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LA THÈSE A ÉTÉ
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INTERNAL-EXTERNAL LOCUS OF CONTROL
AND PERFORMANCE WITH CHILDREN

by Richard Vincent Palumbo

Thesis presented to the School of Graduate Studies
in partial fulfillment of the requirements for the
degree of Doctor of Philosophy

UNIVERSITY OF OTTAWA

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ABSTRACT

The purpose of the present experiment was to further investigate the relationship between the personality construct of Internal-External locus of control and the motor behaviour of children. Accordingly, the response rate on an ambiguous situation-specific lever-pressing task was investigated in a game played under 50 and 100% win conditions. Eight and 12 year old children were administered the Nowicki-Strickland Locus of Control Scale for Children (1973). A group of 80 children consisting of equal numbers of boys and girls who were either Internal or External on the locus of control scale were randomly assigned to one of the performance tasks.

The hypotheses were: (1) Internal locus of control subjects will make more lever presses than External locus of control subjects; (2) Twelve year old subjects will make more lever presses than 8 year old subjects; (3) Subjects in the 50% win condition will make more lever presses than subjects in the 100% win condition.

All hypotheses were substantiated and the results were discussed in light of performance, development and the locus of control of the child.

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CURRICULUM STUDIORUM

Richard V. Palumbo was born September 5, 1948, in Boston, Massachusetts. He received his Bachelor of Arts degree in Psychology from Roger Williams College, Bristol, Rhode Island, in 1970. He received the Master of Education degree in Guidance and Counselling from Springfield College and the Certificate of Advanced Study degree in Guidance and Counselling from Springfield College, Springfield, Massachusetts, in 1972. The Master's Interim Report was accepted by the University of Ottawa in 1974 and was entitled: "High and Low Need for Social Approval and Internal-External Locus of Control's Effect on the Performance of Children Under Various Incentives."

INTRODUCTION

The concept of Internal and External locus of control as conceived by Rotter (1954) in his social learning theory has been the impetus for extensive research. The bulk of studies have investigated adult and college student populations. Investigations dealing with children have focused mainly on studies dealing with achievement (Battle, 1965; McGhee & Crandall, 1968; Nowicki & Roundtree, 1971; Messer, 1972). With the recent availability of reliable questionnaires, the popularity of research with children has increased.

The concept of locus of control is sufficiently broad to allow diversity of study (Rotter, 1975); studies of locus of control with children have assumed this wide perspective. Research on locus of control with children can be examined in clusters: ethnic and cultural groups (Battle & Rotter, 1963; Milgram, 1971); pathological groups (Bialer, 1961; Finch, Nelson, Montgomery & Stein, 1974); achievement studies (Bartel, 1971; Messer, 1972; Maehr & Walker, 1974); and developmental studies (Bialer, 1957; Battle & Rotter, 1965). These investigators, from divergent areas, with diverse interests, have examined numerous variables, including sex, birth order, age and intelligence. In reviewing these findings, it is evident that the results

have been inconsistent and conflicting. The developmental variable has been used in all types of studies with children (Penk, 1969; Riedel & Milgram, 1970; Milgram, 1971; Lifshitz, 1973; Pawlicki, 1974) where the progression from an External to an Internal locus of control has been widely recognized; yet, there are also contradictory findings (Crandall, Crandall & Katkovsky, 1965). Another variable which has been utilized in the examination of locus of control has been performance. In the early studies of locus of control, performance was used as an adjunct or as a means of examining other aspects of the child (James & Rotter, 1958; Bialer, 1961; Battle & Rotter, 1965; Epstein & Komorita, 1971; Walls & Cox, 1971; Ducette & Wolk, 1972). It was used secondarily and only through recent research has the performance variable (temporal persistence, motivation or task performance) been considered more centrally (Blank, 1973; Fine, 1973, Ward, 1973; Dollinger & Taub, 1977).

Studies of performance and locus of control with children have only recently been considered, and the findings remain incomplete. Much of the work dealing with children has implemented a gaming-type format. Since research in Rotter's social learning theory has begun, it has followed two main directions; that of expectancy as a personality variable and through the task structured approach. Yet examining the personality dimensions of the child and placing him in a task situation has not been considered. This

study will examine the locus of control of children at two age levels (8 year olds and 12 year olds) involved in an ambiguous performance gaming-type task. The first chapter will review the basic concepts of Rotter's social learning theory, the clusters of studies which have been completed with children and the recent studies in the area of the present research (i.e. performance and feedback with children). This will be followed, in the second chapter, by the design, experimental sample and hypotheses. The third chapter will report the statistical findings. The interpretations, summary and conclusions comprise the final chapter.

CHAPTER I

REVIEW OF THE LITERATURE

1. Social Learning Theory and the Expectancies of Reinforcement

Julian B. Rotter added his name to the list of modern theorists with his work Social Learning and Clinical Psychology (1954). In the early 1950's, Rotter introduced his social learning theory. A man who had studied under both stimulus-response (S-R) and cognitive influences, he felt his social learning theory would afford a better means of observing, recording, predicting and learning about man.

Initially, Rotter's social learning theory had little impact on psychology. Phares (1955, 1957) was the first to investigate a hypothesis, generated by Rotter's social learning theory, that learning depends, in part, on whether that individual perceives his actions as instrumental in his reinforcement. He found that, directing his subjects in a skill or chance manner, resulted in variations in their performance; that is, reinforcement under the skill condition had a greater effect on the expectancy of future reinforcements. They shifted their expectancy more often, and they shifted more predictably than those functioning

under the chance conditions. Thus, through empirical research, the advocates of social learning theory felt a variable in need of more detailed investigation was coming to light. The observation that different degrees of value or levels of expectancy followed systematically from reinforcements in particular situations was noted. It was also observed that the character of the individual played a role in the expectancy level; that is, the use of one's experience and the expectancy that experience creates, plus the psychological pull or emphasis which is placed on that experience determine the individual's reaction (Rotter et al., 1972).

Thus, Rotter's social learning theory deals with four major variables which are contingent to the theory: concepts of behaviour, reinforcements, psychological situations and expectancy. Only the latter has received significant attention in psychological research, and, in fact, it has often been mistakenly considered as the major thrust and contribution of Rotter's social learning theory.

The concept of behaviour or behaviour potential is not unlike the basic premises of an S-R definition of behaviour; that is, behaviour is any response to a stimulus which can be measured, and behaviour can be measured, directly or indirectly. In direct observation, the frequency of occurrence is monitored and recorded; the indirect behaviour is that which can be predicted and used as a referent to behaviour which is implicit in a situation.

Thus, central to Rotter's social learning theory, concepts of behaviour are both explicit measurable actions which are observed and utilized and implicit behaviour which can only be quantified indirectly. Planning, wondering, organizing, considering, as well as screaming, walking and working are behaviours which are relevant to the theory. Cognitive activity, along with quantifiable action-oriented activity are considered identifiable behaviour. Reinforcement and reinforcement value occur where the potential for a particular behaviour reoccurring is increased. Conceptually, reinforcement value is the predictability of the increase in potentiality of behaviour. In addition, the theory identifies both internal reinforcement and external reinforcement. The latter is determined by the milieu to which the individual belongs and the former is determined by the value those particular circumstances, experiences and perceptions have for the person.

As implied in the previous discussion of Rotter's social learning theory, behaviour and the movement of an individual do not occur in isolation; thus Rotter's social learning theory is a molar approach to personality. Its concern and emphasis on the psychological situation evidence this aspect. The behaviour potential, reinforcement and expectancy are all influenced by the situation. The interaction of the individual occurs on both an internal and an external level simultaneously. The action, therefore, is not a strict stimulus-response interaction,

but rather, takes into account and attempts to examine all aspects of the determined behaviour. The uniqueness of each individual's experience has brought Rotter's social learning theory to view the interaction as a one-of-a-kind, selective and personalized exchange, where not only the observable stimulus, but also the surrounding circumstances are situational determinants of behaviour.

Finally, expectancy can be viewed as the further elaboration and extension of the social aspects of social learning theory. It can be 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. (Rotter et al., 1972)

The psychological situation, the internalized cognitive action of reinforcement and the implicit behaviour are all functional in the expectancy of an event. Expectancies are subjective and cannot be determined through an objective formulation, but must take into account both the individual's history of reinforcement and the generalized expectancies from other similar instances which that person has encountered. Stated in a formula, expectancy is:

$$E_{s1} = f(E'_{s1} + GE)$$

The expectancy of this situation (s1) is a function of one's past experience of reinforcement in similar situations (E'_{s1}) plus the generalized expectancy (GE) one has accrued for similarly related behaviours.

It has been noted previously that expectancies change. This change is considered to be caused by a number of determinants. One's reaction or action in a situation is brought about through expectancy and reinforcement. Expectancies are effected and adaptations are made through reinforcements. The nature of the reinforcements can be positive or negative and still have an input to the expectancy. When reinforced in a positive manner, the expectant probability increases, and the behaviour is more likely to occur and be gratified. For example, children who make their bed when they are told and then receive encouraging comments and a smile for their efforts will be positively reinforced for their actions. This condition will change the probability of receiving reinforcement for that or similar behaviour in the future; thus, the expectancy increases the probability of behaviours recurring. When the nature of the expectancy is negative, the probability of that condition being gratified is minimized and the expectancy of that behaviour recurring is also minimized. Necessarily, the nature of reinforcements involves the recall of past events. Implicit in this recall is a synopsis of past history for similar situations. Previous experiences of both a cognitive and behavioural nature facilitate the organization of the expectancy. Consequently, the pattern of reinforcement too is considered along with the value (a subjective weighing) of the experience. The organization and the summation of categories of information

are also weighed. Individuals are faced with a given situation or circumstance, at their disposal, and view this new experience, through the eyes of their own previous organization. They have an abundance of intricate, varied and personalized data to direct their behaviours, actions or thoughts.

Expectancies are built up and can change with one's experience. In developmental theory, the children develop from a global, undifferentiated perception to a specific, clearly delineated one. They first are able to discriminate objects or events and, as they develop cognitively, these isolated single units begin to be conceptualized for their differences and then their likenesses. The similarities of these "parts" are then categorized and summated into specifically definable concepts. The process takes place on both a cognitive and verbal level; however, the acquisition and use of verbal symbolization, or lack of it, does not suggest a concomitant lack of concept formation. A simple example of this development follows: first, children are able to identify table, chair, lamp, spoon, fork, knife, then they can understand spoon--not spoon. The objects are viewed and recalled by their "sameness." Finally, they can categorize the group of objects for their differences and likenesses in a more abstract frame; thus, the spoon, ~~fork~~ and knife are silverware. The processes of neuronal and cognitive development result in the organization, categorization and

identification of one's experiences. Each identifiable unit is coded, and the code is then used to communicate the experience. Once verbalized, the code is the name given to that object. These experiences are expectancies; conceptualizations of isolated units or events.

The process of identification of both objects and events is similar. Situations which are perceived as similar are conceptualized as units for their sameness and become personalized expectancies. These expectancies of reinforcement are an individual's habitual way of responding. They are dependent upon the individual's past experiences (with their generalized expectancy, history or reinforcement, expectancy for that particular event and their psychological situation).

2. The Dimensions of Expectancy: Internal and External Locus of Control

The two characteristic expectancies of reinforcement are termed Internal and External locus of control, or control of reinforcement. The External locus of control individuals perceive the reinforcement for their behaviours as resulting from forces outside their control. They believe chance, luck, fate or powerful others are responsible for the reinforcement of events in their experience. These individuals react to, rather than interact with, their environment. Since they believe the control of their reinforcements emanates from outside themselves, the

expectancy of reinforcement is contingent upon that external, be it luck or an authority. The External locus of control individuals view all experiences--the history, the reinforcement, the psychological situation--as determined, caused and directed by things, whether they be inanimate or animate, which occur outside of the individual. They respond, they answer, they react, they are dependent upon the environment for reinforcement, but they do not feel they direct or affect that reinforcement. Internal locus of control individuals, on the other hand, view themselves as having some control over their reinforcements. They perceive themselves to be in interaction with and responsible for reinforcements. The individuals feel they take part and they have some input into their experience, thus when they are involved or affected by a situation, they perceive an ability to adjust the outcome of reinforcements in that incident. Reinforcement received is understood to be altered by personal involvement; thus the Internal locus of control individuals are more independent in their thinking and rely less on their environment than does their External counterpart. The expectancy, whether internal or external, is determined by the person's reaction in that situation and is contingent upon their perception of that experience.

The development of the expectancy concept and its elaboration into generalized expectancy and the Internal and External locus of control in Rotter's social learning

theory cannot be considered as a modern conceptualization. Adler (1956) considered power and the development of mastery in a similar fashion. To be helpless or powerless in the face of one's experience was essentially considered as having an External locus of control of reinforcement. Powerless individuals would be ones at the mercy of others and their experiences, for they felt they were unable to effect a change in their experiences; thus, the compulsion of the external environment would be overpowering. Individuals who commanded power and mastery, or at least believed that they did, could actively attempt to manipulate their situation and reinforcements. These individuals maintain the attributes of an Internal locus of control. In Rogers' terms, Internal locus of control persons are self-actualizing and mobile in their involvements. Glasser finds that the External locus of control's equivalents do not take responsibility for their actions and are unaware, or cannot anticipate the logical consequences, of their actions. Regardless of the approach, many studies have been conducted to elucidate the particular dynamics involved which shall be discussed in the next section.

3. Studies of Locus of Control

Within Rotter's social learning theory, a number of methodologies for the investigation of locus of control have been pursued and the research has been plentiful. The main emphasis has followed two directions: the

situation-specific approach, and the personality variable of generalized expectancy. The situation-specific or task-structured approach to the locus of control places the subject in situations, or assign them tasks, where the internality or externality of the encounter is set; thus, the subjects are led to believe that the experiences (conditions) they are placed in are either chance (external) or skill (internal). Their behaviour is then examined in light of the preset skill or chance situation. This situation-specific approach dominated the early literature investigating the Internal and External locus of control dimensions of Rotter's social learning theory, but with the development and implementation of the self report questionnaire, the personality dimension of the locus of control was considered centrally. Studies compiled to investigate this aspect have far outnumbered other areas pursued. Research in this dimension was undertaken by developing questionnaires designed to clarify the individuals' habitual mode of responding.

The first questionnaire and study of locus of control were designed by Phares (1955) in his doctoral dissertation. He created a 13 item list to measure the mode of perception (i.e. the subject's perception of the reinforcement--was it due to chance or himself?). James revised this scale and the Likert type scale of James-Phares (Throop & MacDonald, 1971) began to be implemented. Although limited, investigations into the dimensions of locus of control

continued. Rotter's study with Seeman and Liverant (1962), however, was the impetus for an abundance of investigations; the great interest in the study of locus of control which was generated at that time, has continued until today.

Presently there are over 3,000 published studies dealing directly with the locus of control construct. As a result of the great interest in dealing with this variable, and in an attempt to quantify and organize the burgeoning published and unpublished literature, numerous bibliographies have been completed. Throop and MacDonald's work in 1971 was the first venture of this type. It was followed a year later by an update (MacDonald, 1972). With the aid of Davis, MacDonald again placed an addendum to the previous work in 1974. Thornhill, Thornhill and Youngman (1975) completed a computerized bibliography of published and unpublished studies consisting of over 1,200 references. The most recent compilation completed by Prociuk and Lussier (1975) deals with the published studies of locus of control and reports 277 articles in the two years they reviewed. MacDonald et al. (1971, 1972, 1974) have reported that ". . . there are presently 10 adult scales and 6 children's scales" in existence, while Gilmore (1978), in the Canadian Psychological Review, identifies nine scales dealing with children. The literature is furthered by a number of books dealing with the variable (Rotter, Chance and Phares, 1972; Phares, 1973, 1975; Lefcourt, 1976), plus innumerable unpublished works. This mass of research

has taken many directions. Review articles by Lefcourt (1966) and Rotter (1966) prompted increased investigations. These early reviews divided the field into two major areas-- the investigation of task-varied studies and locus of control as a personality characteristic. They covered virtually all research which had been completed up to that time.

Joe (1971) has limited his review to studies dealing with locus of control as a personality characteristic, while Lefcourt (1972) divides his review into five areas: resistance to influence; cognitive activity; deferred gratification; achievement behaviour, and the response to success and failure; and familial and social responses to locus of control and changes in locus of control.

Through these diversified areas, the great majority of studies have been completed on adult and college student populations. Although a smattering of studies with children have been completed through the prevalent interest in the construct, only recently has the variable been considered more extensively with children.

4. Studies of Locus of Control with Children

Research concerning children can be divided into areas of ethnic or cultural group differences, achievement studies, therapeutic studies and studies dealing with the physically and emotionally disadvantaged. A number of

studies have completed correlational research with locus of control and a variety of variables. Age is the most frequently used, while sex, birth order, grade and social milieu are others. Some investigations of locus of control have attempted to study its antecedents. The main means of data collection has been in retrospect or through the self-report questionnaire. Since this approach does not yield unbiased observations of the subject's experience, this area is one which has been reported to be in need of further research.

a.) Ethnic and Cultural Group Studies

Studies dealing with ethnic and cultural groups have mainly compared divergent groups: black and white, middle and low income, Indians and Mexican Americans, etc. Walls and Cox (1971) completed a study of expectancy in skill and chance situations with disadvantaged and non-disadvantaged children. The treatments were perceived chance and skill, or actual chance and skill situations. In the perceived skill-actual skill situation, the subjects were given 20-seconds to place as many pegs on a board as possible. Upon conclusion of the trial, they were asked their expectancy on the ensuing trial. In the perceived skill-actual chance situation, the time per trial was varied. In the perceived and actual chance situations, the subjects were asked to draw a number from a hat which would determine the number of seconds of their trial, while in the

perceived chance-actual skill situation, the subject was still drawing a number from the hat but it remained constant at 20 seconds per trial. The results show significant findings in both the perceived and reality chance situations. The disadvantaged girls scored more externally than the others while the boys scored more internally.

Other studies of group differences looked at locus of control, level of aspiration and achievement in retarded and normal children. Riedel and Milgram (1970) used two groups of normal children (3rd and 6th graders) and one group of retarded. All groups were administered the Bialer Locus of Control Scale, the Battle and Rotter Level of Aspiration Board and the Symonds Picture Story Test for N-Achievement. The results revealed that the 6th graders performed more internally and realistically. The educable retarded, although older than the 6th graders, performed more like the 3rd graders.

Milgram (1972) followed this study by looking at locus of control in black and white children at four grade levels (grades 1, 4, 7 and 10). He noted a discrepancy in the findings of previous researchers investigating locus of control and scholastic achievement. In order to examine black and white children and clarify the existing contradictory results which had been published, Milgram administered the Bialer Locus of Control Scale, the Metropolitan Readiness Test for Grade 1, the Otis Lennon Mental Abilities Test, the Raven Colored Progressive

Matrices Test and the subjects were asked their occupational choice. The results were analyzed and suggested an age-related progression in the locus of control scores, but no sex or ethnic group significance was found. The results were not significant in the scholastic and non-scholastic measure of intelligence. Milgram suggests that his lack of findings was due to the sample used and the diverse elements which constituted the locus of control scale, both conceptually and operationally.

The Ducette and Wolk (1972) study assessed the environment of lower class black children and middle class white children on locus of control and level of aspiration measures. Subjects were from extremely different settings; one was from a black ghetto school which draws its students from a lower class neighbourhood, while the other two groups were drawn from a predominantly white, middle class school and an all-white middle class college preparatory school. The results showed striking differences in the level of aspiration and locus of control in the different settings. The salient issue which the authors present and discuss, beyond the apparent disparity between the level of aspiration and locus of control of the groups, is that the internally controlled white, middle class children and their high level of aspiration are more closely aligned with the external ghetto blacks. The authors defend the locus of control construct and its apparent inconsistency in defining the behaviour of children in differing milieux.

by suggesting that the internal black children who had characteristically low scores on the level of aspiration measure are clearly reading their environment and thus are fulfilling the behavioural determinants of the locus of control construct, while the external black children, who have consistently high aspirations, are not reading their environment. The writers predict that these subjects will never reach the accentuated level of their predicted aspirations. Thus they suggest the internal subjects have a realistic grasp of their situation while the external subjects remain unrealistic.

Milgram, Shore, Riedel and Malasky (1970) compared culturally advantaged and disadvantaged 6 year olds in locus of control and level of aspiration. They were administered the level of aspiration measure and the Battle and Rotter (1965) Locus of Control Scale. The results suggest the disadvantaged group is higher and less accurate in their level of aspiration and they are less internally controlled. Milgram suggests that since there is little discrepancy between the black and white disadvantaged children's scores in this study, and an equivalent trend in studies completed with retarded was noted, a similar phenomenon may be occurring. These findings seem to contradict the aforementioned study with high school students.

A recent study by Stephens and Delys (1973) compared disadvantaged and advantaged preschool children. The Stephens-Delys Reinforcement Contingency Interview (1973),

an Internal-External locus of control measure of 40 questions in a free response, structured interview, was administered to each child. The scale contains four positive and four negative reinforcements which are paired with five reinforcement agents. The disadvantaged group came from a Montessori School and a Parent Cooperative Nursery. It was found that the middle class subjects had significantly higher total internal scores than the disadvantaged group, while differences between black and white head-start classes and between Montessori and Parent Cooperative classes were not significant. Girls scored more internally than boys but the difference was not significant, while the difference between sex and reinforcement type proved to be significant. Generally, girls scored higher than boys and they (the girls) scored higher on positive reinforcers than on negative ones. Since sex and economic differences are noted at such an early age, the authors discussed their results in light of developing compensatory education programs at this level, specifically aimed at developing internal control expectancies. A follow-up study was completed on the same sample at the end of the school year and determined that the middle class children had made the greatest gains.

Graves (1961) investigated a tri-ethnic community in order to find the ethnic backgrounds affected by locus of control. He tested the high school population of that community and found gradations in the scores of the three

1

groups. The whites were the most internally controlled, followed by the Spanish-Americans, and finally, the Indians. Measures of locus of control have uncovered numerous differences within diverse cultural groups. There is a disparity in the findings, since one study finds girls more internal (Stephens & Delys, 1973) and another reports boys to be (Walls & Cox, 1971); however, the majority of the results seem to confer that, by comparison, the economically more mobile a group is, the more internal its performance is. In the present study, sex and locus of control will be examined to help clarify some of the contradictory findings.

b.) Pathological Group Studies
on Locus of Control

Another area of locus of control studies with children has been with pathological groups. Investigators have examined atypical children and compared them with normal children and, secondly, these investigations have examined homogeneous samples of pathological groups and their performance. The Riedel and Milgram et al. (1970) study previously cited coincided with the results of an early study by Bialer (1961). Bialer tested retarded and normal children and looked at their preference for immediate or delayed gratification. The results showed significant correlation between scores on locus of control, mental age and delayed gratification.

Finch, Nelson, Montgomery and Stein (1974) compared reflective and impulsive emotionally disturbed children. Twenty emotionally disturbed children, categorized as reflective or impulsive by their speed of response to the Matching Familiar Figures Test, were given the Nowicki-Strickland Locus of Control Scale. The reflective and impulsive children's scores on the locus of control scale were compared and the differences did not reach the level of significance. The authors concluded that locus of control is not indicative of cognitive style in emotionally disturbed children. It is evident, however, that their design did not allow them to measure cognitive style; rather, they achieved only a measure of motor speed.

c.) Achievement Studies
on Locus of Control

The study of locus of control and achievement, like the studies of group differences (i.e. ethnic and cultural group differences) and locus of control, has yielded numerous investigations. Studies such as Bartel (1971) and others have bridged the gap between the divergent areas.

Bartel (1971) investigated locus of control and achievement in middle and lower class children. A large sample (N = 431) of 1st, 2nd, 4th and 6th grade students was administered the Bialer Locus of Control Scale. Their socio-economic status was determined and their achievement ratings were based upon the Iowa Test of Basic Skills or the Metropolitan Achievement Test. The author hypothesized

that there would be little difference in the scores of the groups at the earlier grades (younger ages) and their scores would become more significant with age. The findings concur with the hypotheses; at the younger age levels, the locus of control and achievement did not reach significance, yet at the older levels significance was reached. The results were discussed in terms of the school's effect on the developing child. Since the groups were equivalent in grade 1, then the change for the middle class toward internality and better achievement must be indicated by the schools, Bartel argues. It may also be due, however, to those children's readiness for that experience.

Messer's (1972) findings are similar to those of Bartel. He has found that internals have higher grades and achievement test scores than externals. It was also noted that boys who took credit for their success and girls who accepted blame for their failure have higher grades and achievement test scores. The 78 4th grade subjects were administered the Intellectual Achievement Responsibility Questionnaire (IAR) and the Matching Familiar Figures Test. Messer's findings concur with previous works (McGhee & Crandall, 1968), but unlike the earlier investigations, he feels that locus of control is a result of one's grades and achievement, rather than the cause.

A study which refutes this conjecture was completed by Dweck and Repucci (1973). They studied the aspects of learned locus of control by examining learned

helplessness and reinforcement responsibility in 4th and 5th grade children. Their study utilized the IAR questionnaire and the subjects were administered a number of block design problems to solve. The designs were pre-set: some to be passed and others to be failed. The purpose of the designed failures was to measure the number of trials the subjects would continue in attempting to pass. The results confirm the findings of previous studies. Although all subjects were motivated to succeed, some continued to strive while others deteriorated. The conclusions which are reached and which the IAR scores substantiate are that some subjects believe in an Internal locus of control and others in an External one. Dweck and Repucci feel that the expectancies of reinforcement and the striving for success are present or absent in the subjects but that their responses can be altered by a discriminative stimulus which will mediate and thus generalize the training expectancy situation to other situations.

The role of generalized expectancies and specific expectancies were examined by Nowicki and Walker (1974). They sought to investigate the relationship between specific expectancies and generalized expectancies (locus of control) to actual achievement performance. It was hypothesized that subjects who made realistic appraisals of their success in specific situations would achieve more than those who did not. It was also hypothesized that internal white females would achieve more than the external

black male subjects. The subjects were 35 female (25 black and 10 white) and 28 male (14 black and 14 white) 5th and 6th graders. The Nowicki-Strickland Locus of Control Scale and the Rotter Level of Aspiration Board were administered and their files were checked for scores on the Metropolitan Achievement Test. The results were as hypothesized: internal white female subjects achieved more than their counterparts, suggesting that expectancy is something learned and can be altered by adjusting the experience of the child.

Recently, Maehr and Stallings (1974) found that the influence of immediate evaluation on performance is not as strong as may be suggested in studies like Nowicki and Walker's (1974). Maehr and Stallings' study was conducted in two parts: first, instructions were given suggesting an internal or external mode of responding. The subjects were evaluated at the end of ten responses and were then asked if they wished to continue and if they would complete the remainder of the task on their own time. It was found that the success pattern was not significant and did not alter the subjects' desire to continue. Rather, the challenge of the problem for the internals and the feeling of success for the externals was found to be the motivational force.

The second phase of the study, reported by Maehr and Stallings (1974), was a replication of the first, with the addition of the two variables of sex and achievement.

The findings concur with the results of the first study. The additional variables of sex and achievement proved to be interesting additions. There were no direct sex differences or significant findings in the task, yet the boys who scored high on the achievement measure were also motivated and interested in continuing in the second phase of the task.

As with much of the literature, today, an abundance of research has been directed toward achievement and school-related skills. Studies of locus of control and achievement have been no exception. Results of the numerous investigations have been consistent: internals are more highly motivated, need less encouragement and enjoy the challenge of a difficult task, while externals perform better with associations, successes and when they perceive they will be successful. Although the findings are consistent, the rationale varies and numerous theoretical hypotheses are generated.

d.) Practical Application
Studies on Locus of Control

Recently, another area of investigation has come into prominence with children, aimed at the practical application of the locus of control construct.

Lifshitz (1973) looked at the locus of control construct as a function of age and social milieu. He administered the IAR scale to 183 children of three different kibbutz movements. The children ranged in age from 9

to 14 and a large number of the children were considered problematic. Data was classified and analyzed according to age, sex, mental health and kibbutz movement. Lifshitz found significant increases in the three scores (I+, I- and Total I) of the IAR with increasing age; however, unexpectedly, there was no difference in the scores of the problematic and normal children at the younger age levels. At the older levels, the problematic children accepted more blame for their failures than normals. The three kibbutz movements were found to indicate differences in responsibility in their children; consequently, problematic children viewed themselves the same as normals at the younger age levels, yet more toward self-recrimination as they matured. The socialization milieu (i.e. kibbutz movement) had an influence on the children, whether problematic or not.

Following a similar line, Nowicki and Barnes (1973) placed inner city teenagers (7th, 8th and 9th graders) in a camp experience for seven and eight weeks. The Nowicki-Strickland Locus of Control Scale was administered to 261 participating male students at the beginning and at the end of the camping experience. It was hypothesized that since the contingencies of reinforcement (the expectancy), are so poorly established in the experience of the inner city child, an experience where the contingencies and structure are clearly defined would change the locus of control of the subjects: they would, it

was felt, become more internal and this internal change would increase with time. The results verified the predictions: the children's scores significantly increased over the seven week period and continued to increase from the seventh to the eighth week. The authors suggest that changes toward an Internal locus of control were due to the camping experience, in that the youngsters were made to feel more in control of their experience, providing a step toward more internal independent activity.

In a study of 21 delinquent boys, Eitzen (1974) found significant changes in the locus of control scores. The Nowicki-Strickland Locus of Control Scale was administered prior to and at four and nine months of the boys' stay. These testings took place during a period when two different sets of teaching parents resided in the home. The residence was run on a token economy system. Eitzen suggests that a token economy milieu may be generalizable (in reference to locus of control) and an applicable program for the reintroduction of delinquent boys into society.

Another study which has strong implications for a therapeutic means of dealing with locus of control is a two-fold study by Baron, Cowan, Ganz and McDonald (1974). The first phase (study) was a replication of a study completed by Baron and Ganz (1972). In that work, Baron and Ganz found that internals performed better when they were responsible (intrinsically) for their reinforcement.

while the externals' performance improved with an extrinsic (verbal feedback from experiments) reinforcer. In the replication work, both black and white lower class children (10 and 11 year olds) were used, whereas in the Baron and Ganz study, only black lower class children were tested. The results yield support for the hypothesized and previously found results. The second phase (study) attempted to increase the comprehensiveness of the previous findings and was completed using college students as subjects. The results, again, confirm that, at an older age level and socio-economic class, internals perform best with intrinsic reinforcement, while externals perform better with extrinsic reinforcement.

Pawlicki's (1964) study attempted to verify previous works on locus of control and the effectiveness of social reinforcers. The Bialer Locus of Control Scale was administered to 3rd, 4th, 6th and 7th grade subjects and each subject was involved in a card-choosing game. He hypothesized that the developmental changes in the effectiveness of social reinforcers were related to changes in locus of control. The results did not verify the hypothesis. Within the card-choosing game, two experimental social reinforcers were administered; praise-connoting social reinforcers and information-connoting reinforcers. Praise-connoting social reinforcers did not give way developmentally to information-connoting reinforcers, but information-connoting social reinforcers were preferred

throughout the grades. The data also revealed, as in earlier findings, a developmental trend of increasing feelings of control with age and an increase in the locus of control score.

e.) Developmental Studies
on Locus of Control

A small number of studies have been completed examining Internal and External locus of control and the developmental changes which take place in the growing child. Bialer was the first to examine the conceptualization of the child's generalized expectancy (1961). He wanted to determine whether the concept of success and failure was affected by development and mental age. He developed his locus of control scale for children and administered it to normal (ages 6.3 to 14.3) and retarded children (ages 5.3 to 15.9). The children were then given a repetition choice task and finally were asked if they would like one piece of candy immediately or more than one piece upon completion of the task. The results were as hypothesized, suggesting development would progress from an external toward an internal orientation accompanied by an increase in the ability to delay gratification. It was observed that the mental age of the children correlated with the type of response they would render.

Another study which followed Bialer's and was concerned with locus of control was Battle and Rotter's (1965) study of black and white children. The authors

developed the Children's Picture Test and administered Bialer's Locus of Control Scale to all the children. The relationship of the two test scores to age, sex, ethnic group, social class and behaviour on a line-matching test was investigated. They found a negative correlation between the two scales and more external scores for the black lower class subjects. Sex and age differences were not obtained.

Penk (1969) completed a developmental study with children from 7 to 11 years old. It was hypothesized that with increased mastery comes a feeling of greater control and a less generalized feeling that events are chance-related. This was investigated by means of the Bialer Locus of Control Scale and a number of performance tasks. The findings were consistent with the development hypothesis and suggest that there is a significant interaction between verbal abstraction and locus of control: that is, children who can abstract are more internal and tend to perceive their reinforcement as the result of their own actions. As in the Battle and Rotter (1965) study, age and sex differences were not found.

Another investigation into the development of children's locus of control was recently completed by Scanlon (1977) in her doctoral dissertation. She examined the development of an Internal locus of control and school adjustment in language-disabled and average children over three grades: 2nd, 4th and 6th. The Nowicki-Strickland Locus of Control Scale for Children, as well as the

Slingerland Screening Tests for identifying children with specific language disabilities, and a school adjustment rating examination were administered to the groups of children. The results were analyzed and the author concluded that there is a developmental trend toward internality in both language-disabled children and children who did not suffer from a language disability. Scanlon reports that the development of internality is not consistent in the two groups; thus, the pattern of development varies. The language-disabled children report significantly greater difficulties in school adjustment.

Strickland (1973), in an attempt to determine whether locus of control was a measure of competence and maturity, completed a study of 152 (76 male and 76 female) 3rd, 4th and 5th grade subjects. She wished to examine locus of control and delay of gratification in children. They were administered the Nowicki-Strickland Locus of Control Scale for Children. They were then asked if they would like one lollipop at that time, or three lollipops upon their return, in three weeks. The findings indicated age and sex were not related to reward choice, yet the internal subjects were significantly more likely to choose the delayed reward.

Newhouse (1974) has completed an extensive investigation of locus of control and a number of variables-- birth order, sex and grade level--were examined. His sample consisted of 800 subjects from children in 4th,

5th and 6th grades (428 females and 372 males). They were administered the IAR questionnaire. A 2 x 2 x 3 factorial design was implemented with a co-variated adjustment. The findings indicated a sex difference: females assumed more responsibility for blame than the males, while birth order effects indicated that an only child assumes less responsibility for success than first borns and later borns. The grade level variable proved to be barely significant: the 4th graders were likely to assume responsibility for success more readily than were the 5th and 6th graders.

There are conflicting findings in reference to sex differences and locus of control. Newhouse (1974) and Crandall et al. (1965) have found differences in locus of control for children of different sexes, while studies like Bialer (1961) and Battle and Rotter (1965) have found no significant differences in the scores of the children. Unlike the sex variable, the majority of research notes a developmental change in the locus of control; the younger age level scores more external and progress toward an internal frame with age and maturity.

5. Studies of Performance and Locus of Control with Children

Perceived skill and chance, as reported earlier in the review, were initially the basis for extensive work with the expectancy variable of locus of control in Rotter's social learning theory. The first review of

studies dealing with this variable focused on the task-structured approach (Rotter, 1966). This approach, rather than examining the personality of the individual and observing his behaviour, would view the locus of control variable (i.e. skill or chance) as an external force acting upon the individual; thus, the task was predetermined as skill (internal) or chance (external). These environmental conditions would affect one's behaviour and this action was the basis of research. For example, James and Rotter (1958) and Phares (1957) utilized the preset task-structured condition, controlled reinforcements and examined the resultant behaviour. This approach, although initially popular, made way for studies which have dealt with locus of control and personality dimensions; thus, mainly through the use of self-report questionnaire, an assessment of an individual's locus of control is determined and this is examined in relation to other variables. The early studies of locus of control and task structure, then, observed output in a variety of skill and chance situations without looking at the personality of the individual. The focus of interest then turned from variable performance to personality dimensions of locus of control. Recently, however, a number of studies rekindled an interest in the situation-specific dimensions of locus of control.

Baron and Ganz (1972) and Baron, Cowan, Ganz and McDonald (1974) examined locus of control, type of feedback and its effect on performance. The results of their

initial work and its replications have made it clear that one's performance is contingent upon, not only locus of control, but also perception of the situation as either chance or skill.

More recently, Altshuler and Kassinove (1975), in examining temporal persistence, seem to have bridged the gap between the expectation of a skill or chance encounter and the reinforcement of their efforts on the experimental task. They completed a study of 96 (equal numbers of boys and girls) white, 5th grade students from a lower-middle class school district. The children were administered skill and chance instructional sets and reinforced for their efforts on a formation of words from letter sets task at a predetermined level (0%, 33%, 66% and 100%). Their persistence on an open-ended trial (no time limit) was examined. The results were as hypothesized: children given skill instructions persisted longer than those children who were administered chance instructions. Children given chance instructions persisted longest under partial reinforcement and the children who were given skill instructions and were continually reinforced, were the most tenacious. Although the cell size was small, the authors reported significant sex differences (i.e. boys in the skill condition were more persistent with 100% reinforcement and the girls in the same condition and chance instruction frequently stopped).

Ward (1974) examined the effect of praise or correctness reinforcers, locus of control and performance on a marble-sorting game. The subjects were 120 black and Spanish surnamed children. Unexpectedly, his findings did not concur with previously reported data. There was no significant difference between the variables being examined. One's task performance was not affected by locus of control or by the type of social reinforcers which were implemented.

Along a similar line, Pawlicki (1974) set out to study the effectiveness of differing types of reinforcement and their effects on performance at different developmental levels. He found a developmental change occurred in the performance of children with differing locus of control and type of reinforcer employed (praise-connoting or information-connoting reinforcers).

Dollinger and Taub (1977) furthered the work of these investigators and considered the motivational influence of providing a purpose. They utilized 209 children from grades 4, 5 and 6. After administering and scoring the IAR questionnaire, the children were divided into groups with high, medium and low locus of control. A 3 (grade) x 2 (sex) x 3 (locus of control) x 2 (purpose) factorial design was utilized. The results were as predicted; externals' performance and their rated interest, which they reported at the conclusion of the gaming task, were significantly poorer and less interesting respectively

than the internals". The authors suggest these findings have effects for education and child-rearing approaches.

Gurtman (1974), in her dissertation, examined locus of control, tester influence and the feedback of the subject's performance on an electric dart game. She administered the Nowicki-Strickland Locus of Control Scale for Children and arrived at a sample of 92 who fell in the upper and lower 20% of the total sample. She found that there was no significant difference between the internal and the external subjects on the performance task, and there was no significant difference between the children who had feedback and those who did not. She explains that the child's perception of the task, the task difficulty and the setting in which the subjects were tested, may have affected the outcome. Similar inconsistencies, and limitations, have been reported in other research.

Morris and Messer's (1978) recent study, in some respects, concurs with that of Gurtman (1974), while other aspects contradict her lack of findings. Morris and Messer examined locus of control, locus of reinforcement and task persistence, utilizing a teaching machine task with 153 4th and 5th graders. This group of boys was administered the IAR questionnaire and those scoring in the upper or lower quadrants were randomly assigned to a self-reinforcement or external-reinforcement group. The authors found that external reinforcement led to greater task output than self-reinforcement. Externals perform

best with external reinforcement, yet no significant difference in performance was found with those internal subjects. While differences in type of reinforcement in externals and in the performance of internals and externals was observed, no difference was found to be significant in the performance of the internal subjects. Thus, Morris and Messer's findings with internals concur with those of Gurtman.

Blank (1973) administered to a sample of 5th grade students a digit symbol task under a time limit. The subjects, divided into both Internal and External locus of control, were randomly placed in three reward conditions (praise, money and control). The results of their performance on the task suggest that neither the differential reward conditions nor their locus of control had any effect on the performance of these 5th graders. While no significant findings were reported, Blank stated: "Internal subjects performed significantly better on the experimental task during the earlier rewarded trials."

The author further provided support for the locus of control variable as an independent motivating variable affecting task performance, but questioned the findings of previous research. It is apparent that, although under various rubrics such as temporal persistence, motivation, task performance, etc., the measurement of one's behaviour or output is being considered more centrally in recent works on locus of control. Whether the study is

task-structured, where the output is preset as skill or chance, or where the personality dimensions of the locus of control variable are being examined in light of one's abilities on a given task, the trend seems to be that the examination of the expectancy of one's locus of control and one's performance proves to be a fruitful area of research.

As reported earlier, studies with children and locus of control have been limited and the work with variables such as performance, age and sex with children, has received some attention. Unfortunately, with each of these variables, there have been inconsistent findings. It seems that with varying conditions, one would create some variance in the performance of the individual. This variance in relation to the child's locus of control will be examined in the present work.

a.) Gaming Type
Tasks with Feedback

Research with children's locus of control and performance have used almost exclusively a gaming type task, regardless of the specificity of the situation and the variables being studied. As stated earlier in the review, this is due, in part, to the difficulties in utilizing children as subjects, but whatever the impetus gaming tasks yield, it has become the method of choice. For example, Dweck and Reppucci (1973) have used a block design gaming task in an academic setting to elicit the child's performance, while Walls and Cox (1971), Blank (1973) and

Dollinger and Taub (1977) have implemented gaming type tasks to study a variety of behaviours.

A number of studies which have examined performance have utilized a variable schedule of reinforcement. This has been achieved by both varying the total success rate (a percentage of the total response) for a group, or administering groups either success or failure (usually not monitoring the degree). In either circumstance, the schedules of reinforcement have been used as independent measures. In this way, reinforcements, successes, failures, motivational cues, feedback, etc. have been invoked in an abundance of tasks. James and Rotter (1958), for example, in one of the first studies of locus of control, had a partial (50%) and 100% reinforcement condition. They monitored the children's responses until extinction.

Fine (1973), in her doctoral dissertation, implemented a 25% and 75% reinforcement schedule to view the expectancy range, task performance and self-evaluation. Altshuler and Kassinove (1975) designed four levels of reinforcement (0%, 33%, 66%, 100%) when examining temporal persistence, as noted in their previously cited study.

Maehr and Stallings' (1972) sample was comprised of children from a university town. The authors examined external evaluation and its effect on the performance of these children. Although the percentage of reinforcement or the positive external evaluation was not clearly defined, the results and approach were consistent with much

of the work being completed studying performance.

Strickland (1973) examined evaluation or perception of the performance task from the perspective of delayed gratification. In her study, she involved 152 students from grades 3, 4 and 5. She conceded that:

The belief in delay of gratification ties into the network of behavior-reinforcement contingencies that can be assessed along the dimensions of Internal-External locus of control.

Recently, Lewis-Beck (1978) completed a study of children's performance following failure. Their locus of control and task expectancies were rated and the author found that all the children increased their performance following failure feedback and task expectancy had little effect on their performance.

Thus, it can be seen from the frequency of the aforementioned type of performance study, that differing schedules of reinforcement have an impact on the child's performance. There appears to be a link between one's locus of control, perception of the task (i.e. success or failure, positive or negative, purpose or no purpose, etc.), and performance; however, this association remains unclear due, in part, to the variety of variables being examined.

The present study will use a varied schedule (50% and 100% win conditions), to monitor its effect on the performance of children in a gaming task. The gaming task which will be implemented in the present work was selected because it has little inherent interest or value

to the child. It is also easily understood and there is no particular physical ability required to participate. The simplicity of the task, coupled with its lack of interest and the fact that the child's participation in the task is not explained, are all advantageous in the present research, for they provide a vehicle for examining the child's habitual mode of performance. By examining the child's habitual mode of responding, it is hoped that the present study will make the distinction between one's locus of control, perception of an ambiguous task-structured situation and the resultant performance under various conditions. Thus the emphasis of the present research will be to bring into focus the personality dimension of the expectancy variable and its implementation in perception and performance.

6. Theoretical Summation

As was stated previously, Rotter's social learning theory states that the psychological situation, the internalized cognitive action of reinforcement and the implicit behaviour are all functional in the expectancy of an event. It further explains that the expectancies are subjective and must take into account both the individual's history of reinforcement and the generalized expectancy of other similar instances that the person has encountered. Studies dealing with children have examined

the expectancy in its internalized aspects (i.e. personality dimensions) and in external situations (i.e. task structuring). The bulk of research has examined these aspects in an involved system of conditions and reinforcement situations. In an effort to examine the expectancy variable from the personality dimension and its effect in a task structured situation, the present study was undertaken.

With recent new interest, and the complexity of studies being reported examining the personality dimensions of locus of control and performance, studies dealing with feedback have been reported. In light of previous research, a link between locus of control, perception of the task and performance is evident, but it has not yet been explored.

Theoretically, the locus of control of the children will determine their expectancy. The Internal locus of control children are said to be independent, self-motivated, question more, rely less on direction in the outcome of events; the External locus of control children, it is reported, believe that luck, fate and powerful others have control over their reinforcements. They are less independent and do not seek input into changes in their environment; consequently, with this conception, the behaviour of the children can be postulated. Behaviour prediction from these theoretical constructs has taken many modes. A diverse and broad base has been established, in the literature for the investigation of the locus of

control variable with children. Performance has been considered across this complexity of divergent inquiries. Through recent research, the variable of performance has been considered more centrally. This interest has been furthered by its consideration with types of feedback. Here, too, the investigations have been completed examining complex variable situations. No studies were found which have examined locus of control variables in a way which would test the habitual performance of the individual. Thus, examining performance and locus of control in a task structured situation and as a personality dimension will afford a concise view of the effects of the expectancy variable on both dimensions: as a personality trait and within the task situation.

A myriad of studies have been undertaken dealing with the variable of age. Overwhelming evidence suggests that a developmental shift takes place in one's locus of control with increased age. A developmental sampling of children at two age levels will provide additional data to help determine if the increases in internality will be borne out in performance differences.

Rotter's social learning theory would predict differential performance from individuals with differing expectancies of reinforcement; that is to say, the Internal locus of control children will perform differently from the External locus of control children. Research studies have examined this phenomenon in complex situations

(Ward, 1973; Altshuler & Kassinove, 1975). In an attempt to reduce the complexity of the study and reduce the confounding influence of the experimental situation, this experiment utilizes a simple lever-pressing task. The purpose of the task is not clearly stated to the child, thus controlling the complex situational effects and examining the normal child's performance.

The characteristics of the locus of control of the child describes the predominance of control of reinforcement by the Internal locus of control child versus the predominance of chance or luck reinforcements by the External locus of control child. From theory and literature, it seems that variances in locus of control result in variances in performance; however, the research has been complex and a number of variables have been considered. To clarify and add to the current data, the use of variations in the structure of the task with a variable win-loss schedule was utilized. Thus, the present research will underscore a conditional performance due to the task perception of the individual.

While the literature reports consistent age variation throughout the numerous and diverse areas in which studies of locus of control with children have taken root, the variable of sex has been consistently inconsistent. In view of child development, it would seem that sex differences would be consistent, but with the variety of situations being implemented in the studies, a clear conception of the

influence of sex remains in doubt. While its inclusion in the present research is only ancillary, it is hoped that it will provide additional data to help determine if sex differences are observable as performance differences.

In summary, Rotter expounded his theory in the early 1950's; with the start of the 1960's, investigations were prolific and numerous aspects of his unique approach were being examined. Expectancy, and more specifically, the locus of control variable received a great deal of attention; this trend has yet to diminish. Internal and External locus of control has been examined mainly with adult populations; research with children has been restricted. However, there have been clusters of studies completed in areas of achievement, ethnic groups, atypical children, pragmatic studies, developmental studies and studies of performance and feedback, dealing with the locus of control construct. One area which has only recently received attention has been how locus of control affects the development of behaviour in the child. From the review of the literature, it can be seen that studies have approached performance from a multitude of directions, but as yet the questions of task, age and sex differences, and the child's locus of control, have not been resolved. While there have been research projects which report significant findings in these areas, there have been contradictory findings as well.

General hypotheses which have been generated from the review and which will be considered, are: that performance will differ at different age levels; that the Internal locus of control (as per the Nowicki-Strickland Locus of Control for Children) will differ from the External locus of control child on a performance measure; and that the conditions of the situation will result in differences in performance.

The next chapter will present the design, a description of the administration of the locus of control measure, as well as the sample, the performance task and the elaboration of directional hypotheses resulting from the aforementioned expected effects.

CHAPTER II

EXPERIMENTAL DESIGN

This chapter will present the experimental procedures, the sample, definition of the independent and dependent variables, the statistical design and the hypotheses being tested.

1. Description and Administration of the "Nowicki-Strickland Locus of Control Scale for Children"

The Nowicki-Strickland Locus of Control Scale for Children was developed in the early 1970's. It was evident, at that time, that the existing measures (Bialer, 1961; Battle & Rotter, 1963; Crandall, Crandall and Katkovsky, 1965) were, in one way or another, incomplete. In response to this need, Nowicki and Strickland developed their 40 item locus of control scale for children. It is a paper and pencil measure where the subjects mark their responses affirmatively or negatively. Developed from a pool of over 100 questions, the scale was reduced to 59 by a panel of clinical psychology staff members. These 59 items made up the preliminary administration. Items were checked by both elementary school teachers and children to assure the reading and comprehension levels were appropriate for

the ages and grades of the children. The final version constitutes a 40 item scale.

The subject pool utilized in the evaluation of the new measure was 1,017 children from 3rd through 12th grades. They were described as predominantly white children from four suburban communities which border on a large, southern metropolitan city. The socio-economic group was reported to be mixed (however, the upper class was not sufficiently represented), with possible over-representation from the lower class.

Gilmor (1978) reported, in a recent review of locus of control and adaptive behaviour in children and adolescents, that:

The most attractive choice for measurement of generalized locus of control expectancies for efficiency of administration and continuity for different ages would be the Nowicki-Strickland Scale.

The Nowicki-Strickland Locus of Control Scale for Children (see Appendix 1) was administered by the examiner and an assistant to the entire 3rd and 7th grades (five 3rd grade classes and five 7th grade classes) of the Alta Vista Public School, Ottawa, Ontario. A total of 278 children were tested. This sample consisted of 135 8 year olds (i.e. children 8 years old before September 30, 1976) and 143 12 year olds (i.e. children 12 years old before September 30, 1976). The scale was administered to entire classrooms; the teachers were asked to leave

the room during the testing. Standard instructions were given (see Appendix 2). The examiner read each question aloud and the children were asked to follow along on their questionnaire. If they were undecided about a response, they were told to choose an answer closest to how they felt. The record sheets were examined after each question to insure that they were appropriately marked. If a child marked two answers, or answered in the wrong column, the error was brought to his/her attention for correction. There proved to be little need for this close monitoring for there were only a small number of questions and inappropriate responses, but the close monitoring during the administration of the scale did permit the examiner to adjust the speed of administration to accommodate the two age levels. The administration times for the younger groups were approximately 40 minutes, while for the older groups they were approximately 25 minutes. The testing was completed from April 21, 1975 to May 14, 1975.

2. The Sample

As a result of scores on the Nowicki-Strickland Locus of Control Scale for Children, the 80 subjects who were to be utilized in the performance aspects of the study were selected, by first dividing the entire subject pool of 278 into four groups which were divided by age and sex. This yielded 8 year old males, 8 year old females, 12 year old males and 12 year old females. The means and standard

deviation scores are reported in Table I. The children were then ranked by their score on the locus of control scale and the upper 1/3 of the subjects were selected to make up the pool of subjects who were then randomly assigned to the conditions of the performance task. There were 20 subjects in each of the groups. The means and standard deviation scores on the locus of control scale are presented in Table II.

3. The Apparatus

The Lehigh Valley Lab controlled a computerized gaming apparatus which was placed on a table and adjusted for the size of child using it. The experimental panel was 2 feet wide by 3 feet high. In the centre of the panel was a lever, which was spring-loaded so that when the lever was pressed and released, it would return to the centre position. To the left of the lever was a counter which registered a "score" (a point) each time the lever was pressed and released. Above the lever was a yellow light, which, when lit, rendered the counter functional. To the right of the lever was another counter (see Figure 1).

In the two experimental conditions (100% win and 50% win), the apparatus was set so that the subject's lever presses appeared on the counter at the right and the "other person's" points appeared on the counter at the left. In the 100% win condition, the counter at the left,

Table I
Age, Means and Standard Deviations for
the Experimental Groups

Age group	Number per group	Locus of control group	Age mean*	SD*	Range*
8 year olds	20	Internal	99.5	5.29	90-108
	20	External	101.4	2.91	97-108
12 year olds	20	Internal	143.7	7.40	130-154
	20	External	141.4	7.21	132-155

* These figures are indicated in months.

Table II

Locus of Control, Means and Standard Deviations
for the Experimental Groups

Group	N	Mean*	SD*	S*
<u>Internal locus of control</u>				
8 year olds	20	21.40	8.80	2.02
12 year olds	20	19.10	2.70	.62
8 year old males	10	19.30	1.63	.54
12 year old males	10	18.10	2.49	.83
8 year old females	10	21.00	2.00	.22
12 year old females	10	19.00	1.76	.58
<u>External locus of control</u>				
8 year olds	20	10.60	5.16	1.18
12 year olds	20	7.95	4.88	1.12
8 year old males	10	11.70	2.54	.85
12 year old males	10	8.90	2.42	.80
8 year old females	10	14.40	1.95	.65
12 year old females	10	8.00	2.86	.95

* These figures are scores of the Nowicki-Strickland Locus of Control Scale for Children.

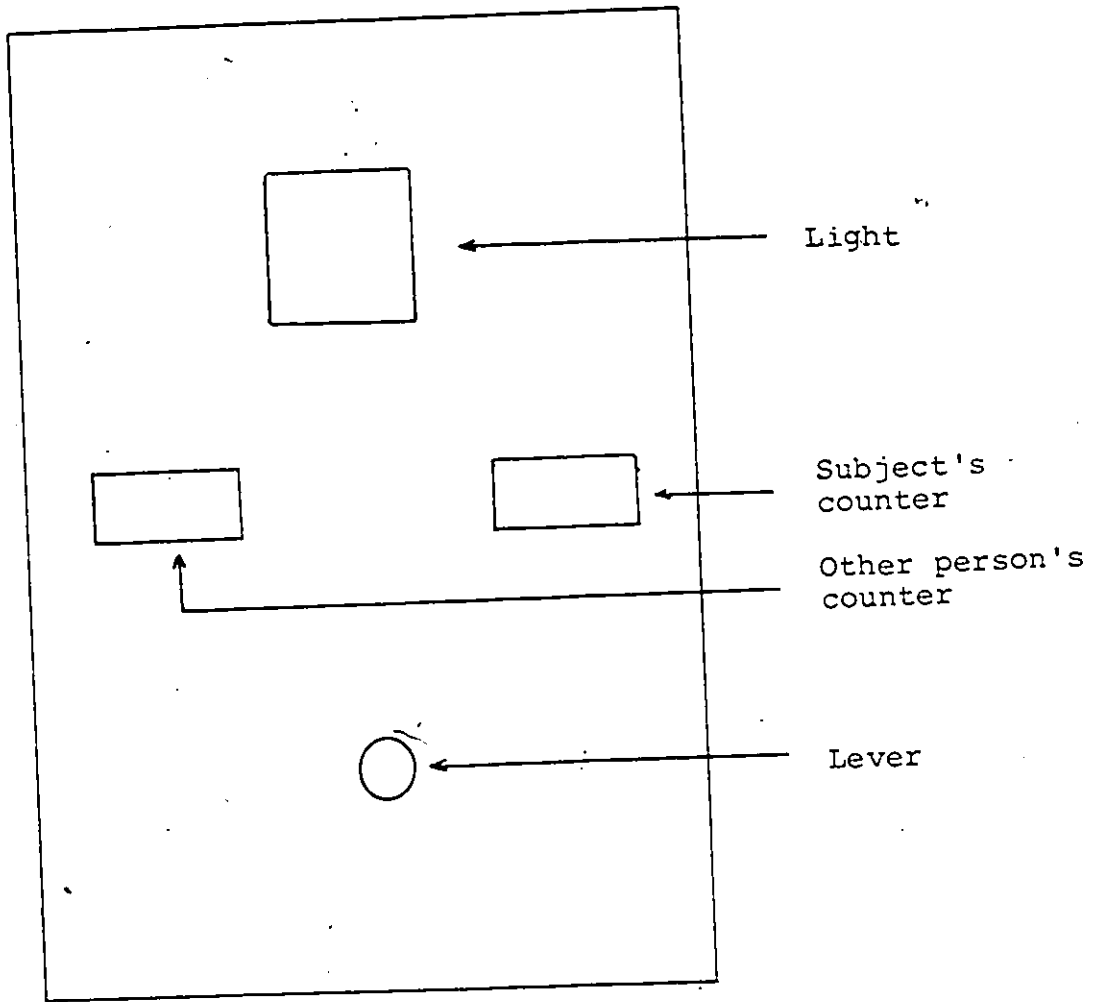


Figure 1:- Lehigh Valley Lab apparatus utilized in the performance measures.

the "other person's," was programmed to register $4/5$ of the subject's points; thus in every trial, the subject would "win" with 20% more points. In the 50% win condition, when the subject was to lose, the "other person's" counter (at left) was set to register 125% of the subject's points. Thus, the "other person's" score was 25% better than the subject's on 50% of the trials. Each child, whether in the 100% or 50% win condition, was administered 20 trials of 1 minute in duration. For the 50% win condition, ten trials were won by a $4/5$ ratio, while ten trials were lost by a $5/4$ margin of the child's points. In the 100% win condition, the subject won on all 20 trials by a $1/5$ margin. A print-out was made for each trial.

4. Administration of the Performance Task

For the experimental situation, subjects were accompanied by the examiner from their classroom to the special testing area in the Guidance Suite (see Figure 2). The examiner engaged in friendly conversation en route.

The subjects were then placed in a cubicle in front of the experimental panel and instructions were given. the instructions given to all subjects were the same:

"You see this switch (pointing to the lever)? Every time you press it, this counter (pointing to the counter on the left) will count your score. The counter only works when the light is on. This counter over here (pointing to the counter on the right) counts the score of the person in the next room. Remember, when the light comes

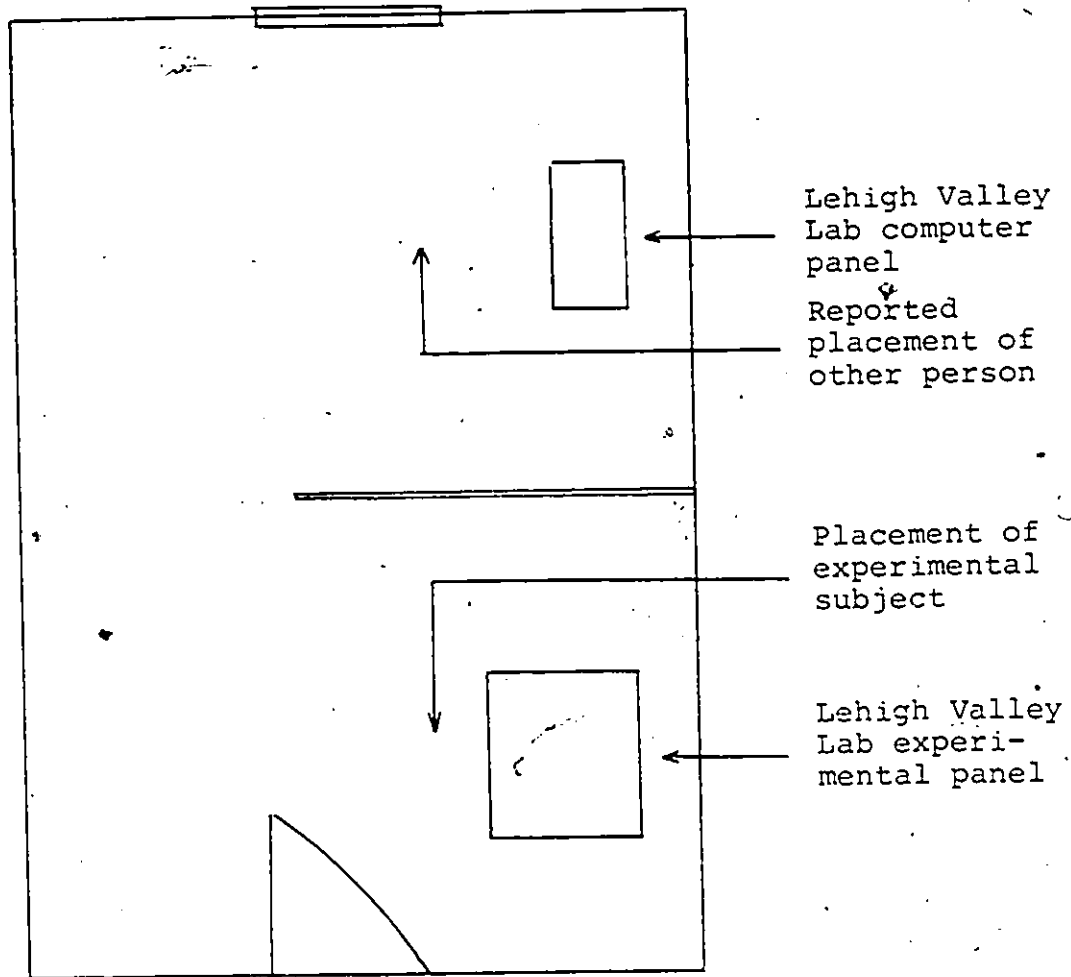


Figure 2:- Floor plan of the testing area in the Guidance Suite.

on, flick the switch until it goes off. The light will come on and off a number of times."
(20 trials)

The experimental conditions were randomly assigned to each subject. The time required for each subject to complete the 20 trials was approximately 20 minutes.

5. The Statistical Design

The format of this study comprises a 2 (locus of control) x 2 (conditions) x 2 (age) analysis of variance. The three independent variables for the present study were Internal-External locus of control, as measured by the Nowicki-Strickland Locus of Control Scale for Children; the 50% win and the 100% win conditions, a percentage of the child's responses (125% or 80%), which were controlled by the Lehigh Valley Lab and the developmental level of the child (either 8 year old or 12 year old). The dependent measure is the number of total lever presses for the 20 trial periods, on a low interest, ambiguous purpose gaming board. This task was chosen in an effort to examine the child's habitual means of responding.

Since the sample was selected with an equal number of males and females in each group, and the literature reports inconsistent findings concerning sex differences, a 2 (locus of control) x 2 (age) x 2 (conditions) x 2 (sex) analysis of variance was executed. Understanding that the cell size is small ($N = 5$), the results can only be

considered as a possible indication of the variance in girls' and boys' performance in an ambiguous situation specific examination. The Tukey Test was the post hoc measure used to rate simple effects.

6. The Hypotheses

Locus of control refers to the individual's perceived control over reinforcements. They are complex learned behaviours which are based on the person's prior history of reinforcement and experience in specific situations. The individual's locus of control can be placed on a continuum and reliably measured by a variety of tests. The Internal locus of control individuals place the control of reinforcements within their personal domain. They are said to be more independent in their thinking, alert, clear, precise and less affected by the environment. They perceive their own behaviour, skill, cunning and abilities as responsible for their reinforcements. The External locus of control individuals perceive their action only in response to situations and their reinforcements are beyond their control. They rely on control of reinforcements by authority figures, unknown forces or powerful others, but they do not consider the reinforcement the result of their action. Thus, the first hypothesis being tested will be:

- (1) Internal locus of control subjects will make more lever presses than External locus of control subjects.

The 12 year olds are entering the adolescent's stage of development, and it is commonly accepted that they are peer oriented, they aim to please and, while wanting to be accepted, they also want to excel and they will readily accept a challenge. The 12 year olds are active, interested and involved. The excitement of this phase of their life is just beginning, and their energy and enthusiasm is burgeoning. They have the physical adeptness of an adult, and they are well versed in the functioning of society. Competition, challenge and performance have become important aspects of their involvements. In school, at home and in play, the standards have been established.

The 8 year old, it is understood by comparison, is just entering the trial with the world beyond the family. The challenges of academia have as yet not reached the point of being serious business. Their peer interests are strong, but are only secondary to pleasing adults. Thus, the increased maturity, mastery, development and involvement would suggest the second hypothesis:

- (2) Twelve year old subjects will make more lever presses than 8 year old subjects.

It can be expected that under varying conditions, the child's performance will change. In the literature, the conditions under which the child has been examined

have been complex and the effects of those varying conditions and the resultant differences in production, remain in doubt. Theory would suggest that the development of the normal child would result in greater abilities, capacities and a desire to achieve. In the present research, the reason for one's performance has remained ambiguous in an effort to examine the child's habitual response, under varying conditions. The third hypothesis states that:

- (3) Subjects in the 50% win condition will make more lever presses than subjects in the 100% win condition.

CHAPTER III

PRESENTATION OF THE RESULTS

This chapter will present the results of the experiment with special emphasis on the data relating to the hypotheses formulated at the end of the previous chapter.

1. The Statistical Findings

The data to be reported are based on the total number of lever presses over the 20 trials. The independent variables are: locus of control (LOC), age (A) and conditions--50% win and 100% win--(C). The summary of the 2 (LOC) x 2 (A) x 2 (C) analysis of variance is presented in Table III.

The first hypothesis stating that Internal locus of control subjects would complete more lever presses than External locus of control subjects was accepted; there was a significant locus of control main effect ($F_{(1/64)} = 28.80; p < .001$), indicating that internally controlled subjects made significantly more lever presses than did the externally controlled subjects.

The second hypothesis indicating that the response rate of 12 year old subjects would be higher than the response rate of 8 year old subjects was accepted. There

Table III
 Summary Table of the Locus of Control by Conditions
 by Age (2 x 2 x 2) Analysis of Variance

Source	Sum of squares	df	Mean square	F'
Internal-External locus of Control (A)	6072.61	1/64	6072.61	28.80*
50% - 100% Win Condition (B)	4992.80	1/64	4992.80	23.68*
Age (C)	22646.45	1/64	22646.45	107.40*
A x B	266.45	1/64	266.45	1.26
A x C	2184.05	1/64	2184.05	10.36**
B x C	4666.51	1/64	4666.51	22.13*
A x B x C	25.31	1/64	25.31	.12
D	13494.10	64	210.84	

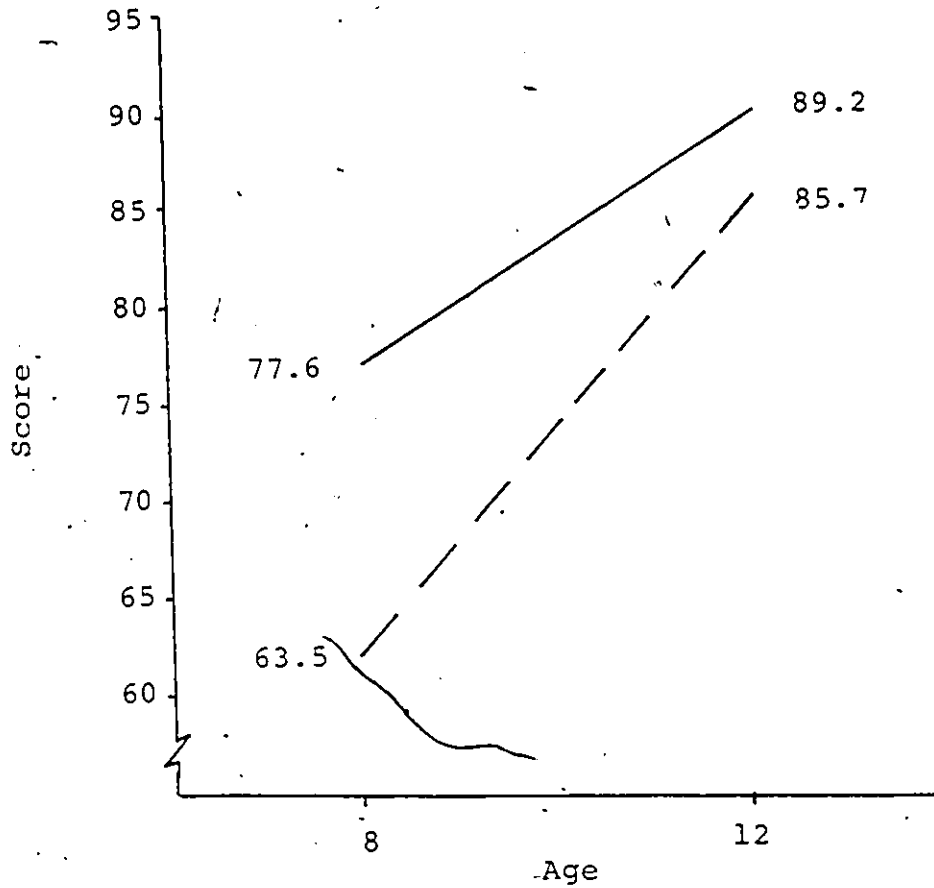
* $p < .001$

** $p < .01$

is an age main effect ($F_{(1/64)} = 107.40; p < .001$), indicating that the 12 year olds' rate of responding significantly exceeded that of the 8 year old subjects. There was an interaction effect revealed between locus of control and age ($F_{(1/64)} = 10.36; p < .05$) (see Figure 3). The Tukey Test indicated that younger, external subjects performed significantly fewer presses than the younger internals and the two older groups ($p < .01$), while the 12 year old internals made more presses than the 8 year old internals ($p \ll .001$). The comparison of the 12 year old externals and the 8 year old internals, as with the 12 year old internals and the 12 year old externals, revealed no reliable differences.

The last hypothesis suggesting that the response rate of subjects in the 50% win condition would be higher than the response rate in the 100% win condition, was accepted and was highly significant ($F_{(1/64)} = 23.68; p < .001$); the 50% win condition prompted a significantly higher response rate than those subjects who performed in the 100% win condition.

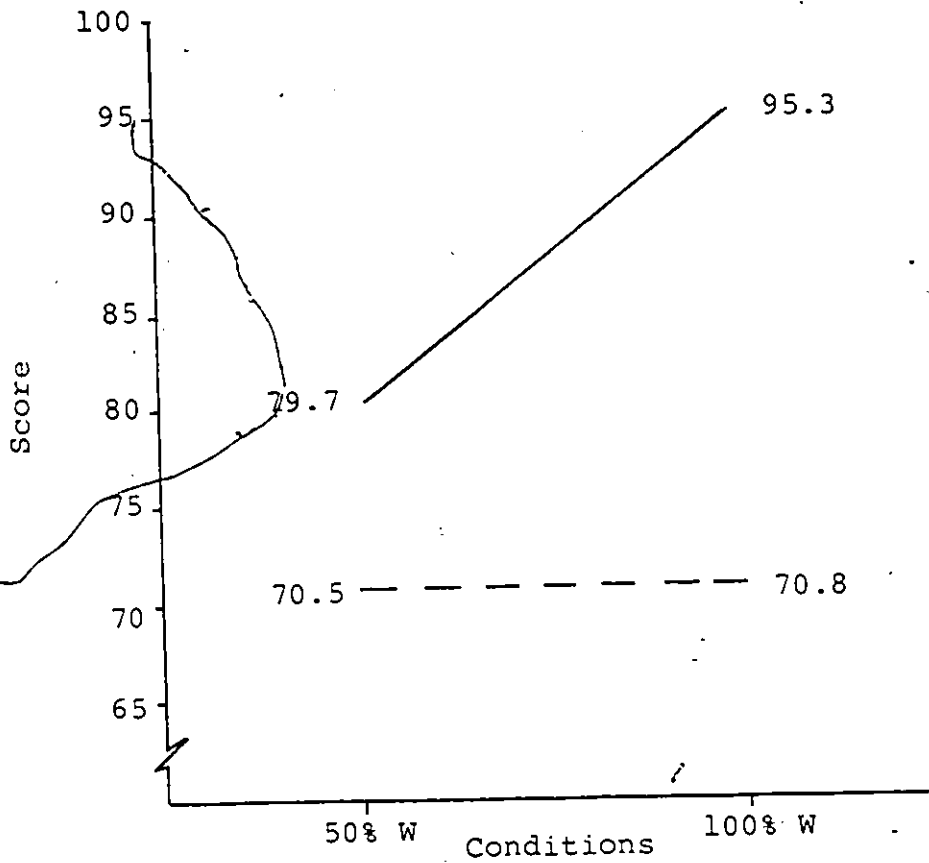
The interaction of conditions by age ($F_{(1/64)} = 22.13; p < .001$) (see Figure 4), reveals that the 8 year olds who performed in the 100% win condition, scored significantly lower than the 12 year olds under either condition ($p < .01$). The 12 year olds, under the 50% win conditions, were significantly higher ($p < .001$), than the younger groups, while no significant differences were found between



Scale:

— Internals
- - - Externals

Figure 3:- Representation of the interaction of Internal-External locus of control subjects at two age levels and their number of lever presses.



Scale:

- 12 year olds
- - - 8 year olds

Figure 4:- Representation of the interaction of the 50% win condition and the 100% win condition with 8 and 12 year olds, and their number of lever presses.

the younger groups or between the 50% win younger group and the 50% win older group.

Since sex was controlled in the sample selection, another analysis of variance was conducted, adding the factor of sex (S); thus a 2 (LOC) x 2 (A) x 2 (C) x 2 (S) ANOVA was utilized (Table IV). This analysis was completed understanding that the cell size was small ($N = 5$). The results therefore can only be considered tentatively. Since the literature has reported inconsistent findings with the sex variable and since the data was available; due in part to the difficulty in arriving at a large enough sample of either girls or boys whose scores on the Nowicki-Strickland Locus of Control Scale for Children were extreme (equal numbers of girls and boys therefore were implemented) this analysis was undertaken. Thus the findings are only reported as an area of possible further research and the results can only be considered as a tentative determination of the influence of the sex of the child. The addition of the fourth independent variable, sex, in this second "Pilot" analysis proved to be an interesting supplementary evaluation of the children; a high probability of interaction ($F_{(1/64)} = 10.91$; $p < .001$) was found, indicating that males performed faster than females on the task.

The sex by conditions interaction ($F_{(1/64)} = 19.53$; $p < .001$), when subject to the Tukey Test, indicated a significant ($p < .01$) difference between males at the 50% win condition and males at the 100% win condition; the

Table IV
 Summary Table of the Locus of Control by Conditions
 by Age by Sex (2 x 2 x 2 x 2) Analysis of
 Variance

Source	Sum of squares	df	Mean square	F Ratio
Sex (A)	2300.51	1/64	2300.51	10.91*
Internal-External locus of control (B)	6072.61	1/64	6072.61	28.80*
50% - 100% win condition (C)	4992.80	1/64	4992.80	23.67*
Age (D)	22646.45	1/64	22646.45	107.40*
A x B	255.61	1/64	255.61	1.21
A x C	4118.45	1/64	4118.45	19.53*
A x D	2.45	1/64	2.45	.01
B x C	266.45	1/64	266.45	1.26
B x D	2184.05	1/64	2184.05	10.36**
C x D	4666.51	1/64	4666.51	22.13*
A x B x C	1428.05	1/64	1428.05	6.77**
A x B x D	9.80	1/64	9.80	.05
A x C x D	3990.31	1/64	3990.31	18.92*
B x C x D	25.31	1/64	25.31	.12
A x B x C x D	183.01	1/64	183.01	.87
E	13494.10	64	210.84	

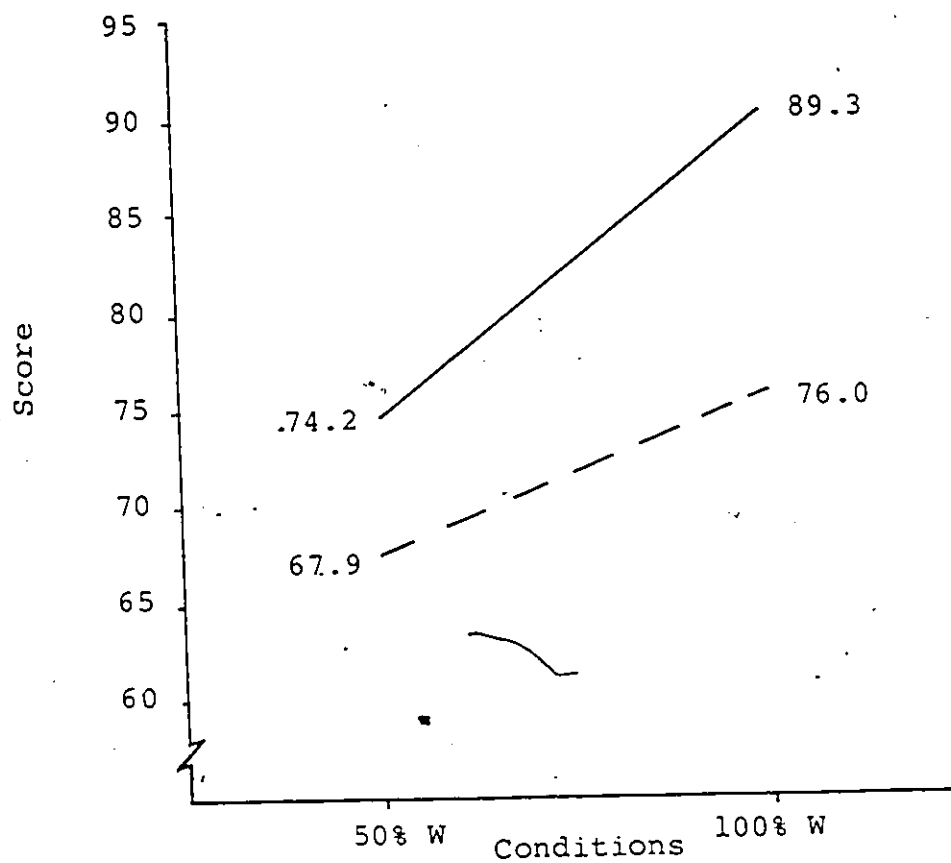
* p < .001

** p < .01

males at the 50% win condition were significantly different from the females of either group. There was no significant difference in the response rate of female subjects under the two conditions, or between the females and the 100% win condition males (see Figure 5).

The three-way interactions further describe the analysis. A locus of control by conditions by sex and a conditions by age by sex were found ($F_{(1/64)} = 6.77$; $p < .001$ and $F_{(1/64)} = 18.92$; $p < .001$, respectively). The application of the Tukey Test to the first three-way interaction effect (LOC \times C \times S) revealed that internally controlled males who won half of their trials performed significantly higher than female externals in an equivalent condition ($p < .01$), and male externals in the 100% win condition. The same group of male externals, under the 50% win condition, performed significantly better than the female externals in the same condition.

The second three-way interaction (C \times A \times S), when the Tukey Test was applied, showed that the younger females under the 50% win condition, scored significantly lower than males of the same age group and under the same 50% win condition. The older boys, in 100% win situations, also were significantly different from this group of girls (8 year olds in 50% win). The older girls in this same condition (50% win) performed significantly more lever presses than the younger females under a common condition and the 8 year old boys subjected to a 100% win situation.



Scale:

—— Males
---- Females

Figure 5:- Representation of the interaction of sex with the 50% and the 100% win conditions.

The 12 year old boys in the 50% win condition were the most active and responsive. They scored significantly better than the younger girls regardless of the condition, and the older girls who had a perfect win record; they (the older boys in 50% win condition) also differed significantly in their response rate from the younger boys who won each trial.

It can be seen that the sex of the child may have an influence on performance, but this conclusion must be considered only tentative until a more complete examination of the sex variable can be considered; a design aimed at the investigation of the influence of sex differences in a more statically meaningful manner is warranted. Thus, while the findings related to sex differences are interesting, due to the small cell size, the findings must be viewed with caution. Further research on this variable appears worthwhile.

CHAPTER IV

INTERPRETATION OF THE FINDINGS

The purpose of the present work was to investigate the effects of locus of control, age and varying conditions as they influence performance on an ambiguous task. In this chapter, the hypotheses will be discussed.

1. Discussion of the Main Effect: Locus of Control

It was observed that the children who were rated as having an Internal locus of control performance on an ambiguous lever pressing task made significantly more lever presses than those children who were rated as having an External locus of control.

These findings would seem to be consistent with the theoretical rationale of Rotter's social learning theory, and its delineation of the personality characteristics of Internal and External locus of control individuals. The fact that the children who performed significantly higher in the rate of lever presses also had an Internal locus of control concurs with much of the previous research which suggests higher drives, motivations and aspirations. Generally and theoretically, these features are avenues

to control one's reinforcements. The Internal locus of control individuals are described as children who were self-starters, independent and more directed and aggressive. In an amorphous, open-ended task, as presently utilized, the data would suggest such personality and behavioural characteristics since the children who scored internally seemed to take the tasks more seriously and worked not only more aggressively, but in a more directed fashion. As reported in the first chapter, individuals who are independent, self-motivated, involved in their experience and ones who feel they take part in the outcome of events (reinforcements), would appear to perform more readily and at a quicker rate. Conversely, commonsense might suggest the individuals who place control of reinforcement outside themselves are less likely to respond and are less involved in the activity.

Studies which have considered locus of control and performance have examined these variables in diverse and complex task situations. The results have often been conflicting. The complexity and variability of the examinations may have resulted in the variability of the results. Rotter has reported that locus of control is a broad and complex variable (Rotter, 1975). He has found, and it can be seen from the numbers of varying studies, that there is a link between one's locus of control and performance. The present findings would support this conjecture while the variance in reported findings may have been due to

the perception of the task and its presentation, as well as the locus of control and the given task assigned.

Rotter (1975) further notes that expectancies can be specific or generalized. The generalized expectancy is the conglomerate of past experiences of reinforcement in similar situations. He reports that when the task is ambiguous, generalized expectancy, at least initially, is important in predicting performance. Thus, this principle suggests that the present results confirm the personality dimensions of locus of control in performance. They further suggest the variability of findings may be due to the specificity of the experimental situation. Thus, the habitual nature of the child's performance would suggest that the External locus of control children do not perceive their action as responsible for the reinforcements they receive. Therefore they are not invested or motivated when the direction of the situation is not clear. On the other hand, the children who are rated as having an Internal locus of control (as a personality dimension) perceive themselves as in control of their reinforcements. When they are called upon to perform, they clearly respond to the situation as previous research would attest. However, most importantly, it can be seen that all the children were actively interpreting the situation. The aspects of generalized as well as specific expectancies are consistent with both the personality aspects of Internal and External locus of control research and with the task

structured approach. It can be seen that the child's perception of the task can elicit the anticipated personality traits or behaviours. The findings of the main effect of locus of control, therefore, indicates that the child's complex response to an unexplained situation is functioning in conjunction with his/her locus of control both perceptually and behaviourally.

The findings of a number of articles form an orderly cluster, which is logically and theoretically consistent with the construct of Internal-External locus of control. The consensus of findings of these personality studies (a majority being completed with adult samples and which are congruent with studies of children), concludes that internals are more mature, independent thinkers, leaders, not swayed by the feelings of others, perform consistently, attempt to maintain control, question more and reserve judgment. The present work agrees with the information reported of generalized expectancy and behaviour patterns of the locus of control construct and shows that the Internal locus of control subjects perform more diligently and rate consistently higher than children who have an External locus of control. Their understanding of an ambiguous task is that they may effect a change in their reinforcement. Thus they seem to interpret the task as chance or skill.

2. Discussion of the Main Effect: Age

As expected, the 12 year olds made more lever presses in the 20 trials than did the 8 year olds. Thus, differences in the rate of lever presses are related to age. At first glance, it could be assumed that the development of the child is the causal influence in these findings; that is, as children mature, their skills on the task improve; however, it has already been demonstrated (Gessell, 1940, 1946, 1956) that the physical and motoric maturation necessary for the type of task utilized in this study, is attained before age 8. The great disparity in scores then, would seem to have been caused by other factors since the development of a child's skill essential to this type of task is considered complete.

This finding can be due to a number of factors. Another consideration would be the social influences placed on the subjects at the two age levels. Through both peer and school interactions, children's attitudes and approach to such a task may have been adjusted. It is widely accepted that the influence of the peer group is maximized during the 12 year old's stage of development. This is a period when the child is looking toward a peer group or peer relationship for commonalities. The state of pre-adolescence or early adolescence is one where children are continually searching for friendship, acceptance and direction, not only in their actions, but in their conceptions and beliefs. It is an age where children measure and judge

their ideas and actions against their family, the families' teachings and the environmental life style in which they have been raised. Their critical eye is not limited to themselves, however. They are equally curious, questioning and concerned about their teachers, adult authority figures and idols, all of whom are significant members of their world. A most important facet of the individual at this stage of pre-adolescence, is the peer group or peer relationship. Sullivan (1966) refers to a need for "Consensual Validation." This need occurs during the critical period of pre-adolescence when the child who is striving for meaning and direction, depends heavily upon peers to validate his/her experiences. Thus, the strong need for group activity and social acceptance is beginning to peak. In this frame, it can be seen that the behaviours of pre-adolescents are affected by their desire for group action and acceptance. In search for identity which so pervades the thoughts of the 12 year olds, their performance would be adjusted; thus, the emotions and social pressures of acceptance and self reliance are factors which can lead to the variances in performance which have been reported.

The 8 year olds, on the other hand, are engrossed in the middle childhood years, a period of assimilation and accomodation in which the child is steadily making cognitive gains and developing social skills. They have just recently been made accountable for their actions and are expected more and more to make judgments on their

own without the direct guidance of an adult. They are entering a stage of an awareness and dislike for children of the opposite sex. While physically refined and accurate in motor control and balance, socially, their interest, concerns and awareness remain personalized. They are restricted in their field and directed to activities which directly affect them (or at least which they perceive to directly affect them). They are still in the process of generalizing and specifying the expectations of their associations, whether they are peers, parents or teachers. The experience of the lever pressing task can then be considered an isolated task which elicits little in terms of anticipation, interest or social pressure for the younger group.

Another social factor which would contribute to the significance of the main effect of age differences, would be school experience. The school experience for the older children has been one of challenge, judgment and achievement; it is a situation where the child has been continually compared and judged in areas of behaviour and performance. This level of comparison and the direction and praise given for striving for achievement are not as noticeable in the earlier grades, but seem to increase in importance after the 3rd grade. This point is evidenced in the fact that there is almost a customary "Social Promotion" through the 2nd grade. The younger group, who are all 3rd graders, have had a minimum of experience

and contact with this prevailing attitude, while the 12 year olds have been immersed in an experience where the emphasis, for over three years, has been placed on production and accomplishment.

The variability of significant findings of studies examining age and performance reported in the review^a may be due to these diverse influences involving higher cognitive processes, reward choices, examiner influence and learning experience. A review of these areas should be considered in future research.

It can be seen that the significant findings in the main effect of age suggest that the accelerated speed of response of the older group can be attributed to a number of diverse social and psychological reasons and, in all probability, are due to a combination of these influences.

3. Discussion of the Interaction Effect: Age and Locus of Control

As stated in the previous chapter, post hoc comparisons revealed meaningful interactions of age x locus of control; the 8 year old subjects who were found to be external in their locus of control, performed significantly slower than either 12 year old groups or the internal 8 year old group. It can be inferred that the dependence of the externally controlled child at the younger age level seeks direction, attention and motivation from external cues. The performance, therefore, even on a simple lever pressing

task, is significantly below that of the Internal locus of control age mate. They are dependent, seeking reassurance and striving to please others, but the ambiguity of the task, coupled with the isolation of the testing cubicle, and no feedback from the examiner, result in the younger externally controlled children performing at a slower rate.

4. Discussion of the Main Effect: Condition (50 and 100% Win)

The third hypothesis stating that the children in the 50% win condition would produce more lever presses than children in the 100% win condition was accepted. This finding can be due to the level of interest and reinforcement of the task. In the 100% win condition, the child was involved in 20 trials of a repetitive task with little variation, but the children in the 50% win condition were confronted with the fact (relatively early in the trials) that the other person's scores were both higher or lower than their own.

Thus, the child's perception of the "other person's" counter, and the variation in scores, affected his/her performance and perception of the task.

This brings to light the possibility that the significant difference found in the condition's effect may, for both the older and the younger children, be the perception of the "other person's" score as a challenge, the situation thus being utilized as a game. If this is

the case, then, the subjects found themselves more interested, attentive and competitive. However, in the 100% win condition, the subjects remained at ease in their performance, while the children in the 50% win situation were more attentive and involved during the progression of the trials and in the final outcomes.

The subjects were 80 children from a public school which draws its population from a predominantly white, middle class, suburban area of Ottawa. The children of this school were reported to perform consistently higher than average on standardized intelligence tests (Kripwell, 1976). It is possible then, that the dull, repetitive nature of the task in the 100% win situation was not stimulating, and thus, their diminished performance; or, at least the 50% win condition presented enough of a variation and engendered an interest so that the children in this situation were more intense in their application to the task.

It seemed, from observation by the examiner during the administration of the performance measure, that children who performed under the 50% win condition were more involved and questioned more readily the results and the "other person," at the conclusion of their performance. Consequently, from the data and the behavioural observation, children subjected to the 50% win condition not only functioned significantly faster than those in the 100% win condition, but were more expressive and interested upon

the conclusion of their performance.

Future research could pursue this area and monitor the influences of the sex of the experimenter as well as the influence of the isolation in the testing cubicle, the perception of the task itself and the child's perception of the "other person."

It can be noted that although not included in the present research, the construct of incentives may have at some level influenced the performance rate of the subjects. Research with incentives, reward and reinforcers have been closely aligned and since the role of these constructs is similar, the confusion concerning their effect on behaviour and perception of the task is not surprising. In fact, although the constructs are quite different, at times the terms have been used interchangeably. An incentive is commonly accepted to be "the promise of a future reward." To avoid misinterpretations of the present work, one must clearly differentiate between the expectancy variable which is built upon the history of reinforcement, plus one's generalized expectancy, as described in the first chapter, and incentive.

Since the element of a "future reward" was not presented in the design of the present study, the influence of a possible reward condition contingency could only be considered conjecture on the part of the child and its inclusion as a determining factor in the response rate, conjecture on the part of the experimenter. In the

early work of locus of control there were concerns that the expectancy variable of locus of control may have been influenced by incentives, and reinforcement value.

The present research was directed to investigate the conception (personality dimension) of the locus of control variable versus the perception (task structuring) of that variable. Since it appears that there is a link between these directions in the research of locus of control in children, it may be beneficial to investigate in future research the effects of various incentives, rewards and the value of various anticipatory goal responses on the performance or behaviour of children.

5. Discussion of the Interaction Effect: Conditions and Age

An interaction effect has been reported between conditions and age. The Tukey Test findings showed that the 12 year olds in the 50% win condition were significantly faster than the 8 year olds, while the younger children in the 100% win condition were significantly slower than the 12 year olds of either condition. It would seem that this interaction identifies a progression from the younger subjects in the repetitive task to the older group in the varied task. This pattern suggested by development theory reported that the 12 year olds have made significant changes in their ability to deal with the world. They have experienced the desire to achieve, and the challenges and

judgments which take place through the middle years of childhood. They have met with both failure and success. The 12 year olds are well stocked with experience and know-how. Their habitual manner of response is quick and, by comparison, more persistent than that of their younger counterpart. The conditions and age interactions then can clearly depend on the developmental maturation of children, both physically and psychologically, via their social experiences at home, as well as in school, and with their peer associations.

6. Discussion of the Main Effect: Sex

In reviewing the literature, numerous works have included sex as an independent variable. The findings of these studies have been conflicting. The sample in the present work was selected with equal numbers of males and females in each group. Although the cell size was small, the main effect of sex showed significant differences between the performance of boys and girls. Boys were faster and more adept at the task than girls. Sex differences have historically been a point of contention. It is felt that the sex differences reported in the present work were due to a combination of constitutional and environmental interactions which are a complex mix in the developmental progression of the child.

Studies by Walls and Cox (1971), as well as others, found significant sex differences, while Milgram (1976)

reported no significant findings. The present work concurs with that of Milgram, and although there was a difference in performance between the sexes, a possible explanation for these findings can be seen in socialization and the development of the child. Boys have been involved in active sports participation through their "Sand Lot" and daily activities in leisure time and also as a part of the physical education program at school. Their environment, their heroes, their leisure, as well as their school (work) related activities, have all been directed toward goal achievement, accomplishments and success. Boys seem to have drives and ambitions to produce. They have been indoctrinated by society to be the worker, the competitor, to seek and achieve.

Girls, on the other hand, have been considered to be more passive and accepting. They are considered to be more interested in feelings and more sensitive to the needs of others. They are generally not as competitive, or have not been socialized toward driving for success and achievement. Their involvement in games has been one of participation rather than in overpowering an opponent. They have been involved in goal and utilitarian activities, while boys' activities (or what has been considered "boys'" activities), are directed toward the challenge, the process, rather than some tangible accomplishment. For example, while girls were involved in playing "house" or "school" or jumping rope, activities which are without

interpersonal challenge, boys are involved in "foot races" and team sports which are goal directed and achievement oriented. It would seem that males are more ambitious, have a stronger drive to succeed, and accomplish the maximum, while the females tend to take the task in stride and are not as interested or as willing to push themselves toward an unknown end. The findings of the present study suggest that these social influences (many of which may be biological as well as social) have had an effect on the results of the present work.


It is interesting, although the level of significance was not reached, that the boys in the 100% win condition were the slowest of all the groups. It would seem that when the boys were not faced with the challenge of the task, that is, if they did not feel threatened by scoring fewer points than the "other person," they treated the task in a most perfunctory, disinterested fashion.

Another factor which may have influenced the outcome of significant sex differences is the fact that the examiner was a male. The sex of the experimenter may be an important consideration in the findings of the present research; the effects of the sex of the experimenter have been found to be influential in the behaviour of children (Gerwitz & Baer, 1958; Stevenson, 1961; Horowitz, 1967). Other studies have documented the influence of the sex of the experimenter on a child's response to an irrelevant task. Stevenson, Keen and Knights (1963), as well as

Allen, Spear and Johnson (1970) have demonstrated the sex of the experimenter can influence the importance of social reinforcement upon a child's performance with this type of task. Specifically they both found that an experimenter of the opposite sex most notably affected the behaviour of children. However, the social and behavioural implications for both boys and girls cannot be accurately assessed, for this factor may have resulted in greater passivity by the female participants, or more diligent efforts to please and be accepted. Similar influences may have been involved for the male subjects, as Hurlock (1964) reported:

Lack of conformity to the socially approved sex role (which is that performance task for boys is a driving effort to succeed and in the girls, passive involvement) leads to criticism, ridicule and social ostracism.

Borstelmann (1961) and Rekers (1975) have each offered formulations for the observed effect of the sex of the experimenter. Borstelmann (1961) noted that if children respond differently to different parental qualities, they should develop levels of expectancy with respect to these qualities in other adults such as experimentors of each sex. Rekers (1975) suggests a similar interpretation utilizing a behavioural perspective. He reports environmental events and stimuli are said to become discriminative for specific behaviours; these stimuli would include sex of the experimenter. The different reinforcement histories of individual children are said to determine the



the form of the behaviour emitted.

In the present instance, the appropriate behavioural model and its effects on performance are not clear, and without a replication utilizing both male and female examiners presenting and monitoring the task, the effects cannot be clearly determined.

The results of the present study, as noted in the previous chapter, show two significant three-way interactions (sex x conditions x age and sex x conditions x locus of control). These factors point to the complexity and involvement of these variables and their inter-relatedness. It can be seen that both variables of sex and conditions are reported in these interaction effects. This may be due in part to the small number of subjects per cell. That is, it is possible, although the sample selection was random, that there was a homogeneity and that without a larger, more diverse sample population, the results are tenuous at best. A replication using a larger N per cell, as well as a more diversified sampling of population, is advisable.

7. Behavioural Observations

Behavioural observations have been noted during the administration of the performance measure, and seem worthy of comment for possible future investigation. The performance of most subjects, it seemed, whether they be 12 or 8 years old, internals or externals, males or females, varied within and between the various trials. From

observation of the subject's counter, on the examiner's side of the Lehigh Valley Lab, the rate of responding appeared to be the fastest initially, within each trial, and diminished as the trial proceeded. The interaction with the examiner and the brief respite between each trial, may have resulted in this type of performance. It was also the examiner's observation that children who were given the 50% performance condition performed more consistently. They readily talked about, were noticeably involved and seemed to be frequently more excited about the experience than were children involved in the 100% win condition. Children in the 50% win condition readily asked questions about the task, about their performance and about the "other person." It would be beneficial in future research of this type, to directly monitor the rates of responding through time, that is, with each trial, as well as between each trial. A second consideration might be to adapt some type of objective measure of other behaviours which the child exhibits. For example, a behaviour-rating questionnaire may be administered upon the conclusion of the performance measure, or trained examiner observations of the subjects' behaviours may be made. In these ways valuable information can be quantified and more objectively utilized.

The dichotomous behaviours found in the two performance conditions could suggest that the ambiguity of the performance measure may have adversely affected the

response rate of the subjects.

Thus, being uncertain and obviously not directed in the task, they understood, or at least interpreted the situation, by their application, to be one of a request for or a need for their achievement. This interpretation could then account for much of the variance in scores and the significant interactions and main effects which have been reported, but more importantly, suggest the need, in future research, to define the task in such a way that misinterpretations or misapprehensions are less likely to occur.

SUMMARY AND CONCLUSIONS

The present study was designed to investigate the effects of locus of control orientation, age and 50% and 100% win conditions as the effects of these variables are measured by an ambiguous, lever-pressing task.

The first chapter reviewed the major theoretical variables of Rotter's social learning theory as well as studies relating to the child and the variables which have received attention in research with children. Works were reviewed which dealt with performance and feedback and gaming type tasks. The necessity of clarifying habitual behaviour within Rotter's theoretical rationale of generalized expectancies was stressed. The theoretical rationale was summarized and general hypotheses were stated.

In the second chapter, the administration of the Nowicki-Strickland Locus of Control Scale for Children, the sample, the apparatus, the administration of the performance tasks, the statistical design and the hypotheses were described.

The first hypothesis, stating significant differences between the performance of the Internal locus of control subjects and the External locus of control ones, was accepted, that is, that children who have an Internal locus of control are significantly different and more prolific

on a performance measure than those children who have an External locus of control.

The second hypothesis indicating significant differences in performance between the 8 year old and 12 year old subjects was also accepted, for the older children were significantly more active on the performance task than the younger ones. A locus of control by age (LOC x A) interaction was found and indicated that the younger external subjects made significantly fewer lever presses than the other groups, while the 12 year old internals performed significantly more lever presses than the younger internals.

The third hypothesis was also accepted, for there was a significant difference in lever pressing during the 20 trials for children who were subjected to the 50% win conditions and those who won 100% of their trials. The interactions of conditions and age (C x A) revealed that 8 year olds in the win condition were slower than the 12 year old subjects, while the latter group (12 year olds) was higher in production in a situation where they won half their trials than the 8 year olds. No differences were found between subjects who won half their trials.

A sex main effect was also reported indicating males in an ambiguous lever-pressing task responded significantly faster than the females. While the cell size was small, the findings concur with some previous research and the results, while cautious, have been discussed in light of

sex differences.

Two three-way interaction effects were reported. Questions concerning sample size, homogeneity of the sample and the complexity of the locus of control concept were raised.

The results of this study suggest the importance of investigating performance within the theoretical framework of Rotter's social learning theory and, more specifically, the locus of control construct. The numerous significant main effects and interactions of the present research further point to the diversity of the construct.

Differential effects have been separated by experimental manipulation. The task is an important consideration and affects the prediction and performance of children. Since the environmental situation which involves task performance was kept at a low level, the personality characteristics inherent in one's locus of control emerged in performance and will further add to the concept of locus of control.

Interesting areas for further research are considered in light of children's locus of control and performance. Further, it has been noted through observation, that behaviourally, children's responses to the task varied and seemed to coincide with the variables being studied. Thus, the area of development in the construct with children is a fertile one. Its continued growth could contribute to the development of parental training programs, as well as the development of educational programs.

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APPENDICES

APPENDIX 1

NOWICKI-STRICKLAND LOCUS OF CONTROL

SCALE FOR CHILDREN¹ UTILIZED TO

MEASURE INTERNAL-EXTERNAL

LOCUS OF CONTROL

Date: _____

Name: _____

Address: _____

School: _____ Age: ___ Grade: ___ D.O.B. ___

Circle One:

- | | | | |
|-----|----|----|---|
| Yes | No | 1. | Do you believe that most problems will solve themselves if you just don't fool with them? |
| Yes | No | 2. | Do you believe that you can stop yourself from catching a cold? |
| Yes | No | 3. | Are some kids just born lucky? |
| Yes | No | 4. | Most of the time do you feel that getting good grades means a great deal to you? |
| Yes | No | 5. | Are you often blamed for things that just aren't your fault? |
| Yes | No | 6. | Do you believe that if somebody studies hard enough he or she can pass any subject? |

¹Nowicki and Strickland, 1973.

- Yes No 7. Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway?
- Yes No 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?
- Yes No 9. Do you feel that most of the time parents listen to what their children have to say?
- Yes No 10. Do you believe that wishing can make good things happen?
- Yes No 11. When you get punished does it usually seem it's for no good reason at all?
- Yes No 12. Most of the time do you find it hard to change a friend's (mind) opinion?
- Yes No 13. Do you think that cheering more than luck helps a team win?
- Yes No 14. Do you feel that it's nearly impossible to change your parent's mind about anything?
- Yes No 15. Do you believe that your parents should allow you to make most of your own decisions?
- Yes No 16. Do you feel that when you do something wrong there's very little you can do to make it right?
- Yes No 17. Do you believe that most kids are just born good at sports?
- Yes No 18. Are most of the other kids your age stronger than you are?
- Yes No 19. Do you feel that one of the best ways to handle most problems is just not to think about them?
- Yes No 20. Do you feel that you have a lot of choice in deciding who your friends are?
- Yes No 21. If you find a four leaf clover do you believe that it might bring you good luck?
- Yes No 22. Do you often feel that whether you do your homework has much to do with what kind of grades you get?

- Yes No 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?
- Yes No 24. Have you ever had a good luck charm?
- Yes No 25. Do you believe that whether or not people like you depends on how you act?
- Yes No 26. Will your parents usually help you if you ask them to?
- Yes No 27. Have you felt that when people were mean to you it was usually for no reason at all?
- Yes No 28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?
- Yes No 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?
- Yes No 30. Do you think that kids can get their own way if they just keep trying?
- Yes No 31. Most of the time do you find it useless to try and get your own way at home?
- Yes No 32. Do you feel that when good things happen it is because of hard work?
- Yes No 33. Do you feel that when somebody your age wants to be your enemy there's little you can do to change matters?
- Yes No 34. Do you feel that it's easy to get friends to do what you want them to?
- Yes No 35. Do you usually feel that you have little to say about what you get to eat at home?
- Yes No 36. Do you feel that when someone doesn't like you there's little you can do about it?
- Yes No 37. Do you usually feel that it's almost useless to try in school because most other children are just plain smarter than you are?
- Yes No 38. Are you the kind of person who believes that planning ahead makes things turn out better?

- Yes No 39. Most of the time, do you feel you have little to say about what your family decides to do?
- Yes No 40. Do you think it's better to be smart than to be lucky?

APPENDIX 2

STANDARD TYPE INSTRUCTIONS GIVEN PRIOR TO
THE ADMINISTRATION OF THE NOWICKI-
STRICKLAND LOCUS OF CONTROL
SCALE FOR CHILDREN

"We are going to spend part of this period answering some questions about your feelings and what you think. There are no right or wrong answers to these questions, we just want to see how you feel. You will not be graded and your answers will be kept secret. If you are unsure of an answer, choose the one closest to how you feel. Make sure you answer every question. If you have any questions, raise your hand and one of us (gesturing to the proctors) will help you.

I will read the questions aloud and you can follow along on your papers. Circle Yes in front of the question if your answer is yes or No in front of the question if your answer is no. First place your name at the top of the page on the line that says Name. . . . (A similar procedure was followed for the other personal data.)

Remember, read the question along with me and answer every one."