of the dyad will be referred to as the one who is in the one-up position and the more cooperative member as being in the one-down position. (However, the assignment of these labels is arbitrary and, in fact, the opposite assignment could have also been made.)

In the parental dyad of the low S-E boys, the father assumes the one-up position. He was very unlikely to respond cooperatively after his wife responded non-cooperatively. The mother is in the one-down position, having been more likely than her husband to respond cooperatively following his non-cooperative response. It is interesting to note that she was more likely to respond cooperatively following a trial in which her husband's non-cooperative response resulted in a greater negative payoff for her.

In the parental dyad of the low S-E girl the father is in the one-down position, that is, he is the more cooperative member of the dyad. He, too, was also more likely to respond cooperatively following a trial in which his wife's non-cooperative response resulted in a greater negative payoff for him. The mother of the low S-E girl was significantly less cooperative than her husband.

It was predicted that there would be greater probabilities of cooperative responses in the interactions between

the high S-E child and the same sex parent than in the interactions between the medium and low S-E children and their parents. The relationship between the boy and his father will be discussed first and then the relationship between the girl and her mother.

Hypothesis 5a stated that: The interactions between the fathers and sons of the high S-E families will be characterized by greater probabilities of cooperative responses and higher probabilities of responses that would reduce conflict than in the interactions between the medium and low S-E boys and their fathers. This hypothesis was confirmed.

The fathers of the high S-E boys were significantly more likely to respond cooperatively following a non-cooperative response by their son (F) than were the fathers of the medium and low S-E boys. The high S-E boys were significantly more likely to respond cooperatively following a non-cooperative response by their fathers than were the medium or low S-E boys. It would appear that both members of the high S-E father-son dyad acted as if they had confidence that the other member would not continue responding non-cooperatively. This would also seem to imply that the high S-E boy and his father have a warmer and, perhaps, closer relationship with each other than do the medium and low

self-esteem boys and their fathers.

On measure Y, the probability that the subject would respond cooperatively following a trial in which he received the "sucker's" payoff, there were no significant differences between the three groups of boys or between the three groups of fathers. However, when each group of boys were compared with their fathers, there appeared to be an interesting and important difference between the high and medium S-E groups and the low S-E groups. The fathers of the high and medium S-E boys were significantly more likely to respond cooperatively after receiving the "sucker's" payoff than were their sons. The relationship between the high and medium S-E sons and their fathers, on this measure, was complementary. The relationship between the low S-E boys and their fathers was symmetrical, that is, their probabilities of responding cooperatively after the other had responded non-cooperatively was statistically equivalent.

Hypothesis 5b stated that: The interactions between the mothers and daughters of the high S-E families will be characterized by greater probabilities of cooperative responses and high probabilities of responses that would reduce conflict than in the interactions between the medium and low S-E girls and their mothers. The data supporting this hypothesis are considerably less clear than for the related hypothesis for boys.

The high S-E girls were significantly more likely to respond cooperatively following a non-cooperative response by their mothers than were either the medium or low S-E girls. This may indicate that high S-E girls feel closer to their mothers and trust that their mothers will not continue to respond in a non-cooperative way.

There was no significant difference between the probabilities of the three groups of female subjects' mothers in their likelihood of responding cooperatively following a non-cooperative response by their daughters. On the measure of the mothers' probability of responding cooperatively following a play on which they responded cooperatively and their daughters responded non-cooperatively (following a play on which they received the "sucker's" payoff), the mothers of the medium S-E girls were significantly less likely to respond cooperatively than were the mothers of the high and low S-E girls.

One of the unexpected findings of the present study was the non-cooperative or competitive orientation of the medium S-E girls. Perhaps mothers of medium S-E girls are, as the data would seem to indicate, more competitive than either the mothers of high and low S-E girls. This finding will be discussed in a later section.

b) THEORETICAL INTERPRETATION.

There are two models for the development of emotional problems in children (Ross, 1964; Handel, 1965; Hobbs, 1966). The more traditional model views present childhood emotional problems as a function of past events in the child's life. The alternative family-centered model of the etiology of childhood psychological problems, views the present behavior of the child as a function of current behavioral events within the family system. The present study may be thought of as an attempt to explore and confirm some of the derivative hypotheses of the family-centered model. It was anticipated that there would be differences in the way members of high, medium, and low S-E families interacted with each other on the P.D. game.

One of the central concepts of family theory (Haley, 1962; Murrell & Stachowiak, 1965; Vogel & Bell, 1960) is that the parents of emotionally disturbed children experience a conflict in their relationship with each other and in order to minimize the potentially destructive effects of this conflict they scapegoat one of their children and focus on his "difficulties" as a means of avoiding their own conflict. The findings of the present study would seem to, not only confirm the notion that

there is greater conflict between the parents of the low S-E children, but also to give additional information about the nature of this conflict, and, perhaps, help to partially answer the question of why a particular child becomes scapegoated.

The finding that the parents of the high and medium S-E children have a symmetrical relationship in the way they play the P.D. game as opposed to the complementary relationship that appears to exist between the parents of the low S-E children would appear to be quite important. The parents of the high and medium S-E children interact with each other as if they have a relationship between equals. The parents of the low S-E children behave with each other on the P.D. game, as if they have a relationship between non-equals. Bandura (1969) suggests that the child learns much of his social behavior and expectations through modeling and vicarious learning. One way that the child learns what he can expect in the world at large is through observing the interactions within his family; therefore, the low S-E child's model of interpersonal relations would be considerably different from that which the high and medium S-E child learns. Rather than learning that he can expect to be treated as an equal by his peers, the low S-E child would learn that interpersonal relationships take a complementary

form with one person taking the one-up position while the other person assumes the one-down position.

From the data that was obtained, it would seem that one concomitant condition for a child to have low S-E or emotional difficulties would be that his parents have a complementary as opposed to a symmetrical relationship. It would appear that perhaps conflict or argument is in itself not the significant factor, but rather that the relationship is one between unequal partners as opposed to a relationship between equals as would appear to exist between the parents of the high and medium S-E children.

In the parental dyad of the low S-E male and female subjects there was a reversal of the parent who was in the one-up and one-down position. That is, for the parents of the low S-E boys, the father was in the one-up position responding in a vengeful or retaliatory way to his wife's non-cooperative responses. The mother of the low S-E boys was in the one-down position. It is interesting that the data may indicate that this is a position that she was not passively taking, but perhaps actively maintains. This position might be thought of as that of a martyr. She was considerably more likely to respond cooperatively after receiving the "sucker's" payoff than after both she and her husband

responded non-cooperatively. She became more cooperative after she had received more "punishment", perhaps very willingly "turning the other cheek."

These positions were reversed in the parental dyad of the low S-E girl. Here it was the mother who was in the one-up position, being relatively less cooperative and, therefore, relatively more vengeful in her responses to her husband's non-cooperative response. The husband, who was in the one-down position, apparently maintains this position by choosing the strategy of the "martyr" and becoming more likely to respond cooperatively as he was "punished" more. Another way of describing the partner who is in the one-down position is that he (she) has a "strong faith in teaching by example." However, the discrepancies between the two parents' probabilities were so large, especially in comparison to the equal probabilities in the symmetrical parental dyads of the high and medium S-E children, that it is strange that the parent in the one-down position had not decided that his (her) noble strategy was not effective.

The question of why a particular child in a family becomes emotionally disturbed or scapegoated has not been adequately answered. The data obtained in this study indicates a possible relationship between the sex of the low S-E child and his parents' relationship.

No clear answer to this question is offered here because there is only data available on one child in each family. It is not known whether the other children in the families of the low S-E children also experience adjustment difficulties.

It would seem that the child of the same sex as the parent in the one-up position, that is the parent who is less likely to cooperate or who is relatively more vengeful in his interaction with his or her spouse, will have low S-E. Possibly the low S-E boy or girl is unable to establish an identification with the parent of the same sex because to do so would place him in an antagonistic relationship with the parent of the opposite sex. It could also be possible that the parents more actively displace the conflict on the child of the same sex as the relatively more antagonistic parent. The important finding would seem to be that it is the parent of the same sex as the low S-E child who is in the one-up position and the parent of the opposite sex who is in the one-down position, in the parents' relationship with each other.

It should not be concluded that the parent who is in the one-up position has greater power or control over the other parent. The relationships between the parents of the low S-E children can be thought of as under mutual

control. It would seem that the parent who occupies the one-down position is using the strategy of a "martyr." Thus, this parent might be actively seeking defeat as a way to achieve victory or control of the relationship. That the parent in the one-down position does not change strategy would seem to lock both partners into the complementary relationship. It seems naive to assume that it was the one-up or non-cooperative parent who was responsible for the complementary relationship.

The hypotheses which predicted that in their overall performance the members of the low S-E families would have been less cooperative than the members of the medium and high S-E families were not confirmed. However, when rates of cooperative behavior were viewed as a function of trial blocks or time, significant differences between the high, medium, and low S-E groups were found. The members of the high S-E families remain fairly constant in the probability that they will respond cooperatively to another member's cooperative response and they also seemed to be able to resist a greater personal reward for one that would be beneficial to both family members. Thus, the members of the high S-E children's families seem to respond in a way that would more likely be beneficial to themselves and the other family members. This would seem to indicate a pattern of mutual support, gain, and trust in the families of high S-E children.

In the families of low S-E children the probabilities of cooperating as a function of time seemed to portend a pattern of increasingly less concern for the other family member and greater concern for individual gain. It would seem that this pattern would indicate progressive fragmentation of the family system as a group and greater emphasis on each individual obtaining what he can. Thus, the interactions in the families of the low S-E children would seem to have low levels of trust and mutual concern, perhaps, supporting the notion of "every man for himself."

There are interesting implications of these different temporal patterns of cooperation for family behavior. For the low S-E subjects' families, the pattern of being less likely to cooperate and being more concerned over individual rather than group gain as the process proceeds over time, may be viewed as an "absorbing chain" (Raush, 1969) which will eventuate in extremely low probabilities of cooperating and resolving mutual differences. If this model is an accurate description of the process in these families, then whenever events in which there is disagreement occur in these families, the result will be greater disagreement and eventual personal dissatisfaction.

Ferreira and Winter (1966) have consistently found that the members of families classified as "abnormal"

have had less "spontaneous agreement" with each other and have taken longer to make decisions than do the members of families classified as "normal." There would then seem to be more opportunity in the less well adjusted families to become involved in the type of "absorbing chain" which was described and which would lead to very low rates of mutual cooperation and mutual benefit.

Such processes may be accompanied by the following types of statements by family members: "My view is never taken as valid. They never listen to me. You always have to have your own way." It would also be expected that a great deal of frustration and anger would accompany these states. Individuals exposed to this process would probably feel little trust and a great deal of suspicion toward people. Clinical observers (Haley & Hoffman, 1967) of families in therapy have frequently noted that the members of these families minimally comment on other members' communicative behavior. This may be a means of avoiding entry into the type of non-rewarding, "absorbing chain" that was observed in the performance of the low S-E subjects.

The state of affairs in the families of the high S-E male and female subjects' families is considerably different. The process of interaction here is not an

"absorbing chain." That is, as people interact over time, the probability remains relatively constant that one will respond positively to another's positive response and the goal seems to be one of mutual gain as opposed to individual gain. The result of this process would seem to be that individuals would have trust in the possibility of a positive outcome in their interactions with other people. Their attitudes and behavior would reflect this trust as well as a concern for the other person.

The level of cooperation for the children was not a linear function of the level of S-E as had been predicted, but rather there was an interesting interaction between level of S-E and the child's sex. The high S-E boys were significantly less likely to respond cooperatively than were the high S-E girls or the medium S-E boys. The medium S-E girls were significantly less likely to respond cooperatively than were the medium S-E boys or the high S-E girls. Both groups of low S-E children were relatively non-cooperative. In interpreting these findings it seemed necessary to consider the influence of sex role identity. It may be assumed that if a child's conception of himself matches the standards that his society establishes for a member of his sex group, this will positively influence his

sense of S-E or self-worth.

Kagan (1964) cites a great deal of evidence supporting his contention that: "One of the primary classes of sex-typed behavior involves aggression. The standard involves inhibition of verbal and physical aggression among girls and women; but gives boys and men license- and even encouragement- to express aggression when attacked, threatened, or dominated by another (male)." It would also seem that the girl's inhibition of aggression becomes elaborated in the feminine ideals of passivity, affiliation and nurturance on the part of women in our culture.

In the context of the P.D. game these differentiated sex-typed behaviors would be reflected in the subjects' propensity to continue to respond cooperatively. The high S-E boy's relatively low probability of continuing to respond cooperatively may reflect the maintenance and assertion of an aggressive, competitive male ideal. Similarly, the high S-E girl's relatively high probability of persisting in the cooperative response can be thought of as conforming to the ideal female standards of behavior. The high rates of cooperation by the high S-E girl as she interacts with her mother may also reflect her adoption of this culturally endorsed female pattern of behavior.

The data from the interactions of the fathers and

sons may offer additional information. It would be expected that the father of a pre-adolescent boy is better equipped to compete with his son and would be able to defeat him in most activities. How can an explanation be given for the high and medium S-E father being in the one-down or more cooperative position vis-à-vis his son? It would seem that by being less competitive with his son, he may be enabling the son not to experience defeat at the hands of a more powerful rival so as to encourage competitive behavior outside of this relationship. The symmetrical relationship that exists between the low S-E boy and his father would imply a relationship among equals which would probably result in competitive behavior from this group of fathers with their sons.

The data for the medium S-E children may indicate that they have difficulty in adopting the culturally prescribed sex role behavior. The medium S-E girls appeared to be competitive or aggressive while the medium S-E boys appeared to be passive and cooperative. Possibly this lack of conformity with the socially appropriate behavioral models would, for these children, establish a conflict which could reduce their feelings of worth. Coopersmith (1967) in his study of the antecedents of self-esteem in male subjects found that "only two values-

refinement and dancing- in which the difference between the medium S-E group and the other groups achieved statistical significance." Both of these values would appear to be feminine. Since Coopersmith's (1967) study did **not** deal with female subjects, we can only speculate that the medium S-E girl's value orientation is most likely closer to the masculine ideal. This suggestion appears to be supported by the available data for the medium S-E girls.

The medium S-E girls' non-cooperative or competitive orientation may be thought of as being modeled directly upon their mothers' competitive orientation. One would then question whether these mothers have more doubts about the traditional female role than their counterparts in the families of the high and low S-E female subjects. There would seem to be some additional support for this notion in the demographic data. A significantly greater number of the mothers of medium S-E girls than high and low S-E girls were employed part time. This may reflect a more competitive, masculine and less traditional orientation by these mothers. Perhaps the medium S-E girls' more competitive orientation is a function of their mothers' competitiveness and non-acceptance of the traditional female role.

The effects of the mothers' behavior on their daughters'

competitiveness would seem to be considerably more complex than a simple modeling hypothesis would suggest. The mothers of the low S-E girls had a high probability of responding cooperatively following a trial on which they had received the "sucker's" payoff when playing with their daughters. However, their daughters had a very low probability of responding cooperatively in this situation. If the low S-E girls' behavior is compared to their mothers' behavior in the game with the fathers, a similarity emerges. Although the mothers of the low S-E girls take a relatively cooperative stand in their interactions with their daughters, they take a relatively non-cooperative stand in the interactions with their husbands. Thus, the question can be raised of which set of the mothers' behaviors will the low S-E girls choose as the more appropriate model when she is faced with two divergent sets of behavior.

Conclusion: It would seem premature to attempt to establish generalizations beyond those that have already been suggested. The following areas would seem to warrant further investigation.

The P.D. game, as well as other simulation techniques appear to be a potentially useful methodology for the study of current family interaction processes. The

present experimental method may be modified to include a period in which the family members could negotiate their strategies. This could be useful in both validating already formulated hypotheses, as well as adding new information to the study of family interaction.

The present finding would seem to suggest that particular attention should be given to the temporal patterns of cooperation and competition in families. It would also be important to continue the investigation of differences in the dyadic relationship patterns such as those found between the parents of the high, medium, and low S-E children. In addition to this, the present finding suggests that there is an interaction between sex role and self-esteem which requires further investigation.

In conclusion, it would seem that the present findings would offer support for the notions of family theory. Differences between the interaction patterns of families with high, medium, and low S-E children would indicate that current interactional behavior within the family is related to different levels of a child's psychological adjustment.

CHAPTER V

SUMMARY

The purpose of the present study was to explore the relationship between current interactional behavior within a child's family and his level of self-esteem. The child's level of self-esteem (S-E) was assessed by the Self-Esteem Inventory (Coopersmith, 1967). Each family consisted of the mother, father, and the tested child. The families were divided into high, medium, and low S-E groups. The groups were extremely similar on all demographic characteristics so that the child's level of S-E was the only variable that differentiated the groups. Sixty "normal" families were obtained from a suburban junior high school and were divided equally into the six groups, three with male and three with female children.

The families participated in an interactional task, the prisoner's dilemma game (Rapoport & Orwant, 1962; Rapoport & Chammah, 1965). The P.D. game has been described as a mixed motive, non-zero sum game which

establishes a conflict between the psychological states or motives of cooperation and competition, trust, and mistrust, etc. The assumption that is implicit in using this simulation technique is that the subject's game behavior is analogous to non-game, real life interactions.

No significant differences were found in the overall levels of cooperation for the members of the high, medium, and low S-E groups. However, when the subjects' performance was viewed as a function of time or trials, significant differences did emerge. The members of the high S-E families were consistent in their probability of responding cooperatively following a cooperative response by another family member. In contrast, the members of the low S-E families became progressively less likely to respond cooperatively following the other family member's cooperative response. A similar pattern was found for the probability that the subject will respond cooperatively following a trial in which he responded non-cooperatively and the other family member responded cooperatively. Again, as the game proceeded, the members of the low S-E families were significantly less likely to respond cooperatively, than were the members of the high S-E families.

It is somewhat difficult to interpret the results for the medium S-E families because there appeared to

be a significant difference between the male and female subjects' families' performance on the P.D. game was similar to that of the low S-E families, while the performance of the medium S-E male subjects' families were similar to the high S-E families.

The differences noted were interpreted as indicating different temporal patterns of dealing with conflict in the families of the high, medium, and low S-E children. It would seem that within the low S-E families, as conflict continues over time, there would be a decreasing likelihood that a mutually beneficial resolution would occur; that is, the members would become more competitive, oriented towards individual as opposed to family group gain, and more frustrated, disappointed and angry. The members of the high S-E families appear to be relatively consistent in the likelihood of finding a mutually beneficial resolution to conflict and appear to hold mutual family group gain as a more important value than individual gain. These differences may be generalized to the attitudes and expectations that the children and parents in each family group would then hold toward society at large.

One of the most interesting findings of the present study was related to the parents' interactions with each other. On two measures of the probability that the

subject would respond cooperatively following a non-cooperative response by the other subject, there was no significant difference between the high and medium S-E mothers' and fathers' probabilities of responding cooperatively. This type of relationship was defined as symmetrical, a relationship in which each parent acts as if he is equal to the other. However, the probabilities of the mothers and fathers of the low S-E children were significantly different, indicating that they may have a complementary relationship in which one partner is more competitive, vengeful, superior or one-up, while the other partner is more cooperative, inferior or one-down.

Although this complementary pattern emerged in the relationship between the parents of the low S-E boys and girls, the relative positions in the relationship were reversed for the parents of the male and female low S-E children. In the parental dyad of the low S-E boys, the father was the one-up or more vengeful parent while the mother was the one-down or more cooperative parent. In the parental dyad of the low S-E girl it was the mother who was in the one-up or relatively more vengeful position while the father was in the one-down or relatively more cooperative position. In both cases, the parent in the one-down position assumed the role

of "martyr," becoming more likely to cooperate as the loss or punishment increased.

The data on the intraparental relationship were thought to lend support to the scapegoating hypothesis (Bell & Vogel, 1960; Murrell & Stachowiak, 1965) which indicates that the disturbed or poorly adjusted child's difficulties are both a function of and a means of resolving intraparental conflict. It was suggested that the present findings may help to answer the question of which child would be scapegoated. The child who develops poor adjustment would be the one who is of the same sex as the parent in the one-up position. The conflict between the parents would establish a difficult identification situation as well as the possibility that negative feelings may become displaced upon this child by the parent in the one-down position.

It also appeared that the interactions between the father and son in the low S-E families was more competitive and less cooperative than the interactions between the father and son in the high and medium S-E families. This would seem to support the notion that identification and appropriate sex role typing is facilitated by warmth in the same sex parent (i.e., Heatherington & Frankie, 1967). However, the relationship between the mothers and daughters in the three S-E groups did not confirm

this hypothesis.

The influence of sex and sex role seems to be an important variable in the study of the relationship of current interactional processes and a child's level of S-E. There were marked differences between the performance of the medium S-E boys and that of the girls, as well as the other members of their families. It was suggested that there might be a conflict and reversal between the families' and society's definition of appropriate sex role behavior in the medium S-E families. The male medium S-E subjects responded as if they had a more feminine or cooperative definition of the male role and the female medium S-E subjects responded as if they had a more masculine or competitive definition of the female role than either the high S-E boys or girls who responded in a way that would conform to the traditional sex role behaviors. It was suggested that there was possibly a family-society conflict in the norms of the medium S-E families as compared to the intrafamilial conflict in the low S-E families.

References.

- Ackerman, N. W., The Emergence of Family Diagnosis and Treatment, Psychotherapy: Theory, Research and Practice, 1967, 4, 125 - 129.
- Bandura, A. Principles of Behavior Modification. Holt, Rinehart and Winston, Inc., New York, 1969.
- Bean, F. D. and Kerckhoff, A. C. Husband-Wife Conflict and Interpersonal Relations. Paper presented at the annual meetings of the American Sociological Association, San Francisco, California, September, 1969.
- Becker, J. and Iwakami, E. Behavioral Ratings and Interactions Within Families of Disturbed Children. Unpublished Paper.
- Berger, C. R. Sex Differences Related to Self-Esteem Factor Structure. Journal of Consulting and Clinical Psychology, 1968, 32, 442 - 446.
- Bermann, E. A. Child Psychopathology and Family Dynamics: Where We Have Been, Where We Are, and Where We Are Going. Paper presented at Symposium on "New Approaches in Current Diagnosis of Children," at meetings of American Psychological Association, New York, September, 1966.
- Bermann, E. A. An Experimental Approach to Family Interaction and Decision Making. Unpublished paper, 1967.
- Breger, L. The Ideology of Behaviorism. In: Breger, L. (ed.) Clinical - Cognitive Psychology, Prentice - Hall, Inc., Englewood Cliffs, N. J., 1969
- Carlson, R. On the Structure of Self-Esteem: Comments on Ziller's Formulation. Journal of Consulting and Clinical Psychology, 1970, 34(2), 264 - 268.
- Clemes, S. R. and Terrill, J. Analysis of Marital Couples Relationships Through a Two Person Game. Paper presented at the annual convention of the California State Psychological Association, Santa Barbara, January, 1968.
- Coopersmith, S. A method for Determining Types of Self - Esteem. Journal of Abnormal and Social Psychology, 1959, 59, 87 - 94.
- Antecedents of Self - Esteem. W. H. Freeman and Co., San Francisco, 1967.

Crowne, D. P. Family Orientation, Level of Aspiration and Interpersonal Bargaining. Journal of Personality and Social Psychology, 1966, 3, 641 - 645.

Deutsch, M. Trust and Suspicion. Journal of Conflict Resolution, 1958, 2, 265 - 279.

_____. Trust, Trustworthiness and the F Scale. Journal of Abnormal and Social Psychology, 1960, 61, 138 - 140.

_____. Socially Relevant Science: Reflections on Some Studies of Interpersonal Conflict. American Psychologist, 1969, 24, 1076 - 1092.

Ferreira, A. J. and Winter, W. D. Stability of Interactional Variables in Family Decision Making. Archives of General Psychiatry, 1966, 14, 352 - 355.

Frank, G. H. The Role of The Family in The Development of Psychopathology. Psychological Bulletin, 1965, 64, 191 - 205.

Gallo, P.S. and McClintock, C. G. Cooperative and Competitive Behavior in Mixed-Motive Games. Journal of Conflict Resolution, 1965, 9, 68 - 78.

Gasner, S. and Murray, E. J. Dominance and Conflict in the Interactions Between Parents of Normal and Neurotic Children. Unpublished paper, University of Miami, 1969.

Guertin, W. H. and Jourard, S. M. Characteristics of Real - Self - Ideal - Self Discrepancy Scores Revealed by Factor Analysis. Journal of Consulting Psychology, 1962, 26, 241 - 245.

Haley, J. Family Experiments: A New Type of Experimentation. Family Process, 1962, 1, 265 - 293.

_____. Research on Family Patterns: An Instrument Measurement. Family Process, 1964, 3, 41 - 65.

_____. Speech Sequences of Normal and Abnormal Families With Two Children Present. Family Process, 1967a, 6, 81 - 98.

_____. Experiment With Abnormal Families. Archives of Psychiatry, 1967b, 17, 53 - 64.

Haley, J. and Hoffman, L. Techniques of Family Therapy. Basic Books, Inc., New York, 1967.

Hall, E. The Silent Language. Fawcett Publications, Inc., Greenwich, Conn., 1959.

Handel, G. Psychological Study of Whole Families. Psychological Bulletin, 1965, 63, 19 - 41.

Handel, G. and Hess, R. D. The Family as an Emotional Organization. Marriage and Family Living, 1956, 18, 99 - 101.

Harris, R. J. Note on "Optimal Policies For The Prisoner's Dilema." Psychological Review, 1969, 76, 363 - 375.

Heatherington, E. M. and Frankie, G. Effects of Parental Dominance, Warmth and Conflict on Imitation in Children. Journal of Personality and Social Psychology, 1967, 6, 119 - 125.

Hobbs, N. Helping Disturbed Children: Psychological and Ecological Strategies. American Psychologist, 1966, 21, 1105 - 1115.

Hollingshead, A. B. and Redlich, F.C. Social Class and Psychiatric Disorders. In; Gorlow, L. and Katkovsky, W. (eds.) Readings in the Psychology of Adjustment, McGraw Hill Book Co., New York, 1968.

Jackson, D. D. The Study of the Family. Family Process. 1965, 4, 1 - 20.

James, B., Steele, N., Gehagan, J. and Tedeschi, J. Matrix Values and Cooperative Behavior in the Prisoner's Dilemma Game. Journal of Personality and Social Psychology, 1968, 8, 148 - 153.

Kagan, J. Acquisition and Significance of Sex Typing and Sex Role Identity. In; Hoffman, M. L. and Hoffman, L. W. (eds.) Review of Child Development Research, Russell Sage Foundation, New York, 1964.

Komorita, S. S., Sheposh, J. P. and Braver, S. L. Power, the Use of Power and Cooperative Choice in a Two person Game. Journal of Personality and Social Psychology, 1968, 8, 134 - 142.

McNemar, Q. Psychological Statistics, John Wiley and Sons, Inc., New York, 1962.

Meisner, W. W. Thinking about the Family: Psychiatric Aspects. Family Process, 1964, 3, 1 - 40.

Mottola, W. C. Family Therapy: A Review. Psychotherapy: Theory, Research and Practice, 1967, 4, 116 - 124.

Murrell, S. A. and Stachowiak, J. G. The Family Group: Development, Structure and Therapy. Journal of Marriage and the Family, 1965, 27, 13 - 18.

Consistency, Rigidity and Influence in the Interaction Patterns of Clinic and Non-Clinic Families. Paper presented at the Midwest Psychological Association meeting in Chicago, May 7, 1966.

Myers, J. L. Fundamentals of Experimental Design. Allyn and Bacon, Boston, 1966.

Oskamp, S. and Perlman, D. Factors Affecting Cooperation in a Prisoner's Dilemma Game. Journal of Conflict Resolution, 1965, 9, 359 - 374.

Parsons, T. and Fox, R. C. Illness, Therapy and the Modern Urban American Family. In; Bell, N. W. and Vogel, E. F. (eds.) The Family, The Free Press of Glencoe, Illinois, 1960.

Pilisuk, M. and Skolnick, P. Inducing Trust: A Test of the Osgood Proposal. Journal of Personality and Social Psychology, 1968, 8, 121 - 133.

Rapoport, A. Two Person Game Theory: The Essential Ideas. University of Michigan Press, Ann Arbor, 1966.

Rapoport, A. and Chammah, A. M. Prisoner's Dilemma: A Study in Conflict and Cooperation. The University of Michigan Press, Ann Arbor, 1965.

Rapoport, A. and Orwant, C. Experimental Games: A Review. Behavioral Science, 1962, 7, 1 - 37.

Raush, H. L. A Markov Model For Studying Interpersonal Process. Paper presented at the American Psychological Association Convention, Washington, D. C., September 4, 1969.

Ravich, R. A. The Use of an Interpersonal Game-Test in Conjoint Marital Therapy. American Journal of Psychotherapy, 1969, 23, 217 - 229.

Rosenberg, M. Society and the Adolescent Self-Image. Princeton University Press, Princeton, New Jersey, 1965.

Ross, A. O. The Exceptional Child in the Family. Grune and Stratton, New York, 1964.

Singer, M. and Wynne, L. C. Thought Disorder and Family Relations of Schizophrenics. III Methodology Using Projective Techniques. Archives of General Psychiatry, 1965, 12, 187 - 212.

Spiegel, J. P. The Resolution of Role Conflict Within the Family. In; Bell, N. W. and Vogel, E. F. (eds.) The Family, The Free Press of Glencoe, Illinois, 1960.

Strodtbeck, F. L. The Family as a Three Person Group. American Sociological Review, 1954, 19, 23 - 29.

_____. Instructions Used in the Study of Family Interaction by the Revealed Differences Technique. Unpublished Manuscript; The Social Psychological Laboratory, The University of Chicago, 1962.

Swingle, P. G. and Gillis, J. S. Effects of the Emotional Relationship Between Protagonists in the Prisoner's Dilemma. Journal of Personality and Social Psychology, 1968, 8, 160 - 165.

Tedeschi, J. T., Heister, D. and Gehagan, J. P. Matrix Values and the Behavior of Children in the Prisoner's Dilemma Game. Child Development, 1969, 40, 517 - 527.

Ullman, L. P. and Krasner, L. Case Studies in Behavior Modification. Holt, Rinehart and Winston, Inc., New York, 1965.

Vandenberg, G. H. and Stachowiak, J. G. Pattern of Conflict and Dominance in Family Interactions. Paper read at Midwestern Psychological Association Meeting in Chicago, May 7, 1966.

Vinacke, W. E. Variables in Experimental Games: Toward a Field Theory. Psychological Bulletin, 1969, 71, 293 - 318.

Vogel, E. F. and Bell, N. W. The Emotionally Disturbed Child as the Family Scapegoat. In; Bell, N. W. and Vogel, E. F. (eds.) The Family, The Free Press of Glencoe, Illinois, 1960.

Watzlawick, P., Beavin, J. H. and Jackson, D. D. Pragmatics of Human Communication. W. W. Norton and Co. Inc., New York, 1967.

Winter, W. D. and Ferreira, A. J. Research in Family Interaction: Readings and Commentary. Science and Behavior Books, Inc., Palo Alto, California, 1969.

Wilson, K. V. and Bixenstine, V. E. Forms of Social Control in Two Person, Two Choice Games. Behavioral Science, 1962, 7, 92 - 102.

APPENDIX A

APPENDIX A

a) SOCIO ECONOMIC INDEX.

The "father's occupational index" was based on the Hollingshead and Redlick presentation (1968) of five levels of social class. "Class I. This stratum is composed of wealthy families whose wealth is often inherited and whose heads are leaders in the community's business and professional pursuits. Class II. Adults in this stratum are almost all college graduates; the males occupy high managerial positions, many are engaged in the lesser ranking professions. These families are well to do, but there is no substantial inherited or acquired wealth. Class III. This stratum includes the vast majority of small proprietors, white collar office and sales workers, and a considerable number of skilled manual workers. Adults are predominantly high school graduates, but a considerable number have attended business schools and small colleges for a year or two. Class IV. This stratum consists predominantly of semi-skilled factory workers. Its adult members have finished the elementary grades...adults under thirty-five have generally graduates from high school. Class V. Occupationally, class V adults are overwhelmingly semi-skilled factory hands and unskilled laborers. Educationally most adults have not completed the elementary grades."

b) SELF-ESTEEM INVENTORY.

University of Massachusetts
Educational Research Project: Form I

Name: _____ Date: _____

PLEASE MARK EACH STATEMENT IN THE FOLLOWING WAY: IF THE STATEMENT DESCRIBES HOW YOU USUALLY FEEL, PUT A CHECK (✓) IN THE COLUMN "LIKE ME." IF THE STATEMENT DOES NOT DESCRIBE HOW YOU USUALLY FEEL, PUT A CHECK IN THE COLUMN "UNLIKE ME."

THERE ARE NO RIGHT OR WRONG ANSWERS.

	<u>LIKE ME</u>	<u>UNLIKE ME</u>
1. I spend a lot of time daydreaming. _____		✓
2. I'm pretty sure of myself. _____	✓	
3. I often wish I were someone else. _____		✓
4. I'm easy to like. _____	✓	
5. My parents and I have a lot of fun together. _____	✓	
6. I never worry about anything. _____		✓
7. I find it very hard to talk in front of the class. _____		✓
8. I wish I were younger. _____		✓
9. There are lots of things about myself I'd change if I could. _____		✓
10. I can make up my mind without too much trouble. _____	✓	
11. I'm a lot of fun to be with. _____	✓	
12. I get upset easily at home. _____		✓
13. I always do the right thing. _____		✓
14. I'm proud of my school work. _____	✓	
15. Someone always has to tell me what to do. _____		✓
16. It takes me a long time to get used to anything new. _____		✓
17. I'm often sorry for the things I do. _____		✓
18. I'm popular with kids my own age. _____	✓	
19. My parents usually consider my feelings. _____	✓	
20. I'm never unhappy. _____		✓
21. I'm doing the best work that I can. _____	✓	
22. I give in very easily. _____		✓
23. I can usually take care of myself. _____	✓	
24. I'm pretty happy. _____	✓	
25. I would rather play with children younger than me. _____		✓
26. My parents expect too much of me. _____		✓

	<u>LIKE ME</u>	<u>UNLIKE ME</u>
27. I like everyone I know.		✓
28. I like to be called on in class.	✓	
29. I understand myself.	✓	
30. It's pretty tough to be me.		✓
31. Things are all mixed up in my life.		✓
32. Kids usually follow my ideas.	✓	
33. No one pays much attention to me at home.		✓
34. I never get scolded.		✓
35. I'm not doing as well in school as I'd like to.		✓
36. I can make up my mind and stick to it.	✓	
37. I really don't like being a boy - girl.		✓
38. I have a low opinion of myself.		✓
39. I don't like to be with other people.		✓
40. There are many times when I'd like to leave home.		✓
41. I'm never shy.		✓
42. I often feel upset in school.		✓
43. I often feel ashamed of myself.		✓
44. I'm not as nice looking as most people.		✓
45. If I have something to say, I usually say it.	✓	
46. Kids pick on me very often.		✓
47. My parents understand me.	✓	
48. I always tell the truth.		✓
49. My teacher makes me feel I'm not good enough.		✓
50. I don't care what happens to me.		✓
51. I'm a failure.		✓
52. I get upset easily when I'm scolded.		✓
53. Most people are better liked than I am.		✓
54. I usually feel as if my parents are pushing me.		✓
55. I always know what to say to people.	✓	
56. I often get discouraged in school.		✓
57. Things usually don't bother me.	✓	
58. I can't be depended on.		✓

c) LETTER 1.

DEPARTMENT OF PSYCHOLOGY
UNIVERSITY OF MASSACHUSETTS
AMHERST, MASSACHUSETTS

March 17, 1970

Dear Parent:

The school district is cooperating with the University of Massachusetts in an educational research project. The general purpose of this project is to investigate how children learn basic attitudes.

In the initial part of this study I will be administering a questionnaire to all of the seventh grade students at the J.H.S. At this time I am asking your permission to allow your child to participate in the questionnaire portion of this project which will be administered in class.

Later in the year I will contact a small group of families to ask their additional cooperation in a second part of this project.

I want to assure you that all necessary precautions will be taken to guarantee your child's anonymity. All of the information gathered in this study will be completely confidential and will not be made available to anyone.

Your cooperation in projects such as the present one is extremely important and necessary if we are to expand our knowledge of human development. Your assistance at this time is greatly appreciated and I want to sincerely thank you for it.

Yours truly,

Joseph W. Newirth, M.S.

I will (will not) allow my son (daughter), _____
to participate in the questionnaire portion (name)
of the University of Massachusetts educational research project described above.

Signed: _____ Date: _____
(parent or guardian)

d) LETTER 2.

DEPARTMENT OF PSYCHOLOGY
UNIVERSITY OF MASSACHUSETTS
AMHERST, MASSACHUSETTS

Dear Parents:

The school district is cooperating with the University of Massachusetts in an educational research project. The general purpose of this project is to investigate how children learn basic attitudes and decision making.

Through the courtesy of the J.H.S., I have obtained your child's name. I am writing for your further cooperation in completing this study.

We have developed a game that can be played by two family members at a time. The object of this game is for each player to get as many points for himself as he can. However, the score that each player gets depends not only on the way he plays, but also on the way his partner plays the game. We are interested in studying the techniques that different family members use while playing this game. The families that have already played this game have found it quite enjoyable.

I want to assure you that all necessary precautions will be taken to guarantee your family's anonymity. All of the information gathered in this study will be completely confidential and will not be made available to anyone.

This study will require only one and a half hours of time when both of you and your child will be available. I will be able to your home at a time that is convenient for you. It is only through the kind cooperation of people like you that we will be able to expand our understanding of human development and thus be able to continue to make the strides in science that will benefit us all.

Since we have a very small budget for this study we have decided to give one of the sixty families that participate a fifty dollar savings bond. The family that gets this prize will be selected randomly from those that participate.

I hope that you decide to participate in this study. I think that you will find it both interesting and enjoyable. I will call you

within the next week and I hope that we can arrange a suitable time. Your assistance is greatly appreciated and I want to sincerely thank you for it.

Yours truly,

Joseph W. Newirth, M.S.

e) Table A: Number of families contacted and percent that participated for the male and female subjects of each self-esteem group.

Self-Esteem	MALE		FEMALE	
	Number Contacted	Percent participated	Number contacted	Percent participated
High	12	83	14	76
Medium	14	76	22	45
Low	19	53	16	63

APPENDIX B

a) Table B: Per cent of S's responding "like me" to S.E.I. in three S-E groups of male and female seventh-grade children. Percentages based on 25 randomly selected S's in each S-E by sex group. (High S-E = E₁, medium S-E = E₂, low S-E = E₃)

	MALE			FEMALE		
	E ₁	E ₂	E ₃	E ₁	E ₂	E ₃
1. I spend a lot of time daydreaming.	4	40	64	8	20	76
2. I'm pretty sure of myself.	100	80	72	96	76	32
3. I often wish I were someone else.	4	24	60	4	32	80
4. I'm easy to like.	100	84	48	100	100	44
5. My parents have a lot of fun together.	96	88	56	92	88	80
6. I never worry about anything.	16	0	12	16	16	4
7. I find it very hard to talk in front of the class.	16	48	48	32	56	64
8. I wish I were younger.	4	16	24	0	12	8
9. There are lots of things about myself I'd change if I could.	40	68	92	40	84	100
10. I can make up my mind without too much trouble.	88	76	56	80	80	48
11. I'm a lot of fun to be with.	100	84	48	96	96	68
12. I get upset easily at home.	8	36	76	28	40	84
13. I always do the right thing.	20	4	8	12	16	4

	MALE			FEMALE		
	E ₁	E ₂	E ₃	E ₁	E ₂	E ₃
14. I'm proud of my school work.	84	48	44	92	72	44
15. Someone always has to tell me what to do.	0	16	44	0	12	52
16. It takes me a long time to get used to anything new.	8	28	36	4	12	48
17. I'm often sorry for the things I do.	12	56	76	28	52	80
18. I'm popular with the kids my own age.	96	48	40	80	64	44
19. My parents usually consider my feelings.	92	60	64	100	84	84
20. I'm never unhappy.	32	4	12	20	16	4
21. I'm doing the best work that I can.	60	32	32	88	72	52
22. I give in very easily.	8	24	32	12	56	40
23. I can easily take care of myself.	100	92	92	100	100	88
24. I'm pretty happy.	100	92	76	100	100	76
25. I would rather play with children younger than me.	0	4	20	4	4	8
26. My parents expect too much of me.	8	16	60	16	16	64
27. I like everyone I know.	20	24	32	36	44	40
28. I like to be called on in class.	100	76	56	76	40	48
29. I understand myself.	100	96	80	100	92	72

MALE FEMALE

	E ₁	E ₂	E ₃	E ₁	E ₂	E ₃
30. It's pretty tough to be me.	20	64	80	4	16	68
31. Things are all mixed up in my life.	4	36	52	0	16	68
32. Kids usually follow my ideas.	84	60	20	80	72	32
33. No one pays much attention to me at home.	12	12	28	0	16	28
34. I never get scolded.	0	24	16	4	16	20
35. I'm not doing as well in school as I'd like to.	44	68	88	24	64	92
36. I can make up my mind and stick to it.	96	80	56	76	68	36
37. I really don't like being a boy - girl.	0	4	8	0	0	32
38. I have a low opinion of myself.	0	24	36	4	16	64
39. I don't like to be with other people.	0	12	16	4	4	8
40. There are many times when I would like to leave home.	8	44	76	8	52	92
41. I'm never shy.	36	28	40	40	8	32
42. I often feel upset in school.	0	24	72	8	40	76
43. I often feel ashamed of myself.	0	24	52	0	36	80
44. I'm not as nice looking as most people.	8	16	48	36	44	72
45. If I have something to say I usually say it.	92	76	60	84	52	52

MALE FEMALE

	E ₁	E ₂	E ₃	E ₁	E ₂	E ₃
46. Kids pick on me very often.	8	32	52	4	4	32
47. My parents understand me.	84	92	56	100	72	52
48. I always tell the truth.	16	20	12	12	32	16
49. My teacher makes me feel I'm not good enough.	4	20	44	4	20	68
50. I don't care what happens to me.	0	12	8	0	8	32
51. I'm a failure.	0	4	28	0	0	56
52. I get upset easily when I'm scolded.	24	44	60	48	64	80
53. Most people are better liked than I am.	8	44	72	20	44	88
54. I usually feel as if my parents are pushing me.	12	40	72	12	20	40
55. I always know what to say to people.	72	52	8	20	28	28
56. I often get discouraged in school.	4	44	56	4	32	76
57. Things usually don't bother me.	68	36	32	40	36	12
58. I can't be depended on.	4	4	28	0	12	28

b) ANALYSIS OF VARIANCE TABLES

Table C: Analysis of Variance for measure A; the probability that the player responds cooperatively following the other player's cooperative response.

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
1. Total	1799			
2. Between subjects	179			
3. Sex (S)	1	.374	1.36	
4. Self-esteem (S-E)	2	.496	1.82	
5. Role (R)	2	.389	1.43	
6. S X S-E	2	.473	1.73	
7. S X R	2	.103	.38	
8. S-E X R	4	.141	.52	
9. S X S-E X R	4	.323	1.18	
10. Error (N/SS-ER)	162	.273		
11. Within subjects	1620			
12. Dyadic partner (DP)	1	2.000	11.49	*****
13. DP X S	1	.891	5.12	***
14. DP X S-E	2	.003	.02	
15. DP X R	2	.173	.98	
16. DP X S X S-E	2	.329	1.89	
17. DP X S X R	2	.032	.18	
18. DP X S-E X R	4	.095	.55	
19. DP X S X S-E X R	4	.195	1.12	

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
20. Error (N X DP/SS-ER)	162	.174		
21. Trial block (T)	4	.576	9.14	*****
22. T X S	4	.101	1.60	
23. T X S-E	8	.212	3.35	*****
24. T X R	8	.066	1.05	
25. T X S X S-E	8	.148	2.33	***
26. T X S X R	8	.039	.62	
27. T X S-E X R	16	.030	.48	
28. T X S X S-E X R	16	.082	1.30	
29. Error (T X N/SS-ER)	648	.063		
30. DP X T	4	.080	1.14	
31. DP X T X S	4	.138	1.97	*
32. DP X T X S-E	8	.162	2.31	***
33. DP X T X R	8	.052	.81	
34. DP X T X S X S-E	8	.195	2.78	*****
35. DP X T X S X R	8	.053	.76	
36. DP X T X S-E X R	16	.023	.33	
37. DP X T X S X S-E X R	16	.082	1.17	
38. Error (N X DP X T/SS-ER)	648	.070		
<hr/>				
* p	.10	**** p	.01	
** p	.05	***** p	.005	
*** p	.025	***** p	.001	

Table D: Analysis of Variance for measure B, the probability that a subject will follow his own cooperative response with a cooperative response.

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
1. Total	1799			
2. Between subjects	179			
3. Sex (S)	1	.007	.03	
4. Self-esteem (S-E)	2	.102	.48	
5. Role (R)	2	2.237	10.50	*****
6. S X S-E	2	.432	2.03	
7. S X R	2	.098	.46	
8. E X R	4	.198	.93	
9. S X S-E X R	4	.473	2.22	*
10. Error (N/SS-ER)	162	.213		
11. Within subjects	1620			
12. Dyadic partner (DP)	1	.876	8.04	*****
13. DP X S	1	.002	.02	
14. DP X E	2	.088	.81	
15. DP X R	2	.186	1.70	
16. DP X S X E	2	.110	1.10	
17. DP X S X R	2	.001	.01	
18. DP X S-E X R	4	.118	1.08	

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
19. DP X S X S-E X R	4	.100	.92	
20. Error (NDP/SS-ER)	162	.109		
21. Trial block (T)	4	.440	8.80	*****
22. T X S	4	.051	1.02	
23. T X E	8	.078	1.56	
24. T X R	8	.027	.52	
25. T X S X S-E	8	.046	.92	
26. T X S X R	8	.104	2.08	**
27. T X S-E X R	16	.070	1.40	
28. T X S X S-E X R	16	.060	1.20	
29. Error (TN/SS-ER)	648	.050		
30. DP X T	4	.004	.08	
31. DP X T X S	4	.131	2.51	**
32. DP X T X E	8	.054	1.04	
33. DP X T X R	8	.030	.58	
34. DP X T X S X S-E	8	.049	.94	
35. DP X T X S X R	8	.024	.46	
36. DP X T X S-E X R	16	.056	1.08	
37. DP X T X S X S-E X R	16	.064	1.23	
38. Error (N X DP X T/SS-ER)	648	.052		

* p .10
 ** p .05
 *** p .025

**** p .01
 ***** p .005
 ***** p .001

Table E: Analysis of variance for measure E; the probability that the subject will respond non-cooperatively following his own non-cooperative response on the preceeding trial.

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
1. Total	1799			
2. Between subjects	179			
3. Sex (S)	1	.002	.03	
4. Self-esteem (S-E)	2	.004	.06	
5. Role (R)	2	.032	.47	
6. S X S-E	2	.255	3.74	***
7. S X R	2	.028	.41	
8. S-E X R	4	.028	.41	
9. S X S-E X R	4	.064	.94	
10. Error (N/SS-ER)	162	.068		
11. Within subjects	1620			
12. Dyadic partner (DP)	1	.184	4.29	**
13. DP X S	1	.037	.86	
14. DP X S-E	2	.017	.39	
15. DP X R	2	.037	.86	
16. DP X S X S-E	2	.029	.67	
17. DP X S X R	2	.031	.72	
18. DP X S-E X R	4	.060	1.39	
19. DP X S X S-E X R	4	.024	.50	

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
20. Error (NDP/SS-ER)	162	.043		
21. Trial block (T)	4	.043	3.58	*****
22. T X S	4	.008	.67	
23. T X E	8	.018	1.50	
24. T X R	8	.003	.25	
25. T X S X S-E	8	.016	1.33	
26. T X S X R	8	.017	1.41	
27. T X S-E X R	16	.010	.83	
28. T X S X S-E X R	16	.013	1.08	
29. Error (TN/SS-ER)	648	.012		
30. DP X T	4	.007	.58	
31. DP X T X S	4	.051	4.25	*****
32. DP X T X E	8	.009	.75	
33. DP X T X R	8	.005	.42	
34. DP X T X S X S-E	8	.009	.75	
35. DP X T X S X R	8	.007	.58	
36. DP X T X S-E X R	16	.013	1.08	
37. DP X T X S X S-E X R	16	.009		
38. Error (N X DP X T/SER)	648	.012		
* p .10	**** p	.01		
** p .05	***** p	.005		
*** p .025	***** p	.001		

Table F: Analysis of Variance for measure F; the probability that a subject responds cooperatively following the other player's non-cooperative response.

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
1. Total	1799			
2. Between subjects	179			
3. Sex (S)	1	.592	2.59	
4. Self-esteem (S-E)	2	.235	1.03	
5. Role (R)	2	.448	1.96	
6. S X S-E	2	.140	.61	
7. S X R	2	.353	1.59	
8. S-E X R	4	.115	.51	
9. S X S-E X R	4	.482	2.11	*
10. Error (N/SS-ER)	162	.228		
11. Within subjects	1620			
12. Dyadic partner (DP)	1	1.025	9.76	*****
13. DP X S	1	.202	1.92	
14. DP X S-E	2	.023	.22	
15. DP X R	2	.261	2.48	*
16. DP X S X S-E	2	.111	1.06	
17. DP X S X R	2	.014	.13	
18. DP X S-E X R	4	.081	.77	
19. DP X S X S-E X R	4	.219	2.08	*

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
20. Error (NDP/SS-ER)	4	.105		
21. Trial Block (T)	4	.410	10.79	*****
22. T X S	4	.030	.79	
23. T X S-E	8	.028	.73	
24. T X R	8	.014	.37	
25. T X S X S-E	8	.059	1.55	
26. T X S X R	8	.035	.92	
27. T X S-E X R	16	.058	1.55	*
28. T X S X S-E X R	16	.048	1.26	
29. Error (TN/SS-ER)	648	.038		
30. DP X T	4	.056	1.36	
31. DP X T X S	4	.010	.24	
32. DP X T X E	8	.041	1.00	
33. DP X T X R	8	.036	.89	
34. DP X T X S X S-E	8	.080	1.95	**
35. DP X T X S X R	8	.042	1.02	
36. DP X T X S-E X R	16	.037	.90	
37. DP X T X S X S-E X R	16	.045	1.09	
38. Error (NDPT/SS-ER)	648	.041		
<hr/>				
* p	.10	**** p	.01	
** p	.05	***** p	.005	
*** p	.025	***** p	.001	

Table G: Analysis of Variance for measure \bar{X} ; the probability that the subject will respond cooperatively after both he and the other player responded cooperatively.

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
1. Total	1799			
2. Between subjects	179			
3. Sex (S)	1	.076	.14	
4. Self-esteem (S-E)	2	.123	.23	
5. Role (R)	2	2.957	5.55	*****
6. S X S-E	2	.760	1.42	
7. S X R	2	.120	.22	
8. S-E X R	4	.855	1.60	
9. S X E X R	4	.756	1.42	
10. Error (N/SS-ER)	162	.533		
11. Within Subjects	1620			
12. Dyadic partner (DP)	1	3.575	9.99	*****
13. DP X S	1	.111	.31	
14. DP X S-E	2	.027	.08	
15. DP X R	2	.165	.46	
16. DP X S X S-E	2	.668	1.86	
17. DP X S X R	2	.078	.22	
18. DP X S-E X R	4	.150	.42	
19. DP X S X S-E X R	4	.171	.48	

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
20. Error (NDP/SS-ER)	162	.358		
21. Trial Block (T)	4	.733	3.59	****
22. T X S	4	.251	1.26	
23. T X S-E	8	.280	1.41	
24. T X R	8	.127	.63	
25. T X S X S-E	8	.307	1.55	
26. T X S X R	8	.407	2.05	**
27. T X S-E X R	16	.087	.44	
28. T X S X S-E X R	16	.135	.67	
29. Error (TN/SS-ER)	648	.198		
30. DP X T	4	.129	.57	
31. DP X T X S	4	.297	1.32	
32. DP X T X E	8	.240	1.12	
33. DP X T X R	8	.112	.50	
34. DP X T X S X S-E	8	.542	2.42	***
35. DP X T X S X R	8	.062	.28	
36. DP X T X S-E X R	16	.243	1.08	
37. DP X T X S X S-E X R	16	.395	1.79	*****
38. Error (NDPT/SS-ER)	648	.224		
*p .10	****p .01			
p .05	***p .005			
p .025	**p .001			

Table H: Analysis of Variance for measure Y; the probability that a subject will respond cooperatively following a play in which he choose cooperatively and the other player responded non-cooperatively.

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
1. Total	1799			
2. Between subjects	179			
3. Sex (S)	1	.373	.94	
4. Self-esteem (S-E)	2	.110	.28	
5. Role (R)	2	1.954	4.95	*****
6. S X S-E	2	.956	2.41	*
7. S X R	2	.494	1.24	
8. S-E X R	4	.693	1.74	
9. S X S-E X R	4	.617	1.55	
10. Error (N/SS-ER)	162	.398		
11. Within subjects	1620			
12. Dyadic partner (DP)	1	.881	3.22	*
13. DP X S	1	.103	.38	
14. DP X S-E	2	.928	3.39	**
15. DP X R	2	.012	.05	
16. DP X S X S-E	2	.438	1.61	
17. DP X S X R	2	.163	.59	
18. DP X E X R	4	.156	.57	
19. DP X S X S-E X R	4	.745	2.72	**

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
20. Error (NDP/SS-ER)	162	.273		
21. Trial block (T)	4	.932	5.42	*****
22. T X S	4	.053	.37	
23. T X S-E	8	.216	1.24	
24. T X R	8	.156	.89	
25. T X S X S-E	8	.145	.83	
26. T X S X R	8	.403	2.31	**
27. T X S-E X R	16	.145	.83	
28. T X S X S-E X R	16	.221	1.27	
29. Error (TN/SS-ER)	648	.174		
30. DP X T	4	.023	.12	
31. DP X T X S	4	.125	.65	
32. DP X T X S-E	8	.157	.83	
33. DP X T X R	8	.161	.84	
34. DP X T X S X S-E	8	.129	.68	
35. DP X T X S X R	8	.343	1.79	*
36. DP X T X S-E X R	16	.132	.69	
37. DP X T X S X S-E X R	16	.142	.74	
38. Error (NDPT/SS-ER)	648	.191		
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* p	.10	**** p	.01	
** p	.05	***** p	.005	
*** p	.025	***** p	.001	

Table I: Analysis of Variance for measure \underline{Z} ; the probability that a subject will respond cooperatively following a play in which he responded non-cooperatively and the other player responded cooperatively.

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
1. Total	1799			
2. Between subjects	179			
3. Sex (S)	1	.151	.14	
4. Self-esteem (S-E)	2	1.867	1.79	
5. Role (R)	2	.486	.47	
6. S X S-E	2	.001	.01	
7. S X R	2	.497	.48	
8. S-E X R	4	.502	.48	
9. S X S-E X R	4	1.661	1.59	
10. Error (N/SS-ER)	162	1.043		
11. Within subjects	1620			
12. Dyadic partner (DP)	1	4.496	5.16	***
13. DP X S	1	.096	.11	
14. DP X S-E	2	.527	.61	
15. DP X R	2	.214	.25	
16. DP X S X S-E	2	.651	.75	
17. DP X S X R	2	.567	.65	
18. DP X S-E X R	4	.714	.81	
19. DP X S X S-E X R	4	1.340	1.54	

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
20. Error (NDP/SS-ER)	162	.871		
21. Trial block (T)	4	3.214	5.85	*****
22. T X S	4	.593	.98	
23. T X S-E	8	1.360	2.47	***
24. T X R	8	.406	.74	
25. T X S X S-E	8	.691	1.26	
26. T X S X R	8	.323	.59	
27. T X S-E X R	16	.608	1.11	
28. T X S X S-E X R	16	.278	.51	
29. Error (TN/SS-ER)	648	.549		
30. DP X T	4	.782	1.39	
31. DP X T X S	4	.628	1.12	
32. DP X T X S-E	8	.393	.70	
33. DP X T X R	8	.230	.41	
34. DP X T X S X S-E	8	.165	.29	
35. DP X T X S X R	8	.599	1.06	
36. DP X T X S-E X R	16	.453	.81	
37. DP X T X S X S-E X R	16	.867	1.54	*
38. Error (NDPT/SS-ER)	648	.561		
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* p	.10	**** p	.01	
** p	.05	***** p	.005	
*** p	.025	***** p	.001	

Table J: Analysis of Variance for measure W; the probability that the subject responds cooperatively following a trial in which both he and the other player responded non-cooperatively.

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
1. Total	1799			
2. Between subjects	179			
3. Sex (S)	1	5.368	3.75	*
4. Self-esteem (S-E)	2	.958	.67	
5. Role (R)	2	2.256	1.57	
6. S X S-E	2	2.032	1.42	
7. S X R	2	.697	.48	
8. S-E X R	4	.842	.59	
9. S X S-E X R	4	2.356	1.78	
10. Error (N/SS-ER)	162	1.430		
11. Within subjects	1620			
12. Dyadic Partner (DP)	1	1.514	1.50	
13. DP X S	1	1.427	1.42	
14. DP X S-E	2	.172	.17	
15. DP X R	2	3.839	3.82	***
16. DP X S X S-E	2	.001	.01	
17. DP X S X R	2	.883	.88	
18. DP X S-E X R	4	.792	.79	
19. DP X S X S-E X R	4	1.002	.99	

SOURCE OF VARIANCE	DEGREES OF FREEDOM	MEAN SQUARE	F	
20. Error (N X DP/SS-ER)	162	1.007		
21. Trial block (T)	4	2.430	3.97	*****
22. T X S	4	.231	.38	
23. T X S-E	8	.398	.65	
24. T X R	8	.698	1.11	
25. T X S X S-E	8	.523	.85	
26. T X S X R	8	.171	.28	
27. T X S-E X R	16	.813	1.33	
28. T X S X S-E X R	16	.487	.79	
29. Error (T X N/SS-ER)	648	.612		
30. DP X T	4	.438	.75	
31. DP X T X S	4	.586	1.00	
32. DP X T X S-E	8	.482	.82	
33. DP X T X R	8	.454	.76	
34. DP X T X S X S-E	8	.753	1.26	
35. DP X T X S X R	8	.841	1.43	
36. DP X T X S-E X R	16	.319	.55	
37. DP X T X S X S-E X R	16	.902	1.54	*
38. Error (N X DP X T/SS-ER)	648	.585		
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* p	.10	**** p	.01	
** p	.05	***** p	.005	
*** p	.025	***** p	.001	

