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ABSTRACT

Aspects of problem-solving measured here are delay of gratification, field-dependence independence, and the relection-impulsivity dimension. The following hypotheses are proposed (1) Those subjects who score high on externality will not delay gratification as those who score low, but they will score lower on measures on field-independence than those who score low, they will respond more quickly on measures of reflection and impulsivity than those who score low, and they will commit more errors on this measure than those who score low. (2) There will be no relation between I.Q. scores and degree of externality on the locus of control measures. (3) Significant sex differences will be found on the measure of externality. Findings indicated no significant relation between the locus of control construct and measured aspects of problem-solving abilities. Significant intercorrelations between the dependent variables are found. The data did not indicate significant sex differences. Future research on the locus of control construct is recommended, especially, a specification of what areas of cognitive activities it influences for black youngsters. (Author/AM)

Locus of Control and Problem-Solving Abilities in Young Black Children[1]

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The purpose of this study was to investigate the relationship between locus of control and aspects of problem-solving in young black children. The locus of control construct is an integral part of social learning theory (Rotter, 1966) and refers to the degree to which people believe they exercise control over their lives. Persons who perceive events as being under personal control or the consequences of one's own actions are viewed as internals. Whereas, those persons who perceive events as being beyond their personal control, being unrelated to their own behaviors, or largely determined by luck, fate, and/or powerful others, are said to be external. The locus of control construct has been evaluated primarily as an independent variable which is predictive across a variety of behavioral and attitudinal situations. This construct has generated a tremendous amount of research that has been summarized in three major review articles (Lefcourt, 1966, 1972; Rotter, 1966), a vast bibliography (Troop & MacDonald, 1971) and continuing publications.

Locus of control has been found to be related to school room achievement behavior, achievement test scores, and grade point level when I.Q. scores were partialled out (Lefcourt, 1972) implicit in accomplishments in academic achievement is success in problem-solving efforts. Therefore, it was reasonable to expect a relationship between problem solving abilities and the locus of control construct. The majority of the work in relating locus of control to problem

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solving abilities has been conducted with white children. This study explored the influence of the locus of control construct on the problem-solving abilities of young black children. The aspects of problem solving that were considered were delay of gratification, field-dependence-independence, and reflection-impulsivity.

The problem-solving process has been viewed as involving the following sequential steps: (1) perception and interpretation of stimulation; (2) memory or the storage of experiences after they have ended; (3) generation of hypotheses of possible solutions to solve the problem; (4) evaluation or the degree to which the child pauses and assesses the quality of this thinking; (5) the deductive phase; and if required (6) a public report (Mussen, Conger, & Kagan, 1974).

The self-regulatory behavior to perform the sequence in seeking a solution to a problem was the issue of concern. It seems as if one of the determinants of whether or not the child will persist in the problem-solving sequence, or abandon the search for a solution, pertains to his willingness to tolerate self initiated frustration. Learning to wait for desired outcomes and to act in the light of anticipated future consequences is fundamental for planning on which complex goal directed behavior depends (Mischel, 1974). Goal-directed behavior requires self-control and/or the ability to defer immediate gratification. The decision as to whether or not to delay gratification is influenced by a person's past reinforcement for waiting behavior and for other forms of planful goal-directed self-control (Mischel, 1974). Therefore, the ability to delay gratification as one aspect of self-control was considered.

The initial step in the problem-solving sequence is the process of perceiving and extracting meaningful information from the stimulus situation (Mussen, et al., 1974). The child must correctly select the critical features to utilize in seeking a solution to a problem. Therefore, his ability to

extract out or analyze a stimulus event for salient features is crucial. One of the aspects of this ability is the concept of field independence. Field independence, a measure of competence at disembedding in perceptual tests, was assessed in this report. The fourth process, evaluation, involves the degree to which the child pauses to consider the quality of his thinking. Evaluation also influence other aspects of problem-solving, i.e., initial perception; recall, and hypothesis generation (Mussen, et al., 1974). Children vary as to whether they will act on the first hypothesis they generate or take time to consider the appropriateness of their hypotheses. These differences have been characterized as the reflection-impulsivity dimension which was also investigated.

Dependent Variables

Delay of gratification. Delay of gratification has been conceptualized at one end of a spectrum as the ability to postpone immediate gratification or to impose delay of reward on oneself for the sake of future consequences (Mischel, 1974) That is, the person who chooses the larger delayed goals for which he must either wait or work. This response pattern resembles what has been called the "Puritan character structure," i.e., trusting, highly motivated to achieve, future oriented, brighter and more mature, etc. (Mischel, 1974). At the other end is the person who usually prefers immediate gratification and refuses the alternative of waiting or working for larger, delayed goals (Mischel, 1974). Social class is related to the construct with middle and upper socioeconomic classes preferring to delay rewards. Generally, the research paradigm presents the subject with a choice between getting a less valuable but immediate reward versus a delayed but larger reward. This experimental design has been critized because the rewards offered in the situations have often been undeserved and of slight value and therefore caution is recommended in generalizing about probable behavior in real life situations

(Lefcourt, 1972). Research studies have found a positive relationship between the ability to delay gratification and age, achievement orientation, social responsibility, personal adjustment, resistence to temptation, sociocultural and rearing conditions, and intelligence (Mischel, 1974). A number of variables seem to influence the accuracy of predicting whether a person will voluntarily delay gratification, i.e., age, sex, experimenter's sex, object he is waiting for, consequences of not waiting, etc. (Mischel, 1974). Price and Ramirez (1974) investigated ethnic differences in delay of gratification between anglo, black and Mexican-American fourth grade children. They found that black and Mexican-American children were more prone, than Anglo children, to accept immediate gratification rather than delayed reward. No sex differences were found within each ethnic group. It was noted that the black children displayed mistrust of the promises of the experimenter although they were tested by a black experimenter.

Attention to the rewards themselves decreases delay behavior, whereas attention to the symbolically presented rewards (i.e., images) increases delay behavior (Mischel, 1974). In addition, representation of reward objects by means of instruction-induced thoughts reduces delay behavior, but externally presented symbolic representation (pictures) of the objects enhances delay of gratification in young children (Mischel, 1974). Most importantly, Mischel (1974) feels that under appropriate motivational and attentional-cognitive conditions, virtually all subjects can manage to delay gratification for relatively long periods of time.

Mischel (1974) theorizes a two-part process in the delay of gratification, (1) the determinants of the individual's choice to delay reward and (2) after the choice to delay gratification how the individual sustains his delay. It is the first part of the process that was of concern to this research. The choice of delaying is related to the individual's expectancies concerning the consequences of his choice. These expectancies are related to his past experience, modeling cues, trust

relationships, etc. It would seem that the person who is externally oriented and believes he is subject to the whims of fate and chance, would prefer immediate gratification because he doesn't know what to expect from tomorrow. Internals on the other hand, have in the past used sequential planning, which involves delays, to accomplish tasks they believe their behavior could influence and therefore will not mind delaying gratification for a larger reward.

Research studies have found that internals choose to delay gratification more than externals (Bialer, 1961; Walls & Smith, 1970). Black subjects were found to be more external and more likely to choose immediate reinforcements than whites, with the greatest differences between black and white females (Zytkoskee, Strickland, & Watson, 1971) However, Strickland (1972) found that blacks were more external than whites, but black subjects' choice of immediate or delayed reinforcement was unrelated to the locus of control construct. Thus a relationship between delay of gratification and locus of control has been substantiated for whites but the results are unclear for blacks.

Field-dependence-independence. Field-dependence-independence refers to a perceptual style or approach to perceptive tasks involving the ability to break up or separate out parts of an organized visual field (Witkins, Dyk, Faterson, Goodenough, & Karp, 1962). Persons who perceive in a field dependent manner are strongly dominated by the overall organization of the surrounding field and the parts of the fields are not discrete. Whereas, persons who are field-independent in their perceptions, experience parts of the field as separate from the organized whole (Witkins, et al., 1962). Field-dependence-independence is viewed as a dimension with the relative designations of field-independence and field-dependence. Consistent sex differences have been found on the dimension with boys being more field-independent than girls. However, this difference is not noted before the age of eight (Witkins, et al., 1962) Field-independence increases with age until

approximately fifteen years, however, an individual's standing on the field-dependence-independence dimensions seems to be relatively stable. The dimension has been found to be related to socialization practices of parents, differences in body concept, a sense of separate identity, and problem-solving tasks of the type where solution depends on using a critical element in a different context from which it has been presented (Karp, 1963, Witkins, et al., 1962).

Witkins and his colleagues (1962) theorize that people with a more field-independent perceptual style have a more developed sense of separate identity. They seem to be more aware of their needs, feelings, and personal attributes which they view as distinct from those of others. This seems to imply an internal frame of reference that is similar to the assumptions concerning internality. Therefore we would expect a relationship between field-dependence-independence and the locus of control construct. However, research findings have not supported this assumption An insignificant relationship has been found between measures of field-independence and measures of locus of control, although it has been found that internals improved steadily as they progressed through the perceptual tasks measuring field-independenc (Lefcourt, 1972). This relationship shall be explored for black children because of the theoretical similarities regarding the importance of a person's view of himself.

The reflection-impulsivity dimension. The reflection-impulsivity dimension refers to the tendency to display slow or fast response times in problem situations with high response uncertainty (Kagan, 1965a). The primary operational index of this variable is response latency of first response in complex visual discrimination tasks in which a standard stimulus and a fixed set of response alternatives are presented and the response alternative that matches the standard is not immediately obvious (Kagan, 1965a). Reflective individuals have long response latency scores and commit few errors, whereas impulsive individuals have short response times and

commit many errors. Response time increases and errors decrease with age and show moderate stability over time (Kagan, Rosman, Day, Albert, & Phillips, 1964).

Since this initial defining work of Kagan and his colleagues, the reflection-impulsivity dimension has been shown to be related to a number of measures of cognitive activity. Research studies have indicated that serial learning tasks (Kagan, 1965a), inductive reasoning problems (Kagan, Pearson, & Welch, 1966), reading errors (Kagan, 1965b), school failure (Messer, 1970), and motor movement (Harrison & Nadelman, 1972) may be influenced by this cognitive style. There seems to be no relationship between response time and intelligence, however, error score seems to relate negatively to intelligence (Kagan, 1965a). For black children it was found that reflection related to motor movement (Harrison & Nadelman, 1972) and impulsivity was associated with a nonanalytic cognitive style for young girls (Harrison, 1974). When compared to white children, black children were more impulsive and commited more errors (Zucker & Stricker, 1968). However, in the Zucker and Stricker (1968) study, the comparison groups were black preschoolers enrolled in a headstart program and white middle class preschoolers with no attempt to control for class differences.

There has been suggestions that a discrepancy exists between the conceptualization of reflection-impulsivity and its operationalization (Block, Block, & Harrington, 1974), followed by a clarification response from Kagan and Messer (1975). Nevertheless, this variable shall be examined as to how it relates to the locus of control construct. The reflection-impulsivity dimension is usually assessed with the Matching Familiar Figures Test (MFF). The MFF is a matching-to-standard task involving several alternatives to create response uncertainty. Response time on the MFF is used as an indication of reflection and impulsivity along with the error score. Studies investigating response time on tasks for internal and external subjects indicate that the nature of the task influences the differences.

Internals have been found to exhibit longer delays in decision time and pay more attention to the tasks if the nature of the task depends upon skill rather than chance with externals showing little differentiation between skill and chance directions (Lefcourt, Lewis, & Silverman, 1968; Rotter & Mulry, 1965). Watson and Baumal (1967) found that internals made more errors in preparation for a task said to be chance determined, whereas, externals made more errors when preparing for a skill determined task. Internals also required longer decision time as the difficulty of making a decision increased (Julian & Katz, 1968). In somewhat related research it was found that internal subjects are more likely than externals to attend to cues providing information which can help to resolve uncertainties (Lefcourt & Wine, 1969) thereby reducing the probability of error. These findings indicate that differences on the reflection-impulsivity dimension may be partially explained by the locus of control construct.

After reviewing the literature the following hypotheses were proposed: (1) Those subjects who score high on externality will not delay gratification as much as those who score low; (2) Those subjects who score high on externality will score lower on measures of field-independence than those who score low; (3) Those subjects who score high on externality will also respond quicker on the MFF than subjects who score low; (4) Those subjects who score high on externality will commit more errors on the MFF than those who score low; (5) There will be no relation between I.Q. scores and degree of externality on the locus of control measures; and (6) Significant sex differences will be found on the measure of externality.

Method

Subjects

The subjects were black (10 females and 10 males) second graders (age range 7-0 to 7-11) from working class, intact families of average intelligence (I.Q.s

ranged from 88 to 112). The subjects were selected from the total class of second graders who attended a predominantly black elementary school in Inkster, Michigan, a largely black suburb of Detroit, Michigan. After controlling for age, social class, I.Q., and intactness of family, the remaining children were included in the study. Written permission from a parent was obtained before a subject was tested.

Procedure

The subjects were examined individually by a black female examiner. The examiner was familiar to the subjects having visited the classrooms on other occasions. The tests were administered in two sessions of approximately 20 minutes each with a minimum of two weeks between sessions for individual subjects. The tests were counterbalanced in order of presentation except for the delay of gratification measure which was always given last. The tests are briefly described below having been described in detail in previous literature.

I. Q. Score. The Peabody Picture Vocabulary Test (PPVT) was administered following standard procedure to obtain the I.Q. score.

Reflection-Impulsivity Dimension. Kagan's Matching Familiar Figures Test (MFF) was used to determine the child's characteristic cognitive tempo (reflective or impulsive). In the MFF, a standard is shown to the subject, and she is asked to select the variant which is exactly like the standard. There are two practice items and 12 items for recording the scores. The examiner recorded latency scores to the next half second, the total number of errors made on each item, and the order in which the errors were made. The examiner coded the responses to each item until the child made six errors (number of choices) or got the item correct. If the subject made six errors, the correct answer was given by the examiner. Two scores are obtained, the average reaction time for the 12 items and total number of errors committed.

Delay of Gratification. The subject was presented with five trials in which to make a decision as to whether to delay reinforcement. On each trial, the subject

had a choice between an immediately available small reward or a larger delayed reward. The items were as follows: small pack of gum versus large pack of gum; small candy bar versus large candy bar, one marking pen versus four marking pens; one small stick-on of batman versus a large stick-on of batman (or superwoman for females); and one balloon versus four balloons. The subject was told he could have the small reward at the end of the day or the larger reward in a week. The examiner demonstrated on a calender the length of a week. The subject's score was the number of times he choose to delay on the five choices.

Field-dependence-independence. The Children's Embedded Figures Test (CEFT) was used to measure this dimension. The test used two simple forms (tent and house) which must be found within a figure. There are two demonstration items and two practice items before the scoring is begun. The subject is presented with the task of finding the tent for 11 items, a practice item for the house, and 14 items for the house. The subject must outline the required simple figure within a complex figure. The test is stopped if the subject fails all of the last five items on the tent section or five consecutive failures on the house section. The subject's score was the number of field-independent answers given to the 25 items.

Locus of Control. A modified version of the Preschool and Primary Internal-External Control Scale developed by Nowicki and Duke (1974) was used to measure this construct. The scale was modified using the same procedure followed by James Savage (Note 1) in his modification of a similar scale for older children. The modification involved rewording the original language of some of the items of the questionnaire in the vernacular of the subjects in the study. For example, original version: "If you ask for something enough, will you get it?" or modified version: "If you ask for something over and over again, will you get it?" Of the 34 items on the test, six were modified. The original and modified versions of the six item are presented in Appendix A. The subject had to respond "yes" or "no" to all the questions and if the answer was "sometimes" or "maybe" the examiner

asked the child what happened the majority of the time. The subject's score was the number of external answers given on the 34 items.

Results

Means and standard deviations for measures of locus of control, I.Q., reaction time and errors on MFF, delay of gratification, and field-independence for boys, girls, and sexes combined are presented in Table 1.

Insert Table 1. about here

No significant sex differences were found on any of the variables. Pearson r correlations for all subjects on all the variables are presented in Table 2.

Insert Table 2 about here

This study does not divide the subjects into the categories of reflection and impulsivity as was done previously by researchers. The sample size is small and a lot of subjects would not have been considered. Most importantly, this technique has been critized because it eliminates important information (Block, et al., 1974) A significant negative correlation (.44) was found between reaction time and errors on the MFF. Reaction time on the MFF had a significant positive relation with delay of gratification (.55) and field-independence (.56). There was a significant negative correlation (-.60) between errors on MFF and field-independence.

Pearson r correlations were calculated separately for boys and girls on all variables. The results are presented in Table 3.

Insert Table 3 about here.

For boys there were significant negative correlations between errors and reaction time (-.68) and field-independence (-.62). Reaction time related significantly in a positive direction (.65) to field-independence for boys. The only

significant relationship for girls was a negative correlation (-.74) between field-independence and errors.

The subjects were categorized as above or below the mean on the degree of externality on the locus of control task. The mean for all subjects was 13.6 and sex was ignored since there were no significant sex differences on the variables. Difference of mean test for those classified above or below the mean on the degree of externality indicated no significant difference between the groups. The means and standard deviations for the two troups are presented in Table 4.

Insert Table 4 about here.

In view of the finding of the importance of the reaction time variable on other variables a Chi-square test was conducted to assess its relation to externality. The subjects were divided into two groups, those above and below the mean on reaction time. The results are presented in Table 5.

Insert Table 5 about here.

There was no significant relationship between the dimension of reaction time on MFF and externality on locus of control

Discussion

Locus of Control

The locus of control construct failed to relate significantly to any of the variables relating to problem-solving for black children. The lack of importance of locus of control may be explained by the modification of the measuring instrument and/or the small sample of subjects used in the study. However, only six of the 34 items were altered and it is doubtful that the modification of such a limited number of items would have that much impact. An alternate explanation to consider is that the influence of feelings of externality may not have an effect on problem-

solving abilities of black children in the early years. Therefore before completely rejecting the idea that externality does not influence black children's problem-solving skills the relationship should be explored in a larger sample of older children. However, research findings on field-dependence-independence, reflection-impulsivity, and delay of gratification indicate that these cognitive styles change very little after the age of eight. Therefore, you would expect that the potential effect of locus of control in these areas would occur during the formative years.

Future research should investigate whether the locus of control construct influences achievement scores and grade-point averages for black youngsters. These variables were not investigated in this report because of the vulnerability of those measures to school environment and the related problems for black youngsters. It was felt that a more valid measure of the influence of the locus of control on the cognitive activities would be assessed by looking at the problem-solving abilities rather than school achievement with it's questionable accuracies. Nevertheless, it should be useful to analyze whether feelings of control about the environment influences whether or not the black youngster actually achieves in school even though locus of control does not seem to relate to his problem-solving abilities. In view of the research studies indicating a relationship between locus of control and reactions to success and failure (Lefcourt, 1972) this approach should be explored.

The validity of the measure of locus of control for black youngsters can also be questioned as it was for older black subjects (Gurin, Gurin, Lao, & Beattie, 1969). Gurin and her colleagues (1965) have presented theoretical and empirical evidence that the internal-external scale based on Rotter's theory is not a unidimentional measure but two relevant separate measures, perceived personal control and perceived control of broader social events. The Nowicki-Duke Scale used in this study was modified for sentence construction only and probably should also be

altered for racial identity considerations before further administration to black children. In view of the findings that school-age black youngsters are aware of the effects of racism, this line of research should be explored.

Future research should be conducted on the locus of control construct to consider on what areas of cognitive activities it influences for black youngsters. Black subjects were more external (means for males 13.5 and 13.7 for females) than white subjects (means for males 11.45 and 11.45 for females; Nowicki & Duke, 1974). However, this says very little about the probable influence of externality for black youngsters as they compete against whites in areas of cognitive accomplishments.

Intercorrelation of Dependent Variables

The measures of field-dependence-independence, reflection-impulsivity, and delay of gratification did show a significant relationship for black youngsters. However, there was no relationship between intelligence and the other cognitive variables, consistent with other research findings except the ability to delay gratification. More intelligent subjects usually delay gratification more than those of lesser intelligence, however, there was no relationship for black children. This may be explained by the limited range of I.Q. scores in this sample, to narrow to adequately assess the relationship. However, an alternative explanation is equally valid. There seems to be no relationship between these two variables for black subjects. The negative relationship between reaction time and errors on the MFF was consistent with previous studies. In other words, the youngster who paused to evaluate the appropriateness of his hypotheses before emiting his answer, reduced the probability of making an error. The negative relationship between errors on the MFF and field-independence also indicates that the ability to analyze stimuli into discrete parts is important for reducing errors. As the child becomes more skillful in noting the critical features of a stimulus events he makes less errors.

The positive relationship between reaction time and delay of gratification suggest there may be a generalized tendency to wait, be it for the purpose of thought or for the purpose of maximizing one's gains. This ability to pause and evaluate also seems to be related to the ability to analyze stimuli into discrete parts and increasing the probability of success in cognitive tasks. Since these relationships are apparent in this small sample future research should be conducted with these variables on a larger sample. Shipman (1971) in a study using lower class black preschoolers failed to find a relationship between the three variables, i. e, reflection-impulsivity, delay of gratification and field-independence. This study suggests that they are interrelated at the second grade level for a different black population. Future research is needed to clarify the issue. Exploration into problem-solving styles of black children is important because of it's implication for teaching and educational achievement. Therefore the parental correlates of these cognitive activities for black children should be investigated. In other words, how do black parents of children who are reflective and field-independent differ in their socialization practices from black parents of impulsive and field-dependent children.

The data failed to show sex differences on any of the variables although it has been found for degree of externality. An explanation for this difference may be in the size of this sample. This study may not have sampled a large enough population for sex difference to emerge. An alternate explanation that can also be considered is that sex differences on this variable in black youngsters do not emerge at an early age. The study by Zytkoskee and his colleagues (1971) found a sex difference on externality using ninth grade adolescents. The findings in this study of no sex difference on field-dependence-independence is consistent with previous suggestions of sex differences becoming apparent after the age of eight.

Summary

The purpose of this study was to investigate the relationship between the locus of control construct and aspects of problem-solving, i.e., delay of gratification, field-dependence-independence, and reflection-impulsivity dimension, for young black children. Subjects were 20 black second graders (10 males and 10 females) from intact, working class families of average intelligence. It was found that the locus of control construct did not significantly relate to any of the measured aspects of problem-solving abilities. However, there was significant intercorrelations between the dependent variables. Since there are very few research studies investigating the relationship between these maasures of cognitive activities for black young children, the study has served a useful purpose. Suggestions were made for future research.

Reference Notes

1. Savage, J. Personal communication, October, 1974.

References

Bialer, I. Conceptualization of success and failure in mentally retarded and normal children. Journal of Personality, 1961, 29, 303-320.

Block, J., Block, J. H., & Harrington, D. M. Some misgivings about Matching Familiar Figures Test as a Measure of Reflection-Impulsivity. Developmental Psychology, 1974, 10, 611-632.

Harrison, A. The relationship between cognitive style and the development of selecti attention. In F. Yates & W. Bodkin (Eds.), Empirical research in black psychology New York: Russell Sage Foundation, in press.

Harrison, A. & Nadelman, L. Reflection-impulsivity dimension and inhibition of movement in preschool children. Child Development, 1972, 43, 657-658.

Julian, J. W. and Katz, S. B. Internal versus external control and the value of reinforcement. Journal of Personality and Social Psychology, 1968, 76, 43-48.

Kagan, J. Individual differences in the resoltuion of response uncertainty. Journal of Personality and Social Psychology, 1965, 2, 154-160. (a)

Kagan, J. Reflection-impulsivity and reading ability in primary grade children. Child Development, 1965, 36, 609-628. (b)

Kagan, J. & Messer, S. B. A reply to "some misgivings about the Matching Familiar Figures Test as a Measure of Reflection-Impulsivity," Developmental Psychology, 1975, 11, 244-248.

Kagan, J., Pearson, L., & Welch, L. Conceptual impulsivity and inductive reasoning. Child Development, 1966, 37, 583-594.

Kagan, J., Rosman, B. L., Day, D., Albert, J., & Phillips, W. Information processin in children: Significance of analytic and reflective altitudes. Psychology Monographs, 1964, 78 (1, Whole No. 578).

Karp, S. A. Field dependence and overcoming embeddedness. Journal of Consulting Psychology, 1963, 27, 294-302.

Lefcourt, H. M. Internal versus external control of reinforcement: A review. Psychological Bulletin, 1966, 65, 206-220.

Lefcourt, H. M. Recent developments in the study of locus of control. In B. A. Maher (Ed.), Progress in experimental personality research. New York: Academic Press, 1972.

Lefcourt, H. M., Lewis, L., & Silverman, I. W. Internal versus external control of reinforcement and attention in a decision making task. Journal of Personality, 1968, 36, 663-682.

Lefcourt, H. M. & Wine, J. Internal versus external control of reinforcement and the deployment of attention in experimental situations. Canadian Journal of Behavioral Science, 1969, 1, 167-181.

Messer, S. Reflection-impulsivity: Stability and school failure. Journal of Educational Psychology, 1970, 61, 489-490.

Mischel, W. Processes in delay of gratification. In L. Berkowitz (Ed.), Advances in experimental social psychology (Vol. 7). New York: Academic Press, 1974.

Mussen, P. H., Conger, J. J., & Kagan, J. Child development and personality. New York: Harper & Row, 1974.

Nowicki, S. & Duke, M. A preschool and primary control scale. Developmental Psychology, 1974, 10, 874-880.

Price, W. & Ramirez, M. Ethnic differences in delay of gratification. Journal of Social Psychology, 1974, 93, 23-30.

Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80 (1, Whole No. 609).

Rotter, J. B. & Mulry, R. C. Internal versus external control of reinforcement and decision time. Journal of Personality and Social Psychology, 1965, 2, 598-604.

Shipman, V. C. Disadvantaged children and their first school experiences: Structure and development of cognitive competencies and styles prior to school entry. Princeton, N. J.: Educational Testing Service, 1971.

Strickland, B. R. Delay of gratification as a function of race of the experimenter. Journal of Personality and Social Psychology, 1972, 22, 108-112.

Troop, W. F. & MacDonald, H. P. Internal-external locus of control: A bibliography. Psychological Reports, 1971, 28, 175-190.

Walls, R. T. & Smith, T. S. Development of preference for delayed reinforcement in disadvantaged youth. Journal of Educational Psychology, 1970, 61, 118-123.

Watson, D. & Baumal, E. Effects of locus of control and expectation of future control upon present performance. Journal of Personality and Social Psychology, 1967, 6, 212-215.

Witkin, H. A., Dyk, R., Faterson, H. F., Goodenough, D. R., & Karp, S. A. Psychological differentiation. New York: John Wiley, 1962.

Zucker, J. S. & Stricker, G. Impulsivity-reflectivity in preschool headstart and middle class children. Journal of Learning Disabilities, 1968, 10, 578-583.

Zytkoskee, A., Strickland, B. R., & Watson, J. Delay of gratification and internal versus external control among adolescents of low socioeconomic status. Developmental Psychology, 1971, 4, 93-98.

Table 1

Means for Boys, Girls, and Sexes Combined on all Variables

Variables	Boys		Girls		Sexes Combined	
	Mean	SD	Mean	SD	Mean	SD
Locus of Control	13.5	3.77	13.7	3.09	13.6	3.36
I. Q.	101.9	7.50	96.1	7.20	99.0	7.75
M F F						
Reaction Time	8.89	4.63	6.68	1.81	7.78	3.60
Errors	16.8	5.76	15.3	3.97	16.0	4.88
Delay of Gratification	4.0	1.63	3.00	1.69	3.5	1.7
Field-Independence	8.1	3.54	6.5	3.37	7.3	3.46

Table 2

Correlations for all Subjects on All Variables

	Locus of control	I. Q.	Reaction time	Errors	Delay of Grat.	Field indep.
Locus of control	X	.03	.06	-.08	-.12	-.32
I. Q.		X	.10	.21	.10	.14
Reaction time			X	-.44*	.55**	.56**
Errors				X	-.14	-.60**
Delay of grat.					X	.38
Field indept.						X

* $p < .05$

** $p < .01$

Table 3

Correlations for Boys and Girls on All Variables

	Locus of Control	I. Q.	Reaction time	Errors	Delay of grat.	Field indep.
Locus of control	X	.35	.35	-.13	.01	.37
I. Q.	-.51	X	.00	-.29	.19	.07
Reaction time	.41	.11	X	-.68*	.57	.65*
Errors	.05	.00	-.31	X	-.55	-.62*
Delay of grat.	-.25	.17	.16	.28	X	.18
Field indep.	-.27	.09	.30	-.74**	.17	X

Note. Results for boys in the upper right of table and girls in the lower left.

* $p < .05$

** $p < .01$

Table 4

Means on Cognitive Variables for Those Above and Below Mean on Externality

	Above[a]		Below[b]	
	Mean	SD	Mean	SD
I. Q.	97.	1.99	100.	2.30
Delay of grat.	3.25	3.33	3.66	2.91
Field indep.	5.88	6.40	8.25	6.09
MFF				
Reaction time	7.71	2.88	7.83	2.91
Errors	14.75*	1.31	16.91	1.93

[a] $\underline{n} = 12.$

[b] $\underline{n} = 8.$

* $\underline{p} < .05$

** $\underline{p} < .01$

Table 5

Chi-Square Test with Yates Correction of Differences Between Externality and Reaction Time Dimensions

Reaction Time	Externality: Above	Externality: Below	χ^2
Above	5	5	.208
Below	3	7	