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**LA THÈSE A ÉTÉ  
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COOPERATIVE BEHAVIOR IN INTERNAL-EXTERNAL LOCUS  
OF CONTROL ADOLESCENTS UNDER AFFECT-LADEN  
INFORMATION

by Charles B. Murray

Thesis presented to the School of  
Graduate Studies of the University  
of Ottawa as partial fulfillment  
of the requirements for the degree  
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C. B. Murray, Ottawa, Canada, 1978

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## CURRICULUM STUDIORUM

Charles Murray was born September 25, 1946, in Kenosha, Wisconsin. He received the Bachelor of Arts from Austin College in Sherman, Texas, in 1968; the Master of Arts in Clinical Psychology from North Texas State University, Denton, Texas, in 1972. The title of his thesis was A Correlational Study of the Weigl-Goldstein-Scheerer Color Form Test and the Proverbs Test.

## ABSTRACT

The present study was designed to explore how affect-laden information, based upon similarity/dissimilarity of ideas and personal evaluation, affects the behavior of male pre-adolescents who are either internally or externally controlled. An initial population of 191 males, ages 12 to 13, was administered the Nowicki-Strickland Locus of Control Scale to determine the individual's locus of control orientation. Participants were then separated into two groups: one group of 40 internals and one of 40 externals, based upon scores on the Nowicki scale. A gaming format allowed for the creation of a situation which could be perceived according to one's locus of control orientation. Immediately prior to participating in the game, each individual was administered one of four treatments: positive, negative, or neutral information. The fourth group received no information. Each subject was led to believe that this information was written by another person participating in the experiment with him. There was no other person.

The experimental game consisted of four phases of 15 trials each, designed in such a manner that the individual would initially receive 100% cooperation in the form of messages from his opponent (phase 1) and then, in phase 2, the individual would be given the opportunity to reciprocate

## ABSTRACT

v

messages. In phase 3, the individual received a 40% reduction in messages. Phase 4 was designed to allow the individual the opportunity to retaliate this decrease in cooperation, thus allowing for the measurement of the dependent variables which were latency of response and retaliatory behavior.

For the latency data, a locus of control by treatments interaction was found. Within the internal group, the positive condition elicited the longest latencies; whereas, in the external group the negative information produced the longest latencies. An interaction was also found between locus of control and experimental treatments for the variable retaliation. Within the internal group, there were no significant differences; however, in the external group, the negative personal evaluation produced the greatest number of retaliations.

These findings were discussed within a social learning theory model, and reflect the importance of considering personality variables as well as individual characteristics as factors in gaming behavior.

## TABLE OF CONTENTS

Chapter	page
ABSTRACT . . . . .	iv
INTRODUCTION . . . . .	ix
I. REVIEW OF THE LITERATURE . . . . .	1
Social Learning Theory	1
The Concept of Locus of Control	6
Locus of Control Studies Utilizing Adult and Late Adolescent Participants	16
Locus of Control Studies Utilizing Child Participants	32
Interpersonal Attraction	37
Use of Games as Tools in Research	43
II. EXPERIMENTAL DESIGN . . . . .	51
Participants	51
Tools of the Experiment	52
Procedure	54
III. PRESENTATION OF RESULTS . . . . .	63
The Statistical Findings Concerning the Dependent Variable Latency of Response	63
The Statistical Findings Concerning the Variable Retaliation	76
IV. DISCUSSION . . . . .	84
Discussion of Response Latencies	84
Discussion of Retaliatory Behavior	92
SUMMARY AND CONCLUSIONS . . . . .	100
REFERENCES . . . . .	105
Appendices	
1. EXPERIMENTAL APPARATUS . . . . .	111
2. NOWICKI-STRICKLAND LOCUS OF CONTROL SCALE FOR CHILDREN . . . . .	113
3. INFORMATION SHEET . . . . .	117
4. INFORMATION GIVEN PARTICIPANT PRIOR TO GAME . . . . .	119
5. INSTRUCTIONS USED IN GAMING SITUATION . . . . .	123
6. STATISTICAL POWER . . . . .	127

LIST OF TABLES

Table	page
1. Locus of Control Scores, Age, and Academic Grade of the Subject Sample . . . . .	57
2. Overall Analysis of Variance for the Dependent Variable Latency . . . . .	65
3. Analysis of Variance for the Dependent Variable Latency: Phases 2 and 4 . . . . .	70
4. Analysis of Variance for the Dependent Variable Latency: Phase 4. . . . .	73
5. Analysis of Variance for the Dependent Variable Retaliation: Phase 4. . . . .	77
6. Analysis of Variance Initial Trial of Retaliation: Phase 4. . . . .	82
7. Analysis of Variance Longest Consecutive Run of Retaliations: Phase 4. . . . .	83

LIST OF FIGURES

Figure	page
1. Latency of Responding, Experimental Conditions, and Phases. . . . .	66
2. Latency of Responding, Phases, and Trial Blocks. . . . .	69
3. Latency of Responding, Phases, and Trial Blocks: Phases 2 and 4 . . . . .	72
4. Latency of Responding, Experimental Conditions, and Locus of Control: Phase 4 . . . . .	75
5. Retaliations, Locus of Control, and Experi- mental Conditions: Phase 4. . . . .	78
6. Retaliations, Locus of Control, Trial Blocks, and Experimental Conditions: Phase 4 . . . . .	80

## INTRODUCTION

Over the past 30 years, research concerning the construct of locus of control has grown enormously. To fully appreciate the major role this concept has come to play in North American psychology, it is significant to note how rapidly the concept has gained in popularity, influenced research, and become a theoretical issue.

Locus of control evolved within the framework of social learning theory (Rotter, 1966). The proponents of this theory have been concerned with trying to integrate two of the major trends in psychology: stimulus-response theory and cognitive theory. Rotter and his associates were originally interested in finding a variable that might be useful in the analysis of how reinforcement influences an individual's expectancies. From his early research, the concept of locus of control emerged. Within a short period of time, scales were developed to measure locus of control, and the term "internal-external locus of control" became standard vocabulary for many psychologists.

Over the past few years, the majority of research with this concept has evolved in one of two directions. Most previous experimental studies have either compared groups of individuals (externals versus internals) or have attempted to attribute certain personality characteristics to both groups. The purpose of the present study is to

investigate how affect-laden information, based upon similarity of ideas and personal evaluation, will influence the game playing behavior of young men who are either externally or internally controlled. The behaviors of specific interest in this study are latencies and retaliations, two variables which have previously been inadequately explored. It is believed that, given a situation in which an individual is led to believe he is participating with another person, the information he receives prior to the game will result in behavioral differences depending upon locus of control orientation.

In the last several decades, the use of games has become a useful tool in allowing experimenters to measure behavior. The use of a game is especially relevant to this study because this tool allows the experimenter to create a situation which can be perceived according to one's locus of control orientation.

This thesis is divided into four chapters. The review of the literature is concerned with a number of relevant theories and specific studies which lead to the formulation of the null hypotheses. The second chapter presents a description of the sample and experimental procedure. The experimental results are presented in the third chapter and a discussion of these findings in the fourth chapter. Conclusions are followed by suggestions for future research.

## CHAPTER I

### REVIEW OF THE LITERATURE

The following chapter presents a review of the literature relevant to this study. It begins in section one by briefly discussing social learning theory. Section two discusses the concept of locus of control and includes a number of theoretical studies dealing with this construct and its history. In sections three and four, a number of divergent studies are discussed which provide pertinent information for the prediction of the experimental hypotheses. There follows a section on interpersonal attraction and some information concerning the use of games as a tool for measuring behavior. The final section contains a brief summary and the null hypotheses.

#### Social Learning Theory

As man has increasingly been able to meet his basic survival needs, more of his time has been spent trying to understand himself and his society. Today's culture is so complex that man is often at a loss as to how to comprehend his interactions with others. Social learning theory (SLT) is one attempt to examine man in his complex environment, focusing especially on human social behavior. The following material will look briefly at the major principles of SLT.

Rotter (1954) and Rotter, Chance, and Phares (1972) have made several assumptions regarding human nature which they believe are useful in explaining social behavior. Rotter (1954) states that "the unit of investigation for the study of personality is the interaction of the individual and his meaningful environment" (p. 25). In other words, to adequately explain personality and behavior, Rotter and his associates believe one must examine not only internal determinants such as traits and needs, but prediction must also include a description of the situation and how it interacts with the internal determinants. Phares (1976) qualifies the above statement by explaining that due to man's past history and experience, he tends to respond to his environment subjectively; hence, not only must the objective properties of the stimulus be considered, but one must also attempt to understand how people interpret these stimuli.

Social learning theory stresses the idea that the majority of human social behavior is, in fact, learned. Rotter et al. (1972) do not rule out the possibility of explaining behavior in other ways such as instincts and biochemical determinants, but believe the learning point of view to be more useful in explaining social behavior. These authors also posit that personality has unity. In this conceptual framework, unity is defined in terms of stability

and interdependence. As man becomes more and more experienced, his personality becomes more stable, so that new learning and experiences are based upon, and interpreted within, a framework of previous experiences. At the same time, behavior is believed to be goal-directed. This provides a motivational base for making choices and selectively attending to his environment.

Expanding the assumption that there is a purposeful quality to human behavior, Rotter (1954) believes that behavior is determined not solely by the nature of the goal, but also by the person's anticipation or expectancy that the goals will occur. This assumption challenges the belief that reinforcement alone explains behavior. In social learning theory, expectancies are a prime determinant of behavior. In accordance with an earlier stated assumption, Rotter states that expectancies are learned, based upon an individual's past experiences with certain behaviors and their outcomes; therefore, expectancies, like other learned behaviors, are subject to change and modification.

Social learning theory concerns itself primarily with how choices are made by individuals given a number of potential behaviors to choose from. Within this theory, there are four major concepts which are used to aid in the prediction of behavior: behavior potential, expectancy, reinforcement value, and the psychological situation. Phares (1976)

states that although SLT looks like a very complex theory since it requires these four concepts to predict behaviors, this complexity is preferable to using a single trait to make complex predictions:

The first variable to be briefly examined is that of behavior potential. Rotter (1975) states that:

the potential for a behavior to occur in any specific psychological situation is a function of the expectancy that the behavior will lead to a particular reinforcement in that situation and the value of that reinforcement (p. 57).

This makes behavior potential a relative concept since one must calculate behavior potential in relation to other alternative behaviors open to the individual. In this theory, behavior is a broadly based term, including all human responses having an effect on the environment, observable as well as implicit (Rotter et al., 1972). So behavior potential is a constantly changing concept since in new situations expectancies and reinforcing values are changed.

A second concept of major importance is that of reinforcement; this is defined as "anything that has an effect on the occurrence, direction, or kind of behavior" (Phares, 1976, p. 15). Reinforcement, like behavior potential, is also a relative term, since the value is determined by the strength of one reinforcement in preference of other anticipated reinforcements that have a possibility of occurring. Once an individual behaves so as

to obtain a particular reinforcer, SLT would predict that at that point, this reinforcer has a greater relative value to the individual than other possible choices (Phares, 1976). However, should an individual attempt to obtain a reinforcement and fail, several things may occur. First, the expectancy may be reduced for obtaining that same reinforcer in a later similar situation. Secondly, it is possible that the reinforcer itself may become paired with the effect of having tried and failed. This would lead to a diminished value for that reinforcer in the future.

Expectancy is defined as "the probability held by the individual that a particular reinforcement will occur as a function of a specific behavior on his part in a specific situation or situations" (Rotter, 1954, p. 107). It is important to note that expectancies are a subjective probability because they are not solely determined by one's past history of reinforcement, but also by the generalization of expectancies from other related behavioral-reinforcement sequences. Therefore, in novel situations, generalized expectancies are likely to play an important role in determining behavior. As the individual becomes more experienced in a particular type of situation, generalized expectancies will be replaced by specific expectancies.

Theorists who subscribe to the social learning theory model believe that failure to take account of the psychological

situation reduces predictive efficiency (Phares, 1976). Each situation presents a variety of clues which serve to alert in the individual certain expectancies for reinforcement of specific behaviors (Phares, 1976). The way an individual characterizes a situation has great import upon his expectancies and the value he places on reinforcements.

It was mentioned earlier in reference to expectancies that, in novel situations, generalized expectancies are important in determining behavior. This implies that people tend to categorize situations along certain dimensions. Phares (1976) mentions that generalized expectancies are similar to learning sets because the individuals see them as presenting similar problems to be solved. An important example of a generalized expectancy is locus of control.

#### The Concept of Locus of Control

Working within a social learning theory model, Rotter, Seeman, and Liverant (1962) define locus of control as one of the ways in which individuals try to make sense of, or categorize reinforcing events. To understand the above statement, one must grasp that, for Rotter, reinforcement "is not a simple stamping-in process, but depends upon whether or not the person perceives a causal relationship between his own behavior and the reward" (Rotter, 1966, p. 1). A reward, then, for one individual in a particular situation

may not be regarded as a reward by a second person in that same situation. What Rotter believes to be important is whether or not the individual perceives that the reward is contingent upon his own actions or whether he believes the reward is controlled by forces outside himself.

Rotter (1966) speaks of a continuum of locus of control. An individual who embraces an external locus of control would believe that the reinforcements he receives are not contingent upon his own actions. In other words, reinforcement is controlled by the external world. There are several possible reasons for this point of view. The belief in luck, chance, fate, or simply the fact that the world is too complex to be predicted, would predispose an individual toward an external orientation. In contrast to this frame of reference, the internally oriented individual believes that what happens to him and what rewards he receives are a consequence of his own actions—not a result of outside forces. Rotter et al. (1962) point out that "it is conceivable but highly unlikely that all or almost all rewards are characterized as exclusively internal or external by a given individual" (p. 500). Thus, it would appear that it is the individual's own history of reinforcement which determines whether or not he would perceive the reinforcement to be contingent upon his own activities.

Reinforcement, with this theory, acts to strengthen an expectancy that a particular behavior or event will be followed by that reinforcement in the future. Once this expectancy is established, the failure of the reinforcement to occur will extinguish the expectancy (Rotter, 1966). It is important to realize that these expectancies are not solely determined by specific experiences in the situation, but also by experiences in other situations that the individual perceives as similar (Rotter, 1975). The locus of control construct, then, becomes a generalized attitude regarding the nature of the relationship between behavior and reinforcement or lack of reinforcement. These generalized beliefs, Rotter believes, affect a variety of behavioral choices in a broad range of situations (Rotter, 1966). However, Phares (1976) cautions experimenters that the use of locus of control without a theoretical framework invites a low level of prediction.

The first attempt to measure these individual differences in a generalized expectancy was accomplished by Phares (1957). He developed a scale, on a priori grounds, and found that, with this instrument, prediction of behavior within a task situation was possible. His study was designed to test the hypothesis that expectancies for success will differ under chance and skill conditions. His subjects were asked to match colors and lengths of line, with one-half

of the subjects being told the task was so difficult as to be a matter of luck. The other half of the subjects were told that matching was a function of the skill of the subject. Specifically, Phares found that increments and decrements in expectancy were greater under skill than chance conditions. He also found that frequency of expectancy change was greater in the skill condition and that there were more unusual shifts in the chance conditions. Phares' explanation for his findings was that skill conditions provide a greater basis for generalizing from past to future than do chance conditions. Specifically, individuals who scored within the "external" range of his scale behaved in a manner similar to all subjects when placed in a chance versus skill situation. James (1957) revised Phares' original scale and predicted that within each group, regardless of chance or skill instructions, those subjects who scored towards the external end of the scale would behave in each group in the same way as the difference between the chance group and the skill group for all subjects. James found a significant, but low, correlation between his test and behaviors in the task situation.

Phares' and James' scales were followed by the work of Rotter, Seeman, and Liverant (1962). These men devised a locus of control scale that would contain items from several areas: academic, recognition, social recognition,

love, affection, dominance, social-political events, and general life philosophy. Their earliest scale contained 100 items. A final revision of this scale came in 1966 and has become known as the Rotter Internal-External Control Scale (I-E). This version consisted of 23 items along with six filler questions and is presented in a forced-choice format. It is an additive scale, for the items attempt to sample I-E beliefs across a range of situations. Rotter believes that because it samples a variety of areas, the scale can claim to be a measure of generalized expectancy. Phares (1976) points out that a measure of locus of control such as the Rotter scale allows us to describe an individual's "average" locus of control attributes over many situations. One must keep in mind that the wider the range of situations, the less predictive the concept will be.

The Rotter scale has been used in many studies. As the literature has grown enormously, there have been several comprehensive reviews (Joe, 1971; Lefcourt, 1966; Procuik & Lussier, 1975; Throop & MacDonald, 1971). Despite the scale's popularity and usefulness, it has been criticized for its relationship with social desirability, for confounding different types of locus of control, and for its difficult reading level (Nowicki & Duke, 1973). In an effort to correct these difficulties, Nowicki and Strickland (1973) first devised a locus of control scale for children,

and later extended this scale to adult populations (Nowicki & Duke, 1973).

The entire area of locus of control has grown tremendously over the last few years. Today there are well over a thousand studies dealing with this single aspect of social learning theory. These studies range from attempts at delineating the antecedents of locus of control to studies concerned with mastery of the environment. Before considering studies which are specifically concerned with this thesis, it seems useful to briefly review the significant findings in several of the major areas of locus of control so as to be able to place the present study in context.

Phares (1976) states:

The best single indicator of the validity of the I-E Scale would undoubtedly be evidence showing that internals are more active, alert, or directive in attempting to control and manipulate their environments than are externals (p. 60).

This hypothesis has received substantial support in a wide range of studies, as well as with various subjects. Seeman and Evans (1962) and Seeman (1963) consistently found that externals do not acquire the kind of information which would enhance their ability to cope with the world in a more effective manner. Considering the cognitive aspects of personality, Phares, Ritchie, and Davis (1968) found internals more willing to take action to rectify their own shortcomings, which is another example of how people can

master their environment. In summary, internals are generally more interested in acquiring information, and are better at utilizing this information (Phares, 1976).

The use of locus of control in a social context has been an area which has attracted the attention of researchers, especially in the area of ability to resist coercion. In general, individuals who perceive themselves to be in control of their lives appear more cautious of others' attempts to manipulate them through persuasion or other forms of social influence. Internals also seem better able to make independent judgments and appear to be less susceptible to pressure and control from others, especially when it comes to attitude changes (Phares, 1976). When internals do tend to conform or change their opinions, it appears to be the result of an analysis of the relevant aspects of the message.

An area within the dominion of social context studies is that of locus of control and altruism. At the present time, the relationship between these two variables is not clear. There is evidence (Phares & Lamiell, 1975) which suggests that internals not only hold themselves responsible for their behavior, but they believe others are responsible for their own behavior. The authors interpreted this study to imply that internals may be less altruistic than externals. At present, however, there seems to be no clear relationship.

Another popular area of LOC research has to do with anxiety, adjustment and reaction to threat. There seems to be substantial evidence which tends to support the hypothesis that externals are more anxious (Joe, 1971). Research suggests that externals describe themselves as more anxious, more concerned with failure, and less able to overcome frustration. However, as Phares (1976) points out, most of these studies are correlational and utilize only a self-report measure of anxiety; consequently, the question of whether anxiety leads to an external belief system or whether externality leads to anxiety, has not really been answered. Considering adjustment, Phares (1976) postulates that at the very extremes of the LOC scale, one might find maladjustment. It would appear from the many studies that when it comes to admitting to threatening stimuli, externals are more willing to do so. Rotter (1966) commented:

The external has less need to "repress" his failures since he has already accepted external factors as determining his success or failure to a greater extent than those subjects scoring as more internal (p. 22).

Since the beginning of the 1970s there has been an increasing interest in trying to discover some of the antecedents of locus of control. Lefcourt (1972), in his review, reported that the early research supported the idea that a warm, consistent, accepting home with predictable parents was more commonly reported by internal children than

by externals. Looking at this same area five years later, Phares (1976) found consistent support for the above hypothesis. Phares also reported that there is some evidence that ordinal position in the family may also affect locus of control.

One area which is now being explored with children is that of achievement and delay of gratification. With adults, the literature has shown some differences between internals and externals in terms of mastery of their environment; however, some of these issues do not really seem relevant for children. As Phares (1976) mentions, the real business of childhood is school. A general finding has been that the achievements of internal pupils, as measured by school grades and test scores, are more substantial than those of externals (Phares, 1976). In terms of delay of gratifications, the general findings have been that internals are more willing to do so; however, Lefcourt (1972) points out that these studies have often suffered from methodological difficulties.

The above five areas of locus of control research were selected as a representative sample of the field. However, that does not imply that these areas are the only ones with ongoing research. As any recent review demonstrates (Prociuk & Lussier, 1975), the field is constantly expanding in new directions. As stated earlier, social

learning theory is concerned with how individuals make choices given a variety of potential behaviors to choose from. As this theory predicts, a person's choice or decision is often influenced by many things, i.e., expectancies, reinforcement value, and the specific situation. The concept of locus of control has emerged from social learning theory and has aided in prediction of many types of behavior.

Two variables from locus of control research which have not been systematically explored in interpersonal situations are latency and retaliation. In some interpersonal situations, an individual is placed in a position of having to decide whether or not to respond to another individual. Should the person decide to respond, the decision then must be made as to what form the response will take. The present study is specifically interested in looking at the effect of affect-laden information on behavior when given prior to an actual social situation (game). It is hypothesized that a person's locus of control orientation should have an influence on the time it takes an individual to decide whether or not to respond (latency) and the form his response will take (cooperative versus non-cooperative/retaliation). The following studies, although in many cases are not directly concerned with latency and retaliation, are important, for they provide the background information necessary for prediction of how a person might respond in a gaming situation in terms of latencies and retaliations.

Locus of Control Studies Utilizing Adult and Late Adolescent Participants

The present investigation is mainly concerned with middle childhood and early adolescence (12 - 13 years old). A review of the literature portrays a sparsity of studies analyzing the variables latency and retaliation in social situations with younger children. Therefore, it is necessary to first review the literature using adult and adolescent populations.

Hersche and Scheibe (1967) correlated the I-E scale with the Adjective Check List (ACL) and with the California Psychological Inventory (CPI). Results showed that internals scored higher than externals on the Dominance, Tolerance, Good Impression, Sociability, Intellectual Efficiency, Achievement via Conformance, and the Well-Being scales of the CPI. On the ACL, internals tended to describe themselves as assertive, achieving, powerful, independent, effective, and industrious. Duke and Nowicki (1973) repeated the above study, only substituting their own locus of control scale, and concluded that the patterns of correlation with the ACL were very similar. The most recent large-scale study was that of Gough (1974). Using university students, Gough tested all subjects with the CPI and the I-E scale. He found that 20 out of 23 correlations were negative, indicating that higher scores on the CPI were, in general,

indicative of lower scores (internals) on the Rotter scale. Correlations ranged from  $-.01$  to  $-.35$ . Subscales which gave the highest  $r$  ( $-.35$   $p < .01$ ) were the Tolerance, Good Impression, and Achievement via Conformance.

While the above studies attempted to find correlations between locus of control and a broad range of personality variables, the majority of studies have utilized only one personality variable at a time. Phares (1965) hypothesized that internals, due to the belief that they are in control of reinforcement, should be more effective agents in bringing about change than would the externals. In that study, Phares had both internal and external subjects read given information in an attempt to influence neutral subjects who previously expressed attitudes regarding a variety of campus issues. He found that internal subjects, as predicted, were able to induce significantly more attitudinal changes than were externals. Although this study did show positive results and suggested how important the locus of control variable is in the study of social influence, Phares believed it was not clear how the superior influence on the part of internals was conveyed. For example, there were variables like skill in oral reading, social skills, or personal appearance, any of which might have biased the results. The study was important, however, in suggesting that locus of control plays an important part in situations involving social influence.

A logical question which arises from the hypothesis of the preceding study is whether or not internals have a differential preference for conditions that appear to offer maximum control of task outcomes. Julian, Lichtman, and Ryckman (1968) attempted to explore this possibility in a two-part experiment. In part one, they asked both internal and external women subjects to estimate their performance at a number of distances in throwing darts at a target. Once they had established a distance in which they were able to hit the target five out of seven times, they were given the choice of moving closer, and receiving five darts or moving back a greater distance and receiving 10 darts. Significantly more internals chose to move to a closer position from which they had greater control of their performance. In part two, the authors hypothesized that interfering with the control of the performance would be more frustrating to internals than to externals. This time, all subjects were blindfolded and were bothered by the experimenter. Results of this study were opposite to what was predicted. It was the external subjects whose performance was most adversely affected. The authors explain these results by suggesting that externals are more concerned about chance situation outcomes, while internals are more concerned about skill situations. Since the subjects were blindfolded, the authors hypothesized that the internals no

longer interpreted the situation as a skill situation. This study, as well as the previous study (Phares, 1965), points out the importance of the interaction between locus of control and the task situation. It appears that, in situations where the outcomes are clearly determined by the skilled performance of the subject, it is the internals who prefer circumstances under which they can exert greater control over their outcomes.

Another variable of interest is that of information-seeking. Davis and Phares (1967) attempted to influence another subject's attitude about the Vietnam war. Their major hypothesis was that, in a situation perceived as controlled by neither skill nor by chance, internal subjects will seek more information about the person they will attempt to influence. The experimenters also predicted that internals would attempt to learn more about the issue at stake than would the externals.

The study called for three experimental conditions, each involving different instructions: chance, skill, and ambiguity. In the skill condition, subjects were told that whether or not a person was influenced depended upon the skill of the interviewer. In the chance condition, individuals were informed that it was a matter of luck or chance as to whether the person would be influenced. The final condition consisted of no statement. The number of questions

asked about the other subject was one of the dependent variables. Each subject was instructed to write down the number of questions they would like to ask about the other person. The results showed that, in situations involving skill or ambiguity, internals attempted to gain more information about the person. In the chance condition, there were no significant differences in information-seeking about the issue involved. Criticism has been directed at this study since, when the same subjects were used in a later study, it was found that internals knew more about the Vietnam war than did the externals. Hence, internals would not need to seek as much information as externals. Despite this weakness, the study may have merit in suggesting that information-seeking, at least for internals, is one way of gaining control and, as a result, increasing one's chances of success.

Phares (1968) went beyond the previous study when he compared the tendencies of internals and externals in their use of information for decision-making. He hypothesized that internals better utilize information since they would likely see correct utilization as a pathway toward reinforcement. He presented university students with material they were to learn to a criterion of one errorless performance. The information consisted of four sets of cards with information about four different people. One week later,

the subjects were given a task which required the utilization of the material they had previously learned. For each matching of the information, they were asked to write their reasons. The results showed that internals gave more reasons than externals. Since the information was available to both internals and externals, Phares suggested that internals tend to make use of information which gives them more potential for effectiveness in their social environment. To correct for deficiencies in an earlier study (Davis & Phares, 1967), the present study controlled for variables such as differences in initial learning and motivation, both of which might have affected the results in different social situations.

In many social encounters, a person has the opportunity to behave in an extreme manner; that is, one may take extreme risks, show large shifts in level of aspiration and confidence, and may or may not persist to the end. DuCette and Wolk (1972) designed an experiment to study locus of control and extreme behavior using female high school students. The Rotter I-E scale was administered in the first session. During the second session a questionnaire containing four questions relating to various aspects of future aspiration and risk-taking was given. The second part of the questionnaire asked the subjects to role play some imaginary situations. As measured by scores on the

questionnaire and by behavior during role-playing, externals were significantly more extreme in their behavior than internals in terms of risk-taking, persistence, and atypical shifts. The authors suggest that:

externality not only implies a belief that one's behavior is under external control, it implies that one prefers it this way and will work to attain such an end (p. 258).

DuCette and Wolk explain this phenomenon by considering characteristics of people who continually prefer extreme behavior (externals). When these people choose the extreme option, they, in effect, are assuring themselves of receiving impoverished and biased feedback. The person thereby limits the amount of useful feedback they can receive. When these same people choose either very easy or very difficult tasks, this also allows for little feedback, because continuous success or failure tells a person little about his abilities. The same would also be true of the person who quits as soon as he is able, therefore eliminating feedback about his own ability to perform the task. In their study, although limited by the use of white, middle-class subjects, only the external females acted in the above manner.

The locus of control construct has also been used when examining the way people cope with threatening situations. Phares, Ritchie, and Davis (1968) investigated whether internals and externals differed in the ways they coped with threatening situations. Using male and female

university students, these authors attempted to create a threatening situation by informing the subjects that they were going to take a number of personality tests which would later be interpreted by a psychologist. After taking these tests, the participants were summoned and told eight positive and 11 negative statements about themselves. They were then instructed to circle the number of statements that made them at least slightly uncomfortable. Following this, each subject was given a questionnaire which allowed him or her to seek help. Finally, they were asked to recall all information. The data showed no significant differences on any of the rating scales. However, internals did show a significantly greater willingness to take overt remedial action to correct their personal shortcomings and external subjects did recall a greater number of interpretations, both positive and negative. Previous studies (Phares, 1968; Seeman & Evans, 1962) had both reported greater retention of material by internals. These studies were nonthreatening in nature. The Phares, Ritchie, and Davis (1968) study occurred in the context of threat and therefore suggests the role of anxiety in retention.

Another study which seeks to understand the way internals and externals deal with potentially threatening situations was that of Sherman (1973). He was interested in the interaction between social influence techniques and

locus of control in determining degree of attitude change. He predicted that in a persuasive communication situation where effectiveness depends upon the individual feeling controlled, externals will show more attitude change. In a counter-attitude situation, he predicted that an individual's behavior should be effective in producing attitude change; furthermore, it was posited that internals would show the most attitude change since they would assume responsibility for their behavior.

All subjects were given a brief attitude scale about whether or not 18-year-olds should vote. Two weeks later they were called back and one group was presented with two persuasive communications that argued against lowered voting ages. They were asked to read the two papers and underline the best points. The other group was asked to write an essay against lowered voting age. Since all subjects were previously in favor of a lowered voting age, the experimenters were able to study the attitude changes by giving out a final questionnaire at the end of the study. As predicted, internals were far more susceptible to the counter-attitudinal essay technique, while externals tended to be more influenced by a persuasive message. The importance of this study is that without defining the exact social situation, one cannot make a blanket statement that externals are more susceptible to influence. Sherman

concluded that for persuasive communications, which could represent a threat to one's beliefs, internals will have no conflict since they are confident and are able to resist manipulation; in such a situation, it is the external who will yield. On the other hand, when faced with one's own counter-attitudinal behavior, internals will take responsibility for their acts and feel conflict. As a result of this conflict, they are likely to change their attitudes to achieve consistency.

A threatening situation can very quickly lead to frustration and quite possibly overt aggression. Butterfield (1964) reported evidence that internals and externals responded differently to frustration. He felt that externals generally regard obstacles as "insurmountable" since they seldom believe they have control over reinforcement. Using a self-report inventory, he found that the more internal a subject is, the more he reacts to frustration in a constructive manner. Brissett and Nowicki (1973) believed that reaction to frustration can be accounted for, at least in part, by the generalized expectancy for locus of control and by the type of situation. Using university students, they administered the I-E scale and the Child Waterhouse Frustration Inventory. The latter inventory measures a subject's claimed reactions to frustration in terms of seven tendencies in behavior. Each subject then participated in an angle-

matching task, and was finally asked to complete four TAT cards. The results supported Butterfield's (1964) finding that internals reacted more constructively to frustration than did externals.

Williams and Vantress (1969) were also interested in the relationship between locus of control and aggression. They correlated the I-E scale and the Buss Durkee Hostility Inventory, a self-report questionnaire which measures several different types of aggression. They found a small, but significant, correlation between the two measurements. Externals scored significantly higher on the subscales of resentment, verbal suspicion, and irritability. The authors cite two reasons for their findings. First, they believe that the external person does not perceive himself as able to manipulate the environment in such a way as to obtain goals. Second, they feel that externals see themselves as powerless. Since the external is at a loss in dealing with his environment in a positive, constructive manner, he is quite likely to turn to aggression when his goals are blocked. In a recent study, Dengerink, O'Leary, and Kasner (1975) examined individual differences in aggressive responses to attack. Based upon previous studies on locus of control, they hypothesized that internal subjects, when attacked by another subject, would be more likely to expect their own aggressive behavior to result in the termination

of the attack. They believe that the externally controlled individual will perceive himself as helpless in the face of attack whereas the internal will take necessary steps to improve his condition. The hypothesis was confirmed in that the investigators found that the internal subjects appeared to adopt a strategy of reciprocation. In other words, if they received a light shock, they responded with one. The external group appeared to act as though they were helpless in the face of the other subject.

Jones and Shrauger (1968) were interested in the commonly observed tendency of individuals in social outcomes to reciprocate their evaluations of another, i.e., agree with others who agree with them and disagree with those who do not agree. They created a situation in which an individual would participate in a group test situation with two other peers, during which they would exchange evaluations on one another's answers. By experimentally manipulating which individual sent which evaluation (positive or negative), they were able to analyze social outcomes in terms of reciprocation among members (number of agreements the individual sent to the negative evaluator subtracted from the number of agreements sent to the positive evaluator). The authors hypothesized that externally oriented individuals would reciprocate like evaluations more often than internals. The authors gave two reasons for their belief.

First, they suggested that internals were more likely to perceive themselves as responsible for social agreements and disagreements. On the other hand, externals would tend to perceive others as responsible. Keeping this in mind, they believed that since externals were more likely to blame others, they were also more likely to attribute favorable characteristics to a person providing positive outcomes and unfavorable characteristics to one providing negative outcomes. A second line of reasoning stems from the evidence that internals make more attempts to gain control than externals. In an evaluation situation, an internal person can control outcomes by changing the responses being evaluated by others or by using his evaluations of others to influence their evaluation of him. Either of these two strategies would reduce the amount of reciprocation.

In this study, male and female university students were divided into groups of three people. Each subject was shown a fictitious test and asked to evaluate unanswered statements. During this time, the subjects were unable to see one another and received all feedback by means of a panel of lights. In rotating order, each subject was required to give his answer. This was followed by feedback from the other two in regard to agreement or disagreement. From one individual, the subject received positive evaluation (14 out of 16 agreements), while from the other he

received negative feedback (6 out of 16 agreements). Two different cognitive sets were also created to affect the perceived nature of the task. One-half of the subjects were told the task was a test of skill. The other group was told that the test was not a test of skill, but rather an indication of their own opinions. The hypothesis that externals reciprocate more than internals was supported. The correlation between locus of control and reciprocation was highly significant in the Opinion Condition ( $r = .61$ ,  $p < .01$ ) but insignificant in the Ability Condition ( $r = .09$ , ns). Jones and Shrauger suggest that either internals "were ingratiating the Negative Evaluator or that they were finding his evaluations useful for guiding their own responses" (p. 667). In either case, they felt that the absence of reciprocation was an attempt by internals to improve their outcomes.

Rotter and Mulry (1965) were the first authors to explore the relationship between decision time and locus of control. They hypothesized that it would take internal subjects longer to make a difficult discrimination in a task which they believed to be skill determined. Also, they predicted that in a chance or luck situation, externals will take longer. Using university students, they divided their groups so that one-half of the subjects believed the angle-matching task to be a skill test, whereas the

other half believed it to be a chance task. On the first eight trials, all subjects were told that they were correct 75% of the time. Following this, on every response they were told that they were wrong. On each trial, the person was asked to state the probability as to whether he expected to be right or wrong. Neither internal or external nor chance versus skill instruction was a significant variable of decision time. However, there were significant interactions. As hypothesized, internals did take much longer when given skill conditions. Also, as predicted, externals took longer when given chance conditions but not significantly so. Most of the difference was contributed by internals in the skill condition. This study was important in that it was the first one to point out differences in decision times between groups varying in locus of control.

Lefcourt, Lewis, and Silverman (1968) designed an experiment to elaborate on Rotter and Mulry's (1965) study. They hypothesized that if internals value success more in a skill condition, then this concern should be evident in a better recall of decisions and scores made in skill conditions as compared with chance conditions. Using a Level of Aspiration Board with two sets of instructions, they found that internal subjects did, in fact, have longer decision times when perceiving the task to be skill rather than chance. Additionally, externals had longer decision times

when perceiving the task to be chance rather than skill. In terms of attention to the task, internals looked away significantly more times in the chance condition, while externals looked away more in the skill condition. It would appear from Rotter and Mulry (1965) and Lefcourt et al. (1968) that when it comes to making decisions, externals and internals differ according to their perception of the situation.

The previously reviewed studies confirm that locus of control alone was not sufficient to explain many of the findings. This is not surprising since locus of control is but one aspect of social learning theory. What was found were important interactions between LOC and the task situations. The greatest impact of locus of control is in ambiguous situations. The author of the present study is interested in examining the variables of latency and retaliation in a social situation. It is believed that by using a gaming approach, a situation can be created which is fairly ambiguous; hence, an individual's locus of control orientation should assist the person in evaluating the situation. Consequently, as a result of this evaluative process, there should be differences in the variables of latency and retaliation. The few studies that have examined these variables directly seem to support this conclusion.

Locus of Control Studies Utilizing  
Child Participants

Experiments with children have not dealt with locus of control as a personality variable in exactly the same manner as adult studies. This can mainly be attributed to the fact that most scales were standardized on adult populations. With children, new scales have had to be constructed based on developmental hypotheses. This has not been an easy problem to overcome since one scale would have to be used with different levels of cognitive maturity. Gorsuch, Henigham, and Barnard (1972) pointed out that the scales need to be reliable for all the children with whom it is used. These authors found that different levels of verbal comprehension greatly influenced the child's responses. In their study, children who did not understand the questions tended to respond in a random manner.

To understand locus of control in children, one must first look at the early studies and their attempts to prove and support the developmental hypothesis. The earliest author to postulate a developmental hypothesis was Bailer (1961). He believed that, in the early stages of development, children had little or no concept of the relationship between their behavior and the outcome of events. As a result, Bailer felt that they viewed all experiences as being externally controlled. This lack of connection

between behavior and outcome exists for very young children. As they come to realize the consequences of their actions and see first-hand the effects of their own behavior, they become more likely to view goal-oriented experiences as being internally rather than externally controlled. Bailer hypothesized that development involved movement from an external orientation to an increasingly internal orientation. To test his hypothesis, he created a locus of control scale for children. His subject population consisted of children from grades 1 to 8. Basically, there were three significant findings in his study. First, he found that as his subjects increased in age there was a significant trend for them to move from an external to an internal orientation. Similarly, he found that children were better able to delay their immediate gratifications as they increased in age and, finally, he concluded that children increasingly respond to success-failure clues as they mature. Despite the fact that later authors have criticized his locus of control scale, this study was important in that Bailer was the first person to actually test the developmental hypothesis.

Crandall, Katkovsky, and Crandall (1965) were also interested in establishing that locus of control could be looked at developmentally. In a massive study, they tested children from grades 3 through 12. Their major aim was in

assessing children's beliefs in reinforcement responsibility exclusively in an intellectual-academic situation. The instrument they created to test locus of control limited the external control to those persons who most often came into contact with the child: parents, teachers, and peers. Analyses indicated that internality could develop as early as grade 3, and that it increased with age. The data also revealed some sex differences indicating that girls tended to be more internal between grades 1 to 6, and boys more internal after grade 8. Penk (1969) also investigated this developmental hypothesis. He felt that, as the child came to increase the mastery of his environment, there should be an increase in feelings that events are under his control. These feelings should lead to a decrease in the external view that events are a product of chance. Using the Bailer scale, Penk's hypotheses were supported. Pawlicki (1974), in a later study, confirmed Penk's findings.

In 1971, the American Psychological Association held a symposium on the developmental aspects of locus of control. The members' general conclusions were that the scales commonly in use showed little intercorrelation amongst themselves. Of the several major scales, some were global measures while others measured strictly academic expectancies. To answer the need for a newer and more reliable scale, Nowicki and Strickland (1973) developed A Locus of Control Scale for

Children. They hypothesized that scores would become more internal with age. They also predicted a relationship between internality and achievement. Finally, they believed that with their scale there would be no relationship with social desirability or intelligence. After testing over one thousand students ranging from grades 3 to 12, these hypotheses were supported. Students did respond more internally with increasing age.

As previously stated, the number of studies which have used locus of control as a personality variable with children have been few. One area which seems particularly relevant is that of delay of gratification and locus of control. Zytoskee, Strickland, and Watson (1971) were interested in the relationship between delay of gratification and locus of control. The authors believed that an individual was able to delay his immediate gratification for two reasons. First, they felt that internals have enough faith in their control over reinforcement to risk a short delay in order to receive a larger reward. Their second assumption was the concept of the "powerful other," or the idea that externals might delay gratification if they felt others expected it of them. The subjects for this study were of high school age, 14 to 17. They were given the Bailer scale and, after waiting one week, were given a choice of receiving one record "now" or three records in

three weeks. Each subject was given the preceding information under two conditions: from a high status person and from a low status person. The results of the study showed no relationship between internal and external control and delay of gratification. Strickland (1972) criticized this study on the grounds that the results might have been a function of the wide socio-economic range of the children, and on the use of the Bailer scale. Strickland repeated the above study, only using the Nowicki-Strickland Locus of Control Scale for Children. As a reward, she offered one record "now" or three records at a later date. This time, a positive relationship was found between locus of control and delay of gratification; internals significantly chose a delay of gratification more often than externals. In another investigation, Strickland (1973) used children in grades 3, 4, and 5. She found that age and sex were not related to reward choice. She did find, however, that internal subjects chose to delay rewards more frequently.

Thus far, the major efforts of most research have been concerned with the construction of adequate measurement scales for children and with trying to prove the developmental hypothesis. It would appear from the literature that progress has been made in both of these areas. However, there have been few studies using children which have examined the relationship between information given and its

effect upon a person's behavior in a gaming situation. Since the majority of research has utilized subject populations of adults and adolescents, it was believed that this current research should explore locus of control as a personality variable with slightly younger children-- 12- and 13-year-olds.

Mention was made that certain information was given to the participant. The information presented consisted of a personal evaluation of the subject supposedly written by the other participant. There is growing interest in the field of interpersonal attraction and its effect upon behavior. The previously reviewed locus of control studies suggest that there are differences in how internals and externals interpret, utilize, and are influenced by information. Studies from the field of interpersonal attraction should help clarify the effect this type of information might have on internals' and externals' behavior.

#### Interpersonal Attraction

The assumption that another person is similar to oneself in some manner could have many behavioral implications; for example, assuming someone is attracted to an individual might allow prediction of how this other person would act in a situation. The author of the present study is interested in seeing what effect information, based upon the relationship

between similarity and interpersonal attraction, will have an effect on a subject's behavior when participating in a gaming situation. Depending upon the experimental condition the subject is assigned to, the information presented will be a positive, negative, or neutral evaluation of the participant.

There have been three major attempts to explain interpersonal attraction: cognitive, reinforcement, and interactional theory. The cognitive theory was derived from the works of Heider (1958) and Newcomb (1968). The primary focus of the theory has been concerned with the way in which an individual conceptualizes the relationships among himself, another person, and a third object. This third object could be a person, an idea, etc. These authors believe cognition to be the basic unit in the interpersonal relationship. Baron, Byrne, and Griffitt (1974) point out that what is important about these cognitions is the way they are organized since there is a tendency for individuals to organize their cognitions about the other person and object in such a way that there is a balance or harmony. Newcomb ascribes to the position that we prefer these balanced or symmetrical relationships because it is more useful (Worchel & Cooper, 1976). By this he means that if two people feel the same about an object, then both are in a better position to predict each other's behavior toward

that object. Secondly, knowing another person feels the same way about something helps one to validate one's own opinions.

Not all interpersonal relationships are in balance and, hence, satisfying. Imbalance occurs when two individuals like each other but disagree about the object. According to this theory, once imbalance is perceived, the individual is motivated to seek a solution and alter the situation (Baron et al., 1974).

An alternate model of interpersonal attraction is based upon reinforcement theory. This theory holds that those individuals who are associated with rewards become preferred or liked (Worchel & Cooper, 1976). This occurs first through a reward; that is, some stimuli one prefers over others. This rewarding stimuli arouses positive feelings which can then become attached to a neutral person that is associated with the reward. The implication is that people generally like other people who give them rewards better than those who make them feel unpleasant.

A third possible alternative theory is based upon the interaction between people, not solely upon the analysis of an individual and his response. Baron et al. (1974) postulate that for a relationship to maintain itself both individuals must receive satisfaction. The interaction theory holds that at different points in a relationship,

different variables may be of more or less influence. This model has proposed a number of stages through which relationships must pass to develop into deeper ones, ranging from no relationship to mutuality (Baron et al., 1974).

Perhaps the greatest amount of research in the field of interpersonal attraction has examined the relationship between similarity and attraction. This might be attributed to the fact that two of the major theories, balance theory and reinforcement theory, hypothesize that persons with similar attitudes should be more attracted to one another (Worchel & Cooper, 1976). The literature supports the assumption that similarity does have a major influence on attraction (Triandis, 1977). Of the many aspects of similarity, the best researched relationship has been the one between the proportion of similar attitudes held by two people and the resulting attraction. Byrne and Griffitt (1973) point out that this relationship is a linear one and also mention kinds of similarities that have sometimes been shown to result in attraction: economic status, task performance, emotional states, and certain kinds of personality characteristics.

The greater the similarity between a person and someone else, the more likely it is that the other person will do something rewarding (Triandis, 1977). It has not been found that the more important the attitude on which

two people agree or disagree, the greater the effect this has on their attraction for each other. Gormly (1974) has shown that disagreement often leads to negative responses on scales measuring attraction. However, the level of abstraction of the issue on which there is disagreement seems to be a crucial variable. Gormly found that disagreement has its greatest impact on interpersonal attraction when there was disagreement on values which are at a high level of abstraction. There is also evidence to suggest that there is strong pressure to reciprocate liking (Worchel & Cooper, 1976).

Another major variable which influences attraction is the interpersonal response of the other person. It is a common sense assumption that we all like to hear positive things about ourselves and dislike hearing negative things. The literature on attraction has consistently shown that subjects like those who evaluate them positively and dislike those who evaluate them negatively (Byrne & Griffitt, 1966). Byrne and Rhamey (1965) designed an experiment to explore the effect that both attitude similarity and evaluation has on attraction. In this experiment, subjects examined a stranger's attitudes on 12 topics. These topics agreed with the subject's own attitudes on none, one-third, two-thirds, or all of the issues. In addition, each subject was given either a positive or negative evaluation from

"other participant." The authors found that subjects who agreed on the largest proportion of attitudes and who received the positive evaluation showed the most attraction to the other participant..

There is a special case which arises when dealing with interpersonal evaluations. Most people like to think that the compliments they receive are attributable to themselves and not based on an ulterior motive. Ingratiation is the term used when a person acts in such a way as to illicitly enhance his image in the eyes of another (Worchel & Cooper, 1976). These authors point out that one is less likely to feel attracted to an individual who compliments them if it is felt that that person needs or wants something from them.

The above studies suggest that the variables of similarity and personal evaluation play an important role in determining interpersonal attraction. The present research design calls for presenting information, based upon these two variables, to a subject prior to participating in an experimental game. It seems reasonable to speculate that since these variables influence interpersonal attraction, they might also influence behavior. The experimental conditions are based upon information which combines similarity of ideas with personal evaluation. Thus, an individual will be presented with information designed to

portray attitudes and ideas which are either similar, dissimilar, or neutral, as well as a positive, negative, or neutral personal evaluation. It is believed that this feedback, in the form of information, will have important consequences when playing the game. It has been mentioned that externals and internals appear to make sense of and utilize information differently (Phares, 1976). Consequently, when the same information is given to the two groups of locus of control orientation, there should be behavioral differences in their game playing.

#### Use of Games as a Tool in Research

Luce and Raiffa's (1967) work has been a primary impetus for utilizing games as experimental paradigms in the study of interpersonal interactions. The gaming approach has evolved from problems abstracted from life situations; more specifically, from situations which involve the necessity of making decisions (Rapport, 1966). This approach aims at developing criteria for rational behavior in situations involving partial or total conflict of interests between two or more individuals. Games are particularly relevant to the study of behavior since they deal with choices that people make, especially when individuals have opposing goals in which each player has partial, but not total, control over the outcome.

The internal workings of games has been dealt with by Luce and Raiffa (1967). They assume that two factors are operating in a game. The first factor has been called the postulate of individual utility maximization or individual rationality. This states that each player tries to maximize his own expected satisfaction (or utility). The second, known as the postulate of mutually expected rationality, states that each player expects and acts on the expectation that the other player or players will also try to maximize his own expected utility. These two postulates allow for a description of the interaction of two or more individuals in terms of behavior which can be defined as the pursuit of self-interest.

Rubin and Brown (1975) state that there is little doubt that personality variables, as well as other individual characteristics, are important determinants of gaming behavior. Research (Terhune, 1970) has demonstrated that measures such as cooperation, conflict, and strategy employed by an individual are functions of the person's own underlying personality dynamics. Terhune (1970) believes that "there is always sufficient behavioral variance among subjects to infer that individual differences in personality must be exerting a significant influence also" (p. 194).

Researchers, when trying to discover the relationships among personality variables and behavior in games, have

generally followed the design of separating subjects on some personality dimension. The experimenters have then matched the subjects with respect to the same pole of the presumed continuum or paired the subjects in terms of opposites on the continuum (Terhune, 1970). Other studies have been concerned with controlling the strategy of one player and then seeing the effect this strategy has on the other player. These studies have usually utilized a confederate or an electronic computer as a way of controlling the strategy presented.

Locus of control has previously been defined as a generalized attitude regarding the nature of the relationship between behavior and reinforcement or lack of reinforcement. Since locus of control orientation helps the individual make sense of situations, a correlation ought to exist between what a person thinks and what he does. Rotter (1966) found that LOC affected a variety of behavioral choices in a broad range of situations. The gaming approach should be particularly useful in that games allow the experimenter to create a situation which can be perceived according to the subject's locus of control orientation.

Condry (1967) found no relationship between LOC and behavior in a two-person negotiation game. Bobbitt (1967), in a slightly more complex experiment, did find some interesting results. When he controlled the strategy of one player

so that his responses were consistently competitive, internals behaved less competitively than externals. However, when the individual received predominantly cooperative responses, internals were less cooperative than externals. Internals maximized their own gains by choosing competitive responses when the other consistently cooperated. Externals, however, made cooperative choices in direct proportion to the frequency of the other's cooperativeness.

As previously mentioned, the author of the present study is interested in presenting information in the form of similarity/dissimilarity of ideas and personal evaluation to participants of different locus of control orientations. It is believed that this information should result in behavioral differences as measured by latencies and retaliations in a gaming situation. An important study which looks at the emotional relationship between protagonists is that of Swingle (1966). Swingle, working within a cognitive congruity model, had pairs of male students with different affective relationships compete for a prize in a two-person game. He hypothesized that when one is harmed by an unfavorably evaluated person, that dissonance should be at a minimum since several responses are open to a person in this situation: retaliate in kind, increased ill-will, or withdrawal. Swingle believes, based upon principles of cognitive consistency, that there will be an

increase in ill-will, but no retaliation. When a person is harmed by a friend, then cognitive inconsistency would exist and the individual would likely take a step to resolve the inconsistency. Swingle suspects that in this situation a person will reciprocate the harm, but maintain the original attitude towards the friend. A final situation examined by Swingle was the playing of a game against an unknown partner. In this situation, Swingle predicted that retaliatory harmful behavior would be expected.

Swingle (1966) found that:

the maintenance of cooperative behavior in interpersonal situations, when material rewards are small, is affected by an interaction between the subject's perception of his partner's cooperativeness and the pre-existing affective relationship between these persons (p. 277).

Specifically, subjects who received harm (non-cooperation) from a liked or unknown opponent became less cooperative. Those who received harm from a disliked opponent did not become more uncooperative.

The above study was also important for the reason that Swingle was able to obtain an accurate measure of response latencies by utilizing a four-phased game. The purpose of using four separate phases is, first, to create a situation where an individual receives 100% cooperation from another player (phase 1) and then to provide the player with the opportunity to respond in a like manner (phase 2)

and, second, by decreasing the level of cooperation from 100% to 60% (phase 3), it is possible to create a situation where the individual should perceive a change of strategy on the part of his opponent. Finally (phase 4), the participant will again have the opportunity to respond or not. This design allows for the accurate measurement of the time it takes an individual to decide whether or not to respond (latency), as well as a measurement of whether or not to respond at all (retaliation). It is hypothesized that the information given prior to the game, in addition to the change in reinforcement (100% to 60%) should significantly affect how internals and externals respond in terms of latencies and retaliations.

To review, social learning theory has been one attempt to examine man in his complex environment, focusing especially upon human social behavior. This theory has concerned itself primarily with how choices are made by individuals given a number of potential behaviors to choose from. Expectancies that a person holds regarding the relationship between his behavior and the reinforcement he receives are a prime determinant of social behavior. Depending upon how the person perceives this relationship, Rotter (1966) speaks of a dimension of locus of control. An

externally oriented individual believes that the reinforcements he receives are not contingent upon his own behavior, but rather upon outside forces. In contrast, internals believe that the rewards they receive are based upon their own efforts and behavior.

Various research has demonstrated that internals and externals react differently in many situations and vary among different personality characteristics. One variable which seems of importance in understanding these two types of locus of control orientation is the use of information. In other words, how a person makes sense out of new information will greatly affect that person's behavior in that task. In general, studies have shown internals to be more cognitively oriented, more active in seeking information, and show superior utilization of information over externals.

It would appear, then, that at least for general information, internals are more active from a cognitive point of view. However, in many situations, especially interpersonal contexts, one is asked to make sense out of information which is very affect-laden. It is suspected that locus of control would also aid in the prediction of how an individual would interpret and react to this type of information. The affect-laden information presented in this study was based

upon similarity/dissimilarity of ideas and personal evaluation. Studies from the area of interpersonal attraction have demonstrated that these two types of information have profound influence upon interpersonal relationships.

When looking at the relationship between locus of control and affect-laden information, two variables which have not been adequately explored in this type of situation are latency of response and retaliatory behavior. People are often placed in situations where it is necessary to decide whether to respond to another (latency) and, if so, what form the response will take (cooperative/noncooperative). Since the locus of control orientations make sense out of information differently, it is suspected that, as a result of their decision processes, there should also be behavioral differences on these variables.

Affect-laden information, especially that based upon personal evaluation, plays a crucial role in interpersonal relationships during the preadolescent and adolescent period. This is a time of intense emotional relationships which often have long lasting effects upon a person's ideas and behaviors. Developmentally, it is a period where the young person is forced to explore new roles and situations. In these new situations and roles, the

situational clues and information present are quite minimal, so how an individual interprets the givens of this new situation should greatly affect his behavior in that situation. As locus of control has its greatest input in new or ambiguous situations, the period of adolescence should be particularly relevant for exploring this construct, especially considering the importance of affect-laden information to the adolescent.

A gaming paradigm was chosen to explore the relationship between locus of control and affect-laden information. Since locus of control helps the individual make sense of situations, a correlation ought to exist between what a person thinks and the behavior he displays in the game. An important aspect of this approach is that it allows the experimenter to create a situation which is somewhat ambiguous in nature and permits interpretation according to locus of control orientation. By presenting affect-laden information prior to the game, it is suspected that, depending upon a person's locus of control orientation, there will be differences on the variables of latency and retaliation.

Since the literature has shown that internals are more active in the cognitive realm, it is hypothesized that when presented with affect-laden information their latencies

would be longer than externals. It is believed that they would devote more time to analyzing this information which, for them, would be a way of gaining control of the situation. On the other hand, externals' latencies may not be based so much upon a cognitive elaboration of their impending decision, but more upon a reaction to the social parameters i.e. personal evaluation and reductions of partner's cooperation. The externals' latencies should vary according to the nature of the information presented. For retaliatory behavior, it is believed that internals would be more likely to delay their impulse to retaliate and, hence, by not doing so, to control the general atmosphere of the game. Externals, on the other hand, should react and retaliate according to the evaluation they receive. A formal elaboration of these ideas is now articulated in the form of the null hypotheses.

1. There is no significant difference between internals and externals on response latencies.
2. There is no significant difference in response latencies between experimental conditions.
3. There is no significant difference between internals and externals in retaliation.
4. There is no significant difference in response retaliations between experimental conditions.

## CHAPTER II

### EXPERIMENTAL DESIGN

#### Participants

The participants in this study were males. The literature frequently presents studies of contrasting sex-role differences; therefore, to eliminate this possible confounding variable, only males were utilized in this study.

The initial population consisted of 191 males at Lester B. Pearson Junior High School in Ottawa, Canada. This school was chosen by the research committee of the Carleton Roman Catholic School Board. The age group of the population utilized was that of 12- and 13-year-olds, which corresponded to the academic grades 7 and 8. A review of relevant literature showed a sparsity of studies similar to this experiment utilizing children of this age range. Although no racial criterion was pre-established, all participants were Caucasian. Only English-speaking males were used in order to eliminate possible language comprehension problems. Previous research (Nowicki & Strickland, 1973) has shown that locus of control does not correlate reliably with intelligence test scores; therefore, the principal was asked to review the subject list and eliminate all individuals whom he felt were not of average intelligence or who were behavioral problems. No participants were eliminated by the

principal. This might be attributed to the fact that by the seventh grade, due to the screening processes in the schools, most children of below-average intelligence had been placed in special education classes. Two parental permission forms were utilized, one asked permission for their son to be allowed to fill out a personality questionnaire--all parents agreed to this. At a later date, a second letter was sent to the parents of those participants chosen for the actual experiment. One parent refused to allow his child to participate.

#### Tools of the Experiment

The gaming apparatus consisted of a standard table-mounted relay rack having a steel face panel. At the subject's eye level was located one yellow "go" light. Slightly below this light were two other stimulus lights--one green and one blue, with a push button below each light. In the far right-hand bottom corner was an automatic counter which registered a response whenever one of the above buttons was pushed (see Appendix 1 for a complete diagram). The control of the different panel lights, dispensing of points, and recording of data were all accomplished automatically through a computerized "Behavioral Laboratory" manufactured by Lehigh Valley Electronics, Fogelsville, Pennsylvania. This programming apparatus was acoustically and visually

isolated from the experimental room. This apparatus allowed for an accurate measurement of the dependent variables mentioned in the hypotheses. A pilot study demonstrated that both the apparatus and the gaming program were comprehensible to males of this age.

The Nowicki-Strickland Locus of Control Scale for Children (1973) was used to determine the individual's locus of control. This test is a paper-and-pencil scale consisting of 40 questions which are answered either "yes" or "no" (see Appendix 2, for complete scale) and is based upon Rotter's dimension of internal-external control. The Rotter I-E scale was standardized on adult populations and, therefore, seemed inappropriate for use with this age of children. Of all the previously reviewed LOC scales for children, the Nowicki-Strickland scale was considered to be the best scale for this study, based upon findings concerning both the statistical properties of the scale and its support of the developmental hypothesis.

An information sheet of seven questions was designed by the experimenter to elicit background information from all participants (see Appendix 3 for complete questionnaire). This sheet, although never actually used in the experiment, was provided to tap information based upon principles of interpersonal attraction (Triandis, 1971). One final information sheet was given to each participant. This sheet consisted of three parts: part one was a number of pairs

of adjectives, part two was a handwritten paragraph, and part three was a line consisting of the words "like," "neutral," or "dislike." The entire sheet was filled out by the examiner in either a positive, neutral, or negative direction in each of the three sections mentioned above.

#### Procedure

The initial testing for locus of control of all seventh and eighth grade male students was accomplished in one session. Each student was asked to complete the Nowicki-Strickland Locus of Control Scale for Children and a background information sheet. This was accomplished in the school cafeteria and took approximately one hour.

Since locus of control is a developmental concept, there is no one cut-off score to determine either internal-ity or externality for all groups of people; rather, the experimenter must take the age of the individual into account. Following a general procedure utilized by Nowicki (1976a), the students were separated into groups of internals and externals by eliminating individuals falling within one-half a standard deviation above and below the mean of the population or sample group. The population mean obtained was 12.80, with a standard deviation of 4.31. This mean was found to be very similar to other studies utilizing the same age groups (Nowicki, 1976b). When applied to the

range of population scores, this method eliminated the middle 50% of the subjects. For this study, an internal subject was operationally defined as an individual with a score of 9 or below on the Nowicki-Strickland scale, whereas an external individual was considered to be a person obtaining a score of 15 or above. Using this method a subject pool of 99 individuals remained.

After separating the subjects into two major groups based upon LOC, the internals were then randomly assigned to one of four treatment conditions; the same procedure was initiated regarding the external group. The experimental treatment conditions consisted of three types of information given to the participant immediately prior to playing the game. The subjects were randomly assigned to these treatment conditions, each participant receiving information presented in one of three directions: positive, negative, or neutral. The fourth group received no information prior to beginning the experiment. The information presented consisted of a sheet of paper which the subject was led to believe was written by the other person participating in the experiment with him. This sheet of paper consisted of three parts. In the first section was 11 pairs of adjectives commonly used to describe people. Depending upon which treatment the individual received, these adjectives were checked in such a way as to describe a person in either a

positive, negative, or neutral manner. Following this was a handwritten paragraph mentioning such things as wanting or not wanting to have this person as a friend and liking or disliking the same kinds of people. This, too, was written in one of the three directions. Finally, at the bottom of the page was a line on which either the word like, dislike, or neutral was circled to coincide with the information presented in the first two sections (see Appendix 4 for exact information presented). The fourth group received no information prior to starting the game.

Since the balanced design called for a total of 80 subjects, there were 40 internals with 10 individuals per treatment group, and 40 externals with 10 individuals per group. Table 1 shows the characteristics of these groups. The subjects not assigned to a treatment group were put into a pool to be used later if necessary.

Each subject was met at his classroom by the experimenter and led to a large room with several adjoining rooms. Once seated, the participant was told that his purpose in being there was to see "how people make simple decisions." They were informed that they were participating with another individual somewhere else in the building. The sex of this other person was not mentioned in order to make this aspect as ambiguous as possible; thus the subject might project his own ideas regarding his opponent into the game. No other

Table 1  
Locus of Control Scores, Age, and Academic Grades of  
the Subject Sample

Group	<u>N</u>	$\bar{X}$ LOC Test Scores	<u>SD</u>	$\bar{X}$ Age in Years	<u>SD</u>	$\bar{X}$ Grade	<u>SD</u>
<b>Internals</b>							
Positive	10	7.5	1.68	12.7	.64	7.5	.50
Negative	10	7.5	1.57	12.6	.67	7.6	.49
Neutral	10	7.5	1.28	12.5	.67	7.4	.49
Control	10	7.6	1.49	12.5	.50	7.5	.50
<b>Externals</b>							
Positive	10	18.0	2.28	12.7	.90	7.3	.46
Negative	10	17.9	2.38	12.6	.80	7.3	.46
Neutral	10	18.2	3.05	12.9	.98	7.4	.49
Control	10	18.5	3.20	12.7	.65	7.5	.50

information was given about this "fictitious" person regardless of the number of questions the subject asked. The instructions were presented to the individual on a typed sheet of paper. As the subject read them silently, the experimenter read them aloud. After the participants were given the instructions, they were then presented a sheet of paper which they were told was completed by the "other participant" (see Appendix 4). They were asked to recall the background information sheet that they had filled out during the initial testing session. Each individual was told that his information sheet was given to this "other participant," and that, based upon what he had written down, the other participant was making his "best guess" about the subject. As there was no other participant, the experimenter supplied three different modes of information depending upon the treatment group the individual was assigned to.

The actual experimental game was a slight modification of the one designed by Coady (1971). All subjects, regardless of treatment group, played the same game. This game consisted of four phases. It was necessary to have a four-phased game for two reasons: first, in order to establish an initial level of cooperation on the part of the subject and, second, to set the stage for a reduction in reinforcement level, which the subject should perceive

as a change of strategy on the part of the other player. Each phase consisted of 15 10-second trials each with a 5-second interval between the termination of one trial and the beginning of the next. It was found, in a pilot study, that it was necessary to have 15 trials in each phase in order for the subject to reach asymptote, but beyond 15 trials, the participants seemed to lose interest and motivation in the task. A 10-second trial was chosen in order to allow the subject the time needed to respond to the stimulus lights and make a decision. A 5-second inter-trial interval was utilized to keep the participants motivated during the 15-trial sequence. This time was found to be long enough to allow the subject a brief break yet short enough to command his attention to the next response.

After explaining the instructions for phase 1 only (see Appendix 5 for complete instructions), each individual was given three practice trials. The purpose of these trials was to familiarize the individual with the machine. Following these practice trials, the experimenter left the room and did not appear until the end of the phase. At this time the explanation was given for the next phase.

In phase 1, the subject received a message (one of the lights coming on) from the other person (the pre-set computer program) 100% of the time. The yellow warning light came on for 5 seconds. This light was followed by

one of the other lights programmed in random order. This second stimulus light stayed on for 5 seconds. If the person pressed the button underneath the light which was on within the time limit, then he received 1 point on the counter. Phase 1 was designed to familiarize the subject with the game and the apparatus; however, the major impetus of this phase was to create a situation where the subject received 100% reinforcement so that during a later phase this level, when altered, would be perceived by the subject as a change in strategy and level of cooperation on the part of the other participant.

In phase 2, the participant was given the opportunity of sending the message to "the other." It was explained that once the yellow warning light came on, the individual had the opportunity to push one of the other buttons. By doing so, it would allow "the other" to know which light was on and receive a point. Thus, by pushing the button every trial, it would allow "the other" to receive a maximum of 15 points. It was also explained that if the individual did not press the button within the time limit, "the other" would not be able to receive a point. A cooperation level of 100% was necessary in this phase in order to establish initial level of cooperation. Four subjects, three internals and one external, were disqualified in this phase for not meeting the criterion of 100%. They were replaced by participants with their exact score on the locus of control scale.

Phase 3 was identical to phase 1 except that the subject received only 9 stimulus lights after the onset of the warning light instead of the maximum 15 lights. This was a 40% decrease in the number of lights received in phase 1. A pilot study of male preadolescents similar in age indicated that this level of partial reinforcement was perceived as being the result of a change in strategy. This phase was crucial since applying the experimental treatment (60% reinforcement) in conjunction with the prior information, a situation was created which could produce differences in latencies and retaliations.

Phase 4 was exactly the same as phase 2, allowing the subject the opportunity to either send a message or to retaliate by sending no message; thus, phase 4 allowed for the accurate measurement of the dependent variables.

The experiment took place from January 19 to February 18, 1976. Since the experiment extended over a month, each subject was informally questioned at the end of his participation. A series of informal questions were asked in part to insure that the participant understood what was happening in the game, and also to obtain his view of the other person. Due to the nature of these questions, they were not analyzed for quantitative analysis in this study.

Although some information regarding the type of experiment had seemed to spread, no subject ever questioned if another player was actually present. At the end of the experiment all subjects were gathered together and debriefed. All questions were answered at this time and the experimental procedure was explained.

The present study utilized two dependent variables: latency and retaliation. In phases 1 and 3, a latency was defined as the time it took the individual to respond after the onset of the stimulus light to receive a message. In phases 2 and 4, latency was defined as the time it took the individual to respond to the onset of the stimulus light to send a message; consequently, regardless of the phase of the experiment, a latency was always a response time either sending or receiving a message. A retaliation was recorded when the individual did not send a message during the allotted 5.0 second time period in phase 4.

## CHAPTER III

### PRESENTATION OF RESULTS

This chapter will present results stemming from the research findings in terms of the hypotheses formulated at the end of Chapter I. Summaries of analyses of variance of the two dependent variables, latency of response and retaliations, will be presented and commented upon.

#### The Statistical Findings Concerning the Dependent Variable Latency of Response

Statistical procedures for the dependent variable latency included a four-way analysis of variance, with repeated measures as described by Kirk (1969). The overall analysis of the latency data consisted of the following factors: locus of control (L), experimental conditions (C), phases (P), and trial blocks (T). Before submitting to the statistical analysis, the data in phase 4 was "corrected." When an individual did not send a message during the allotted 5.0 second time period (interpreted as a retaliation), the machine recorded a 5.0 second time latency. Since the individual did not respond at all, a score of 5.0 seconds cannot be interpreted as a latency. In order to "correct" for this occurrence, the mean of the trial block in which the retaliation occurred was substituted for each score of 5.0 seconds.

A summary regarding the analysis of variance for the overall latency data is presented in Table 2. The first null hypothesis, that there is no significant difference between latencies of externals and internals, was not rejected. A significant difference was found among the experimental conditions (C), ( $p < .05$ ). Applying a Tukey test (Kirk, 1969) to the means of the four experimental conditions, it was found that the positive condition ( $\bar{X} = .7104$ ) had significantly longer latencies than the control condition ( $\bar{X} = .4133$ ). This would provide evidence to reject the null hypothesis that there is no significant difference among experimental conditions.

When analyzing latencies between the four phases, a highly significant  $F$  was found ( $p < .001$ ). Applying the Tukey test to the means yielded the following results: phase 4 ( $\bar{X} = .8892$ ) had significantly longer latencies than phase 2 ( $\bar{X} = .5424$ ), phase 1 ( $\bar{X} = .3867$ ), and phase 3 ( $\bar{X} = .4058$ ). It was also found that phase 2 differed from phases 1 and 3 ( $p < .05$ ). These results are not surprising since phases 1 and 3 were controlled by the experimental apparatus; phases 2 and 4 were the results of the individual's own decision as to when he would respond.

Adding clarification to the above finding, was a significant interaction (see Figure 1) found between experimental conditions (C) and phases (P) ( $p < .001$ ). A Tukey

Table 2  
Overall Analysis of Variance for the Dependent Variable  
Latency.

Source	<u>df</u>	<u>ms</u>	<u>F</u>
Between			
Locus of Control (L)	1	.2042	.1985
Conditions (C)	3	3.5855	3.4849*
L X C	3	1.9565	1.9021
Error	72	1.0286	
Within			
Phases (P)	3	12.9924	39.1711***
L X P	3	.0462	.1395
C X P	9	1.0731	3.2351***
L X C X P	9	.5082	1.5322
Error	216	.3317	
Trials (T)	2	.5440	4.8478**
L X T	2	.0344	.3069
C X T	6	.1461	1.3014
L X C X T	6	.0347	.3100
Error	144	.1122	
P X T	6	.2442	2.5772**
L X P X T	6	.1488	1.5708
C X P X T	18	.1064	1.1236
L X C X P X T	18	.0606	.6395
Error	432	.0947	

\* $p < .05$

\*\* $p < .01$

\*\*\* $p < .001$

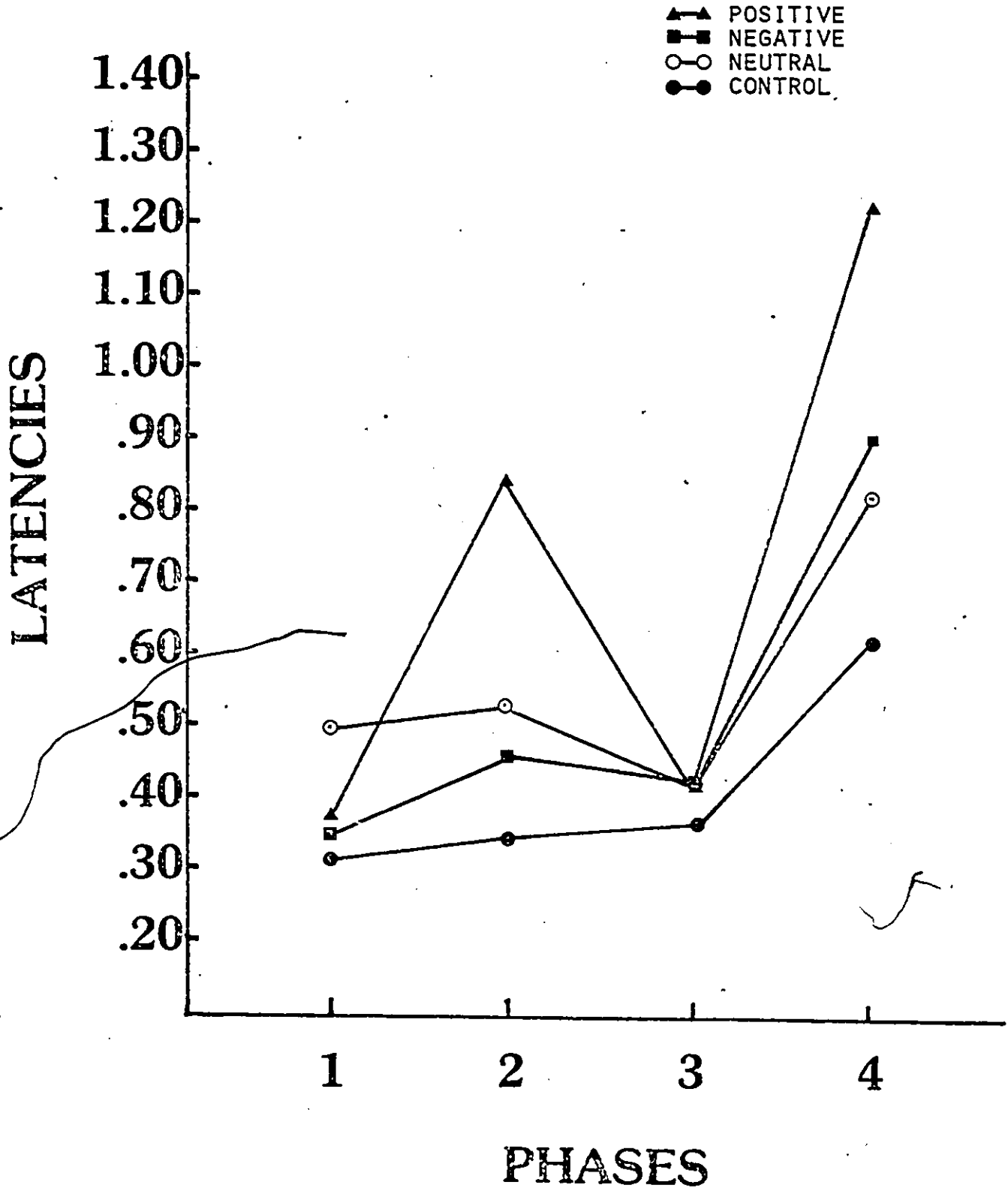


Figure 1. Latency of Responding, Experimental Conditions, and Phases.

test comparing the mean latencies of phases 1 and 3 showed there to be no statistically significant difference. In phase 2, it was found that the positive condition ( $\bar{X} = .8383$ ) differed from the neutral condition ( $\bar{X} = .5283$ ;  $p < .05$ ), and from the negative ( $\bar{X} = .4583$ ) and control ( $\bar{X} = .3450$ ) conditions ( $p < .01$ ). Hence, individuals in phase 2 given a positive statement took longer to respond by sending the message than in all other conditions. In phase 4; after having received a 40% reduction in messages, it was found that the positive condition ( $\bar{X} = 1.22$ ) differed from the negative condition ( $\bar{X} = .9017$ ;  $p < .05$ ). The positive condition also differed from the neutral ( $\bar{X} = .8183$ ) and from the control ( $\bar{X} = .6199$ ) at the .01 level (Tukey test). In this phase, the negative condition differed significantly from the control condition ( $p < .05$ ). After having received non-cooperation from the fictitious "other," all phase 4 latencies were increased over phase 2. This suggests that the treatment effect of the 60% reinforcement significantly increased the response latencies of the subjects in the final phase.

In the analysis of trial blocks, it was found that the mean latencies in trial block 3 ( $\bar{X} = .5806$ ) and trial block 1 ( $\bar{X} = .5790$ ) were significantly longer ( $p < .05$ ) than in trial block 2 ( $\bar{X} = .5084$ ). This finding was further qualified by the significant phases X trial blocks

interaction (see Figure 2). In all three trial blocks, phase 4 had significantly longer latencies and differed from the other phases ( $p < .01$ ). In trial blocks 2 and 3, phase 2 also differed from phase 1.

Of major interest in the study were phases 2 and 4, since phases 1 and 3 were controlled by the experimental apparatus. A second analysis of variance was performed analyzing the same independent variables, only this time phase 1 and phase 3 were excluded and the data was analyzed for phases 2 and 4. Table 3 presents a summary of these findings. Once again, it was found that there were no significant differences between the latencies of externals and internals. When comparing the experimental conditions, a significant difference was found between the positive condition ( $\bar{X} = 1.03$ ) and the control condition ( $\bar{X} = .4820$ ); the positive condition having significantly longer latencies. This finding is similar to that found when all four phases were analyzed and supports the rejection of the second null hypothesis that there are no significant differences among latencies in experimental conditions.

A highly significant difference ( $p < .001$ ) was found between the latencies of the two phases: phase 2 ( $\bar{X} = .5425$ ) and phase 4 ( $\bar{X} = .8892$ ).

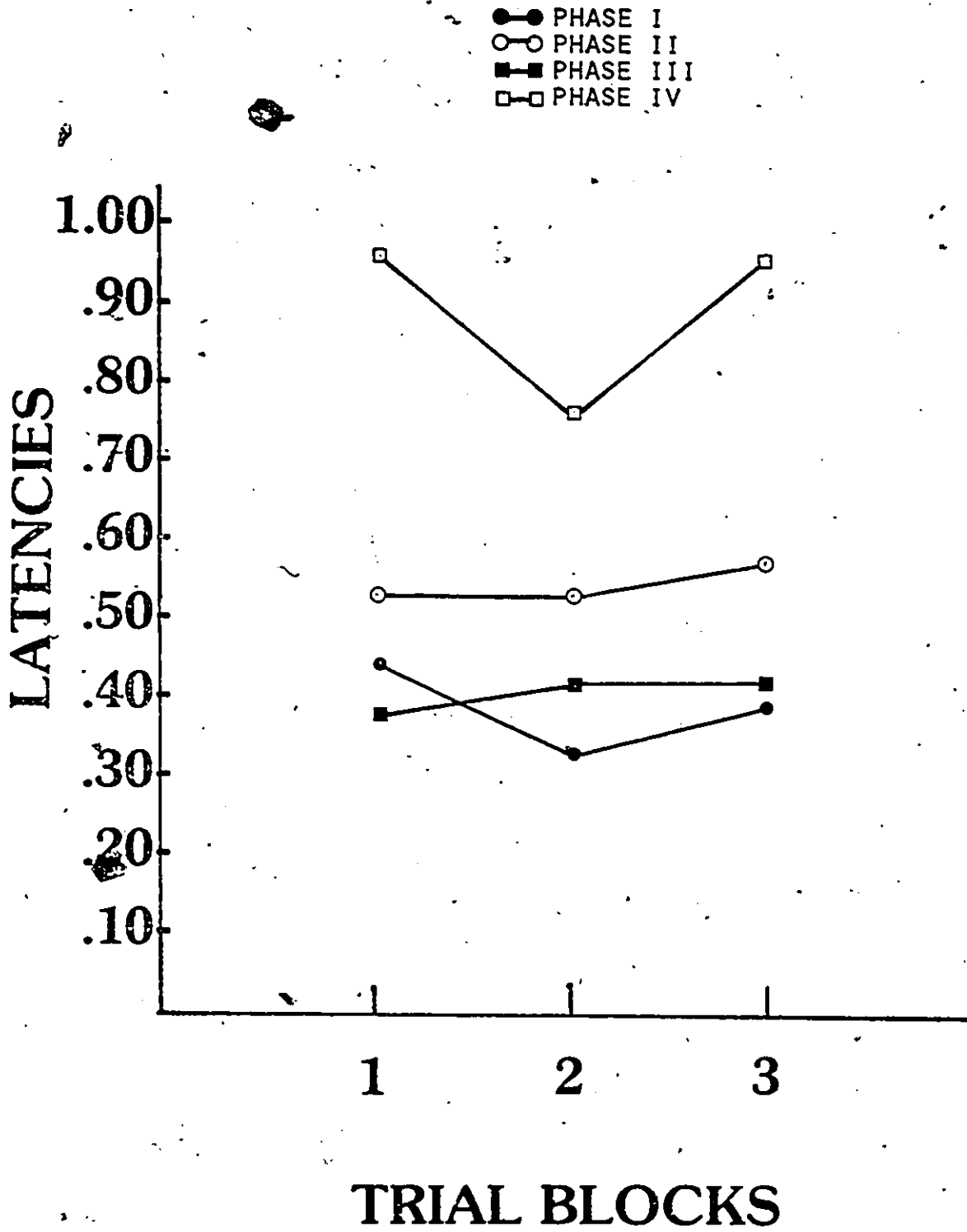


Figure 2. Latency of Responding, Phases, and Trial Blocks.

Table 3  
 Analysis of Variance for the Dependent Variable Latency:  
 Phases 2 and 4

Source	df	ms	F
Between			
Locus of Control (L)	1	.2253	.1677
Conditions (C)	3	6.1868	4.6057**
L X C	3	2.2531	1.6773
Error	72	1.3433	
Within			
Phases (P)	1	14.4213	45.9705***
L X P	1	.0053	.0170
C X P	3	.1869	.5959
L X C X P	3	.5674	1.8087
Error	72	.3137	
Trials (T)			
L X T	2	.5960	4.1268**
L X T	2	.1656	1.1469
C X T	6	.3038	2.1039
L X T X P	6	.0721	.4995
Error	144	.1444	
P X T			
L X P X T	2	.3848	3.2446*
L X P X T	2	.0202	.1709
C X P X T	6	.0635	.5354
L X C X P X T	6	.0116	.0983
Error	144	.1186	

\*p &lt; .05

\*\*p &lt; .01

\*\*\*p &lt; .001

Analysis of the independent variable of trial blocks revealed that the latencies for trial block 3 ( $\bar{X} = .7456$ ) and trial block 1 ( $\bar{X} = .7323$ ) were significantly longer than for trial block 2 ( $\bar{X} = .6456$ ). This finding was further qualified when considering the significant phases X trial block interaction (see Figure 3). In all three trial blocks, phase 4 latencies were significantly longer ( $p < .05$ ) than phase 2.

A further analysis was performed on phase 4 latencies only (see Table 4), since phase 2 was of interest only because it enabled the experimenter to establish a criterion for initial cooperation. Any individual who failed to send a message 100% of the time in phase 2 was eliminated. In this manner, it was possible to establish that all individuals were cooperative before any reductions in the reinforcement level occurred. When analyzing phase 4, no significant difference was found between internal and external latencies. As in the two other analyses, there were significant differences among the latencies of the experimental conditions. A Tukey test revealed the positive condition ( $\bar{X} = 1.22$ ) to differ significantly ( $p < .01$ ) from the control ( $\bar{X} = .619$ ). This similarly provides evidence for rejecting the second null hypothesis. Given the positive experimental treatment, the latencies were significantly longer than when given no information.

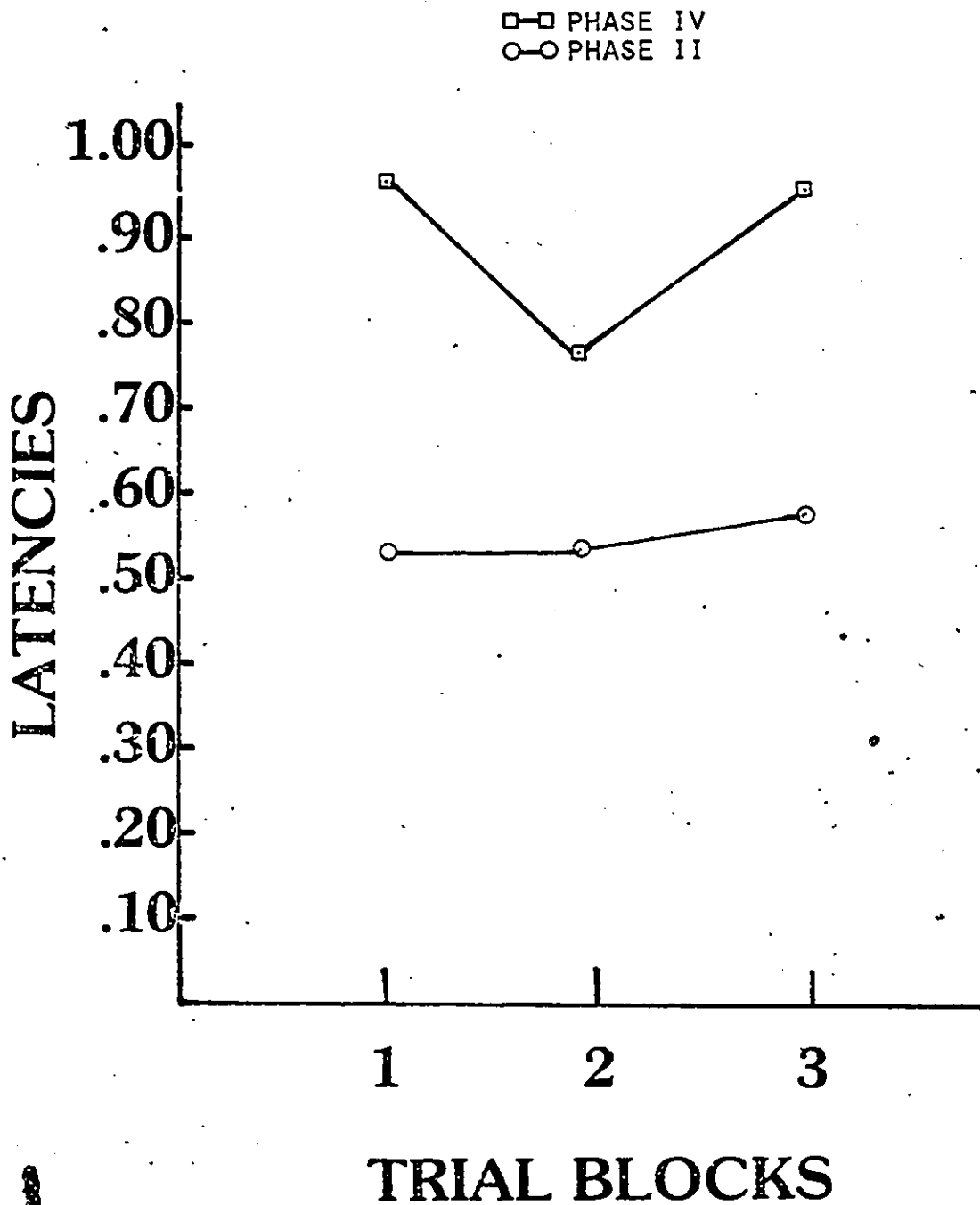


Figure 3. Latency of Responding, Phases, and Trial Blocks: Phases 2 and 4.

Table 4

Analysis of Variance for the Dependent Variable Latency:  
Phase 4

Source	<u>df</u>	<u>ms</u>	<u>F</u>
Between			
Locus of Control -(L)	1	.1500	.1771
Condition (C)	3	3.6976	4.3659**
L X C	3	2.4987	2.9504*
Error	72	.8469	
Within			
Trial Blocks (T)	2	.9462	4.5970**
L X T	2	.0526	.2556
C X T	6	.2152	1.0456
L X C X T	6	.0423	.1955
Error	144	.2058	

\* $p < .05$

\*\* $p < .01$

The above finding is further clarified by the significant interaction between locus of control and experimental conditions ( $p < .05$ ). As Figure 4 portrays, within the internal group, the latencies for the positive condition ( $\bar{X} = 1.496$ ) were significantly longer than all other internal conditions. Within the external group, both the negative condition ( $\bar{X} = 1.03$ ) and the neutral condition ( $\bar{X} = .963$ ) were significantly different ( $p < .05$ ) from the positive condition ( $\bar{X} = .590$ ). These findings further clarify the patterns of response within the locus of control groups under different experimental conditions.

When analyzing trial blocks, a significant difference was found using the Tukey test between trial block 1 ( $\bar{X} = .9575$ ) and trial block 2 ( $\bar{X} = .7637$ ) and trial block 3 ( $\bar{X} = .9462$ ) and trial block 2 ( $p < .01$ ). This finding is consistent with the other two analyses of trial blocks. It appears that individuals, regardless of locus of control, employ similar strategy when responding over time; that is, the latencies seem to decrease towards the middle portion of the experiment and increase toward the end.

The power of the preceding nonsignificant  $F$  ratios is given in Appendix 6.

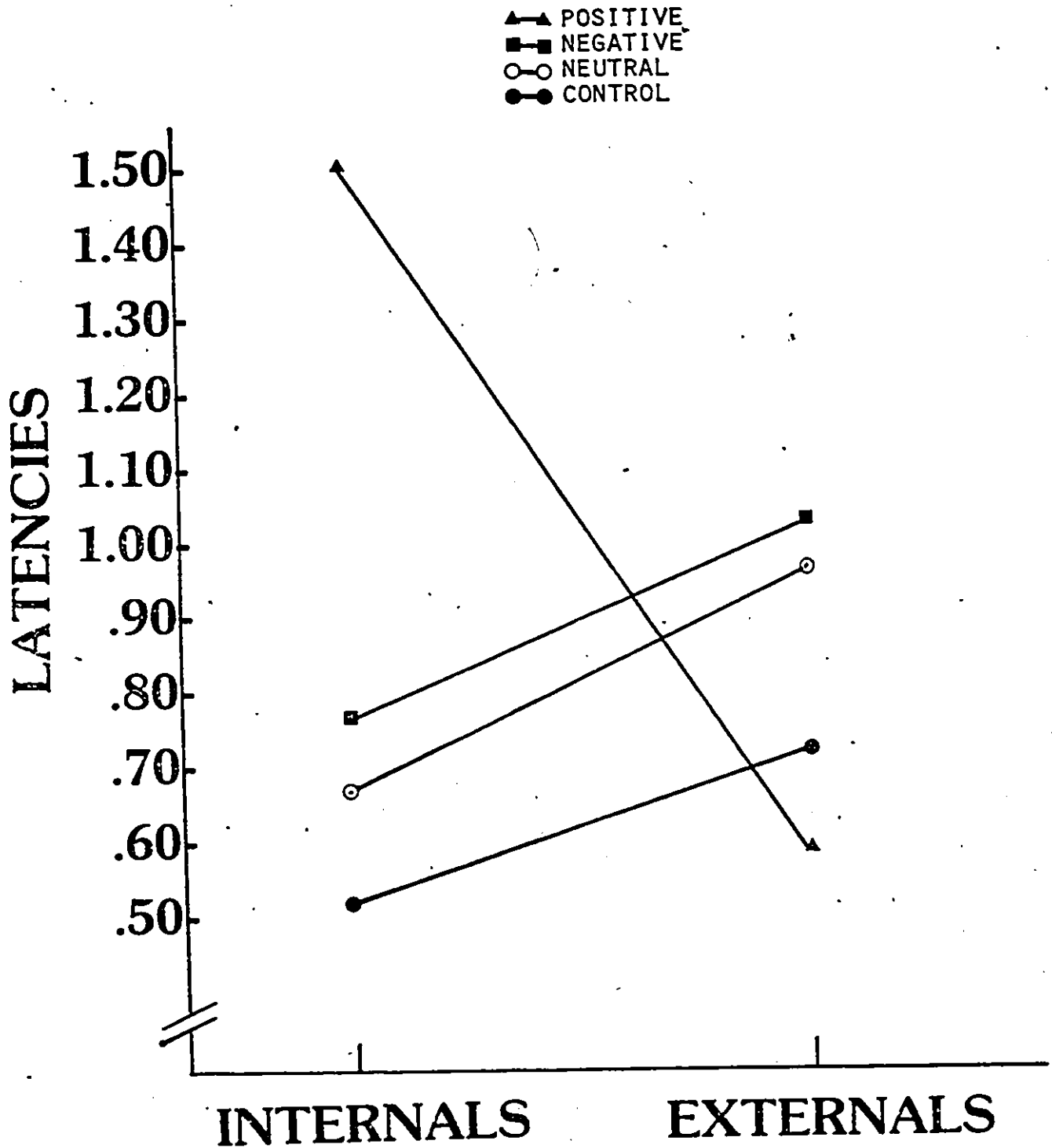


Figure 4. Latency of Responding, Experimental Conditions, and Locus of Control: Phase 4.

The Statistical Findings Concerning the Dependent  
Variable Retaliation

The second dependent variable analyzed was that of retaliation. In this study, a retaliation was operationally defined to be the failure on the part of the subject to send a message within the 5.0 second time period in phase 4. To analyze this data a 2 (locus of control) X 4 (experimental conditions X 3 (trial blocks) design with repeated measures was utilized. Table 5 presents this data. The third null hypothesis stated that there is no significant difference between internals and externals in retaliations. This hypothesis was not rejected; there were no significant differences between internals and externals ( $p > .10$ ). The fourth null hypothesis, that there is no significant difference in retaliations between experimental conditions, was also not rejected. There was, however, a significant locus of control X experimental conditions interaction; a Tukey test showed no significant differences within the internal group, but within the external group (see Figure 5) the negative condition ( $\bar{X} = 1.63$ ) had significantly more retaliations than the control group ( $\bar{X} = 1.06$ ) and than the neutral group ( $\bar{X} = .86$ ) ( $p < .05$ ). It would seem reasonable to believe that within the external group, the different experimental conditions received by the person did affect the number of retaliations made.

Table 5

Analysis of Variance for the Dependent Variable Retaliation:  
Phase 4

Source	<u>df</u>	<u>ms</u>	<u>F</u>
Between			
Locus of Control (L)	1	.9375	1.2004
Condition (C)	3	1.2819	1.6414
L X C	3	2.1511	2.7542*
Error	72	.7810	
Within			
Trial Blocks (T)	2	.2541	.6303
L X T	2	.3875	.9610
C X T	6	.2486	.6165
L X C X T	6	.8697	2.1600*
Error	144	.4032	

\*p < .05

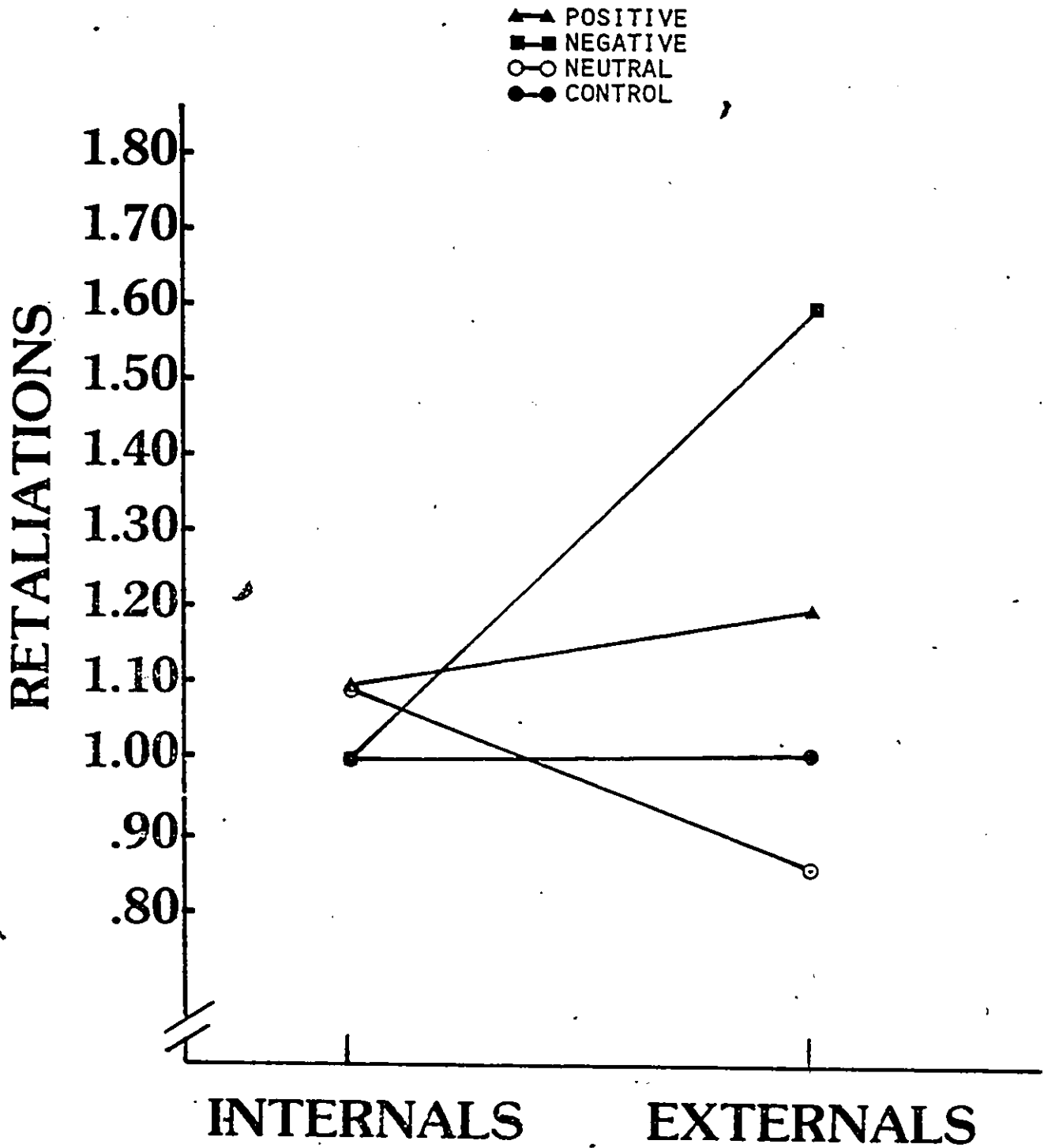


Figure 5. Retaliations, Locus of Control, and Experimental Conditions: Phase 4.

Since the retaliation data is considered to be on a nominal scale, Nowicki (1977) suggests a  $X^2$  analysis to be performed as a check on the possibility of spurious significance. The  $X^2$  analysis yielded the same results as those presented in Table 5. The chi square value was nonsignificant for the overall L X C interaction but significant for the interaction of interest; i.e., conditions within the external group ( $X^2 = 8.20$ ,  $df$  3,  $p < .05$ ). An examination of the difference ratios for each cell indicates that the net for the negative condition was greater than the net for all other groups. This latter method of analysis follows that recommended by Waxler and Mishler (1970).

A significant locus of control X experimental conditions X trial blocks interaction was also found (see Figure 6). In trial block 1, a Tukey test revealed that the external positive condition ( $\bar{X} = 1.5$ ), the internal negative ( $\bar{X} = 1.4$ ), and the external negative ( $\bar{X} = 1.3$ ) all differed significantly from the external neutral condition ( $\bar{X} = .80$ ;  $p < .05$ ). In block 2, the external negative condition differed significantly from all other conditions. Also, the internal positive ( $\bar{X} = 1.3$ ) and the external control ( $\bar{X} = 1.2$ ) condition differed from the external neutral ( $\bar{X} = .70$ ) and the internal positive ( $\bar{X} = .70$ ). In trial block 3, the only difference found was between external negative ( $\bar{X} = 1.8$ ) and all other conditions.

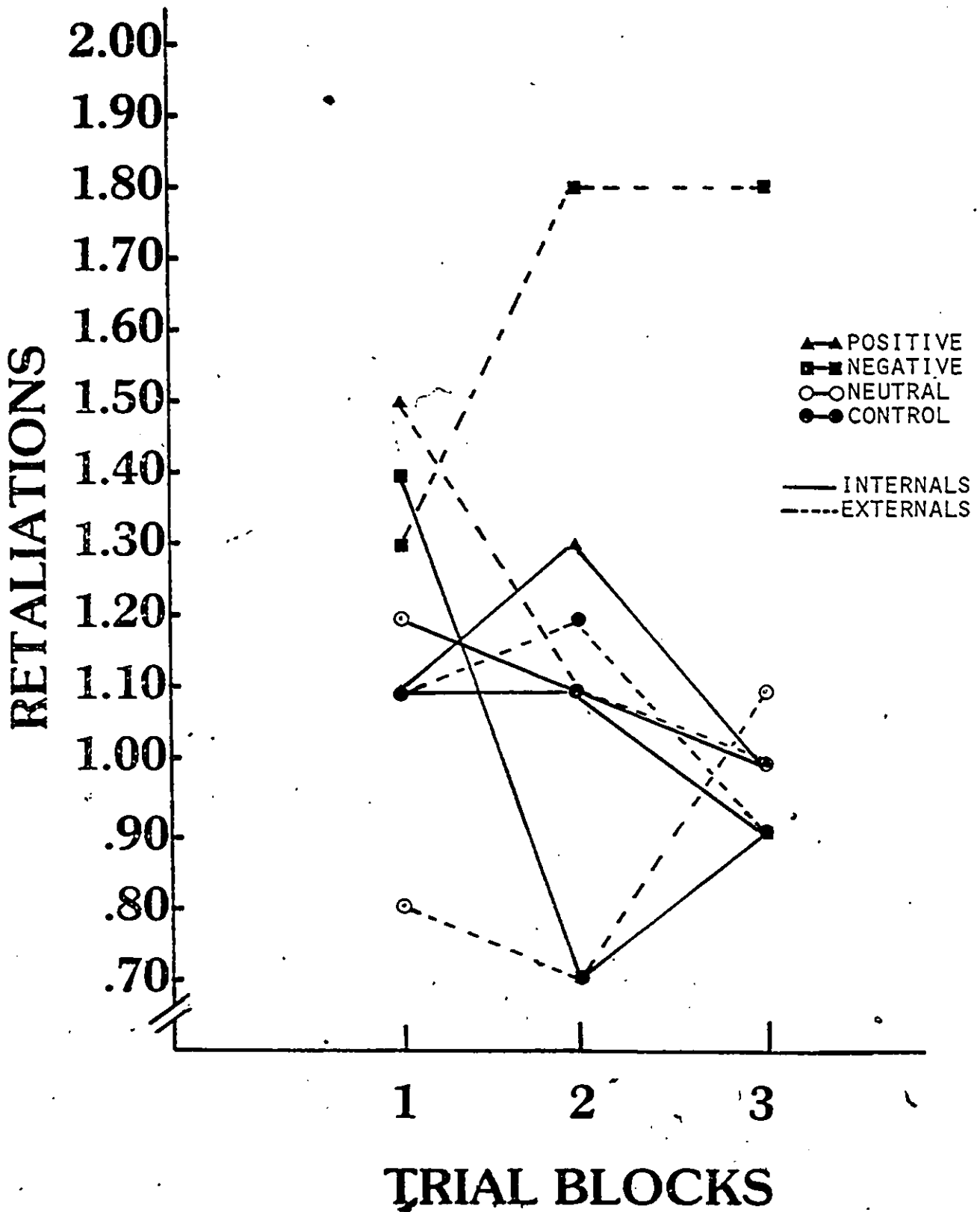


Figure 6. Retaliations, Locus of Control, Trial Blocks, and Experimental Conditions: Phase 4.

Two final analyses were made regarding retaliations: the first considered the initial trial of retaliation and the second was concerned with the longest run of retaliations. As Tables 6 and 7 portray, there were no significant differences in either analysis ( $p > .10$ ).

The power was calculated for nonsignificant F ratios concerning retaliations (see Appendix 6).

Table 6  
Analysis of Variance Initial Trial of Retaliation:  
Phase 4

Source	<u>df</u>	<u>ms</u>	<u>F</u>
Locus of Control (L)	1	1.02	.09
Conditions (C)	3	22.81	2.13
L X C	3	16.31	1.52
Error	72	10.69	

Table 7

Analysis of Variance Longest Consecutive Run of Retaliations:  
Phase 4

Source	<u>df</u>	<u>ms</u>	<u>F</u>
Locus of Control (L)	1	.61	1.96
Conditions (C)	3	.25	.80
L X C	3	.25	.81
Error	72	.31	

## CHAPTER IV

### DISCUSSION

This chapter has two sections in which the findings concerning the dependent variables of latency of response and retaliatory behavior will be discussed. To obtain an accurate measure of response latencies and retaliations, a four-phased game was utilized. Phases 1 and 3 were controlled by the experimental apparatus and were designed to create a situation in which the individual should perceive a change of strategy on the part of his opponent. Phase 2 was of interest because it enabled the experimenter to establish a criterion for initial cooperation. Any individual who failed to send a message 100% of the time in this phase was eliminated; responding in phase 4 is the major concern of this study. It is in this phase that the individual has the opportunity to respond or not, having previously received a decrease in level of cooperation from his opponent.

#### Discussion of Response Latencies

Before discussing the results, it seems relevant to examine the variable of latency. Regardless of the phase of the experiment, a latency was always a response time, either sending or receiving a message. One of the ways

latencies have traditionally been interpreted in the experimental literature as a measure of conflict. It has often been suggested that the more responses a person has to choose from, the longer the decision time might be. Social learning theory and game theory have both been concerned with how choices are made by individuals from a variety of potential behaviors. In this study, an individual's decision to respond was complicated by the fact that, prior to the situation, he had received a personal evaluation of himself from his opponent; immediately prior to phase 4, the subject experienced a 40% reduction of level of cooperation. Since the participant was faced with these added factors, it seems probable that the longer latencies might indicate a period of conflict and decision in which the individual was trying to choose between the two options available to him; i.e., to send or not to send a message.

An alternate interpretation for long latencies is suggested--that being a form of retaliation. It is important to note that when a participant took considerable time deciding whether or not to send a message, he was, in effect, limiting the response time of the "fictitious other" and, consequently, decreasing the likelihood of receiving a point. The longer the participant waited to send a message, the less time the "other" had to respond. This added factor makes prediction much more complicated since the participant

must consider the other person while making a decision. Since both internals and externals received the same information (personal evaluation), as well as a 40% reduction in level of cooperation, it seems reasonable to suggest that, by delaying sending a message, they could in effect be "paying back" their opponent for any perceived wrongdoing.

The first null hypothesis stated that there is no significant difference between internals and externals in response latencies. This hypothesis was not rejected. This finding is consistent with other studies which have researched locus of control and decision times. Both Rotter and Mulry (1965) and Lefcourt et al. (1968) found that internals took longer to make decisions when responding but only under skill instructions; under chance instructions, it was found that the external group had longer decision times. In these studies, instructional set interacted with the variable locus of control, illustrating a basic tenet of social learning theory: the "situation" must also be considered when making predictions.

In the current study, neither skill nor chance instructions were given; rather, the individual was told that the purpose was "to see how people make simple decisions." This left the orientation rather ambiguous so that each participant would interpret the instructions according

to his own personal predilection. Since instructional set was purposefully not controlled, it is possible that within each of the groups the individuals interpreted the meaning of the task differently, which, in effect, might have cancelled out any differences. As in the Lefcourt et al. (1968) study, it is possible that externals may have interpreted the task as a skill task or the internals may have interpreted it as chance controlled, thus cancelling out differences between the two groups. According to social learning theory, it is in the ambiguous condition that perceived locus of control as a problem-solving expectancy can most clearly be seen.

The literature review suggests that in a somewhat ambiguous situation, internals are more alert and sensitive, seem more eager to seek out cues and to manipulate the situation so as to be better able to achieve certain outcomes (Phares, 1976). Internals appear to be more cognitively active, more active in seeking information, and show superior utilization of information (Phares, 1961). Considering these findings, one might suspect that internals would devote more time to deciding whether or not to send a message since their decision might be an important factor in helping them gain control of the situation. On the other hand, externals, by definition, generally believe that what happens to them is a result of luck, chance or fate. Often,

they see little connection between their behavior and the reinforcement they receive. It is possible that externals' latencies were not based so much on a cognitive elaboration of their impending decision but were rather a reaction to what was happening to them -- personal evaluation and reduction of partner's cooperation. In this case, their latencies may have been retaliatory in nature. The finding that there were no differences between groups may have been based upon different assumptions held by the two different orientations.

The second null hypothesis stated that there is no significant difference in response latencies among experimental conditions; this hypothesis was rejected. It was found that the positive condition differed significantly from the control group. Given the positive experimental treatment, the latencies were significantly longer than given no information at all.

The above finding is clarified by the significant interaction between locus of control groups and experimental conditions. As Figure 4 indicates, within the internal group, the latencies for the positive conditions were significantly longer than for all other groups. Within the external group, however, both the negative and neutral condition produced significantly longer latencies than the positive condition. To explain and elaborate these results,

it will be useful to examine each locus of control group independently.

With respect to the internal group, it was the positive condition which produced the longest latencies. It is important to keep in mind that, prior to phase 4, all subjects were exposed to a partner's 15 trials of 100% cooperative strategy (phase 1) and later to 15 trials of 60% partial cooperative strategy (phase 3). It is suggested that this change in the partner's strategy from a person who positively evaluated the participant must have produced response uncertainty. One could interpret the increase in latencies as a period of conflict in which the participant hesitated while trying to decide how he would respond against someone who liked him as a person. Since the literature has demonstrated that internals exhibit better learning and acquisition of material (Seeman, 1963), make better use of this information (Phares, 1968), and are more alert, attentive, and sensitive (Phares, 1976) than externals, it can be speculated that it must have been a difficult decision to try, on the one hand, to objectively interpret one's partner's change in strategy while also keeping in mind the prior personal evaluation. Thus, the individual is faced with a dilemma of whether or not to respond in a harmful manner; hence, an increase in weighing and choosing between possible responses.

Within the external group, both the negative and neutral treatment conditions differed significantly from the control and positive groups. As mentioned previously, externals do not appear to be as cognitively active as internals (Phares, 1976) nor do they acquire the kind of information that would better enable them to cope with their world in an effective way (Seeman, 1963). When externals are in situations that contain cues indicating they lack control, their learning and acquisition of knowledge are often reduced. Their low expectancy that their own effort will have an effect makes information acquisition an unproductive activity. Finally, as Pines and Julian (1972) found, internals respond more to the informational demands of the task, while externals respond more to the social parameters. Considering these findings, it would seem more productive to interpret external latencies, not as time of intense weighing and choosing, but more as a response to the social parameters of the situation in which they found themselves.

Those external subjects who received a negative evaluation and then were subjected to a reduction in partner cooperation produced the longest latencies. In the Jones and Shrauger (1968) study, it was found that when externals receive negative feedback, they were much more likely to retaliate than internals. These authors believed that

externals tended to perceive others as responsible for social behavior and were more likely to project unfavorable characteristics to one providing negative feedback. Whereas, in the internal group, the positive condition yielded the longest latencies, the positive condition yielded the shortest latencies in the external group. The literature would lead one to suspect that externals are more easily influenced by those people around them. If one accepts this premise, it becomes feasible that the positive condition would produce the shortest latencies. It is suggested that externals would tend to value highly the friendship of the other participant and, as a result, would not be as likely to reciprocate harmful behavior. An external, by definition, is one who categorizes rewards as not contingent upon his own behavior but rather as a result of luck, chance or fate. It seems reasonable that externals might perceive this situation as being out of their own hands. As a result, they might possibly believe that they have nothing to lose by taking a long time to respond, especially if the other participant has made negative comments about them.

It was also found that externals who received a neutral evaluation had significantly longer latencies. The neutral evaluation presented prior to the game could be considered to be neither negative nor positive. Given ambiguous information such as this, externals might be

uncertain as to whether to reciprocate or not. This idea was not supported. Apparently, as the gaming literature (Swingle, 1966) suggests, participating with someone unknown often leads to a decreased level of cooperation instead of uncertainty.

An interesting finding was the significant difference between trial block 1 and trial block 2, and trial block 3 and trial block 2 (Figure 3). Gaming research has utilized the procedure of trial blocks as a way of analyzing data over time. The participants' 15 responses in each phase were broken into 3 trial blocks of 5 responses each so as to present a clearer picture. It would appear that individuals, regardless of locus of control orientation, employ a similar strategy when responding during an experimental phase; this being a decrease in cooperation over time. This pattern is similar to other studies which have found that, generally, cooperation decreases as responses continue. Oskamp and Perlman (1965) have attributed this decrease in cooperation to be due partly to an increase in boredom and a desire for variety on the part of the subjects.

#### Discussion of Retaliatory Behavior

A retaliation was operationally defined to be the failure on the part of the subject to send a message within the 5.0 second time period in phase 4. As an aid in

understanding the variable retaliation, it seems prudent to examine succinctly the findings of several key studies concerning emotional relationships and gaming.

Oskamp and Perlman (1965), using a Prisoner's Dilemma game, looked at factors which affected cooperation. In this study, they found no consistent relationship between cooperation and friendship within the range from unacquainted to fairly friendly. They concluded their study with the prediction that the greatest effects of friendship would probably be found at the extremes--very friendly and very unfriendly. In a followup study, Oskamp and Perlman (1966) found contrasting results which serve to emphasize how sensitive to situational factors cooperative behavior is. Students were asked to write down the names of best friends, acquaintances, and people they disliked. In the small liberal arts college, a strong positive relationship was found between the degree of friendship and the amount of cooperation. In the all-male college, the reverse relationship was found. Here, the best friend group displayed the least cooperation.

Swingle (1966), using a cognitive congruity model, found that subjects who received harm (non-cooperation) from a liked or unknown opponent became less cooperative. On the other hand, those subjects harmed by a disliked opponent did not become more non-cooperative. Swingle and Gillis (1968) found support for Swingle's previous findings. In this study,

subjects who liked one another had a greater tendency to match the behavior of their liked opponent. They found that a friend is more likely to retaliate in kind than is a disliked opponent.

Returning to the present study, the third null hypothesis stated that there is no significant difference between internals and externals in retaliatory behavior. This hypothesis was not rejected. The majority of literature reviewed suggested that a difference should have been found with externals retaliating significantly more often. However, Dengerenk et al. (1965) found that internal subjects, when attacked by another subject, would be more likely to expect that their own aggressive behavior would result in the termination of the attack. Their study confirmed these results since it was the internal group which took the necessary steps to improve their conditions. Thus, it would appear that in special situations, internals will not hesitate to retaliate as a way of attempting to rectify a situation which they perceive to be wrong.

In a gaming situation, Condry (1967) found no relationship between LOC and behavior in a two-person game. Bobbitt (1967), however, found that when he controlled the strategy of one player so that his responses were consistently competitive, internals behaved less competitively than externals. However, when the individual received predominantly

cooperative responses, internals were less cooperative than externals.

The final hypothesis stated that there is no significant difference in retaliations between experimental conditions. This hypothesis was not rejected. A significant interaction was found between experimental conditions (different personal evaluations) and locus of control. This finding is consistent with social learning theory which emphasizes the importance of the specific situation as it interacts with personality orientation.

As Figure 5 illustrates, within the internal group the differences were small and statistically nonsignificant. Based upon this finding, it can be concluded that the different types of personal evaluation that internals received did not significantly affect their game playing behavior. This finding is supported by other related studies in the area of locus of control (Jones & Shrauger, 1968; Sherman, 1973). According to social influence studies, it has been demonstrated that in persuasive situations, internals are not so easily influenced as externals. Sherman (1973) concluded that, for persuasive communications, which could represent a threat to one's beliefs or self-esteem, internals will have little conflict since they are confident and are able to resist manipulation; in such a situation, it is the external who should yield. Crowne and Liverant (1963) found

greater resistance to group pressure on the part of internals. Internals were also more reliant upon their own judgments.

In this experiment, providing internals different affect-laden information did not affect their actual retaliatory behavior. Internals did not resort to extreme behavior as DuCette and Wolk (1972) found with externals, but rather were more interested in controlling the situation and attempting to maximize their own gains. In order to accomplish this, it would appear safer to cooperate and both receive points than to retaliate against the other participant and risk losing points. By doing so, internals would be exercising a form of control by attempting to manipulate the general atmosphere in which the experiment is carried out. Studies in the area of reaction to frustration and aggression also lend insight into this finding. Butterfield (1964) and Bissett and Nowicki (1973) both found that internals reacted more constructively to frustration than externals. Finally, large-scale studies which were designed to measure personality characteristics such as Hersche and Scheibe (1967) and Gough (1974) found that internals scored higher on the Tolerance, Sociability, and Good Impression scales of the C.P.I. It is possible that this type of behavior might have contributed in part to the lack of retaliatory behavior.

Within the external group, those participants who received the negative feedback produced the largest number

of retaliations. From this finding, it seems reasonable to conclude that within the external group, the experimental treatment the person received did affect the number of retaliations made. These results are similar to Jones and Shrauger's (1968) finding that when externals receive negative feedback, they were much more likely to retaliate than internals. These authors believed that externals tended to perceive others responsible for social behavior and were more likely to project unfavorable characteristics to one providing negative feedback. The positive evaluation produced the fewest retaliations, which lends support to Phares (1976) statement that:

externals may possess such a strong need for approval and reinforcement from social agents who have prestige, power, or other attractive qualities that they may be easily led or induced to behave in a fashion they believe will attain those valued goals (p. 92).

Studies from related areas also lend support to this finding. Butterfield (1964) and Brissett and Nowicki (1973) found that reaction to frustration can be partially accounted for by the generalized expectancy of locus of control. Both studies reported that externals reacted less constructively to frustration than did internals.

Externals, according to Rotter's (1966) definition, tend to interpret events that happen to them as not under their control. It, therefore, seems likely that when placed in a situation with someone who has previously

indicated a nonliking for them, the externals' behavior might be interpreted as indicative of an attitude of having "nothing to lose" by further non-cooperation. Studies in this area concerning delay of gratification (Strickland, 1972, 1973) have demonstrated that externals are often not able to delay their own gratifications; hence, the immediate impulse to retaliate might override the best strategy to gain points.

Early adolescence is the beginning of a period of intense friendships. It is a period in which the adolescent begins to detach his emotional life from his family; he now seeks to establish an identity that is recognized by others--his friends (Sutton-Smith, 1973). Consequently, the whole area of interpersonal attraction often plays a crucial role in determining behavior.

It is believed that the findings of this study may be important for it presents results which are somewhat contrary to gaming research.

Other studies which have looked at the relationship between emotional relationships and gaming have found that when participants receive harm (non-cooperation) from liked or unknown opponents they become less cooperative. It would appear that considering a participant's locus of control orientation alone is not sufficient. This is not surprising for the LOC is but one aspect of social learning theory.

However, when locus of control is looked at as it interacts with specific situations, some interesting findings occur. This study produced results which are contrary to the findings of Swingle (1966). Affect-laden information and a reduction of partner's cooperation did not change the internals' game playing behavior. This did present a dilemma regarding how an internal should respond, which led to longer latencies; however, there were no significant differences in retaliations within the internal group.

Within the external group, a negative evaluation, combined with a 40% reduction in cooperation, produced the longest latencies as well as the largest number of retaliations. This finding is also opposite to what one would suspect from gaming literature. These findings emphasize the importance of considering personality variables as well as other individual characteristics as determinants of gaming behavior. It is believed that variables such as latency and retaliation take on a new meaning when considered within a social learning theory framework.

## SUMMARY AND CONCLUSIONS

The purpose of the present study was to investigate how information, based upon the variables of similarity and personal evaluation, affects the behavior in a gaming situation of young men who are either internally or externally controlled. The concept of locus of control originated within a social learning theory model (Rotter, 1966). In a variety of situations, more particularly in a gaming situation, the attitude an individual holds regarding the relationship between behavior and reinforcement or lack of reinforcement should have important consequences. An individual who is accustomed to perceiving that the rewards he receives are a result of luck or chance is quite likely to behave differently than an individual who believes that the rewards he receives are a result of his own behavior. Thus, a person's locus of control orientation should assist in the prediction of some behavior. The behaviors of interest in this study were latency and retaliation.

Since the main purpose of this study was to analyze how information affects the behavior of internal and external men, an experimental game was utilized. The use of a gaming format seemed particularly applicable to measure the desired behaviors since one is able to use games to structure a situation which can be perceived according to one's own locus of control orientation. Prior to the beginning of the

game, an individual was presented with information designed to portray attitudes and ideas which were similar, dissimilar, or neutral, as well as a positive, negative, or neutral personal evaluation.

The first null hypothesis stated that there is no significant difference between internals and externals in response latencies. This hypothesis was not rejected. It was suggested that the different personality characteristics of the two types of locus of control orientation may have contributed to this finding. The literature had suggested that internals might devote more time to deciding whether or not to send a message since their decision might be an important factor in helping them gain control of the situation. Thus, long latencies for internals might be considered to be a time of weighing and choosing. It was believed that external latencies were based not so much upon a cognitive elaboration of their impending decision, but rather, were a reaction to what was happening to them. In this case, their latencies may have been retaliatory in nature.

The second null hypothesis, that there is no significant difference in response latency between experimental conditions, was rejected. It was found that the positive condition differed significantly from the control group; that is, those individuals given the positive experimental

treatment had significantly longer latencies than individuals given no information. This finding was further clarified by a significant interaction between locus of control and experimental conditions. Within the internal group, the latencies for the positive condition were significantly longer than for all other groups. However, in the external group, both the negative and neutral conditions produced significantly longer latencies than the positive condition.

The third null hypothesis stated that there is no significant difference between internals and externals in retaliations. This hypothesis was not rejected. The majority of literature reviewed suggested that a difference should have been found with externals retaliating significantly more often.

The final hypothesis, that there is no significant difference in retaliations between experimental conditions, was not rejected. However, a significant interaction was found between experimental conditions and locus of control. Within the internal group, the differences were small and statistically nonsignificant. Within the external group, those participants who received the negative feedback produced the largest number of retaliations.

In view of future research, a few suggestions can be offered as this field is relatively new and unexplored. First, it is suggested that sample size be increased in

future studies. This is one way of increasing the power and, as a consequence, the sensitivity of the experiment. Since the power in this study was moderately low, the probability of finding statistical differences, should they exist, was reduced. An increase in power would lead to a greater probability that the statistical tests would detect the differences that exist.

Second, further research should explore situations where actual participants meet before participating. This would add another dimension to the study, that being the idea of knowing with whom you are participating. This should clarify the effects of making decisions, especially when one is involved with friends or nonfriends. It is during this period when friendships become very significant. As young adolescents gradually separate from their parents, they become increasingly dependent upon their friends to provide emotional support and to serve as a testing ground for new values. Previous studies utilizing the variable of friendship have found contrasting results which serve to emphasize how sensitive to situational factors cooperative behavior is.

Although a gaming format has been utilized effectively with adults, it is a relatively new technique with the younger population. The present study indicates how

useful it is as a tool in measuring young adolescents' behaviors. It is believed that this technique will be a valuable aid in measuring other related aspects of friendship, cooperation, and competition.

Finally, an area which should be explored in the near future is that of sex difference in latencies and retaliations. Horner (1972) has recently introduced the concept of "the motive to avoid success" in women. According to Horner, the "motive to avoid success" in women is a latent, but stable, personality disposition which is acquired early in life. She feels that most women avoid success because they expect negative consequences, such as social rejection or being labeled unfeminine. As the role of women is changing, future research should utilize a mixed-sex design in order to explore if a study such as this could reflect these changes.

In conclusion, the concept of locus of control is rapidly becoming a major variable in personality research. Since adolescence is a time of questioning, decision making, and relationship forming, the concept of locus of control seems particularly relevant for understanding this period of growth.

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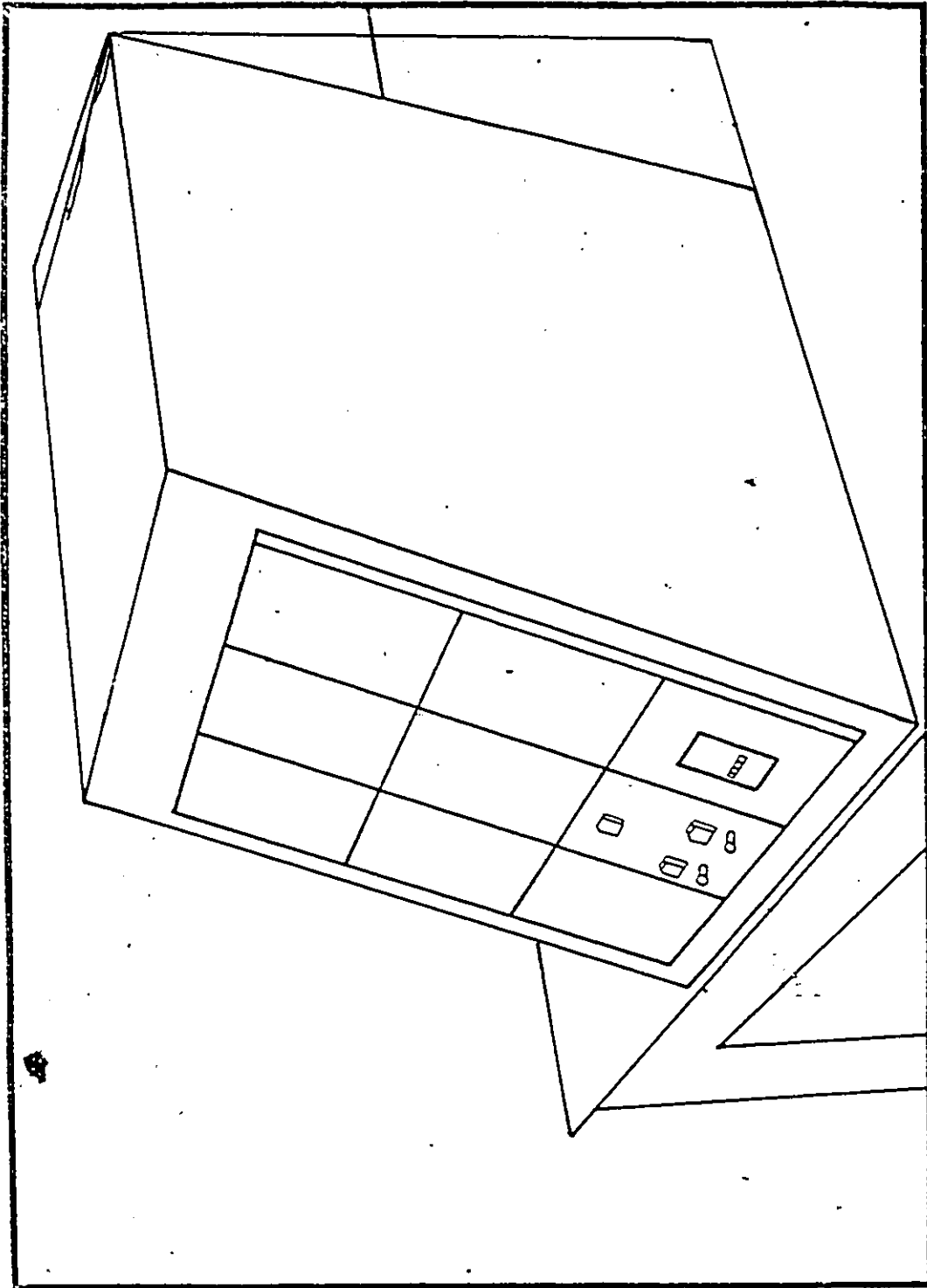
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APPENDIX 1

EXPERIMENTAL APPARATUS



Experimental Apparatus

APPENDIX 2


NOWICKI-STRICKLAND LOCUS OF CONTROL  
SCALE FOR CHILDREN

## APPENDIX 2

NOWICKI-STRICKLAND LOCUS OF CONTROL  
SCALE FOR CHILDRENCircle one:

- |   |   |   |
|---|---|---|
| Y | N | 1. Do you believe that most problems will solve themselves if you just don't fool with them?                        |
| Y | N | 2. Do you believe that you can stop yourself from catching a cold?  |
| Y | N | 3. Are some kids just born lucky?   |
| Y | N | 4. Most of the time do you feel that getting good grades means a great deal to you?                                 |
| Y | N | 5. Are you often blamed for things that just aren't your fault?   |
| Y | N | 6. Do you believe that if somebody studies hard enough he or she can pass any subject?                              |
| Y | N | 7. Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway?         |
| Y | N | 8. Do you feel that if things start out well in the morning that it's going to be a good day no matter what you do? |
| Y | N | 9. Do you feel that most of the time parents listen to what their children have to say?                             |
| Y | N | 10. Do you believe that wishing can make good things happen?  |
| Y | N | 11. When you get punished does it usually seem it's for no good reason at all?                                      |
| Y | N | 12. Most of the time do you find it hard to change a friend's (mind) opinion?                                       |
| Y | N | 13. Do you think that cheering more than luck helps a team to win?  |

- Y N 14. Do you feel that it is nearly impossible to change your parent's mind about anything?
- Y N 15. Do you believe that your parents should allow you to make most of your own decisions?
- Y N 16. Do you feel that when you do something wrong there's very little you can do to make it right?
- Y N 17. Do you believe that most kids are just born good at sports?
- Y N 18. Are most of the other kids your age stronger than you are?
- Y N 19. Do you feel that one of the best ways to handle most problems is just not to think about them?
- Y N 20. Do you feel that you have a lot of choice in deciding whom your friends are?
- Y N 21. If you find a four leaf clover, do you believe that it might bring you good luck?
- Y N 22. Do you often feel that whether you do your homework has much to do with what kind of grades you get?
- Y N 23. Do you feel that when a kid your age decides to hit you, there's little you can do to stop him or her?
- Y N 24. Have you ever had a good luck charm?
- Y N 25. Do you believe that whether or not people like you depends on how you act?
- Y N 26. Will your parents usually help you if you ask them to?
- Y N 27. Have you felt that when people were mean to you it was usually for no reason at all?
- Y N 28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?

- Y N 29. Do you believe that when bad things are going to happen they just are going to happen no matter what you try to do to stop them?
- Y N 30. Do you think that kids can get their own way if they just keep trying?
- Y N 31. Most of the time do you find it useless to try to get your own way at home?
- Y N 32. Do you feel that when good things happen they happen because of hard work?
- Y N 33. Do you feel that when somebody your age wants to be your enemy there's little you can do to change matters?
- Y N 34. Do you feel that it's easy to get friends to do what you want them to do?
- Y N 35. Do you usually feel that you have little to say about what you get to eat at home?
- Y N 36. Do you feel that when someone doesn't like you there's little you can do about it?
- Y N 37. Do you usually feel that it was almost useless to try in school because most other children were just plain smarter than you are?
- Y N 38. Are you the kind of person who believes that planning ahead makes things turn out better?
- Y N 39. Most of the time, do you feel that you have little to say about what your family decides to do?
- Y N 40. Do you think it's better to be smart than to be lucky?
- 

3

APPENDIX 3  
INFORMATION SHEET

## APPENDIX 3

## INFORMATION SHEET

PLEASE ANSWER BRIEFLY:

1. What are your interests?
2. What are your hobbies?
3. What kind of activities do you do on the weekend?
4. What are your favorite sports?
5. What kind of books do you read?
6. What qualities do you like best in a friend?
7. What qualities do you dislike in other people?



APPENDIX 4

INFORMATION GIVEN PARTICIPANT PRIOR  
TO GAME



NAME: Negative Condition

From the information sheet we have given you regarding the other person, we would like your best guess about this person. Indicate your present impression by checking one of the five spaces on each line. ANSWER EVERY ONE.

Sociable	_____	_____	_____	_____	<u>X</u>	Unsociable
Wise	_____	_____	_____	<u>X</u>	_____	Foolish
Negative	_____	<u>X</u>	_____	_____	_____	Positive
Kind	_____	_____	_____	_____	<u>X</u>	Cruel
Cooperative	_____	_____	_____	_____	<u>X</u>	Uncooperative
Dishonest	<u>X</u>	_____	_____	_____	_____	Honest
Selfish	_____	<u>X</u>	_____	_____	_____	Unselfish
Friendly	_____	_____	_____	_____	<u>X</u>	Unfriendly
Aggressive	_____	<u>X</u>	_____	_____	_____	Unaggressive
Unfair	<u>X</u>	_____	_____	_____	_____	Fair
Trustworthy	_____	_____	_____	_____	<u>X</u>	Untrustworthy

In your own words, please write what you think of this person.

From the little I know I do not think I would like this person. I do not think we would be good friends and get along well. We do not like to do the same things and do not like the same kind of people.

Circle the spot which comes closest to your feelings towards the other person.

X
X
X  
 dislike neutral like



APPENDIX 5

INSTRUCTIONS USED IN GAMING SITUATION

## APPENDIX 5

## INSTRUCTIONS USED IN GAMING SITUATION

## PHASE I

Today we want to see how people make simple decisions. You are going to be involved with another person who is in another location. Please be seated and instructions will be given shortly.

In front of you is a panel with a yellow center light and two other lights--one green and one blue with buttons under them. Now, when the yellow light comes on watch both of the other lights. One of them will come on. It comes on because the other person sent a message to you. If you press the button under the light which comes on, then you will get a point. However, you must press the button as soon as the green or blue light comes on or you will miss your chance. If the yellow light comes on but the blue or green light does not, then the other person did not send you the message so that you will be unable to get your point. Continue until I tell you to stop.

Are there any questions?

## PHASE II

Now it is your turn to send the message to the other person. When the yellow light comes on choose one of the buttons and push it. When you do this the other person will know which light is on and can press the button to get a point. If you do not press one of the buttons as soon as the light comes on the other person will not get a point. Continue sending signals until I tell you to stop.

Are there any questions?

## PHASE III.

Now it is your turn to receive the message again. When the yellow light comes on watch the other lights. One of them will come on. It comes on because the other person sent a message to you. If you press the button under the light that comes on, then you will get a point. You must press the button as soon as the green or blue light comes on or you will miss your chance. If the yellow light comes on but the blue or green light does not, then the other person did not send you a message so that you don't get your point. Continue until I tell you to stop.

Are there any questions?

## PHASE IV

Now it is your turn to send the message to the other person. When the yellow light comes on choose one of the buttons and press it. When you do this, the other person will know which light is on and can press the button to receive the point. If you don't press one of the buttons as soon as the light comes on, the other person will not get a point. Continue until I tell you to stop.

Are there any questions?

APPENDIX 6

STATISTICAL POWER

## APPENDIX 6

## STATISTICAL POWER

	<u>Source</u>	<u>Power</u>
Table 2	L X C	.35
	L X C X P	.50
	C X T	.40
	L X P X T	.40
	C X P X T	.40
Table 3	L X C	.25
	L X C X P	.27
	L X T	.20
	C X T	.45
Table 4	C X T	.20
Table 5	L	.25
	C	.25
Table 6	C	.35
	L X C	.20
Table 7	L	.25