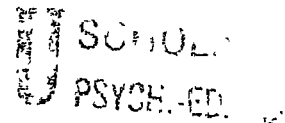
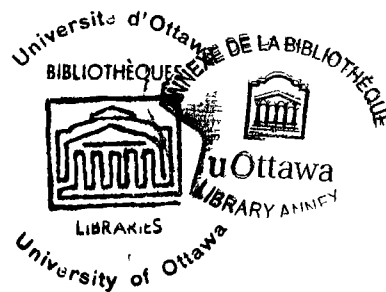


LOCUS OF CONTROL AND THE DIFFERENTIAL EFFECTS
OF INCENTIVES ON PERFORMANCE

by Claudette Bastien

Thesis presented to the School of
Graduate Studies of the University
of Ottawa in partial fulfillment of
the requirements for the degree of
Master of Arts in Psychology



Ottawa, Canada, 1976



C. Bastien, Ottawa, Canada, 1976

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ACKNOWLEDGEMENTS

This thesis was prepared under the supervision of Henry Coady, Ph.D., Faculty of Psychology, University of Ottawa. The writer would like to express her sincere gratitude for the guidance and the advice he has extended.

Appreciation is also expressed to John Gillis who gave assistance with the statistical treatment of the data, and to Lise Labrecque who so kindly helped with some translation problems.

Thanks are also due to Mr. Dubé, School Inspector, Board of Education, and to Mr. Gagnon, Principal, Ecole Ducharme, Vanier, for allowing children to participate in the study.

CURRICULUM STUDIORUM

Claudette Bastien was born July 23, 1945, in Matheson, Ontario, Canada. She received a teacher's certificate from l'Ecole Normale de l'Université d'Ottawa in 1968; the permanent school teacher's certificate in 1970; the Bachelor of Arts degree from the University of Ottawa in 1972.

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ERRATA

1. Table of Contents: Chapter III Presentation of Results
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Chapter III Statistical Findings Read page 46

2. Page 52, fourth line EG should be Eg
3. Page 67, second line should read responsiveness
4. Page 62, third line of the quotation, add after largely:
a reflection of their greater desire for approval from
authority.
5. Page 52, third paragraph, third line should read:
differed from Ib at $p < .05$;
6. Page 46, last paragraph $(F(3.41) = \underline{29.5475})$

INTRODUCTION

A review of psychological literature reveals that numerous factors have been considered in an attempt to study the concept of motivation. Most of the contributing variables can be grouped under two classes, organismic and environmental. The first considers physiological states, instinctive forces, energy, habits, attitudes, and values as important factors influencing a person's mode of action. The second category is concerned mainly with environmental cues that act as energizers for activity.

In this particular research, an organismic variable (locus of control) will be considered in relation to an environmental variable (incentive) in the study of children's responses.

Locus of Control is taken from Rotter's Social Learning Theory and refers to the individual's basic belief system about his control over the outcome of events happening to him. Differences in this belief have been related to variation in individuals' performances on a variety of tasks.

Not only do children differ in their internal beliefs, but they also differ in their preferences for specific external cues. In working with children, many educators, teachers, parents, and psychologists have

observed that a particular incentive which serves to motivate one child, will not necessarily stimulate another to action. Consequently, anyone desiring to influence children's behavior in a particular direction is faced with the task of finding what works best and with whom.

This research paper will address itself to this problem and study the influence that external cues have on children's motivation.

The first chapter will review the literature pertaining to both internal-external locus of control and incentive research. Underlying concepts related to locus of control and the development of scales to measure the concept will be elaborated. This will be followed by a presentation of findings pertaining to developmental aspects such as age and sex differences, parental attitudes, and the learning of locus of control, in addition to achievement and personality variables. The second section will deal with theoretical questions concerning incentives and consider the particular ones chosen for this study. Research related to age and sex differences with incentives will follow. The second chapter will describe the sample, the administration of the locus of control scale, the administration of the cancellation task and, finally, the statistical design. In the third chapter, results will be presented and in the last chapter they will be discussed. The thesis will end with conclusions and suggestions for future research.

CHAPTER I

REVIEW OF THE LITERATURE

1. Internal-External Locus of Control.

A. Basic Concepts and Scale Development

The concept of locus of control is an expectancy variable stemming from Rotter's Social Learning Theory. In its development, Rotter's main concern was the understanding of human behavior in complex social situations. He brings together theoretical constructs from both reinforcement and cognitive approaches. It is Rotter's conviction that a large part of human social behavior is acquired through a learning process. Concomitantly, an individual will learn or repeat a behavior if the stimulus has carried with it positive reinforcement. On the other hand, it will be discarded if negative reinforcement has been experienced and is anticipated. The anticipation of a particular reinforcement is the directional aspect of Social Learning Theory, which determines future behavior.

In terms of Rotter's Social Learning Theory, the probability for a behavior to occur is a function of the person's expectancy that such a given behavior will bring about the desired reinforcement. Ambiguous circumstances

tend to increase the occurrence of generalized expectancies. The contrary holds true when the person gains experience in a situation.

The locus of control construct is therefore described as a generalized expectancy variable used to indicate an individual's belief in personal control or lack of it over what happens to him. In other words, it is a dimension measuring the degree to which an individual perceives himself as a responsible agent in mastering events in his psychological environment.

Internal, as opposed to external, locus of control is used to describe individuals who perceive themselves as responsible for the positive and/or negative happenings in their life.^{1,2,3} They are said to have a feeling of mastery over their actions and their consequences. On the other hand, external locus of control refers to an individual's belief that positive and/or negative events bear no

1 Julian B. Rotter, Melvin Seeman, and Shephard Liverant, "Internal Versus External Control of Reinforcements: A Major Variable in Behavior Therapy," in N. F. Washburne (Ed.), Decision, Values and Groups, Vol. 2, London, Pergamon Press, 1962; p. 473-516.

2 Julian B. Rotter, "Generalized Expectancies for Internal Versus External Control of Reinforcement," Psychological Monographs, Vol. 80, No. 1 (Whole No. 609), 1966, p. 1-28.

3 Julian B. Rotter, June E. Chance, and Jerry E. Phares, Applications of a Social Learning Theory of Personality, New York, Holt, Rinehart & Winston, 1972, p. 1-43.

relationship to his own behavior. Events are seen as being out of the realm of one's personal influence. External individuals tend to describe what happens to them as the result of fate, luck, chance, powerful others, etc. They project the responsibility on others and seem to depend on them for the regulation of reinforcements. In its extreme, such a belief system leads to the conception of a world so complex and unpredictable that one is somewhat incapable of having any power over it.

As pointed out by Rotter, individuals seldom become extreme internals or externals. Along the continuum there is a wide range of individual differences in people's perception of control. The distribution among normal people is hypothesized to follow the normal curve.^{4,5}

In an attempt to verify the validity of Rotter's hypothetical construct of generalized expectancy for internal-external locus of control, a series of studies dealing with the nature of the task were undertaken.

4 Rotter, Seeman and Liverant, op. cit., p. 473-516.

5 Julian B. Rotter, "Some Problems and Misconceptions Related to the Construct of Internal Versus External Control of Reinforcement," Journal of Consulting and Clinical Psychology, Vol. 43, No. 1, 1975, p. 56-57.

Phares⁶ investigated the effects of chance and skill instructions on the direction of the subjects' expectancies. Results showed that under skill conditions, reinforcement had a greater effect on raising or lowering expectancies for future reinforcement. In this situation, subjects tended to shift or change expectancies more often in the direction of previous experience. Under chance conditions, the tendency toward unusual shifts in expectancy appeared; that is, expectancy went up after failure and down after success.

Several other studies confirmed and elaborated Phares' findings that chance and skill situations produce differential effects on expectancy. These results have been supported by James and Rotter⁷ with verbal reinforcement paradigms; by Holden and Rotter⁸ using a direct betting condition; and by Rotter, Liverant and Crowne⁹ with situations

6 Jerry E. Phares, "Expectancy Changes in Skill and Chance Situations," Journal of Abnormal and Social Psychology, Vol. 54, No. 3, 1957, p. 339-341.

7 W. H. James and J. B. Rotter, "Partial and 100% Reinforcement Under Chance and Skill Conditions," Journal of Experimental Psychology, Vol. 55, 1958, p. 397-403.

8 K. B. Holden and J. B. Rotter, "A Nonverbal Measure of Extinction in Skill and Chance Situations," Journal of Experimental Psychology, Vol. 63, 1962, p. 519-520.

9 J. B. Rotter, S. Liverant and D. P. Crowne, "The Growth and Extinction of Expectancies in Chance Controlled and Skilled Tasks," Journal of Psychology, Vol. 52, 1961, p. 161-177.

that were clearly detected as chance or skill conditions on the basis of social knowledge so that differential instructions could be eliminated.

Some of these studies involved comparisons between partial and total reinforcement versus chance and skill conditions. Results indicate striking differences between individuals under the two modes of reinforcement.

Under structured conditions such as when a task is perceived as skill, absolute (one hundred per cent) reinforcement brings about a greater resistance to extinction than partial (fifty per cent) reinforcement.

When a task is perceived as unrelated to one's own efforts and ability, such as in a chance condition, subjects in the one hundred per cent reinforcement groups extinguish the reinforced behavior much more rapidly than subjects in a partial reinforcement group.

Briefly, a partially reinforced group tends to resist extinction more than the absolute reinforcement group only when subjected to situations perceived as chance and consequently out of their personal control. On the other hand, when tasks are succeeded or failed as a result of one's own ability and are perceived as such, then the contrary holds true.

From the aforementioned studies and others not included here, it could be concluded that chance versus

skill tasks influence the acquisition, extinction, and generalization of expectancies. They also may be related to unusual shifts in one's expectancy of reinforcement.

Following these positive results, Phares¹⁰ attempted to measure individual tendencies towards internal or external beliefs of control by means of a Likert-type scale. The new instrument comprised twenty-six items, half of which measured the internal locus of control feature and the other half contended with external locus of control.

In 1957, James made some revisions to the scale. In 1961, a final form of internal-external (I-E) locus of control for adults,¹¹ put forth by Rotter, Liverant and Crowne.¹¹ This measure, in use today, is a twenty-nine item, forced-choice scale published by Rotter in 1966.¹²

Among the other scales that followed, Levenson¹³ distinguished between two modes of externality: one is a belief that powerful others control their life, while another is more prone to attribute responsibility to chance factors.

10 Phares, op. cit., p. 339-341.

11 Julian B. Rotter, S. Liverant, D. P. Crowne, "The Growth and Extinction of Expectancies in Chance Controlled and Skilled Tasks," Journal of Psychology, Vol. 52, 1961, p. 161-177.

12 Rotter, op. cit., p. 1-28.

13 Hanna Levenson, "Activism and Powerful Others: Distinctions Within the Concept of Internal-External Control," Journal of Personality Assessment, Vol. 38, No. 4, 1974, p. 377-383.

From the James-Phares scale, Bialer¹⁴ developed a questionnaire for detection of internality and externality trends in children. The Children's Locus of Control Scale comprises twenty-three true-false items, administered orally.

Other children's scales have since been developed. Among the better known are: The Intellectual Achievement Responsibility Questionnaire (IAR) by Crandall, Katkovsky and Crandall¹⁵ and the Battle and Rotter Children's Picture Test of Internal-External Control.¹⁶ The former has been specifically constructed for use in academic situations involving intellectual achievement; the latter is a projective instrument constructed with pictures that are similar in fashion to the Rosenzweig Picture Frustration Test.

More recently, the Nowicki-Strickland Locus of Control Scale for Children¹⁷ has been devised. It comprises

14 Irv Bialer, "Conceptualization of Success and Failure in Mentally Retarded and Normal Children," Journal of Personality, Vol. 29, 1961, p. 303-320.

15 Virginia C. Crandall, Walter Katkovsky and Vaughn J. Crandall, "Children's Beliefs in Their Own Control of Reinforcements in Intellectual-Academic Achievement Situations," Child Development, Vol. 36, 1965, p. 91-109.

16 Esther S. Battle and Julian B. Rotter, "Children's Feelings of Personal Control as Related to Social Class and Ethnic Group," Journal of Personality, Vol. 31, 1963, p. 482-490.

17 S. Nowicki and B. Strickland, "A Locus of Control Scale for Children," Journal of Consulting and Clinical Psychology, Vol. 40, 1973, p. 148-155.

forty yes-no items and can be administered to a primary and secondary school population.

The increasing number of scales that have been developed indicates a widespread interest in I-E control as a personality dimension.

B. Internal-External Control and
Developmental Aspects.

(a) Age Differences.- In the following section, a few pertinent areas of research concerning the I-E construct in the study of children will be reviewed. As an infant, the child is totally dependent on others for the satisfaction of his needs. He progressively acquires skills that should give him a sense of greater control over his environment. Based on these developmental observations, it is hypothesized that children grow in their belief of internal control as a function of their age.

On the assumption that young children are motivated by hedonistic tendencies and that success or failure can be experienced when children become old enough to assume responsibility for their actions, Bialer¹⁸ set up experimental conditions to investigate the existence of developmental trends in the child's success-failure conceptualization.

¹⁸ Bialer, op. cit., p. 303-320.

He tested eighty-nine mentally retarded and normal children of 6.3 to 14.3 years of age, having mental ages ranging from 5.3 to 15.9 years. The children were subjected to a repetition-choice situation, appealing to hedonistic choices in one direction and success-failure in the other. Immediate versus delayed patterns of gratification were also assessed. Bialer's results indicate that, as the child grows older, he progressively favors success-failure cues over hedonistic ones. At the same time, he begins to perceive with an internal locus of control and he becomes capable of choosing a later reward rather than an immediate, smaller gratification.

As expected, Bialer isolated mental age as a major variable contributing to the developmental changes in success-failure conceptualization.

Support for increase in internal locus of control as a function of age was also reported by Penk¹⁹ with seven- to eleven-year olds and by Pawlicki²⁰ with children of grades three, four, six, and seven. Similar results were

19 W. Penk, "Age Changes and Correlates of Internal-External Locus of Control Scale," Psychological Reports, Vol. 25, 1969, p. 856.

20 Robert E. Pawlicki, "Locus of Control and the Effectiveness of Social Reinforcers," The Journal of Genetic Psychology, Vol. 125, 1974, p. 153-159.

also obtained by Land and Vineberg²¹ with physically disabled and normal children of average I.Q. In addition to developmental trends in the acquisition of internal locus of control, the study demonstrates construct validity for locus of control. Theoretically, blind children would be expected to score lower on the internal dimension since they are, in fact, less capable of manipulating their environment; results support the assumption. In general, sighted children tend to show a greater belief in their own personal control as compared to blind children.

From their study, Crandall, Katkovsky and Crandall²² have observed that, by the third grade, a child's belief in internal locus of control is established beyond the chance level. They also noted that from grades three to twelve, very little change in internality was noticeable in either girls' or boys' responses.

(b) Sex Differences.- Sexual differences in relation to beliefs of I-E locus of control have also been explored. Crandall et al.²³ studied a large sample of children from

21 Shirley Land and Shalom Vineberg, "Locus of Control in Blind Children," Exceptional Children, Vol. 31, No. 5, 1965, p. 257-260.

22. Crandall, Katkovsky and Crandall, op. cit., p. 91-109.

23 Ibid.

grades three to twelve. The results show that girls tend to receive higher internal scores than boys. These differences are more discernible at the higher levels of grades six to twelve.

The IAR (Intellectual Achievement Responsibility Questionnaire) is constructed with the possibility of distinguishing between an individual's belief of control in success situations (I+) and a belief in one's responsibility in failure situations (I-). In this study, girls' I- scores increased significantly over the years, while their I+ scores remained similar. By grade six, girls achieved I- locus of control comparable to I- scores of grade twelve male students. It should be noted that boys showed a significant decrease in their belief of responsibility for successful events between grades ten and twelve.

The indication that girls assign responsibility for their successes and/or failures to themselves rather than to extraneous events or persons, has been substantiated by Crandall, Katkovsky and Preston²⁴ and by Nowicki and Walker²⁵

24 V. J. Crandall, W. Katkovsky and A. Preston, "Motivational and Ability Determinants of Young Children's Intellectual Achievement Behaviors," Child Development, Vol. 33, 1962, p. 643-661.

25 S. Nowicki and C. Walker, "The Role of Generalized and Specific Expectancies in Determining Academic Achievement," The Journal of Social Psychology, Vol. 94, 1974, p. 275-280.

in studies related to academic achievement with first, second, and third graders and children from the fifth and sixth grades.

However, conflicting results are also reported in the literature. Battle and Rotter,²⁶ who presented a line-matching task to sixth and eighth grade students, and Shaw and Uhl,²⁷ who measured reading skills of second graders, failed to find significant differences between I-E construct and sex.

Very often the significant sex differences are obtained in academic achievement situations. Attention will be given to this variable in the following pages.

Recently, Litner and Ducette²⁸ have investigated the effect of praise on the behavior of girls and boys of third, fifth, and seventh grades. Praise proved to have very little influence on girls' behavior; on the other hand, boys' performances were significantly altered. Externals were positively responsive in the expected direction, while internal boys' performances were significantly lowered when subjected to the praise condition.

26 Battle and Rotter, op. cit., p. 482-490.

27 R. L. Shaw and N. P. Uhl, "Control of Reinforcement and Academic Achievement," The Journal of Educational Research, Vol. 64, No. 5, 1971, p. 226-228.

28 A. C. Litner and J. Ducette, "The Effects of Locus of Control, Academic Failure and Task Dimensions on a Student's Responsiveness to Praise," American Educational Research Journal, Vol. 11, No. 3, 1974, p. 231-239.

(c) Parental Attitudes and Learning of Locus of Control.- As previously indicated, there is strong evidence that children become stable in their belief of I-E control as they grow older, presumably reaching a set belief by third grade.²⁹ It can therefore be assumed that past influences in the child's life are responsible for the development of locus of control. It is likely that parents have a major effect on a child's inner belief system.

In the past decade, a few investigators have explored parental attitudes in relation to children's locus of control. Davis and Phares³⁰ collected parents' reports on child-rearing attitudes as well as children's reports of parental behavior and the I-E scores for both groups. It was noted that internal children viewed their parents as more accepting and having less hostile disciplinary methods; externals reported inconsistencies in parental discipline. The internal-external orientation of the parents was not related to their children's I-E beliefs, but some aspects of parental discipline and attitudes did differ considerably for internal and external children.

²⁹ Crandall, Katkovsky and Crandall, op. cit., p. 91-109.

³⁰ W. L. Davis and J. E. Phares, "Parental Antecedents of Internal-External Control of Reinforcement," Psychological Reports, Vol. 24, 1969, p. 427-436.

Fathers of internals appeared more indulgent, giving their child the opportunity for independent action and personal responsibility; on the other hand, the external child's parents believed in more restrictive rearing attitudes.

Similarly, MacDonald³¹ found that internals described their mothers and fathers as more nurturant as well as more consistent in their demands.

When Katkovsky, Crandall and Good³² observed child-parent interactions in addition to taking other measures of parents' attitudes and children's perceived parental behavior, they obtained analogous results. Generally, they found that nurturing, affectionate attitudes cultivated internal beliefs of control in children while opposing models yielded externality. However, in this particular study, girls of nurturing fathers appeared less likely to accept responsibility for their failures.

An interesting distinction was posed by Baumrind³³ who distinguished between authoritative, authoritarian, and

31 A. P. MacDonald, "Internal-External Locus of Control: Parental Antecedents," Journal of Consulting and Clinical Psychology, Vol. 37, No. 1, 1971, p. 141-147.

32 W. Katkovsky, V. C. Crandall and S. Good, "Parental Antecedents of Children's Beliefs in Internal-External Control of Reinforcement in Intellectual Achievement Situations," Child Development, Vol. 38, No. 3, 1967, p. 765-776.

33 D. Baumrind, "Effects of Authoritative Parental Control on Child Behavior," Child Development, Vol. 37, 1966, p. 887-907.

permissive disciplines. He proposes that extremes, that is, severe control and very lax discipline appear related to external scores. On the other hand, a moderately firm discipline or authoritative model seems more conducive to the development of internal locus of control in children.

From another angle, Loeb³⁴ considered different possible conceptual explanations of parental influences on fourth and fifth grade boys. From the literature, he gathered three explanatory models which had yielded positive results in accounting for children's acquisition of locus of control. These are: modeling of parents, role complementarity, and a reinforcement explanation. Of the three, he found the role complementarity explanation most helpful in understanding the control construct. His results indicate that mothers of internal boys were less directive and more suggesting than the mothers of externals. Fathers' attitudes followed the same trend but did not appear as useful in prediction of boys' locus of control. The author proposes that suggesting parents give their children more freedom to choose, to act, and to be self-reliant; consequently, they tend to develop a more internal frame of reference.

34 R. Loeb, "Concomitants of Boys' Locus of Control Examined in Parent-Child Interactions," Developmental Psychology, Vol. 11, No. 3, 1975, p. 353-358.

Attempts have been made to change internal-external beliefs by means of training programs.

A twelve-week program was constructed by Wicker and Tyler³⁵ to increase educable mentally retarded children's awareness of their own behavior and consequences. The direct method of instruction proved fruitful in increasing the children's internality.

Very little research has been done to date in this particular area of locus of control, consequently much remains to be explored before conclusive comments can be made.

Other variables such as ethnic groups and social class have been investigated as influential sources leading to beliefs of expectancy. Most of these show greater internal beliefs in higher and middle class subjects.^{36,37} Greater external beliefs are more frequent in social or ethnic groups that effectively have less opportunities of control over their situations.

35 P. L. Wicker and L. J. Tyler, "Improving Locus of Control Through Direct Instruction: A Pilot Study," Education and Training of the Mentally Retarded, Vol. 10, No. 1, 1975, p. 15-18.

36 Battle and Rotter, op. cit., p. 482-490.

37 P. M. Gore and J. B. Rotter, "A Personality Correlate of Social Action," Journal of Personality, Vol. 31, 1963, p. 58-64.

C. Internal-External Control as Related to
Achievement and Other Personality Variables

Internal-external locus of control has been a particularly useful construct in the academic achievement situation. Several investigators concur with the finding that internality is significantly related to children's achievement measures.^{38,39,40,41}

Several measures of intellectual achievement-- performance on achievement test, I.Q., option to participate in free play, as well as efforts displayed during play--were collected on young children of first, second, and third grades. From their data, Crandall et al.⁴² observed that internal scores were related to engagement in free play activities for boys but not for girls. Girls' internal scores tended to increase in correlation with heightened performance in academic situations.

38 Crandall, Katkovsky and Preston, op. cit., p. 643-661.

39 Crandall, Katkovsky and Crandall, op. cit., p. 91-109.

40 P. E. McGhee and V. C. Crandall, "Beliefs in Internal-External Control of Reinforcements and Academic Performance," Child Development, Vol. 39, No. 1, 1968, p. 91-102.

41 Nowicki and Walker, op. cit., p. 275-280.

42 Crandall, Katkovsky and Preston, op. cit., p. 643-661.

Three years later, Crandall et al.⁴³ again found that academic achievement could be predicted for young girls (grades three-four) by their belief of responsibility in their successful accomplishments (I+). The belief that one is responsible for his failures (I-) was more predictive of grade five boys' achievement. Inconsistent relations were found for the other grades, six to ten.

McGhee and Crandall⁴⁴ studied a large sample of children from grades three to twelve. Their results are in accord with the previous study, that is, boys' I-, as compared to I+ scores, appeared to be better indicators of academic success; whereas, girls' I total scores seemed a more appropriate measure for prediction of academic achievement as revealed by report cards, grade averages, and achievement tests.

General expectancy has been repeatedly related to academic achievement. There is also some evidence in a study by Nowicki and Walker⁴⁵ for specific expectancies to be related to performance. Their study indicates that when a child is capable of learning from his immediate experience

43 Crandall, Katkovsky and Crandall, op. cit., p. 91-109.

44 McGhee and Crandall, op. cit., p. 91-102.

45 Nowicki and Walker, op. cit., p. 275-280.

and also able to build correct expectancies for future performance, he obtains a higher achievement score.

Another variable investigated in relation to academic achievement is birth order. In accord with other research, Eisenman and Platt⁴⁶ reported higher achievement levels with firstborn individuals. In this particular study, firstborn girls generally obtained internal scores while firstborn males tended towards external beliefs of control.

A personality dimension which sheds some light on the question of individual variations in belief of expectancy is a person's resistance to influence. As reviewed by Lefcourt⁴⁷ most of the studies in this area reveal the tendency for internals to resist influence especially when subtle coercive methods are used.⁴⁸ Internals seem to rely to a greater extent on their own personal judgment and tend to follow instructions or to yield to experimenter

46 R. Eisenman and J. Platt, "Birth Order and Sex Differences in Academic Achievement and Internal-External Control," The Journal of General Psychology, Vol. 78, 1968, p. 279-285.

47 H. Lefcourt, "Recent Developments in the Study of Locus of Control," in B. Maher (Ed.), Progress in Experimental Personality Research, New York, Academic Press, 1972, p. 1-39.

48 J. Biondo and A. P. MacDonald, "Internal-External Locus of Control and Response to Influence Attempts," Journal of Personality, Vol. 29, 1971, p. 303-320.

control when such options are in accord with their own beliefs.⁴⁹ Externals, on the other hand, are greatly influenced by stated demands, or statements. They, in consequence, change their attitude much more readily in the expected direction.^{50,51}

Pines and Julian⁵² also point out that internals respond better to informational data about a task, while externals rely more on the social cues for their responses. The latter showed increased performance when the experimenter remained physically present during the task and when recordings were taken for later evaluation. The authors suggest that both internals and externals may be attempting to control their situation by dissimilar modes of action.

49 H. M. Lefcourt, L. Lewis and I. W. Silverman, "Internal Versus External Control of Reinforcement and Attention in a Decision Making Task," Journal of Personality, Vol. 36, 1968, p. 663-682.

50 H. M. Lefcourt, "Effects of Cue Explication Upon Persons Maintaining External Control Expectancies," Journal of Personality and Social Psychology, Vol. 5, 1967, p. 372-378.

51 H. M. Lefcourt and J. Wine, "Internal Versus External Control of Reinforcement and the Deployment of Attention in Experimental Situations," Canadian Journal of Behavioral Science, Vol. 1, 1969, p. 167-181.

52 H. A. Pines and J. W. Julian, "Effects of Task and Social Demands on Locus of Control Differences in Information Processing," Journal of Personality, Vol. 40, 1972, p. 407-416.

1. Incentive Research.

A. Some Theoretical Considerations and Definitions

Incentive research is closely allied to those aspects of motivational research that are concerned with the role of stimulus and behavioral response on future performance. Because of the close and intricate connections of these constructs (incentive and reinforcement), it is not surprising to find confusion in the literature about the meaning attributed to incentives. The word is frequently used indiscriminately as reinforcement, expectation of rewards,⁵³ anticipatory goal response,⁵⁴ etc. To avoid misinterpretations, one must clearly define the meaning of incentive and other closely related terms.

An incentive, as defined by Witryol et al., "is a construct which accounts for the anticipation of reward following experiences with the reward."⁵⁵ On the other hand, reinforcers and rewards are referred to as motivational

⁵³ F. A. Logan, Incentive, New Haven, Yale University Press, 1960.

⁵⁴ K. Spence, Behavior Theory and Conditioning, New Haven, Yale University Press, 1956, 262 p.

⁵⁵ L. Witryol, "Incentives and Learning in Children," in H. W. Reese (Ed.), Advances in Child Development and Behavior, Vol. 6, New York, Academic Press, 1971, p. 1-61.

properties increasing the probability of a response.

Witryol further differentiates these constructs--

reinforcements and rewards:

Reinforcement has been used in the most general sense to denote enhancement of response strength; reward which has similar properties has connoted motivation somewhat more distinctively.⁵⁶

The concept of incentive originated within the realm of animal research. Many theorists have conceptualized incentives within their theoretical framework as a directive agent of behavior.

The expectancy principle has also been integrated into more complex human theories such as Rotter's Social Learning Theory discussed earlier.

From the incentive research, it is gathered that man's behavior is largely governed by anticipated events that motivate him toward a desired goal. The literature attempts to investigate the properties which increase or decrease the strength of an incentive. Such variables include the quality and the magnitude of rewards, the preference value of incentive for particular groups of individuals, the relationship of incentives and needs, and the idiosyncracies of needs across individuals.

Earlier studies applied the method of paired comparisons to their investigation of hierarchical values of

56 Ibid.

common incentives used in experimental studies. Such scaling procedures dealt mostly with edibles, tokens, money, toys, and verbalisms.⁵⁷

Other areas of incentive research have been concerned with discrimination learning. In these studies, the required task is to choose from two or more stimuli; this procedure has gained popularity in the study of reward preferences.

An additional area of research from which this present study stems considers incentives by using a performance schedule.

Among the several types of stimulus manipulation used in incentive research are included: material, social, knowledge of results, secondary reinforcement, and aversive incentives.

57 S. L. Witryol, D. J. Tyrrell and L. M. Lowden, "Development of Incentive Values in Childhood," Genetic Psychology Monographs, Vol. 72, 1965, p. 201-246.

B. Incentive Manipulation

(a) Material Incentives.- Many research projects with children point to the greater effectiveness of material incentives in stimulating learning in children.^{58,59,60,61}

With four-five year old and eight-nine year old children subjected to a discrimination learning task, Terrell and Kennedy⁶² studied a variety of reinforcements: candy, verbal praise, reproof, and beans having a trade value toward a bag of candies. They found that children receiving candy took half the number of trials or less to reach criterion as compared to other conditions. The candy group's performance was significantly better than any other group. No age differences were found.

58 W. F. Fischer, "Sharing in Preschool Children as a Function of Amount and Type of Reinforcement," Genetic Psychology Monographs, Vol. 68, 1963, p. 215-245.

59 M. Nickell and R. M. Travers, "Effects of Different Reinforcers: A Comparison Across Age Levels," Psychological Reports, Vol. 13, 1963, p. 739-746.

60 G. Terrell and W. A. Kennedy, "Discrimination Learning and Transposition in Children as a Function of the Nature of the Reward," Journal of Experimental Psychology, Vol. 53, No. 4, 1957, p. 257-260.

61 Witryol, Tyrell and Lowden, op. cit., p. 201-246.

62 Terrell and Kennedy, op. cit., p. 257-260.

Similar results were reported by Benowitz and Busse⁶³ with a scholastic spelling learning task. Using the natural setting, four groups of fourth graders were assigned to either of two conditions. One group was promised a material reward (box of crayons), the other group received the familiar verbal praise from the classroom teacher. For both boys and girls, the material reward condition proved more stimulating in the learning of spelling.

Conflicting results by Marshall⁶⁴ suggest that material rewards can thwart performance. Her study with 160 white kindergarten children scoring high and low on educational environment aspects of social class (E.E.) and assigned either to an interesting or uninteresting learning task, was performed with five reinforcement conditions including knowledge of results, immediate-verbal, delay-verbal, delay-material, or combination. Marshall noted that children from both E.E. groups learned faster under immediate-verbal reinforcement than under any other condition. The author speculates that the verbal information

63 M. L. Benowitz and T. V. Busse, "Material Incentives and the Learning of Spelling Words in a Typical School Situation," Journal of Educational Psychology, Vol. 61, No. 1, 1970, p. 24-26.

64 H. Marshall, "Learning as a Function of Task Interest, Reinforcement, and Social Class Variables," Journal of Educational Psychology, Vol. 60, No. 2, 1969, p. 133-137.

given serves to focus attention and to give feedback, while material reinforcers administered during the task may have acted as distractors and hindered performance.

It is noteworthy to observe, however, that children from low E.E. can learn as quickly as high E.E. children when the task is interesting. High E.E. children show a better performance on the low interest task than on the interesting one.

In a visual discrimination task with nine-year-old boys offered either fifty cents, one cent, or knowledge of results, Miller and Estes⁶⁵ found that groups receiving monetary rewards obtained a lower performance score than those under the knowledge of results condition.

In a study using lever-pressing performance with male college students, Swingle, Coady and Moors⁶⁶ observed that monetary incentive failed to yield significant differences from other social conditions: class norm, social competition, social competition for monetary reward. In this study, a self-competition condition was shown to contribute a larger part of the variability. The authors

65 L. Miller and B. Estes, "Monetary Reward and Motivation in Discrimination Learning," Journal of Experimental Psychology, Vol. 61, No. 6, 1961, p. 501-504.

66 P. Swingle, H. Coady and D. Moors, "The Effects of Performance Feedback, Social and Monetary Incentives Upon Human Lever Pressing Rate," Psychonomic Science, Vol. 4, No. 6, 1966, p. 209-210.

suggest that for some subjects in a lever-pressing task, self-competition may be more motivating than the particular external incentives under study. In such cases, adding other incentives (social or monetary) would be detrimental to performance. On the other hand, it is hypothesized that less motivated subjects could benefit from social and monetary reinforcers.

In a later study by Swingle and Coady,⁶⁷ children of six, ten, and fifteen years of age were divided into lower class and middle class groups and offered one of four incentives: money, control verbal, and verbal plus money. Results indicate that middle class children respond better to verbal incentives. For these children, the control condition was just as motivating as the material condition. Lower class children, on the other hand, were more responsive to material incentives.

Similar class differences with adolescents were also noted in Douvan's research.⁶⁸ Senior high school students from lower social class revealed a drop in performance when material rewards were eliminated. When material rewards were

67 P. Swingle and H. Coady, "Social Class, Age and the Nature of Incentive in Children's Lever-Pressing Performance," Canadian Journal of Psychology, Vol. 23, No. 1, 1969, p. 41-48.

68 E. Douvan, "Social Status and Success Striving," Journal of Abnormal and Social Psychology, Vol. 52, 1956, p. 219-223.

offered, both middle class and lower class students gave comparable performance.

Monetary as opposed to material rewards have generally been shown to yield detrimental effects on the performance of children as noted by the above studies; however, conflicting results have been reported. A penny, bubble gum, a plastic cow, a verbalism and no reinforcement were assigned to five stimulus patterns.⁶⁹ These were randomly given to 120 boys and girls chosen from grades one, three, and five, and from upper socioeconomic class. Two other lower class groups were formed from grade one boys and grade five girls.

Results from this study indicate the general superior incentive value of monetary rewards over other reinforcement conditions. However, many individual differences concerning the choice of a particular incentive are noticed. Witryol et al.⁷⁰ have investigated these and also other variations with respect to age, sex and socioeconomic class. Some of these will be considered in the following pages.

(b) Social Incentives.- Social incentives as delineated in the literature are understood most frequently in reference to praise, verbal reinforcement or approval.

69 Witryol, Tyrrell and Lowden, op. cit., p. 201-246.

70 Ibid.

Such terminology implies the relationship of at least one other person and is therefore taken as a social component, capable of modifying the child's behavior. The greater bulk of social incentive research has focused its attention mainly on the child-adult relationship.

The effects of adult approval on children have been shown to be a function of the experimenter's sex and the sex and age of the child.^{71,72} Such effects are more clearly observed at a young developmental age. Stevenson⁷³ found significant differences for boys and girls, three to four years old, who were tested by a female experimenter. He concluded that women are more effective than men in modifying the performance of boys and girls at the three-four year level in this type of task (marble game). No significant differences were found for the other two age groups: six-seven and nine-ten.

In a later study, using preschool to sixth grade students, controversial results were found by Horowitz⁷⁴

71 H. W. Stevenson, "Social Reinforcement with Children as a Function of Chronological Age, Sex of Experimenter, and Sex of Subject," Journal of Abnormal and Social Psychology, Vol. 63, No. 1, 1961, p. 147-154.

72 J. L. Gerwitz and D. M. Baer, "The Effect of Brief Social Deprivation on Behaviors for a Social Reinforcer," Journal of Abnormal and Social Psychology, Vol. 56, 1958, p. 49-56.

73 Ibid

74 F. Horowitz, "Social Reinforcement Effects on Child Behavior," in W. Hartup and N. Smothergill (Eds.), The Young Child, Washington, 1967, p. 27-41.

who observed cross-sex effects with five to eight year old children.

In social incentive studies, there is evidence to support that deprivation of social contact for a period of time prior to being exposed to a socially reinforced task, serves to increase performance. Such conclusions are drawn from Gerwitz and Baer's studies with preschool children⁷⁵ and with first and second graders;⁷⁶ also from Erickson's study⁷⁷ with forty-three sixth grade students.

Children's performance is not only modified by the experiences prior to the task or by the characteristics of the person administering the reward, but also by the verbal comments of praise or disapproval accompanying a specific behavior.

Verbal approval is considered as a social reinforcement. Such verbal rewards include expressions such as "good," "fine," "you're doing well," "correct," "right," etc.

75 Gerwitz and Baer, op. cit., p. 49-56.

76 J. Gerwitz and D. Baer, "Deprivation and Satiation of Social Reinforcers as Drive Conditions," Journal of Abnormal and Social Psychology, Vol. 57, 1958, p. 165-172.

77 M. T. Erickson, "Effects of Social Deprivation and Satiation on Verbal Conditioning in Children," Journal of Comparative and Physiological Psychology, Vol. 55, No. 6, 1962, p. 953-957.

Verbal approval and a physical light signal have been compared by Lewis, Wall and Aronfreed⁷⁸ in a probability learning study using first to sixth graders. They reported a greater responsiveness for social rewards in younger subjects as compared to older subjects. The older group of children responded with greater variability. The authors indicate a decrease for verbal social approval as children grow older. As an explanation they suggest that older children rely more on themselves for judging the correctness of their response, while younger children are more dependent on the adult for approval.

Similar results have been obtained by McCullers and Stevenson.⁷⁹ The 120 preschool and elementary school children were grouped in two age groups, three-four and nine-eleven. As elaborated in the preceding study, the younger children showed a clear preference for social verbal reward. The older ones did not show significant differences in their performance under verbal, no-verbal, or material reinforcement schedule.

78 M. Lewis, A. M. Wall, and J. Aronfreed, "Developmental Change in the Relative Values of Social and Non Social Reinforcement," Journal of Experimental Psychology, Vol. 66, No. 2, 1963, p. 133-137.

79 J. C. McCullers and H. W. Stevenson, "Effects of Verbal Reinforcement in a Probability Learning Situation," Psychological Reports, Vol. 7, 1960, p. 439-445.

In the literature, different types of verbal reinforcement have been employed. Investigations can be subsumed under two classes. The first, called person reinforcers are verbalisms emphasizing praise (e.g., "good," "fine"); the second, called performance reinforcers, give an implication of correctness (e.g., "right," "correct").

Results from Zigler and Kanzer's work⁸⁰ with lower and middle class second grade children indicate that middle class children respond better to correct reinforcers, while praise yields greater incentive value for lower class children.

In an attempt to replicate the Zigler-Kanzer study, Rosenhan and Greenwald⁸¹ could not support the same findings. Their data suggest that middle class girls and lower class boys yield better results under verbal reinforcement conditions than either middle class boys or lower class girls. In a second experiment, middle class boys responded better to person reinforcers while girls were stimulated by performance reinforcers.

It is suggested that as children grow older, they become open to a greater span of reinforcers and that

80 E. Zigler and P. Kanzer, "The Effectiveness of Two Classes of Verbal Reinforcers on the Performance of Middle and Lower-Class Children," Journal of Personality, Vol. 30, No. 2, 1962, p. 157-163.

81 D. Rosenhan and J. A. Greenwald, "The Effects of Age, Sex and Socioeconomic Class on Responsiveness to Two Classes of Verbal Reinforcement," Journal of Personality, Vol. 33, 1965, p. 108-121.

abstract as well as concrete incentives take on a motivating value.

In a study mentioned earlier, several levels of incentives including self-competition, class norms, social competition, social competition for monetary reward, and monetary reward, were compared for their effectiveness in stimulating freshman psychology students on a lever-pressing task.⁸² It was noted that social competition was as motivating as monetary rewards. Although self-competition rated highest in incentive value, the authors suggest that for some people who are not naturally self-competitive, social or monetary rewards may become a very important source of motivation.

C. Developmental Aspects and Incentive Research

(a) Age Differences.- As noted in the previous sections, the inherent quality of the incentive appeals differentially to children. The attraction for a particular incentive may be a function of social, developmental or personal aspects. In the following, age variations found in children's reactions to particular incentives will be considered.

82 Swingle, Coady and Moors, op. cit., p. 209-210.

Material rewards in the form of edibles, toys and tokens have been shown to be superior in stimulating the child to learn. However, as children grow older, they also increase their responsivity to a wider range of incentives.

In an extensive study by Witryol et al.⁸³ boys and girls from grades one, three and five were given a five-choice selective learning task. Rewards included bubble gum, penny, charm, verbalism ("good boy, I like that one too"), and nothing. The younger first grade children showed a preference for the bubble gum and the charm over the verbal reward or no reward at all. The results of the study indicate that as children grow older there is a tendency for them to gradually shift their incentive value from material to verbal rewards.

Prior to this study, Miller and Estes, with nine-year-old subjects,⁸⁴ and Jeffrey and Skager with seven- and ten-year-old children,⁸⁵ as well as Estes, Miller and Curtin with college students,⁸⁶ show evidence supporting

83 Witryol, Tyrrell and Lowden, op. cit., p. 201-246.

84 Miller and Estes, op. cit., p. 501-504.

85 W. E. Jeffrey and R. W. Skager, "Effect of Incentive Conditions on Stimulus Generalisation in Children," Child Development, Vol. 33, 1962, p. 865-870.

86 B. Estes, L. Miller and M. E. Curtin, "Supplementary Report: Monetary Incentive and Motivation in Discrimination Learning--Sex Differences," Journal of Experimental Psychology, Vol. 63, No. 3, 1962, p. 320.

differential age trends. As revealed by these studies, the motivating value of material tangible rewards appeals more readily to younger children. As age increases, children tend to assume a more internalized frame of reference and they can then be motivated by the nature of the task itself. By the same token they become more responsive to the symbolic character of incentives and are incited to action by the mere thought of being correct rather than by a wish to be praised.

In McCullers and Stevenson's study with three-four and eight-nine year old children,⁸⁷ and in Lewis et al.'s study with first and sixth graders,⁸⁸ older children responded as well to a buzzer, a light, or marble, as to a verbal reward while younger children appeared significantly more sensitive to verbal reinforcement.

The age difference is explained in terms of the younger children's social dependency needs. When verbal approval is delivered by the adult, it acquires a positive significance which provides incentive for future performance.

Similarly, performance reinforcers (e.g., "correct," "right") appealed more to sixth grade children than to

87 McCullers and Stevenson, op. cit., p. 439-445.

88 Lewis, Wall and Aronfreed, op. cit., p. 133-137.

younger second graders in both Horowitz's⁸⁹ and Rosenhan and Greenwald's⁹⁰ studies. One author explains that the growing interest in performance incentives does not necessarily mean a decrease of interest for person reinforcers ("good," "fine"), but simply that as the child becomes older, a greater openness to a variety of stimuli occurs.

(b) Sex Differences.- Another variable which is of interest in the realm of the present research paper lies in sex variations in children's preferences for particular incentives. Although the studies reported in the literature are few and inconclusive, some trends may be outlined.

In a study previously mentioned, Rosenhan and Greenwald⁹¹ indicated that, in general, boys from second and fifth grades perform better under person reinforcers, while girls of the same age groups show a preference for performance reinforcers.

An interaction between sex of children and conditions of verbal and physical reinforcement was also observed by Nickell and Travers.⁹² They found that the most

89 Horowitz, op. cit., p. 27-41.

90 Rosenhan and Greenwald, op. cit., p. 108-121.

91 Ibid.

92 Nickell and Travers, op. cit., p. 739-746.

significant difference appeared at the pre-kindergarten level. Girls responded better to the verbal condition, while boys from pre-kindergarten as well as boys and girls from the other grades (three, six, and nine) did not show any significant differences in responding to either condition.

The tendency for girls to increase their performance under a verbal condition was also noted with fifth grade girls in Witryol et al.'s study;⁹³ however, as observed by the authors, the verbal incentive administered by "two handsome men" might have been a stimulating social reward accounting for the increase in response with these pre-adolescent girls. The fifth grade boys, on the other hand, chose to accumulate pennies more than any other reward.

Apart from these differing tendencies, few sex differences were observed at the other age levels. Interesting similarities were also appreciated between children of lower and higher socioeconomic strata with the exception of first grade lower class boys who showed a greater interest for the penny than their counterparts.

In a later study, Witryol et al.⁹⁴ subjected boys and girls from grades one, three, and five to skill and

93 Witryol, Tyrrell and Lowden, op. cit., p. 201-246.

94 S. L. Witryol, L. M. Lowden, J. F. Fagan, T. C. Bergen, "Verbal Versus Material Rewards as a Function of Schedule and Set in Children's Discrimination Preference Choice Behavior," Journal of Genetic Psychology, Vol. 113, 1968, p. 3-25.

chance conditions. Freedom to choose between two schedules of reinforcement: 100% verbal versus 100% material or 100% verbal versus 50% material, revealed that children selected the 100% verbal reward more often than the 50% material reward in the last four trial blocks. When the instructions denoted skill conditions, boys tended to accumulate more verbal rewards. Girls, on the other hand, increased their verbal choices under the chance conditions.

As pointed out earlier, some studies--Gerwitz and Baer⁹⁵ and Horowitz⁹⁶--have suggested that women have more influence on performance of boys and that men obtain better results on the performance of girls.

Similar results were obtained by Stevenson⁹⁷ with children at the six-seven year level. In this study, women were found to create a greater effect on both boys and girls of the three-four year level. Differences at the nine-ten year age level were not significant. Stevenson pointed out that the obtained differences could be a function of the personality of the experimenter rather than of his sex, since experimenters who obtained better results with younger children were also less stimulating with older children.

95 Gerwitz and Baer, op. cit., p. 49-56.

96 Horowitz, op. cit., p. 27-41.

97 Stevenson, op. cit., p. 147-154.

Rosenhan and Greenwald⁹⁸ likewise question the sex effects of experimenters on children's performance.

Numerous factors are responsible for an individual's motivational system. The internal-external locus of control construct, as developed by Rotter,⁹⁹ appears as a valid means of understanding and explaining differing motivational systems. As mentioned in the first section of this paper, when a person's belief is in accord with an internal locus of control, his behavior appears less affected by extraneous events. Externals, on the other hand, are believed to be more dependent on environmental cues, since they see their life as being regulated by influential others and by outside events. A person's belief in locus of control is a function of many individual differences including factors such as sex and age. Younger children tend to be developmentally more dependent on others and on the environment; thus, they appear more external and less able to accept responsibility for their action. Elementary school girls tend to accept responsibility for both their successes and their failures much more readily than boys of the same age; therefore, they appear to be more internally oriented than their male counterparts.

98 Rosenhan and Greenwald, op. cit., p. 108-121.

99 J. B. Rotter, Social Learning and Clinical Psychology, Englewood Cliffs, N.J., Prentice-Hall, 1954, 1-488 p.

The personal belief in the control of one's action plays a crucial role in motivating an individual's behavior. However, other factors pertaining to the nature and quality of incentives also serve as directing agents in motivating to action. For example, social and material incentives as noted in the preceding section appeal differently to boys and to girls of different ages. Girls seem to favor socially oriented incentives, while boys appear more attracted by material rewards. There is also evidence pointing to the younger children's preference for material rewards and to their progressive responsiveness to verbal and more abstract rewards as a function of their age.

Such considerations would lead one to believe that in the present research project, internal boys and girls will be less influenced by the nature of the incentives (social, material) and that their performance will remain relatively unchanged among various conditions. It is also expected that external children will show lower performances when no incentives are presented and that since girls appear more responsive to verbal rewards suggesting praise or approval, they will also respond better to a social incentive appealing to the group standards. Boys, on the other hand, would be expected to expend more effort in order to receive the material reward.

In view of the purpose of this study to investigate the effects of incentives on the behavior of girls and boys of different locus of control orientation, the following null hypotheses were formulated:

1. There is no significant difference between the number of digits cancelled on the different incentive conditions.
2. There is no significant difference between the number of digits cancelled by internal and external children on the task.
3. There is no significant difference between the number of digits cancelled by boys and girls on the task.

CHAPTER II

EXPERIMENTAL DESIGN

In this chapter, the sample and experimental procedures will be described, and the mode of statistical analysis will be indicated.

1. The Sample.

The subjects were chosen from a French elementary school in the Ottawa region; experimentation took place March 4 - 13, 1975.

All children in grades four, five, and six were administered the Bialer-Cromwell Locus of Control Scale. From the 172 children, thirty boys and thirty girls were chosen to participate in the study. Their ages ranged from eight years nine months to twelve years inclusive. Sample composition is described in Table I.

2. Administration of the Locus of Control Scale.

The Children's Locus of Control Scale constructed by Bialer and Cromwell comprises twenty-three "yes-no" items.¹

¹ Irv Bialer, "Conceptualization of Success and Failure in Mentally Retarded and Normal Children," Journal of Personality, Vol. 29, 1961, p. 303-320.

Table I.-
Mean Age and Locus of Control Means for the
Subject Sample.

Group	Mean Age (in months)	Locus of Control Means	Standard Deviations
Internal boys	128.4	17.9	1.1
Internal girls	130.3	16.5	1.5
Middle boys	128.0	14.0	.44
Middle girls	122.0	14.0	-
External boys	120.6	10.2	.97
External girls	119.3	10.0	1.4

There are eighteen "yes" and five "no" responses which indicate internality.

Because of the lack of a French locus of control test for children, the Bialer-Cromwell was translated by the experimenter and corrected by a translator. It was then re-read by two other fluently bilingual individuals. The test (Appendix 1) was administered by the experimenter in the children's respective classrooms; it was read out loud and the children gave their responses by indicating their choice on the questionnaire by a check mark.

The tests were then scored for internality; a high score indicates internal locus of control. After eliminating those questionnaires with ambiguous responses, subjects were assigned to three groups on the basis of their I-E scores. A score of 16 and above determined those belonging to the internal group; a score of 11 or lower designated externals; and those scoring between 12 and 16 were assigned to the middle group.

Ten boys and ten girls were randomly chosen for each group to participate in the study. At this point, three children had to be replaced because parents' permission was not available.

3. Administration of the Number Cancellation Task.

The task was presented to three children at a time. The subjects were separated from one another by partitions in order to eliminate social competitive effects. They were seated individually at desks after having been taken from their classroom. Instructions (Appendix 2) were given orally and children were asked to cancel the numbers four and nine from a sheet of random numbers (Appendix 3). When the task was understood (after a trial session), three incentives (Appendix 2) were presented with the task. For each condition (material incentive, social incentive, and control [no incentive]), five trials of one minute each were allowed.

Every child was subjected to the three conditions (material, social, control) in a Latin Square design; thus, each condition preceded and followed all the other conditions an equal number of times for each group.

4. Statistical Design.

Data were collected and the total number of four's and nine's cancelled were cumulated for every trial in every condition for each individual. A four-way analysis of variance with repeated measures was performed.

CHAPTER III

PRESENTATION OF RESULTS

1. Statistical Findings.

A four-way analysis of variance was performed on the scores obtained on each of the five trial blocks, on the following factors: locus of control (A), sex (B), incentive (D), and trial blocks (E). Table II summarizes the results from the analysis of variance.

Since the analysis fails to reveal any significant differences ($p > .10$) among the different incentive conditions, the first null hypothesis was not rejected.

The second null hypothesis was rejected on the basis of a significant main effect for the locus of control variable ($F = 2.99, p < .05$).

Sheffé's test for multiple comparisons revealed that internals performed significantly better than their external counterparts; however, the middle group did not differ significantly from either of the other groups (see Figure 1).

Another highly significant main effect was obtained on the trial blocks ($F(3.41) = 29, 5475, p < .001$). Sheffé's test indicates that performance on the first trial is significantly lower ($p < .005$) than on every other trial.

Table II.-

Table of Variance of 3 X 2 X 3 X 5 Split-Plot Design for
Number of Digits Cancelled.

Source	Sums of Squares	df	Mean Square	F
A	31.08	2	15.54	2.99*
B	33.12	1	33.12	0.63
A X B	11.73	2	58.66	1.13
C (Within)	28.00	54	51.85	
D	47.86	2	23.93	.22
A X D	39.05	4	97.63	.18
B X D	85.12	2	42.56	.51
A X B X D	25.79	4	64.48	.78
C X D (Within)	88.80	108	82.23	
E	10.70	4	26.76	29.54**
A X E	67.46	8	84.32	.93
B X E	47.80	4	11.95	1.31
A X B X E	17.82	8	22.27	2.45**
C X E (Within)	19.56	216	90.58	
D X E	10.11	8	12.64	.93
A X D X E	29.97	16	18.73	1.38
B X D X E	55.86	8	69.82	.51
A X B X D X E	19.68	16	12.30	.91
C X D X E (Within)	58.32	432	13.50	

*p \leq .05
**p \leq .01

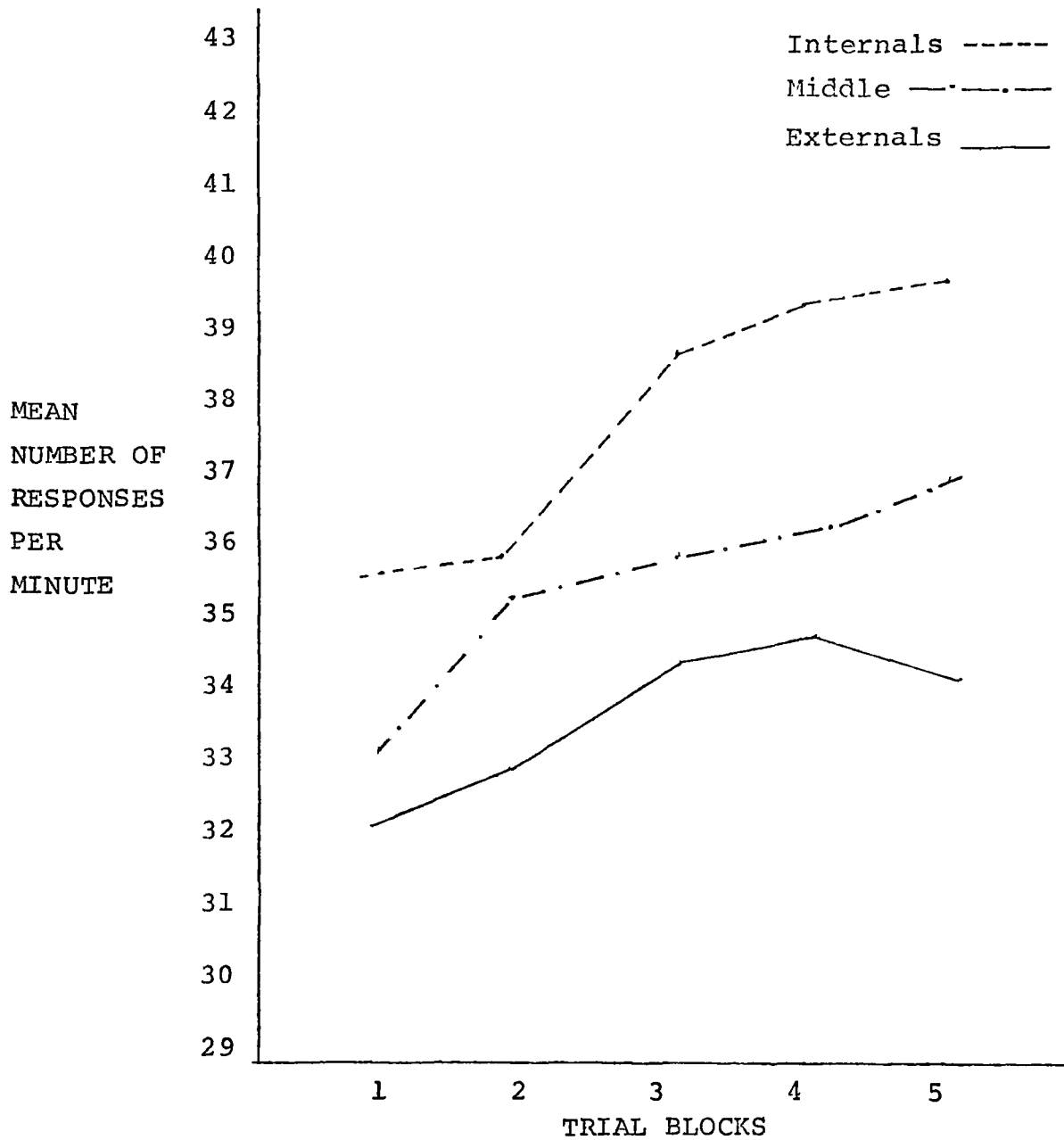


Figure 1.- Mean Number of Responses for Internal, External and Middle Group Across Trial Blocks.

There are also significantly less ($p < .005$) digits cancelled on the second trial than on trials four and five, but second trial performance is not significantly different from trial three. Performances on trials three, four, and five did not vary significantly from one another ($p > .10$).

No substantial differences were found between girls' and boys' performances when sex was analysed as a main effect variable ($p > .10$); consequently, the third null hypothesis was accepted. However, an interaction was observed between sex, locus of control and trial blocks ($F = 22.27, p < .01$). Figure 2 illustrates the distribution for the interaction between locus of control, sex, and trials.

When a Sheffé test was performed on trial sums, internal boys (Ib) and internal girls (Ig) were seen to differ significantly ($p < .005$) from one another on trials three and four (Figure 3). Girls and boys from the middle group did not differ from one another, nor did external girls (Eg) and external boys (Eb) differ from one another.

Multiple comparisons were performed on the trial sums of boys and girls from the three locus of control groups. Most comparisons point to the internal girls' superior performance on the cancellation task. On trial one, Ig scored significantly better than Eg ($p < .01$) and

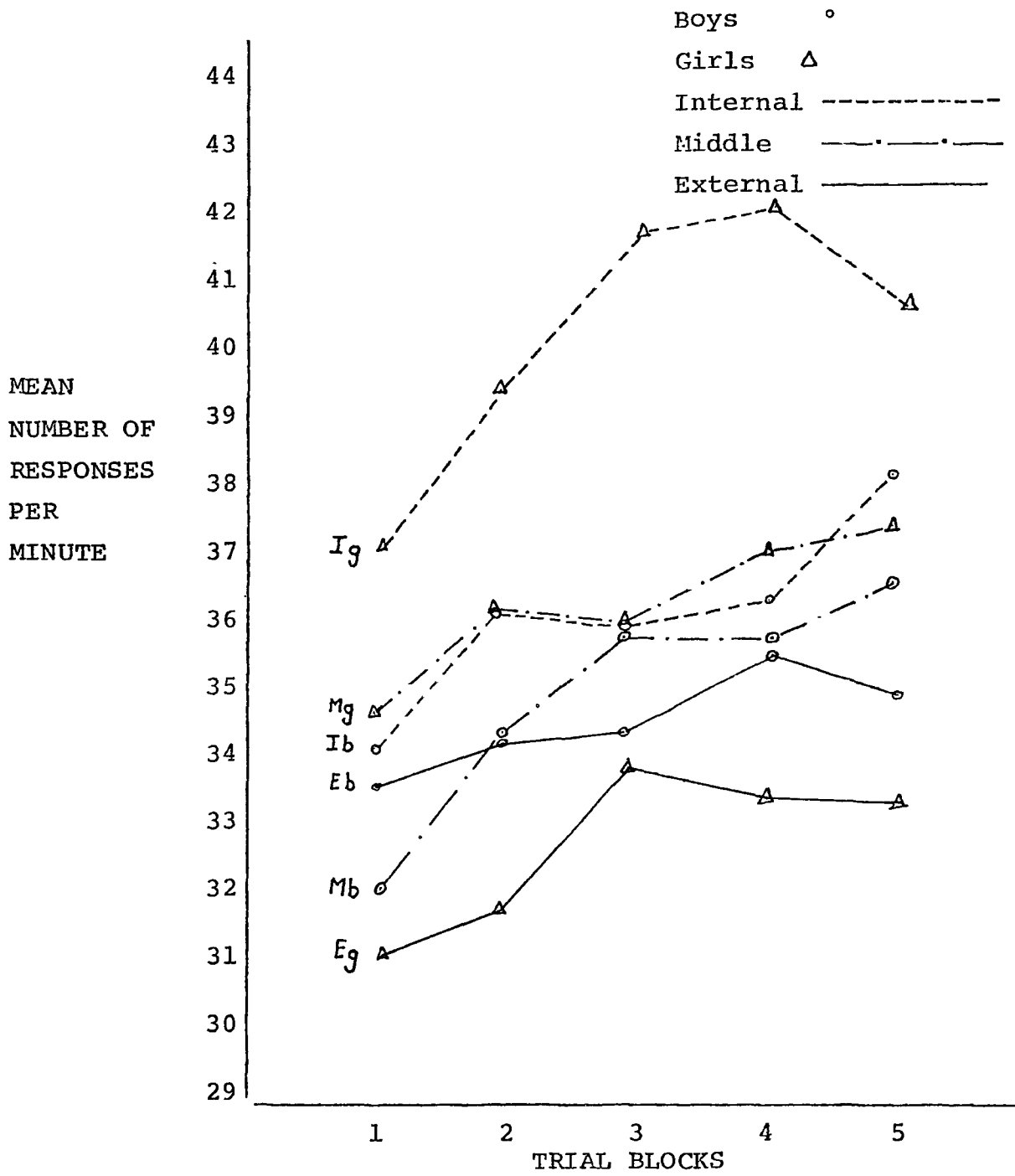


Figure 2.- Mean Number of Responses of Boys and Girls of Internal, Middle and External Locus of Control Groups.

middle boys (Mb) ($p < .025$). On trial two, Ig differed from both Eg, Eb, and Mb ($p < .05$). On the third trial, Ig obtained scores that were significantly different from all other individual groups: Ib, Mb, Mg, Eb, and EG ($p < .005$). On the same trial, Ib also varied from all other groups by scoring significantly lower than Ig ($p < .005$) and significantly higher than Mb, Mg, Eb, and Eg ($p < .005$).

Middle boys and girls, and external boys and girls scored significantly lower than internals, but their scores did not vary significantly amongst themselves ($p > .10$).

Sheffé's test indicated significantly higher performance scores in favor of Ig on the fourth trial. Ig differed from Ib at $p < .005$; from Mb at $p < .01$; from Mg at $p < .05$; from Eb and Eg at $p < .005$.

On the last trial, internal girls obtained significantly different scores, only with respect to the external group: Eb ($p < .01$) and Eg ($p < .005$).

Boys' and girls' performances in the middle and external groups as well as boys' performances from the internal group did not differ significantly amongst themselves.

CHAPTER IV

INTERPRETATION OF FINDINGS

1. Discussion of the Main Effect: Incentives.

In the present study, the number cancellation task was chosen since it does not seem to require exceptional cognitive or learning skills; the child is merely asked to cancel the digits 4 and 9. This requires of the eight- to eleven-year-old such skills as the recognition of numbers, the use of a pencil, and the following of simple directions. Furthermore, children of this age have usually mastered these simple skills. Also, this task did not appear interesting; thus, it was felt that it would be the incentive itself which would motivate the child to involve himself in the given task. When presented with a social incentive and a material incentive, children did not differentially cancel digits on the task; consequently, the first null hypothesis was accepted.

A possible explanation of this finding is concerned with the repeated measures design. As was previously stated, every child was subjected to each condition; the study attempted to eliminate learning and transfer effects

by counterbalancing.¹ When counterbalancing with repeated measures, it is possible for an incentive to be operative during the control condition (especially when preceded by one or two incentives, i.e., social or material).

Another possible explanation can be seen in relation to the age level of the children involved in this research project. Studies by McCullers and Stevenson² with three-four year olds and eight-nine year olds, and Lewis, Wall and Aronfreed³ with first graders and sixth graders show age differences in children's responses to incentive conditions. They did not obtain significant differences with the older children of eight to twelve years, but they did observe significant differences with younger pre-school and first grade children. In studying reward magnitude, Witryol⁴ also found that older children

1 B. J. Underwood, Psychological Research, New York, Appleton-Century-Crofts, 1957, p. 105-112.

2 J. C. McCullers and H. W. Stevenson, "Effects of Verbal Reinforcement in a Probability Learning Situation," Psychological Reports, Vol. 7, 1960, p. 439-445.

3 M. Lewis, A. M. Wall and J. Aronfreed, "Developmental Change in the Relative Values of Social and Non Social Reinforcement," Journal of Experimental Psychology, Vol. 66, No. 2, 1963, p. 133-137.

4 L. Witryol, "Incentives and Learning in Children," in H. W. Reese (Ed.), Advances in Child Development and Behavior, Vol. 6, New York, Academic Press, 1971, p. 1-61.

manifest a greater flexibility in their choices of incentives as compared to less mature children.

It is apparent that the young child has not yet acquired the necessary physical and psychological skills that would enable him to exert a certain control over himself and his surroundings. On the contrary, he is still dependent on others for the satisfaction of his needs and on his environment for stimulation. It is therefore not surprising to find that he prefers "person stimuli."⁵ As children become older and more mature, they display a greater variability in their responses to different incentives. They are able to respond in terms of more abstract motives and they progressively acquire the capacity of being stimulated by the task itself. One may think here in terms of Allport's functional autonomy of motives.⁶ Personal motives that children have introjected as a consequence of socialization, then, become operative in stimulating the child to action.

Most incentive studies tend to use verbal praise as a social stimulus. In this project, the social incentive is different in nature. The child was asked to make

5 Ibid.

6 G. W. Allport, Patterns and Growth in Personality, New York, Holt, Rinehart and Winston, 1961, p. 196-257.

a social-normative comparison of himself with his group. Very little research using this type of social norm comparison as opposed to informational data has been done in incentive research. There is some congruence, however, between the obtained lack of significance with the social and material incentives and the results of a study by Swingle, Coady and Moors.⁷ Using a similar class norm incentive, along with self-competition, social competition, social competition for monetary reward, and monetary reward, no significant differences were found between class norm and monetary reward.

In an effort to explain the nonsignificant results of the present study, one is led to assume that either there existed a transfer of training or that such results are a consequence of the age level (eight to twelve years old) of the sample involved.

2. Discussion of the Main Effect: Locus of Control.

The analysis of variance demonstrated a significant locus of control main effect: internals obtained significantly higher performance scores than externals; the middle

⁷ P. G. Swingle, H. Coady and D. Moors, "The Effects of Performance Feedback and Monetary Incentive Upon Human Lever Pressing Rate," Psychonomic Science, Vol. 4, No. 6, 1966, p. 209-210.

group, however, did not vary significantly from the other two groups. Such results are in agreement with several studies.^{8,9,10} In these, the tendency for internals to perform better than externals has been repeatedly found.

From Rotter's Social Learning Theory,¹¹ it would follow that internals believe the outcomes of events to be mainly a result of their personal effort, and therefore their own responsibility. In developing an internal locus of control, children have learned to rely on themselves for successful accomplishments, and failures. For most children, success has usually been experienced through various learning situations. When the child has experienced success, he comes to expect success in similar circumstances. In this way, the expectancy of success becomes related to the experience of success. Thus, it is not

8 V. C. Crandall, W. Katkovsky and V. J. Crandall, "Children's Beliefs in Their Own Control of Reinforcement in Intellectual-Academic Situations," Child Development, Vol. 36, 1965, p. 91-109.

9 V. J. Crandall, W. Katkovsky and A. Preston, "Motivational and Ability Determinants of Young Children's Intellectual Achievement Behaviors," Child Development, Vol. 33, 1962, p. 643-661.

10 S. Nowicki and C. Walker, "The Role of Generalized and Specific Expectancies in Determining Academic Achievement," The Journal of Social Psychology, Vol. 94, 1974, p. 275-280.

11 J. B. Rotter, J. E. Chance and J. E. Phares, Applications of a Social Learning Theory of Personality, New York, Holt, Rinehart and Winston, 1972, p. 1-43.

surprising to find that internals respond with greater enthusiasm and obtain higher performance scores than children who fail to expect success as part of their own effort. The latter believe they are left at the mercy of events.

In our society, where children spend numerous hours in school and where scholastic achievement is highly valued, the school situation appears very important in view of the children's experiences of success and/or failure. In the classroom, children are repeatedly compared to a criterion of success (i.e., pass-fail; good, poor, excellent, etc.). Consequently, a close relation between internality and academic success is to be expected.^{12,13,14}

3. Discussion of the Sex Main Effect.

The present study failed to reveal any significant differences between girls and boys when sex was analyzed as a main effect; that is, both sexes cancelled approximately the same number of digits on the cancellation task.

¹² Crandall, Katkovsky and Crandall, op. cit., p. 91-109.

¹³ Crandall, Katkovsky and Preston, op. cit., p. 643-661.

¹⁴ Nowicki and Walker, op. cit., p. 275-280.

In the literature there is much disagreement concerning sex effects on children's performance. Some studies such as Crandall et al.¹⁵ and Nowicki and Walker¹⁶ indicate the existence of sex differences, while others such as Battle and Rotter¹⁷ and Shaw and Uhl¹⁸ have not been able to discriminate sex differences in performance for internal or external children.

The results from this investigation can be seen to concur with the latter group of authors. It is also interesting to compare the present results with a particular study by Crandall et al.¹⁹ In their experiment, they included a much larger age sample (grades three to twelve) than most research projects. They indicated that sex differences could be observed between older girls and boys (grades six to twelve) but not among younger grade three to six children. The sample for the present study was taken among grades four, five, and six children. This age group

15 Crandall, Katkovsky and Crandall, op. cit., p. 91-109.

16 Nowicki and Walker, op. cit., p. 275-280.

17 E. S. Battle and J. B. Rotter, "Children's Feelings of Personal Control as Related to Social Class and Ethnic Group," Journal of Personality, Vol. 31, 1963, p. 482-490.

18 R. L. Shaw and N. P. Uhl, "Control of Reinforcement and Academic Achievement," The Journal of Educational Research, Vol. 64, No. 5, 1971, p. 226-228.

19 Crandall, Katkovsky and Crandall, op. cit., p. 91-109.

is comparable to Crandall et al.'s²⁰ younger group of subjects. It would appear that age is an important factor in the appearance of sex differences for locus of control beliefs. Younger children are not as differentiated (in terms of internal versus external locus of control) as older children. They are in the process of acquiring skills and beliefs about themselves and others. From their experience, of being a girl or a boy, they slowly develop and adopt a personal internal or external belief about their locus of control. It would seem that the age characteristic of the present sample could account for the lack of significant sex effects.

Although no significant differences were seen between the sexes as a main effect, observation of the raw data indicates a slight tendency for internal and middle group girls to obtain higher scores than boys in their respective group. Furthermore, sex differences were also observed in an interaction effect with locus of control and trials. This particular effect will be discussed in the following section.

20 Ibid.

4. Discussion of the Trial, Sex, and Locus of Control Interaction.

A significant interaction was obtained between sex, locus of control, and trials. The internal girls obtained significantly higher scores in comparison to all other groups on trials three and four.

Ausubel's research^{21,22} concerning sex differences in social development may elucidate this finding. According to his theory, such differences could be explained by the different sex roles children are invited to play very early in their education. Girls appear to adjust quite readily to the school situation while young boys find it more difficult. As Ausubel points out,²³ girls tend to satellize (learn by identification, that is, through a dependency relationship with the adult) much more, and therefore they tend to be better accepted by parents, especially the mother, and finally by the primary school teacher who is usually a female. The values and demands that the school imposes through its female staff are taught and believed to be more becoming to the girls, i.e., order, submission, obedience,

21 D. Ausubel, Theory and Problems of Child Development, New York, Grune and Stratton, 1958, p. 572-577.

22 D. Ausubel, Educational Psychology. A Cognitive View, New York, Holt, Rinehart and Winstron, 1968, p. 434-435.

23 Ibid.

cleanliness. When the girl conforms to such demands, she receives approval. Such approval is not as easily given to boys who are supposed to be tougher, less obedient, and more aggressive. The school situation therefore appears to be more favorable to girls. Ausubel explains:

At this age (elementary and junior high school) the higher achievement motivation of girls is largely from authority figures and for the vicarious status that this confers. It is not at all surprising, therefore, that boys furnish a disproportionate share of the nonreaders, the underachievers, the truants, the behavior problems, the inattentive and the drop-outs.²⁴

The generally higher performance of girls as compared to boys in this study can possibly be explained in terms of Ausubel's conceptualization. It should be noted, however, that in middle adolescence boys' and girls' achievement motivation becomes comparable. At this level, cultural demands on the boys are that he performs successfully in academic endeavors.

24 Ibid., p. 434.

SUMMARY AND CONCLUSIONS

In an attempt to understand children's motivation, the concept of expectancy in terms of Rotter's Learning Theory as well as the effect of incentives were considered.

The first chapter reviewed some ideas underlying Rotter's theory, especially those concerning internal-external locus of control and their measurements. Studies related to developmental aspects such as age, sex, parental attitudes, and learning were reviewed as well as research related to achievement and personality variables. The first chapter also elaborated some of the theoretical implications of the incentive research; it reviewed studies related to material and social incentives and considered age and sex variables as they are related to incentives.

The experimental design including the sample, administration of number cancellation task, and statistical design were described in the second chapter.

The first null hypothesis stating nonsignificant differences between the different incentive conditions was accepted.

The second null hypothesis stating no significant differences between internal and external children was rejected. Internal children cancelled significantly more digits than their external counterparts.

The third null hypothesis, proposed no significant differences between sexes; this last null hypothesis was not rejected. However, the interaction of sex with locus of control and trials shed some light on the aforementioned hypothesis.

The results of this study suggest that sex differences in children's behavioral responses to incentive conditions should possibly be researched and interpreted as a function of age.

An interesting finding which warrants further investigation stems from the observation that external girls in this study received the lowest scores on all trials. Since girls usually have a tendency to obtain better scores than boys, this result raises questions as to the negative effects of external beliefs on the performance of girls. Only further study would provide evidence as to whether such a finding is valid or whether it is idiosyncratic of the present sample.

A replication of this study, using several other groups, each receiving only one incentive or no incentive, would be useful in verifying the applicability of using the developmental concept of age in explaining children's responses to incentive conditions.

Another possible study, stemming from the present research data, would indicate the utilization of a

developmental approach in this area. Observation of age and sex differences would illuminate how these variables affect performance of children.

It is hoped that research on the dimension of locus of control and effect of incentives may be helpful to the teacher and parent who is often in search of the means to motivate the child to learn and engage in activity.

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In this study, changes in success-failure conceptualization from hedonistic to more objective cues are shown to be related to a developmental aspect, where more mature children (regardless of their chronological age), have a greater facility to perceive internal locus of control.

Crandall, Virginia C., Walter Katkovsky, and Vaughn J. Crandall, "Children's Belief in Their Own Control of Reinforcements in Intellectual-Academic Achievement Situations," Child Development, Vol. 36, 1965, p. 91-109.

A study using a large N which provides normative data for the use of locus of control construct in academic situations and which suggests some relation between locus of control scores and intellectual achievement.

Lefcourt, Herbert, "Recent Developments in Study of Locus of Control," in B. A. Maher (Ed.), Progress in Experimental Personality Research, New York, Academic Press, 1972, p. 1-39.

Good review, presenting the major areas of research in locus of control construct: resistance to influence, cognitive activity, deferred gratification and achievement behavior, familial and social attitudes, changes in locus of control.

Lewis, Michael, Martin A. Wall, and Justin Aronfreed, "Developmental Change in the Relative Values of Social and Non-Social Reinforcement," Journal of Experimental Psychology, Vol. 66, No. 2, 1963, p. 133-137.

A good study illustrating the differential effects of social and non-social incentives on children at different developmental stages.

McGhee, Paul E., and Virginia C. Crandall, "Beliefs in Internal-External Control of Reinforcements and Academic Performance," Child Development, Vol. 39, No. 1, 1968, p. 91-102.

An important study which examines sex differences according to locus of control and age in the subject's own belief of personal responsibility in academic success or failure.

Rosenhan, David, and Jean A. Greenwald, "The Effects of Age, Sex and Socioeconomic Class on Responsiveness to Two Classes of Verbal Reinforcement," Journal of Personality, Vol. 33, 1965, p. 108-121.

Abstract and less abstract incentives are studied in relation to socioeconomic, class, age and sex. Age is discovered to account for differences in children's ability to respond to abstract as well as more concrete incentives.

Rotter, Julian B., "Generalized Expectancies for Internal Versus External Control of Reinforcement," Psychological Monographs, Vol. 80, No. 1, 1966, p. 260-306.

The author presents a brief theoretical statement of the locus of control concept and summarizes the findings of several major articles in the area. Development of scales measuring this construct and statistical normative data, reliability and validity for Rotter's locus of control scale are also reported.

Rotter, Julian B., June E. Chance, and Jerry E. Phares, Applications of a Social Learning Theory of Personality, New York, Holt, Rinehart and Winston, 1972, 624 p.

This book gives a concise view of Rotter's Social Learning Theory. It is an excellent source of information on the application of this theory to personality study. Major works are assembled under several themes.

Witryol, L. "Incentives and Learning in Children," in H. W. Reese (Ed.), Advances in Child Development and Behavior, Vol. 6, New York, Academic Press, 1971, p. 1-61.

Extensive study, which concerns itself with scaling of children's verbal and material rewards, and mainly with the effects of incentive magnitude in selective and verbal learning in children.

Witryol, Sam L., Donald J. Tyrrell, and Lynn M. Lowden, "Development of Incentive Values in Childhood," Genetic Psychology Monographs, Vol. 72, 1965, p. 201-246.

A series of thorough investigations on children's incentive preferences and the influence they have on their learning behaviors. Age and sex differences are also analysed in relation to incentive value in learning situations.

APPENDIX 1

QUESTIONNAIRE UTILIZED TO MEASURE
LOCUS OF CONTROL

APPENDIX 1

QUESTIONNAIRE UTILIZED TO MEASURE
LOCUS OF CONTROL

Nom _____ Sexe _____
 Adresse _____ Tel. _____
 Ecole _____ Année _____

	<u>Année</u>	<u>Mois</u>	<u>Jour</u>
Date	_____	_____	_____
Date de naissance	_____	_____	_____
Age	_____	_____	_____

- | | <u>Oui</u> | <u>Non</u> |
|---|------------|------------|
| 1. D'habitude lorsque quelqu'un se met contre toi, penses-tu que tu ne peux rien faire? | _____ | _____ |
| 2. Crois-tu vraiment qu'un enfant peut être ce qu'il a envie d'être? | _____ | _____ |
| 3. Quand quelqu'un est méchant (e) envers toi, est-ce parce que tu as fait quelque chose qui l'a poussé à agir méchamment envers toi? | _____ | _____ |
| 4. D'habitude est-ce que tu décides quelque chose par toi-même sans d'abord demander aux autres quoi faire? | _____ | _____ |
| 5. Peux-tu faire quelque chose pour changer ce qui va arriver demain? | _____ | _____ |
| 6. D'habitude quand les gens sont gentils avec toi, est-ce parce que tu as fait quelques choses pour qu'ils soient gentils? | _____ | _____ |

	<u>Oui</u>	<u>Non</u>
7. Parfois peux-tu obliger les autres à faire ce que tu veux?	_____	_____
8. Est-ce qu'il t'arrive de penser que des enfants de ton âge peuvent changer ce qui se passe dans le monde?	_____	_____
9. Si un autre enfant était sur le point de te frapper pourrais-tu faire quelque chose?	_____	_____
10. Un enfant de ton âge peut-il parfois faire à sa tête?	_____	_____
11. Est-ce difficile pour toi de comprendre pourquoi certaines personnes font certaines choses?	_____	_____
12. Quand quelqu'un est gentil avec toi est-ce parce que tu as fait quelque chose de bien?	_____	_____
13. Es-tu capable d'essayer d'être ami(e) avec un autre enfant même s'il ne le veut pas?	_____	_____
14. Est-ce que ça peut t'aider de penser à ce que tu deviendras quand tu seras grand?	_____	_____
15. Quand quelqu'un se met en colère contre toi peux-tu normalement faire quelque chose pour qu'il (elle) redevienne ton ami(e)?	_____	_____
16. Est-ce que les enfants de ton âge peuvent donner leur idée quand il faut choisir l'endroit où ils vont demeurer?	_____	_____
17. Quand tu te chicanes est-ce parfois de ta faute?	_____	_____
18. Quand il t'arrive des choses qui te font plaisir est-ce dû à la chance?	_____	_____

	<u>Oui</u>	<u>Non</u>
19. Penses-tu que souvent tu te fais punir quand tu ne le mérites pas?	_____	_____
20. D'habitude si tu demandes quelque chose est-ce que les gens le font pour toi?	_____	_____
21. Crois-tu qu'un enfant peut-être ce qu'il veut devenir quand il sera grand?	_____	_____
22. Quand ça va mal est-ce habituellement le faute d'un autre?	_____	_____
23. Est-ce vraiment possible de savoir pourquoi certaines personnes font certaines choses?	_____	_____

APPENDIX 2

GENERAL INSTRUCTIONS AND SPECIFIC
INCENTIVES ADMINISTERED TO THE SUBJECTS

APPENDIX 2

GENERAL INSTRUCTIONS AND SPECIFIC
INCENTIVES ADMINISTERED TO THE SUBJECTS

General Instructions

The examiner instructed the subjects in the following manner:

Je veux que tu raies tous les "4" et les "9", comme ceci [examineur lève la feuille et raie le premier nombre] en placant un traie de gauche à droite. Quand tu as fini la première ligne, passe à la deuxième [instructeur indique sur la feuille] puis à la troisième et ainsi de suite jusqu'à ce que je te dise d'arrêter. Raie tous les "4" et les "9" que tu peux mais pas les autres nombre. Y-a-t-il des questions? [examineur répond aux questions et exécute les démonstrations nécessaires].

The administration of the specific incentives took place immediately after the general instructions.

Social Incentive:

"La plupart des enfants de ton âge réussissent très bien cette tâche."

Material Incentive:

"Tu as la chance de gagner un prix."

Control:

No comment was given.

APPENDIX 3

NUMBER CANCELLATION TASK

Tom

Feuille no.

315768906541234589745319810618543276594187231432765841902315673483457621907
390874513851092457385492108761543219168473920483645997622196198453289670487
083957467203948517639210648345829014831327310218149319574620917648376296453
946372847364599736253478564739872635419177651863524172536410967587465342866
907865423189796567450934563428623094181615431817253649782354617863540925347
845369087652431987546319018745372188750935427564298765121316537692054978432
871954673876519087123476954987201978561237945617890341678234235292342098751
345678194562189045637578954223198765035728576539245918764884229754326797433
2670164234790545671764329561683456781876434568901543257876431775432245689187
823457242387694561918651416299654327840542876544326794231962345643976212143
2543764528965741567819345216784561672348917563451764234890176532756176458967
2376548977156714519213145213478961574890156784930456716423456717563458359578
0345869396745671768904560345923142365428765320875321098753159643890632101816
958753207643808752547087654213517191468976846554268643902526552843890201843
0375428642204789764795236710917231543875198716754312095618139023417918615641
0934507089523872074387620763467997543198715969814743287014761587003143701765
0987431548013795365174220639875275801653427074353680479357297531095132874513
2795803094627309209451206511984651947560251386563822199350650619515815150987
0972645413709595139723192794512084756128756214947576208746233275613917171509
1847345141207513972214985445109973120720130987451084765837475629387562937464
0929384574138759413974726384792837594874513092763749241486768474664102733847
3365228374562187516151393139751297379265951287566102028812000227465383921285
0929837419374660138465138515836513765838648832202028375679793333745613896898
3735459922659603151617158468631586926345175045761349686253840713965883414658
8856552027202028475602021212151617138415964608236400283765402084658683345686
0384776612987515396766384513059020047479382751274795022128650475109209832456
0293756683939023875612037518365212835512753502127595129836551286579376950217
9237661365087265950039661461417879168635092736458763086441396950151617178190
0294657399292085763514780613987513987502149855014756201548620515985115077061
0746587930208798479572510977056986306535157616798692120208616770650518468563
0286586856147993092926485863389629696351779269415998726502876512658822616733
0287461460364829465936462993745344275856294746636151185198253898818643297527
8745642907675847676846329375628174097777165938762047562527483927462026238392
9863823472632802736558756493011181861535915422947644562329564783028764533856
95467388262549506735834617158416391343568694234920475620264785945892026465y8
3635427453635759799584634656147671468936419787352424565767159703920173624074
0285688629309861117811312151784629202309857693646984672634566546858680986268
4563728264595167494136355401364552809015874634801375638373519825247501297653
0534278035514653918376252027565513846539517581267418763900264517684179352647
6547922925376029465651365181769642313260486324265782634174179562395685698236
8563428502818735002837566139767504808272683648490149715371851573001795140761
9029836501329651298735148763912086359051476935109374910275149864109754198623
9873410298704876293661473693021204569878002138648659320398478565120477263874
9844256852436484354688765542917115168416741739476175158406147632683698469476
7574573923797375756238794886286386486842384028080579620408567611161141363864
1614141151667493161396745169629-13020708512076927397402121156169855453098243
0982636840283746831131415171715139843149879408273655187693498203985149864885
9826315093896451984562031289984752020837650213987521094653720212946569793872
0928736502993645026548633113487515839681487934795149720208351975207676650840
7656748390283756820412741572041585961398756300128692061262539047566857847394
0938475566151518159864768651486380229873415760861347657430023875864951497028
6573245690865246716143897642136902874645300384726395846238u93620212941487561
8736202856617641486502199850214965621208651207465512983651298365129836512967
0836326378541309451376513976520395761484651384633195882098451209564783928375
174714641498263547684645493002121575639047251274659020856255779920273549381
9474528452028365127544921596586861587639029465657593018646032183765693991463
7-58382385342835548220174534315762901386501466856483290219845664876693022364

APPENDIX 4

ABSTRACT OF

Locus of Control and the Differential Effects of
Incentives on Performance

APPENDIX 4

ABSTRACT OF

Locus of Control and the Differential Effects of Incentives on Performance¹

The project studied variations in locus of control and its relation to boys' and girls' performances under different incentive conditions. The responses of eight- to eleven-year-old boys and girls from internal, middle, or external locus of control groups under three incentive conditions were analysed. Locus of control was determined by a translation of the Bialer-Cromwell Children's Locus of Control Scale; incentives were administered immediately before a five trial number cancellation task of sixty seconds duration. Three locus of control groups of ten boys and ten girls were subjected to every condition (social, material, control). Conditions were counterbalanced.

The null hypotheses were: (1) there is no significant difference between the number of digits cancelled on the different incentive conditions; (2) there is no significant difference between the number of digits cancelled by internal and external children on the task; (3) there is no

¹ Claudette Bastien, Master's thesis presented to the School of Graduate Studies, University of Ottawa, Ontario, July 1976, viii-76 p.

significant difference between the number of digits cancelled by girls and boys on the task. The second hypothesis was rejected; the first and third were not. However, a significant interaction between locus of control, sex and trials gave support for sex differences in relation to locus of control.

Results were interpreted in terms of age and sex differences in children's responses to different incentives.

ERRATA

1. Table of Contents: Chapter III Presentation of Results
Read page 46

Chapter III Statistical Findings
Read page 46

2. Page 52, fourth line EG should be Eg
3. Page 67, second line should read responsiveness
4. Page 62, third line of the quotation, add after largely:
a reflection of their greater desire for approval from
authority.
5. Page 52, third paragraph, third line should read:
differed from Ib at $p < .05$;
6. Page 46, last paragraph $(F(3.41) = \underline{29.5475})$