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HYPERACTIVE VERSUS NORMAL CHILDREN

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LOCUS OF CONTROL IN

HYPERACTIVE VERSUS NORMAL CHILDREN

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ABSTRACT

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HYPERACTIVE VERSUS NORMAL CHILDREN

By

Michael Lee Lopez

The present study investigated the attributional patterns of 52 hyperactive and 22 normal-control children. Subjects were compared on two measures of locus of control, the Nowicki-Strickland Locus of Control Scale (Nowicki & Strickland, 1973) and the Multidimensional Measure of Children's Perceptions of Control - MMCPC (Connell, 1985). The MMCPC examines three possible sources of control (internal, external, and unknown) across four domains (cognitive, social, physical, & general) and two possible outcomes (success or failure).

Results indicated no significant differences between subjects on either the Nowicki-Strickland Scale or the overall-internal, overall-external, and overall-unknown subscales of the MMCPC. Within the hyperactive group, no significant differences were found for perceptions of control across domains. However, the hyperactive children did make significantly more attributions to unknown causes for their successful outcomes in academic situations than did the control children. Additional post-hoc analyses suggested that the group of hyperactive subjects could be usefully divided into two distinct groups: those with reported conduct problems and those without conduct problems.

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CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

The traditional concept of locus of control has been theorized to involve the perceived causal relationship between behavior and subsequent reward and/or punishment (Rotter, 1966). When an individual perceives that rewards and/or punishments are clearly a result of, and primarily contingent upon his/her own actions then the individual is said to have an internal locus of control. On the other hand, another individual may observe reinforcement and/or punishment following his/her behavior that is perceived to be primarily controlled by powerful others, luck, chance, or fate. The perception held by this latter individual is said to be an external locus of control. In other words, rewards and punishment are perceived to be beyond personal control.

The normal development of the expectancies of control occurs through the learning of the behavior-reinforcement contingencies that operate in the individual's environment. This development of perceived control may be parallel to the development of self-control behavior, as outlined by Luria's (1961, 1969) three stage developmental progression. In his model, Luria asserts that the normal developmental progression moves from external-overt control of behavior, to internal-overt control, and finally to internal-covert control (Luria, 1961,1969).

Restated, the development of self-control behavior progresses from an initial stage of little to no control, through a temporary stage of known external control, and ends up at a point of known internal control. A number of studies providing support for this normal developmental increase in the internalization of self-guiding speech, have suggested a progression from unknown control, to external control, and finally to internal control (Luria, 1959, 1961; Meichenbaum & Goodman, 1969a , 1969b). This process occurs as the child gradually learns the behavior-contingency relationships that exist in the environment. Similarly, it may be that the critical factor in the normal development of perceived control may be related to a parallel, gradual shift from unknown sources of control to those sources which are known, both internal and external.

Certain groups of individuals may have difficulty learning normal contingencies that operate in the environment. Such difficulties may lead to the learning of what Seligman (1975) refers to as response-outcome independence, or learned helplessness. For these individuals, the perception held is that in certain situations events are uncontrollable and there is nothing they can do which will affect the outcome.

One group of individuals that may be particularly susceptible to difficulties in learning normal contingency relationships is the population of hyperactive children. Due to problems with inattention, impulsivity, and distractibility, these children often experience significant learning difficulties (Cantwell, 1975). For these children it might be more difficult to learn that there exists contingent

relationships between given behaviors and particular reinforcements and/or punishments. Therefore, hyperactive children may be more likely to attribute control of their behavior and the reinforcements to an unknown source.

Past measures that have been developed to measure locus of control in children (Battle & Rotter, 1963; Bialer, 1961; Crandall, Katkovsky, & Crandall, 1965; Mischel, Zeiss, & Zeiss, 1974; Nowicki & Strickland, 1973; Stephens & Delys, 1973) have suffered from three major design problems. First, these measures have emphasized measuring a generalized global locus of control. Little attention has been paid to the possibility of variance in an individual's perceptions of control across situations. An individual's perception of the contingency relationships operating in one particular situation may be quite different in another very different situation. Only the Intellectual Achievement Responsibility Scale (IAR) (Crandall, Katkovsky, & Crandall, 1965) attempts to examine the construct of locus of control in a very specific area; the academic realm.

Second, few instruments distinguish between perceptions of control over success outcomes and perceptions of control over failure outcomes. The two current measures that do utilize such a distinction are the Intellectual Achievement Responsibility Scale (IAR) (Crandall, Katkovsky, & Crandall, 1965) and the Stanford Preschool I-E Scale (SPIES) (Mischel, Zeiss, & Zeiss, 1974).

Third - and perhaps most important - is the problem related to the bipolar conceptualization of the construct of locus of control. The internal-external formulation of locus of control, as outlined by Rotter

(1966), emphasizes the primary distinction between those sources of control that are perceived to be internal and those that are perceived to be external. The major problem with this conceptualization arises from how external control has been defined in the past. Within the domain of external locus of control, those sources of control that are known (ie. parents, teachers, peers, etc.) have been equated with other sources of control which are unknown or otherwise unpredictable, such as luck, chance, or fate. However, there is a theoretically important difference between knowing and not knowing why certain events occur. The knowledge that a particular event may be under the control of a known powerful other will allow an individual to learn the contingency relationship that is operating. It may also allow for some degree of predictability in future similar situations. On the other hand, if the source of control remains unknown, then the individual may only be able to learn that his/her behavior is independent of the outcome. In this latter situation, the amount of predictability will be minimized, if not entirely absent. Therefore, it is necessary to distinguish between perceived sources of control that are known and those that are unknown.

The recently developed New Multidimensional Measure of Children's Perceptions of Control (Connell, 1985) represents a significant advancement over the previously existing measures of locus of control. This new measure is designed to overcome the three major design limitations of past measures. First, it assesses perceived control in three specific domains (academic, social, and physical), as well as a fourth more global domain of perceived control. Second, this new instrument examines locus of control as it relates to the two different

types of possible outcomes, success and failure. Third, it expands upon the traditional internal-external conceptualization of possible perceived agents of change to include a third, separate category for unknown sources of control.

The New Multidimensional Measure of Children's Perceptions of Control (Connell, 1985) may yield a variety of specific patterns of locus of control for hyperactive children. Various studies have found that learning disabled children make fewer internal attributions and more external attributions for their success outcomes than normal children (Chapman & Boersma, 1979; Fincham & Barling, 1978; Hallahan, Gajar, Cohen, & Tarver, 1978; Hill & Hill, 1982; Pearl, Bryan, & Donahue, 1980). This perception of little internal control over success outcomes may have risen from their lack of understanding of the reasons for their successes. On the other hand, it has also been suggested that learning disabled children may tend to take more personal responsibility for their failures than do normal children. When they fail, they may believe their failure is due to an internal factor, such as a lack of ability. Given the similarities between the hyperactive and learning disabled populations (Ross & Ross, 1976; Safer & Allen, 1976), it is expected that an attributional pattern of external (or unknown) success and internal failure will emerge for hyperactive children as well.

An additional response pattern that may emerge from the use of the New Multidimensional Measure of Children's Perceptions of Control (Connell, 1985) with hyperactive children is related to the potential situation specificity of locus of control beliefs. Hyperactive children often experience more difficulty learning contingency relationships in a

variety of settings (Cantwell, 1975). The severity of these difficulties may vary, depending on the particular setting as well as how difficult it is to learn the "rules of behaving" in one environment compared to another. It has been shown that hyperactive children tend to have more academic, physical, and social problems than normal children (Sprague & Toppe, 1966; Werry, 1968; Mendelson, Johnson, & Stewart, 1971). In the different environments, as the sources of control over reinforcement and punishment become increasingly unclear, the amount of uncertainty or unpredictability regarding outcomes should also increase. Within social settings it could be hypothesized that problems might be most severe, as contingency relationships in social situations are often ambiguous or undefined. On the other hand, within the academic domain problems might be expected to be the least severe, primarily due to more clearly outlined and defined contingency relationships. Finally, within the physical domain, the uncertainty surrounding the control of outcomes may fall somewhere between the level of uncertainty experienced in the social and academic domains.

The purpose of this study will be to compare hyperactive children and normal children, with respect to the construct of locus of control. More specifically, the study will try to determine whether or not (a) hyperactive children show a higher overall unknown locus of control than normal children on the New Multidimensional Measure of Children's Perceptions of Control (Connell, 1985); (b) the hyperactive group of children show a pattern of unknown-success and internal-failure locus of control scores; (c) hyperactive children show a higher unknown locus of control score in the social domain, followed by the physical and

academic domains, respectively; and (d) the New Multidimensional Measure of Children's Perceptions of Control (Connell, 1985) will more clearly discriminate the hyperactive group of children from the normal control group of children, than the Nowicki-Strickland Locus of Control Scale (Nowicki & Strickland, 1973).

CHAPTER II

REVIEW OF THE LITERATURE

Locus of Control

It has long been acknowledged that reinforcement and punishment can significantly influence the occurrence or nonoccurrence of behavior. However, Rotter (1966) asserted that the actual effects of reinforcement and punishment on an individual's behavior are not determined in a straightforward manner. Rather, he believed that rewards and punishments have differential effects on the subsequent behavior of an individual, when there are differing perceptions as to the causal relationship between the individual's own behavior and the reward or punishment that follows. He felt that

> "one of the determinants of this reaction is the degree to which the individual perceives that the reward follows from, or is contingent upon, his own behavior or attributes versus the degree to which he feels the reward is controlled by forces outside of himself and may occur independently of his own actions" (1966, p.1).

Thus, the perceptions of the causal relationship between behavior and subsequent reward or punishment may either increase or decrease the probability of the reoccurrence of the behavior by the individual at another point in time. In addition, he stated that these perceptions can vary with time, across situations, and even in degree, depending upon the interaction between the immediate perception of causality and a

more generalized set of perceived causal relationships that the individual has experienced in the past. He further described that

> "when a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then, in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way by an individual, we have labeled this a belief in external control. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in internal control" (1966, p.1).

It appears then, that the traditional concept of locus of control, as outlined by Rotter (1966), divides the possible perceptions of causality into two general categories, internal control and external control. In addition, any given individual will fall somewhere along the continuum between the two categories of locus of control.

The development of a perception of an internal or external locus of control is hypothesized to involve the learning of the behavior-reinforcement contingencies that operate in the individual's environment. Over time, as children learn these contingencies they come to believe that they are able to have some control over the outcome of events. In fact, it has been shown that with age there is a gradual increase in an internal locus of control for normal children (Bialer, 1961; Nowicki & Strickland, 1973).

The Development of Self-Control Behavior

This normal development of locus of control may be parallel to the development of self-control behavior, as outlined by Luria's (1961, 1969) three-stage developmental model. Self-control behavior is often conceptualized as the internal mechanism by which individuals are able to voluntarily control their own behavior. This control is a result of the active implementation of specific internalized procedures which guide the individual toward the behavior that will maximize the probability of a self-selected outcome (Kazdin, 1980). The need for the application of self-control behaviors occur "in a variety of situations that require the individual to (a) demonstrate behavioral restraint such as delay of gratification or show persistence; (b) eliminate maladaptive responses; (c) establish adaptive approach responses that aid in the tolerance of unpleasant, strenuous, or difficult situations that carry the long-term promise of reward (i.e., short-range unpleasant, but long-range positive consequences); (d) demonstrate behavior patterns that are contrary to the conspicuous environmental consequences" (Meichenbaum, 1979, p.6). In other words, with the application of self-control behavior, the probability of the occurrence of a particular behavior with a high likelihood of occurrence is reduced, as the probability of the occurrence of an incompatible, low likelihood behavior is subsequently increased (Kanfer, 1977).

Vygotsky (1962) asserted that the critical factor responsible for the development of self-control behavior is the internalization of speech. This assertion relates to the functional relationship between language, thoughts, and behavior. In normal children, the development

of self-control behavior is believed to follow a three-stage developmental progression (Luria, 1961,1969). At the first stage of development the child's behaviors are brought under the overt control of external agents, primarily the parents. It is at this stage that the initiation and/or inhibition of behaviors is clearly controlled by the parent's speech. In the second stage of development, the child begins to control his/her own behavior with the use of overt speech. This is often seen when a toddler "talks to him/herself" while playing. In the final stage, which occurs around 5-6 years of age, the child begins to utilize internal speech to control his/her own behavior. With further increases in age there is also an increase in the use of internalized speech as a primary means of controlling one's own behavior.

This progression of self-control behavior, from unknown control to external control, and finally to internal control appears to be a learned behavior. It develops through the formal and informal training a child receives, and is reinforced and maintained by the significant others around him/her. Thus, as a child grows he/she is significantly influenced by individuals in the surrounding environment, particularly by his/her parents. Through the processes of modeling, direct reinforcement, and social control, the child gradually learns the expected, external standards of performance which are conveyed by others and determine when it is necessary to control their own behavior. That is, the appropriate occurrence of self-control behaviors becomes associated with subsequent reinforcement. Eventually, these external standards of performance become independent of the original external consequences, as the child internalizes them (Kazdin, 1980). A number

of studies have provided support for this normal developmental increase in the internalization of self-guiding speech (Luria, 1959, 1961; Meichenbaum & Goodman, 1969a, 1969b).

The Development of Locus of Contol

A similar developmental progression may occur for the construct of locus of control. Initially at birth an infant is presented with an environment in which he/she has no knowledge that reinforcements and/or punishments can be at all controlled. However, as development proceeds the child gradually learns that outcomes of certain events can be controlled by powerful others, usually his/her mother. Around the same time, or shortly after, the child may also be learning the he/she is able to have an influence on the outcome of other events by his/her own actions. In both situations the sources of control of either rewards or punishment that follows the child's behavior, becomes more known to the child. Therefore, it might be hypothesized that, with age, there may be a normal developmental shift from sources of control that are unknown to those sources which are more known, both internal and external.

Learned Helplessness in Hyperactive Children

However, it may be that for some special populations of children this normal development of an internal locus of control may have gone awry. One concept that may be related to a disruption in the development of locus of control is the construct of learned helplessness. Seligman (1975) defines helplessness as "the psychological state that frequently results when events are uncontrollable" (1975, p. 9). That is, helplessness occurs when a person perceives that there is nothing he/she can do to influence, or

otherwise control the outcome of a particular situation, which is believed to be beyond control. "The person may be described as anticipating no contingency between any effort on his part and the end results in the situation" (Lefcourt, 1966, p. 207).

The process by which individuals develop learned helplessness is believed to be through the gradual learning that outcomes are independent of their own responses (Seligman, 1975). For some individuals, Seligman (1975) postulates that this learning process may begin early in life, at a time when our voluntary responses are normally shaped by our socializing agents. That is, the individual has difficulty learning the normal contingencies that operate in his/her environment. Yet, in not learning the contingencies that would normally link the individual's responses to outcomes, there is a different type of learning that actually takes place. This learning is what Seligman (1975) refers to as response-outcome independence, or that events are believed to be uncontrollable.

There may be certain groups of children who are much more likely to exhibit this learned helplessness behavior, due to an initial predisposing factor, such as a chronic illness, attention deficit disorder, learning disability, or any other related deficit (Cunningham & Barkley, 1978; Dweck & Reppucci, 1973; Hill & Hill, 1982). Children who are unable to attend to, or process relevant information that links behavior to outcomes, may also have difficulty learning the contingency relationships that operate in the environment. One particular population of children that may be predisposed to the eventual

development of learned helplessness behavior is the population of hyperactive children.

The current conceptualization of hyperactivity suggests that this term describes a very heterogenous group of children that has historically been included under a single diagnostic category. The primary symptoms of the disorder include attentional difficulties, impulsivity, and overactivity (Barkley, 1981, Cantwell, 1975, Ross & Ross, 1976, Safer & Allen, 1976). A variety of secondary symptoms that also often associated with hyperactivity, including: poor peer relationships, academic difficulties, noncompliance, aggressiveness, and physical coordination problems (Barkley, 1979; Cantwell & Satterfield, 1978; Minde, Weiss, & Mendelson, 1972; Patterson, 1976; Ross & Ross, 1976).

Routh (1980) put forth a working definition of the hyperactive child syndrome, describing hyperactivity as "a child's frequent failure to comply in an age-appropriate fashion with situational demands for restrained activity, sustained attention, resistance to distracting influences, and inhibition of impulsive response" (1980, p.56). In other words, hyperactive children often show a lack of self-control behavior, due to a deficiency in the acquisition of rule-governed behavior (Barkley, 1981). Because of this deficiency, Barkley (1981) believes that these children have trouble making the normal developmental shift from external (social) control to internal self-control of their behavior. As previously noted, this shift of stimuli control is essential for the normal development of self-control behavior (Vygotsky, 1962).

Therefore, given the debilitating combination of attentional problems and the absence of self-controlled behavior, hyperactive children may have a more difficult time attending to and understanding the behavior-reinforcement contingencies operating in the environment. In fact, if they do not fully understand why certain events occur they may perceive that the outcomes of their actions are caused by luck, chance, fate, or some other unknown source. The perception may then arise that there is little they can do to influence the rewards and/or punishments they receive. If any possible remedial efforts are to be directed towards the alleviation of the hyperactive child's problems with self-control, then a thorough assessment must examine the child's attributions of causality.

Measures of Locus of Control

A variety of measures have been developed to assess the construct of locus of control in individuals (eg., Battle & Rotter, 1963; Bialer, 1961; Crandall, Katkovsky, & Crandall, 1965; Levenson, 1981; Lefcourt, Von Baeyer, Ware, & Cox, 1979; Mischel, Ebbeson, & Zeiss, 1974; Nowicki & Strickland, 1973; Rotter, 1966; Stephens & Delys, 1973). Of these measures, there are six which are specifically oriented towards assessing locus of control in children. These children's measures include the Children's Locus of Control Scale (Bialer, 1961), the Children's Picture Test of Internal-External Control (Battle & Rotter, 1963), the Crandall Intellectual Achievement Responsibility Scale (IAR) (Crandall, Katkovsky, & Crandall, 1965), the Nowicki-Strickland Locus of Control Scale For Children (Nowicki & Strickland, 1973), the Stephens-Delys Reinforcement Contingency Interview (Stephens & Delys,

1973), and the Stanford Preschool I-E Scale (SPIES) (Mischel, Zeiss, & Zeiss, 1974).

Bialer Children's Locus of Control Scale

One of the earliest developed children's measures of locus of control was the Bialer Children's Locus of Control Scale (1961). This scale consists of an orally presented, 23-item questionnaire, structured in a yes-no format. It was originally designed for use with normal and mentally retarded elementary school children. Responses are scored to yield a general score, reflecting the total number of answers in the direction of internal control. The higher the score on the measure, the more internal the child is said to be. A low split-half reliability figure was reported for the Bialer measure by Nowicki & Strickland (1973).

Children's Picture Test of Internal-External Control

Another early locus of control measure, the Children's Picture Test of Internal-External Control (Battle & Rotter, 1963), was designed to assess children's attributions of responsibility. Children are presented with each of six cartoons and are asked what their verbal responses would be if they were in the portrayed situations. A seven-point, bipolar scale is used to score the children's responses, with three degrees of internality, three degrees of externality, and a neutral midpoint. A high overall score on the test reflects an external locus of control, while a low score indicates an internal locus of control. When compared to the Bialer (1961) locus of control questionnaire, a significant negative correlation was reported (r=-.42,

$p<.01$) between the two measures (Battle & Rotter, 1963). Reliability and validity information provided for this measure, however, is incomplete.

Crandall Intellectual Achievement Responsibility Scale (IAR)

Crandall, Katkovsky, and Crandall (1965) chose to measure children's belief's in reinforcement responsibility in the very specific intellectual domain. They presented an argument for the possible situational specificity of children's perceptions of control. In addition, the Crandall Intellectual Achievement Responsibility Scale (IAR) distinguishes between children's perceptions of acceptance of responsibility in both success and failure situations. They felt that there might be very different dynamics operating between when children accept personal responsibility for positive outcomes and when they accept personal responsibility for negative outcomes. Finally, unlike other internal-external locus of control measures, the IAR does not include luck, chance, fate, or any other unpredictable forces as possible external sources of control. The external sources were limited to "known" factors, such as persons who have the most face-to-face contact with children: parents, teachers, and peers. This exclusion of unknown sources of control yields a more accurate assessment of those known external sources of control.

The IAR scale consists of 34 forced-choice items, half containing descriptions of positive situations (I+), and the other half containing descriptions of negative situations (I-). Each description is followed by two possible responses, one attributing the outcome to the child and the other attributing the outcome to a powerful other. Scoring of the

measure yields an internal responsibility for success score (I+), an internal responsibility for failure score (I-), and a total internal responsibility score (total I). Over a two-month period, reported test-retest reliabilities were .66 (I+), .74 (I-), and .69 (total I), for a sample of children in grades 3-5. A ninth grade sample yielded test-retest reliabilities of .47 (I+), .69 (I-), and .65 (total I), for an equivalent two month period. Internal consistency was demonstrated with split-half reliabilities of .54 (I+) and .57 (I-) for the younger group, and .60 (I+) and .60 (I-) for the ninth grade group. Low correlations between the three different IAR scores and a measure of social desirability (Crandall, Crandall, & Katkovsky, 1965) indicated that social desirability accounts for relatively little of the variance of the IAR scores.

Nowicki-Strickland Locus of Control Scale

A fourth measure of locus of control is the Nowicki-Strickland Locus of Control Scale for Children (1973). This paper-and-pencil measure consists of 40 yes-no questions describing reinforcement in a variety of general areas, such as affiliation, achievement, and dependency. Scoring is done in the direction of externality, with a low score representing an internal locus of control and a high score an external locus of control. Reported test-retest reliabilities, over a six week period, ranged from .63 (3rd graders) to .71 (10th graders). Split-half reliabilities, reflecting internal consistency, ranged from .63 to .81. There was no significant correlation between the locus of control scores and an abbreviated form of the Children's Social Desirability Scale (Crandall, et. al., 1965). Construct validity was

demonstrated for the Nowicki-Strickland measure, with reported correlations of .41 with the Bialer Scale and .31 and .51 with the I+ scale of the IAR.

Reinforcement Contingency Interview

Stephens & Delys (1973) developed a free-response, Reinforcement Contingency Interview for use with preschool-age and older children. They felt that such a free-response measure would reduce both the complicated judgemental processes of the more limited-response-choice measures, as well as the tendency to choose the more socially desirable responses. The measure was structured to employ a success-failure dichotomy, similar to the IAR. Five reinforcement agents (self, peers, mothers, fathers, and teachers) were crossed with two different types of reinforcement (success and failure) to yield a total of ten possible response categories. With four questions in each resulting category the measure has a total of 40 questions. It should be noted that, like the IAR, the Stephens & Delys measure does not include such external variables as luck, chance, fate, or other unpredictable sources of control. Test-retest reliability for two parallel forms of the measure was reported to be .69. Intercorrelations between the Stephens & Delys measure, the Nowicki-Strickland measure, and the IAR were reported to be low, suggesting differences in the aspects of locus of control that are measured by these different scales. Construct validity was indicated to be supported by behavioral correlates and age and socioeconomic differences.

Stanford Preschool Internal-External Scale

A final locus of control measure is the Stanford Preschool Internal-External Scale (Mischel, Zeiss, & Zeiss, 1974), designed for very young children (3-6 years). Fourteen forced-choice items describe either a positive or negative event. Similar to the IAR, the measure yields three scores, expectancy for internal control of positive events (I+), negative events (I-), and a sum of these two scores (total I). Low split-half reliabilities were reported, .14 (I+), .20 (I-), and .04 (total I). The authors explained the low reliabilities as due to the heterogeneous sampling of a variety of specific events involving locus of control. Reported test-retest reliabilities, over a mean interval of 7 months, were .42 (I+), .52 (I-), and .47 (total I). Evidence for the validity of the measure comes from reported correlations with various behavioral measures of delay of gratification under differing conditions.

Limitations of Existing Measures of Locus of Control

Despite the variety of these locus of control measures for children, most are plagued with one or more serious design limitations. First, all but one of the measures have emphasized measuring a generalized global locus of control. Little attention has been placed on the possibility that an individual's perceptions of control may vary across situations. One of the earliest adult measures, Rotter's (1966) Internal-External Locus of Control Scale, was specifically designed to assess generalized expectancies of control. His reasoning for a such a generalized assessment approach was threefold. He stated that "generalized expectancies are interesting in their own right, since they may be thought of (a) as important personality characteristics, (b) as

defining dimensions of generalization, and (c) as allowing broad predictions from limited data" (1975, p. 59). However, this conceptualization rests on the questionable assumption that these perceptions may be consistent across situations. Rotter himself, does acknowledge that such a geeralized assessment approach may significantly reduce the level of predictions in specific situations.

Within the context of investigating children's development, it may be necessary to examine the expectancies for control in very specific situations, such as in the academic setting. A more comprehensive assessment focus would likely result in more accurate assessments and predictions within the various domains examined. The IAR (Crandall, Katkovsky, & Crandall, 1965) was developed with this purpose in mind. Within the context of a research program investigating various aspects of children's achievement development, they felt that a specific locus of control measure was needed to detect, subtle patterns of expectancies. Therefore, their scale was limited to children's perceptions of control in the intellectual-academic domain. Of all of the children's locus of control measures, the IAR is the only one to utilize such a specific focus.

The second design problem is that only half of the measures distinguish between perceptions of control over success outcomes and perceptions of control over failure outcomes. One of the measures that does incorporate such a distinction is the Intellectual Achievement Responsibility Questionnaire (Crandall, et.al., 1965). "It was felt that the dynamics operative in assuming credit for causing good things to happen might be very different from those operative in accepting

blame for unpleasant consequences. It is possible that belief in personal responsibility for the two kinds of events may develop at differential rates, or that this may be so for some children" (1965, p.94). Since the development of the IAR, two other children's measures have utilized such a distinction between positive and negative outcomes: the Stephens & Delys Reinforcement Contingency Interview (Stephens & Delys, 1973) and the Stanford Preschool Internal-External Scale (Mischel, Zeiss, & Zeiss, 1974).

Unknown Sources of Control

The final, and perhaps most important design problem that characterizes all six of the children's measures is related to the bipolar conceptualization of the construct of locus of control. This internal-external formulation, as originally outlined by Rotter (1966), emphasizes the primary distinction between those sources of control that are perceived to be internal and those that are perceived to be external. In his explanation, Rotter stated that any reward and/or punishment that does not result from the individual's own actions is considered to be "external". Included in this category of external sources are powerful others, luck, chance, fate, and any other unpredictable forces.

Nevertheless, upon careful examination it becomes clear that there is a potentially wide range of variability within what has been defined in the past as an external perception of causality. Essentially, the perceived control by known powerful others (ie. parents, teachers, peers, etc.) has been equated with those unknown and unpredictable sources of control, such as luck, chance, or fate. However, there seems

to be a theoretically significant difference between known sources of control and unknown sources of control.

In typical learning situations rewards affect an individual's behavior in several ways. They provide information that enables the individual to learn appropriate contingency relationships. If an individual perceives that his/her behavior is controlled by a known source of reward/punishment, then even though that source of control may be external, the individual will likely learn that there exists a relationship between his/her behavior and subsequent reward/punishment. Therefore, it may be the combination of the pleasurable value of the reward, in conjunction with the information about the contingency relationship which facilitates the development of a known perception of control. The knowledge of clear behavior-outcome contingencies allows an individual to believe that there is some control over his/her own behavior, regardless of whether it is internal or external control. What this suggests is that it may not be enough to only distinguish between internal versus external sources of control. Rather, another discrimination seems to be equally important, that of known versus unknown sources of control. Yet, past measures of locus of control have failed to make this important distinction.

Multidimensional Measure of Children's Perceptions of Control

There is a recently developed measure, The New Multidimensional Measure of Children's Perceptions of Control (Connell, 1985), which represents a significant advancement over the previously existing measures of locus of control. It has been designed to overcome the three major design limitations of past measures. First, it assesses

perceived control in three specific domains (academic, social, and physical), as well as a fourth more global domain of perceived control. Second, this new instrument examines locus of control as it relates to the two different types of possible outcomes, success and failure. Third - and perhaps most important - it expands upon the traditional internal-external conceptualization of possible perceived agents of change to include a third, separate category for unknown sources of control.

Connell's unknown control subscale originally was similar to the chance dimension included in Levenson's adult locus of control scale (1981). Included in Levenson's chance subscale were such items as luck, chance, and fate. However, low internal consistency and the observed lack of "chance" attributions by children necessitated some modifications in the subscale. The resulting unknown subscale retained only those items that were clearly related to children's lack of understanding of why particular events occurred.

The structure of the New Multidimensional Measure of Children's Perceptions of Control consists of a 3 X 4 X 2 matrix. Three sources of control (internal, external, & unknown), are examined in four domains (cognitive, social, physical, & general), yielding 12 subscales. In addition, success and failure attributions can further divide the subscales in half. With four items comprising each of the 12 subscales, the measure consists of a total of 48 items. Each item consists of a statement, followed by a set of four possible responses, structured in a Likert format. The four responses ("very true", "sort of true", "not

very true", and "not at all true") are scored from 1 to 4, with "very true" = 4 and "not at all true" = 1.

Separate factor analyses (Connell, 1985) on the 12 items within each of the four domains (cognitive, social, physical, & general) supports the distinct factors for source of control (internal, external, & unknown) and outcome (success & failure). Source of control also emerged as the stronger organizing factor, indicating that items representing different outcomes could be organized under the same source of control. The cognitive and social domains were clearly defined by the three sources of control. The remaining two domains however, necessitated a more complex factor structure to account for the majority of the variance. The physical domain was best defined by four factors: (unknown, powerful others, internal-success, & internal-failure), while the general domain required five separate factors: (unknown, powerful others-success, powerful others-failure, internal-success, & internal-failure).

Internal consistency of the subscales, calculated with coefficient alpha as an index of reliability, ranged from .43 to .70 (elementary sample) and .39 to .67 (junior high sample). The lower reliability coefficients reportedly resulted from the more complex factor structure within the physical and general domains.

Test-retest reliabilities were reported for the twelve, 4-item subscales. Over a nine month interval, test-retest reliabilities ranged from .30 to .48, with a mean of .34. Over a longer 17 month time interval, reliabilities ranged from .25 to .50, with a mean of .32. In

addition, split forms of the measure, given one week apart, yielded correlations between .60 and .78.

Finally, the new measure has been shown to be sensitive to developmental changes in locus of control. More specifically, when administered to a sample of 1300 normal school children (third through ninth grade), the results indicated that there was a significant decrease in the unknown and external perceptions of control, with age (Connell, 1985). "The clearest developmental finding is that over the ages from approximately 8 to 14 children show a decrease in the extent to which they say they are unsure about the reasons for their success and failures in general and in the three domains tapped by this measure" (1985, p. 1039). In other words, in children there appears to be a normal developmental trend towards a decrease in the extent to which children perceive events to be controlled by unknown factors or external agents.

Use of the MMCPC with Hyperactive Children

The use of this new measure may yield a variety of specific patterns of locus of control for hyperactive children. The most distinct pattern may arise from the unique structure of the New Multidimensional Measure of Children's Perceptions of Control (Connell, 1985). As previously mentioned, this new scale assesses three sources of control (internal, external, & unknown), compared to only two sources (internal & external) measured by past locus of control instruments. This additional unknown category may be particularly important for the population of hyperactive children.

The severe problems with inattention, impulsivity, and distractibility that hyperactive children experience often result in difficulties with learning (Cantwell, 1975). Given this trouble with learning, these children may not be able to learn behavior-reinforcement contingencies as rapidly, or as readily as normal children. By not learning the behavior-reinforcement contingencies that operate in the environment they would also be less likely to understand the reasons for both their success and failure outcomes. In other words, they may not know who is responsible for the outcomes, or whether or not they can have any control over what happens. This lack of knowledge and perceived control would then make it more difficult to perform successfully in different situations. In fact, Harter & Connell (1984) have found that, for normal children, knowing the sources of control operating in the environment predicted perceived competence and intrinsic motivational orientation in the classroom setting.

Using measures of locus of control that have been constructed on a continuum ranging from internal to external, several studies have found that hyperactive children display more external perceptions of control than normal children (Bolton, 1981; Linn & Hodge, 1982). Other studies have failed to find any differences between the two groups of children (Ackerman, Elardo, & Dykman, 1979; Omizo, 1980). However, when differences are observed, this "external" locus of control may not be an accurate representation of how hyperactive children perceive behavior-reinforcement contingencies. Rather, the differences that have appeared may have been in the direction of external control, since unknown sources of control have traditionally been included in an

external attributionl category. It would therefore appear to be critical to distinguish between known and unknown sources of control when assessing the construct of locus of control in hyperactive children. This distinction becomes possible with the use of the New Multidimensional Measure of Children's Perceptions of Control (1985). Thus, it is hypothesized that hyperactive children will display a pattern of higher unknown locus of control scores, relative to normal children, with the use of this new measure.

An additional response pattern that may emerge from the use of the new measure with hyperactive children is related to the potential situation specificity of locus of control beliefs. Since hyperactive children tend to have more academic, physical, and social problems than normal children (Sprague & Toppe, 1966; Werry, 1968; Mendelson, Johnson, & Stewart, 1971),it would appear that they have difficulty learning contingency relationships in a variety of settings. The severity of these difficulties may depend upon the particular setting, as well as how difficult it is to learn the "rules of behaving" in one environment compared to another. Therefore, in different environments, as the sources of control over rewards and punishment become more unclear, the amount of uncertainty and/or unpredictability regarding the causes of behavior should also be expected to increase. Any increases in uncertainty and/or unpredictability should be indicated by lower internal and/or external scores and higher unknown scores, on locus of control measures.

Hyperactive children often experience the most severe problems within social settings. These children have great difficulty

understanding and learning the appropriate rules and expectancies within social settings. Without rules to guide their behavior these children have more trouble behaving appropriately in social settings. This is consistent with the findings that problems with peers and caretakers are among the major types of secondary behavior problems exhibited by hyperactive children (Ross & Ross, 1976). On the other hand, problems with learning contingency relationships might be expected to be the least severe within the academic domain, primarily due to more clearly defined contingency relationships. Finally, within the physical domain, the uncertainty surrounding the control of outcomes may fall somewhere between the level of uncertainty experienced in the social and academic domains. This may occur as a result of an increase in the clarity of the contingency relationships in physical activities (e.g. sports & games), as compared to the social domain. However, the greater number of opportunities for uncertainty and unpredictability in physical situations, relative to academic situations, would likely place the physical domain between the social and academic domains.

A final pattern of predicted responses for hyperactive children comes from the literature on learning disabled children. Various studies have found that learning disabled children make fewer internal attributions and more external attributions than normal children, especially for success outcomes (Chapman & Boersma, 1979; Fincham & Barling, 1978; Hallahan, Gajar, Cohen, & Tarver, 1978; Hill & Hill, 1982; Pearl, Bryan, & Donahue, 1980). As discussed earlier, this external pattern of attributions may be due to a pattern of attributions reflecting unknown perceptions of causality. Not knowing why one

succeeds may contribute to the perception that there is little that can be done to control the outcome. In addition, it has been suggested that learning disabled children may be susceptible to assuming more personal responsibility for their failures, than normal children (Hill & Hill, 1982; Chapman & Boersma, 1979). When they fail they might possibly believe that an internal factor, such as a lack of ability may be responsible (Hill & Hill, 1982).

In summarizing the potential impact of such an attributional pattern, Hill & Hill indicated that "it should come as no surprise that such a child is often described as engaging in off-task and disruptive behavior; the learning-disabled child may in fact perceive little to gain and much to lose from participating in on-task, classroom activities where he can be responsible for failing but receiving little if any satisfaction when he succeeds" (Hill & Hill, 1982, p.982). Therefore, given the observed similarities between the hyperactive and learning disabled populations (Ross, 1976; Safer & Allen, 1976), it is expected that a pattern of external- (or unknown-) success and internal-failure will emerge for hyperactive children, on the Connell (1985) locus of control scale.

CHAPTER III

OVERVIEW AND STATEMENT OF THE HYPOTHESES

The Child Behavior Project was a clinical evaluation and treatment program for hyperactive children, jointly administered by the Department of Psychology and the Department of Pediatrics at Michigan State University. The hyperactive children were all between 7 and 11 years of age and were from the Mid-Michigan area. Referrals to the program were due to reports of impulse control and inattention problems in the home or at school. Assessments of developmental, behavioral, and cognitive functioning were given to 77 children during the 1984-1986 academic years. Of the total number of children assessed, 52 met the criteria for a diagnosis of cross-situational hyperactivity. The present study investigated differences in the construct of locus of control for cross-situational hyperactive children and normal control children. The following hypotheses were addressed:

Hypothesis I: Given hyperactive children's severe problems with learning, that have been shown to be related to difficulties with inattention, impulsivity, and distractibility, it was predicted that the hyperactive group would show a higher overall unknown locus of control on the Multidimensional Measure of Children's Perceptions of Control than the normal control group.

Hypothesis II: Given the possible cross-situational variation in the clarity of reinforcement contingencies, it was hypothesized that, within the hyperactive group, the unknown locus of control scores would be highest in the social domain, followed by the physical and cognitive (academic) domains, respectively.

Hypothesis III: Given the high degree of overlap between learning disabled children and hyperactive children it was hypothesized that, within the cognitive domain, the hyperactive subjects would have higher scores on the cognitive-unknown-success and cognitive-internal-failure subscales than the normal control group.

Hypothesis IV: Given its broader assessment focus, it was hypothesized that when the hyperactive group of children were compared to the normal control group, the main effect sizes for diagnosis from the three overall scales of the Multidimensional Measure of Children's Perceptions of Control would be greater than the effect size for for diagnosis the Nowicki-Strickland Locus of Control Scale.

CHAPTER IV

METHOD

Subjects

Subjects were 52 elementary school-age children who were assessed for the Child Behavior Project, an evaluation and treatment program for hyperactive children at the Michigan State University Psychological Clinic. Of these 52, 36 were males and 15 were females. Their ages ranged from 84 to 132 months, with a mean age of 103 months. The following inclusion criteria were met for all of the subjects included in the present study: (1) age between 7 years, 0 months and 11 years, 0 months; (2) the absence of developmental delay, psychosis, or mental retardation in either the child or parents; (3) the child was not receiving any medication for problems stemming from his/her hyperactivity; and (4) a score of 15 or greater on the Hyperactivity Index of both the Conners Parent Questionnaire (Goyette, Conners, & Ulrich, 1978) and the Conners Teacher Rating Scale (Conners, 1969).

In addition, a normal control group of 22 subjects, equated for IQ, age, and grade level was included in the study. Of these 22, 13 were males and 9 were females. Their ages ranged from 97 to 130 months, with a mean age of 105 months. Critera for inclusion as a normal control subject were as follows: (1) age between 7 and 11 years; (2) the absence of gross physical impairments, mental retardation, developmental delay, or psychoses in either the parents or the child; and (3) both parents reported that the child did not have behavior problems.

Procedure

Children were referred to the Child Behavior Project at the Michigan State University Psychological Clinic by physicians, teachers, or other professionals in the local community. In addition, many parents had seen or heard public service announcements about the program on local television and radio stations. Copies of the letter sent to the physicians and other professionals, the general description of the Child Behavior Project, and a sample Public Service Announcement are included in Appendix VI.

A Clinician with the Child Behavior Project initially contacted the parents by phone to explain the program, as well to determine whether or not the program would be appropriate for their child. For those children not deemed appropriate for the program, the clinician provided the parents with referrals to other available services. If the clinician determined that the child would benifit from the program and the parents agreed, an appointment was then set up for the initial assessment and a packet of parent questionnaires was mailed to them.

The assessment process involved a 3-4 hour session at the MSU Psychological Clinic. During this assessment, each child was individually administered a battery of measures by a trained research assistant, blind to subject status (ie. clinic referral vs. normal control). Included in the battery were four of the measures used in the present study, as well as other measures of developmental, behavioral, and cognitive functioning. The Peabody Picture Vocabulary Test - Revised (PPVT; Dunn & Dunn, 1981) was given to assess the children's

level of general cognitive development. The Nowicki - Strickland Locus of Control Scale for Children (1973) and the Connell Multidimensional Measure of Children's Perceptions of Causality (1985) were administered to measure locus of control. Finally, the Ford Social Desirability Scale for Children (Ford & Rubin, 1970) was given as a check for socially desireable responding.

While a child was being tested, his/her parents were interviewed by a clinician to collect a developmental history and additional information on the referral problem(s). After the parent interview, the parents were instructed to complete any incomplete measures of the total parent questionnaire packet that had been sent to them prior to the assessment appointment. In addition, consent forms were signed by the parents, giving their permission for their child to participate in the program and for the researchers to contact the child's teacher. Copies of the consent forms can be found in Appendix VII.

If a child was determined to have a diagnosis of ADD-H, as defined by DSM III (APA, 1980) criteria, the child's teacher was then contacted and asked to complete the Conners Teacher Rating Scale (Conners, 1969) regarding the classroom behavior of the child. If the teacher agreed, the questionnaire was sent to the teacher, along with a self-addressed and stamped return envelope.

The normal control group of children was recruited through local hospitals and health care facilities, a local school, as well as by several of the families involved in the program. They were administered the same assessment battery administered to the children referred due to behavioral problems. Parents and teachers of the normal control

children completed the same parent and teacher measures, as the parents and teachers of the clinic-referred children. Consent forms were signed for the normal control children as well. For their participation in the program, the normal control families received a stipend of $25.00 upon the completion of the assessment.

In the present study, six of the measures given in the pre-treatment assessment were used, the Conners' Parent and Teacher Rating Scales (Conners, 1969; Goyette, Conners, & Ulrich, 1978), the Peabody Picture Vocabulary Test - Revised (PPVT; Dunn & Dunn, 1981), the Ford Social Desirability Scale for Children (Ford & Rubin, 1970), the Nowicki-Strickland Locus of Control Scale (Nowicki & Strickland, 1973), and the New Multidimensional Measure of Children's Perceptions of Causality (Connell, 1985).

Measures

The following measures were included in the assessment battery which was administered to the children prior to enrollment in the program (copies of the measures are included in Appendices I - V).

Conners' Parent and Teacher Rating Scales - Revised. The Conners' Parent and Teacher Rating Scales (Conners, 1969; Goyette, et al.,1978) are two behavior rating scales which were developed to both discriminate hyperactive children from normal children and to evaluate treatment effectiveness. The scales include items concerning children's behavior and the possible problems they may experience, such as "Disturbs other children", "Restless or overactive", or "Inattentive, easily

distracted". Parents and teachers are requested to indicate on the measure how much they think their child has been bothered by the various problems during the past month. Possible responses range from "not at all" (0) to "very much" (3). The score on the abbreviated Parent-Teacher questionnaire (Conners, 1973) reflects the total number of points for the 10 items, with possible totals ranging from 0 to 30 points.

Test-retest reliabilities for the 93-item (parent) and 39 item (teacher) questionnaires range from .70 to .90 (Conners, 1973; Goyette, et al., 1978). Correlations between the 10-item abbreviated Parent-Teacher questionnaire and the hyperactivity factor on the longer parent and teacher scales have been reported as .94 and .92 (Werry, Sprague, & Cohen, 1975). In the present study, eligibility was established with a cut-off score of 15 on both the parent and teacher questionnaires, representing two or more standard deviations above the mean (Werry, Sprague, & Cohen, 1975).

Peabody Picture Vocabulary Test - Revised. The Peabody Picture Vocabulary Test - Revised (PPVT; Dunn & Dunn, 1981) provides a quick assessment of a child's general level of cognitive functioning. Two parallel forms of the PPVT-R are available, Form L and Form M. Each form has 5 training items followed by 175 test items, arranged in order of increasing difficulty. All items consist of four numbered illustrations arranged in a multiple-choice format. A stimulus word is orally presented by the examiner, and the child is requested to select the picture that best illustrates the meaning of the word.

For children between the ages of 2-1/2 and 18 years, the reported split-half reliability coefficients ranged from .67 to .88 with a median of .80 (Form L) and .61 to .86 with a median of .81 (Form M). Reliability coefficients for immediate retest with alternate forms ranged from .71 to .89 (median of .79) for standard scores. Delayed retest (9 days to 31 days) with alternate forms yielded reliability coefficients for standard scores ranging from .54 to .90, with a median of .77. Construct validity was demonstrated with correlations between the PPVT and the Stanford-Binet Intelligence Scale ranging from .15 to .88, with a median of .62. In addition, correlations ranged from .04 to .88 (median of .66) and -.16 to .91 (median of .64) for the WISC Verbal Scale and the WISC Full Scale, respectively.

Ford Social Desirability Scale for Children. The Ford Social Desirability Scale for Children (Ford & Rubin, 1970) is a 26-item, orally presented scale developed to measure socially desirable responses by children. Each item consists of a pair of statements that are literal opposites of each other, structured in a forced-choice format. For example, for the item "Do you sometimes play with toys? or Do you never play with toys" a child must choose the statement that is most true for him/her. All of the items are scored in the direction of culturally approved characteristics, with a high score reflecting a general motivation to comply with social demands.

Internal consistency was demonstrated by reported odd-even reliabilities ranging from .51 to .82 for a sample of boys and .48 to .82 for a sample of girls. A 5-week test-retest stability coefficient

was reported as .58, for a sample group of 46 children. Over a three-month retest interval, reliability coeficients of .09, .81, .44, and .63 were reported for groups of 3-year old males, 3-year old females, 4 & 5 year old males, and 4 & 5 year old females, respectively.

Nowicki-Strickland Locus of Control. The Nowicki-Strickland Locus of Control Scale (Nowicki & Strickland, 1973) is a paper-and-pencil measure that consists of 40 yes-no questions describing reinforcement in a variety of general areas, such as affiliation, achievement, and dependency. The measure either can be given to the child to work on individually or it can be administered orally by an examiner. In the present study the measure was administered orally.

Items such as "Do you believe that most problems will solve themselves if you just don't fool with them?" and "Do you often feel that whether you do your homework has much to do with what kind of grades you get?" were scored in the direction of internality. The overall score on the measure represents the total number of items scored in the internal direction, with a low score representing an external locus of control and a high score representing an internal locus of control.

Reported test-retest reliabilities, over a six-week period, ranged from .63 (3rd graders) to .71 (10th graders). Split-half reliabilities, reflecting internal consistency, ranged from .63 to .81. There was no significant correlation between the locus of control scores and an abbreviated form of the Children's Social Desirability Scale (Crandall, et. al., 1965). Construct validity was demonstrated for the

Nowicki-Strickland measure, with reported correlations of .41 with the Bialer Children's Locus of Control Scale (Bialer, 1961) and .31 and .51 with the I+ scale of the Crandall Intellectual Achievement Responsibility Scale (IAR) (Crandall, Katkovsky, & Crandall, 1965).

New Multidimensional Measure of Children's Perceptions of Control (MMCPC). The New Multidimensional Measure of Children's Perceptions of Control (Connell, 1985) represents a significant advancement over the previously existing measures of locus of control. It has been designed to overcome the three major design limitations of past measures. First, it assesses perceived control in three specific domains (academic, social, and physical), as well as a fourth more global domain of perceived control. Second, this new instrument examines locus of control as it relates to the two different types of possible outcomes, success and failure. Third, and perhaps most important, it expands upon the traditional internal-external conceptualization of possible perceived agents of change to include a third, separate category for unknown sources of control.

The structure of the New Multidimensional Measure of Children's Perceptions of Control consists of a 3 X 4 X 2 matrix. Three sources of control (internal, external, & unknown), are examined in four domains (cognitive, social, physical, & general), yielding 12 subscales. In addition, success and failure attributions can further divide the subscales in half. With four items comprising each of the 12 subscales, the measure consists of a total of 48 items. Each item consists of a statement, such as "The best way for me to get good grades is to get the teacher to like me" or "A lot of times I don't know why people like me".

Following each item is a set of four possible responses, structured in a Likert format. The four responses ("very true", "sort of true", "not very true", and "not at all true") are scored from 1 to 4, with "very true" = 4 and "not at all true" = 1. In the present study the measure was administered orally to each child.

Separate factor analyses (Connell, 1985) on the 12 items within each of the four domains (cognitive, social, physical, & general) supports the distinct factors for source of control (internal, external, & unknown) and outcome (success & failure). Source of control also emerged as the stronger organizing factor, indicating that items representing different outcomes could be organized under the same source of control. The cognitive and social domains were clearly defined by the three sources of control. The remaining two domains however, necessitated a more complex factor structure to account for the majority of the variance. The physical domain was best defined by four factors: (unknown, powerful others, internal-success, & internal-failure), while the general domain required five separate factors (unknown, powerful others-success, powerful others-failure, internal-success, & internal-failure).

Internal consistency of the subscales, calculated with coefficient alpha as an index of reliability, ranged from .43 to .70 (elementary sample) and .39 to .67 (junior high sample). The lower reliability coefficients reportedly resulted from the more complex factor structure within the physical and general domains.

Test-retest reliabilities were reported for the twelve 4-item subscales. Over a nine-month interval, test-retest reliabilities ranged

from .30 to .48, with a mean of .34. Over a longer 17-month time interval, reliabilities ranged from .25 to .50, with a mean of .32. In addition, split forms of the measure, given one week apart, yielded correlations between .60 and .78.

Finally, the new measure has been shown to be sensitive to developmental changes in locus of control. More specifically, when administered to a sample of 1300 normal school children (third through ninth grade), the results indicated that there was a significant decrease in the unknown and external perceptions of control, with age (Connell, 1985). "The clearest developmental finding is that over the ages from approximately 8 to 14 children show a decrease in the extent to which they say they are unsure about the reasons for their success and failures in general and in the three domains tapped by this measure" (1980, p. 1039). In other words, in children there appears to be a normal developmental trend towards a decrease in the extent to which children perceive events to be controlled by unknown factors or external agents.

CHAPTER V

RESULTS

A series of univariate t-tests were computed to determine whether the 52 hyperactive subjects and 22 control subjects differed on age, IQ, or grade level. The results presented in Table 1 indicate that differences between the groups were not statistically significant. Thus, the two groups of subjects do not appear to differ on age, grade level, or intellectual functioning.

Correlations between the three overall scores (internal, external, and unknown sources of control, each collapsed across the cognitive, social, physical, and general domains) and nine scale scores (domain x source of control) of the Multidimensional Measure of Children's Perceptions of Control (MMCPC) and the remaining dependent variables of age, the Ford Social Desirability Questionnaire, the Peabody Picture Vocabulary Test - Revised, and the Nowicki-Strickland Locus of Control Scale are presented in Table 2. There were no significant correlations found between the Ford Social Desirability Questionnaire and either the Multidimensional Measure of Children's Perceptions of Control or the Nowicki-Strickland Locus of Control Scale. This lack of significant correlations indicates that the subjects did not appear to respond in a socially desirable manner on either the Multidimensional Measure of Children's Perceptions of Control or the Nowicki-Strickland Locus of Control Scale.

Table 1

Univariate T-tests to Equate for Age, IQ, and Grade Level for Hyperactive (n=52) and Control (n=22) Subjects.

Variable	N	Mean	S.D.	Significance of t
Age (months)				
Controls	22	104.59	12.30	.61
Hyperactives	52	102.94	12.89	
IQ[a]				
Controls	22	108.77	10.96	.14
Hyperactives	52	104.48	12.05	
Grade				
Controls	22	2.68	1.09	.51
Hyperactives	52	2.50	1.08	

[a] Standard scores from the PPVT-R are used as a rough estimate of intelligence.

df = 72

Table 2

Correlations Between the Multidimensional Measure of Children's Perceptions of Control and Remaining Variables.

Locus of control scales	Age	Social Desirability	PPVT-R	Nowicki-Strickland
Internal	-.08	.05	.21	-.01
External	-.29 *	.11	.02	-.30 *
Unknown	-.23	.14	-.21	-.34 **
Cognitive-Internal	-.14	-.09	.18	.05
Cognitive-External	-.28 *	.03	.04	-.30 **
Cognitive-Unknown	-.19	.20	-.25 *	-.28 *
Social-Internal	-.07	-.05	.16	-.003
Social-External	-.32 **	.11	-.03	-.18
Social-Unknown	-.09	-.13	-.18	-.23 *
Physical-Internal	-.08	.06	.14	-.07
Physical-External	-.17	.07	.19	-.26 *
Physical-Unknown	-.21	.18	-.21	-.29 *
General-Internal	.01	-.05	.12	.07
General-External	-.05	.11	-.13	-.16
General-Unknown	-.25 * [b]	.22 [b]	-.01 [b]	-.28 *
Nowicki-Strickland Locus of Control	.24 *	-.11	-.06	----

* $p \leq .05$, ** $p \leq .01$, df=73

b df=74 for indicated correlations with the Nowicki-Strickland Scale.

Statistically significant negative correlations with the ages of the subjects were found for the overall-external scores [r(df=73) = -.29, $p \leq .05$], the cognitive-external scores [r(df=73) = -.28, $p \leq .05$], the social-external scores [r(df=73) = -.32, $p \leq .01$], and the general-unknown scores [r(df=73) = -.25, $p \leq .05$]. Thus, for these scales the older subjects tended to respond less externally. On the other hand, there was a statistically significant positive correlation between age of subject and score on the Nowicki-Strickland Locus of Control Scale [r(df=74) = -.24, $p \leq .05$]. In this case, the older the subject was the more internally they tended to respond.

With respect to the possible influence of intellectual functioning, only the cognitive-unknown scale of the Multidimensional Measure of Children's Perceptions of Control was significantly correlated with the PPVT-R [r(df=73) = -.25, $p \leq .01$]. This statistically significant correlation indicates that with increases in intellectual functioning there were decreases in the magnitude of cognitive-unknown scores.

Finally, statistically significant correlations were found between the Nowicki-Strickland Locus of Control Scale and several of the scales of the Multidimensional Measure of Children's Perceptions of Control. The scales correlated with the Nowicki-Strickland Scale include the overall-external [r(df=73) = -.30, $p \leq .05$], overall-unknown [r(df=73) = -.34, $p \leq .01$], cognitive-external [r(df=73) = -.30, $p \leq .01$], cognitive-unknown [r(df=73) = -.28, $p \leq .05$], social-unknown [r(df=73) = -.23, $p \leq .05$], physical-external [r(df=73) = -.26, $p \leq .05$], physical-unknown [r(df=73) = -.29, $p \leq .05$], and general-unknown [r(df=73)

= -.28, $p \leq .05$] scales. Thus, a higher, or more internal score on the Nowicki-Strickland scale is significantly correlated with lower scores on eight of the ten external or unknown scales of MMCPC. No statistically significant correlations were found between the score from the Nowicki-Strickland scale and any of the five internal scales of the MMCPC.

Hypothesis I

A series of 2 x 2 ANOVAs (diagnosis x sex) were computed for the Nowicki-Strickland Locus of Control Scale and the overall-unknown, overall-internal, and overall-external scales of the MMCPC (see Table 3). The results of these analyses were utilized to test the hypothesis that the hyperactive group of subjects would have higher scores than the control subjects on the overall-unknown scale of the MMCPC (collapsed across the cognitive, social, physical, and general domains). No statistically significant differences were found between the hyperactive and control subjects on the overall-unknown scale. The main effects for sex and the diagnosis x sex interaction also did not achieve statistical significance.

Hypothesis II

To examine whether or not the hyperactive group of subjects displayed statistically significant differences in the magnitude of unknown locus of control scores across the social, physical, and cognitive domains, a series of t-tests were computed (see Table 4). It was predicted that the unknown scores would be the highest in the social domain, followed by the physical and cognitive domains, respectively. The results indicate that although the means for the three scales were

Table 3

2 x 2 ANOVAs (diagnosis x sex) for the MMCPC Overall-Unknown, Overall-Internal, Overall-External, and Nowicki-Strickland Scores.

Locus of control	N	Mean	S.D.	F	p
Overall-Unknown					
Controls					
Males	13	2.37	.55		ns
Females	9	2.53	.28		
Hyperactives					
Males	36	2.59	.70		
Females	15	2.77	.87		
Overall-Internal					
Controls					
Males	13	2.93	.55		ns
Females	9	3.24	.21		
Hyperactives					
Males	36	3.18	.46		
Females	15	3.16	.49		
Overall-External					
Controls					
Males	13	2.34	.53		ns
Females	9	2.57	.41		
Hyperactives					
Males	36	2.74	.61		
Females	15	2.67	.80		
Nowicki-Strickland					
Controls					
Males	13	22.70	5.95	D=3.74	.06
Females	9	24.67	4.85		
Hyperactives					
Males	37	21.54	4.18		
Females	15	21.00	4.64		

Note. For the Overall-Unknown, -Internal, & -External scales, the higher the mean the greater the attribution (range = 0-4).

Only those F values achieving a significance level of $p \leq .10$ are reported. D= main effects for diagnosis, S= main effects for sex, and DxS= interaction of diagnosis x sex.

df = (1,69) for the Overall-Unknown, -Internal, and External ANOVAS.
df = (1,70) for the Nowicki-Strickland ANOVAS.

Table 4

Results of Comparisons Between the Social-Unknown, Physical-Unknown, and Cognitive-Unknown Scores for the Hyperactive Group of Subjects (n=51).

Comparison	Mean	S.D.	t	p
Social-Unknown X Physical-Unknown				
Social-Unknown	2.69	.91	t=.82	ns
Physical-Unknown	2.59	.96		
Physical-Unknown x Cognitive-Unknown				
Physical-Unknown	2.59	.96	t=.18	ns
Cognitive-Unknown	2.57	.96		
Social-Unknown x Cognitive-Unknown				
Social-Unknown	2.69	.91	t=.89	ns
Cognitive-Unknown	2.57	.96		

df = 50

note. The higher the mean the greater the attribution (range = 0 - 4).

ordered in the predicted direction, the differences between them did not attain statistical significance.

Hypothesis III

Within the cognitive domain, it was hypothesized that the hyperactive group of subjects would have higher scores on the cognitive-unknown-success and cognitive-internal-failure subscales than the normal control group. A set of 2 x 2 Anovas were computed to test this hypothesis, with the results presented in Table 5. For the cognitive-unknown-success subscale, the main effect for diagnosis was in the predicted direction and statistically significant [$F(1,69) = 3.93$, $p=.05$], with the means for the hyperactive subjects being higher than those for the control subjects. The main effects for sex and the diagnosis x sex interaction did not attain statistical significance.

For the cognitive-internal-failure subscale the differences between the groups of subjects did not attain statistical significance for the main effects of diagnosis or sex. There was, however, a statistically significant diagnosis x sex interaction [$F(1,69) = 4.39$, $p \leq .05$], as it seems that the male hyperactive children scored higher than the female hyperactive children on this scale, while the female control children scored higher than the male control children.

Hypothesis IV

The results for the 2 x 2 ANOVA (diagnosis x sex) for the overall-unknown scores were presented earlier in Table 3. As was previously discussed, there were no statistically significant main effects for diagnosis, sex, or the diagnosis x sex interaction. The 2 x

Table 5

2 x 2 ANOVAs (diagnosis x sex) for the Cognitive-Unknown-Success and Cognitive-Internal-Failure Scores.

Locus of control	N	Mean	S.D.	F	p
Cognitive-Unknown-Success					
Controls					
Males	13	1.96	.95	D=3.93	.05
Females	9	2.28	.87		
Hyperactives					
Males	36	2.51	1.14		
Females	15	2.83	1.01		
Cognitive-Internal-Failure					
Controls					
Males	13	2.88	1.08		ns
Females	9	3.56	.63		
Hyperactives					
Males	36	3.42	.91	DxS=4.39	.04
Females	15	3.07	.92		

Note. Only those F values achieving a significance level of $p \leq .10$ are reported. D= main effects for diagnosis, S= main effects for sex, and DxS= interaction of diagnosis x sex.

The higher the mean the greater the attribution (range = 0-4).

df = (1,69)

2 ANOVAs for the overall-internal and overall-external scores were also presented in Table 3. Again, the main effects for diagnosis, sex, and diagnosis x sex interaction did not attain statistical significance.

Finally, the results of a 2 x 2 ANOVA (diagnosis x sex) for the Nowicki-Strickland Locus of Control Scale are shown in Table 3. The main effect for diagnosis was not statistically significant, though there was a trend for diagnosis [$F(1,70) = 3.74$, $p=.06$]. This trend indicated that the mean score for the control subjects was higher, or in the direction of greater internality, than the mean score for the hyperactive subjects. The main effect for sex and the diagnosis x sex interaction also did not attain statistical significance for this variable.

The hypothesis that the main effect sizes for diagnosis from the three overall scores of the Multidimensional Measure of Children's Perceptions of Control would be greater than the effect size for diagnosis from the Nowicki-Strickland Locus of Control Scale could not be supported. None of the four analyses revealed statistically significant differences between the hyperactive and control subjects.

Post Hoc Analyses

Upon examination of the initial findings, it was thought that the lack of more significant results may be related to the heterogeneity of the sample of hyperactive subjects. There are indications in the literature that samples of hyperactive children often used in empirical studies may actually represent two or more distinct subgroups of

children and could be further subdivided (Lahey, et. al., 1986; August & Stewart, 1982; August, Stewart, & Holmes, 1983). One proposed division, separates hyperactive subjects into two distinct groups on the basis of whether or not there are concomitant conduct problems (Brown, 1985; Ullmann, Sleator, & Sprague, 1985). This division is proposed as there are often high correlations between scores on the Conners Teacher Rating Scale (Conners, 1969) and measures of conduct problems (Werry, Sprague, & Cohen, 1975; Sandberg et al., 1978).

Therefore, additional post hoc analyses were conducted to explore the possible utility of dividing the hyperactive subjects into more homogeneous groups. The large sample of hyperactive subjects was divided into two groups based on scores from the Externalizing Factor (Factor 1) of the Personality Inventory for Children (Wirt, Lachar, Klinedinst, & Seat, 1977; Lachar, 1982). A cutoff score of T=80 was used to divide the subjects into one group with reported conduct problems (T score greater than T=80) and a second group without conduct problems (T score less than T=79). Scores greater than T=80 have typically been used to distinguish those children who primarily exhibit conduct problems from those who primarily suffer from problems with inattention, impulsivity, and distractibility (Lachar, 1982).

A series of oneway ANOVAs were subsequently computed to ensure that the groups were equated on age, grade, and IQ (see Table 6). Differences between the three resulting groups, hyperactive subjects with conduct problems (n=30), hyperactive subjects without conduct problems (n=22), and control subjects (n=22) were not statistically significant. For all subsequent analyses the groups were further

Table 6

Results of ANOVAs to Equate Three Groups of Subjects for Age, IQ, and Grade Level.

Variable	N	Mean	S.D.	F	p
Age (months)					
Controls	22	104.59	12.30		ns
Hyperactives without conduct problems.	22	101.14	13.97		
Hyperactives with conduct problems.	30	104.27	12.11		
IQ[a]					
Controls	22	108.77	10.96		ns
Hyperactives without conduct problems.	22	102.73	14.87		
Hyperactives with conduct problems.	30	105.77	9.55		
Grade					
Controls	22	2.50	.99		ns
Hyperactives without conduct problems.	22	2.67	1.24		
Hyperactives with conduct problems.	30	2.55	1.07		

Note. Only those F values achieving a significance level of $p \leq .10$ are reported.

The higher the mean the greater the attribution (range = 0 - 4).

df= (2,70)

[a] Standard scores from the PPVT-R are used as a rough estimate of intelligence.

divided by sex and 3 x 2 ANOVAs (diagnosis x sex) were utilized to evaluate differences.

Several 3 x 2 ANOVAs (diagnosis x sex) were computed for the Nowicki-Strickland Locus of Control Scale and the overall-unknown, overall-internal, and overall-external scales of the MMCPC (see Table 7 and Table 8). The results of the 3 x 2 ANOVA for the overall-unknown locus of control scale (collapsed across the cognitive, social, physical, and general domains) were used to explore whether there were statistically significant differences between the hyperactive children without conduct problems, the hyperactive children with conduct problems, and the normal control children. The results indicate that there were no statistically significant main effects for diagnosis, sex, or diagnosis x sex. However, there was a trend for diagnosis [$F(2,67) = 2.49$, $p=.09$]. The hyperactive subjects without conduct problems had the highest overall-unknown scores (collapsed across domains), followed by the hyperactives with conduct problems and the control subjects, respectively. Separate t-tests revealed that the mean for the hyperactive subjects without conduct problems was significantly greater than the mean for the control group [$t(df=42) = 2.53$, $p \leq .05$]. The differences between the two hyperactive groups and between the hyperactive group with conduct problems and the control group were not statistically significant .

A series of t-test were used to examine the levels of reported unknown control across the social, physical, and cognitive domains. In the original analyses, it had been predicted that the unknown scores for

Table 7

3 x 2 ANOVAs (diagnosis x sex) for Overall-Unknown, -Internal, and -External Locus of Control Scores.

Locus of control	N	Mean	S.D.	F	p
Overall-Unknown					
Controls					
Males	13	2.37	.55	D=2.49	.09
Females	9	2.53	.28		
Hyperactives without conduct problems.					
Males	18	2.77	.59		
Females	4	3.12	.52		
Hyperactives with conduct problems.					
Males	18	2.41	.77		
Females	11	2.63	.95		
Overall-Internal					
Controls					
Males	13	2.93	.55		ns
Females	9	3.24	.21		
Hyperactives without conduct problems.					
Males	18	3.22	.45		
Females	4	3.39	.37		
Hyperactives with conduct problems.					
Males	18	3.15	.49		
Females	11	3.08	.51		
Overall-External					
Controls					
Males	13	2.34	.53		ns
Females	9	2.57	.41		
Hyperactives without conduct problems.					
Males	18	2.70	.68		
Females	4	2.84	.83		
Hyperactives with conduct problems.					
Males	18	2.77	.55		
Females	11	2.61	.82		

Note. Only those F values achieving a significance level of $p \leq .10$ are reported. D= main effects for diagnosis, S= main effects for sex, and DxS= interaction of diagnosis x sex.

The higher the mean the greater the attribution (range = 0-4).

df=(2,67)

Table 8

3 x 2 ANOVA (diagnosis x sex) for the Nowicki-Strickland Locus of Control Scores.

Locus of control	N	Mean	S.D.	F	p
Nowicki-Strickland					
Controls					
Males	13	22.69	5.95		ns
Females	9	24.67	4.85		
Hyperactives without conduct problems.					
Males	18	21.17	3.43		
Females	4	22.75	6.24		
Hyperactives with conduct problems.					
Males	19	21.89	4.85		
Females	11	20.36	4.11		

Note. Only those F values achieving a significance level of $p \leq .10$ are reported. D= main effects for diagnosis, S= main effects for sex, and DxS= interaction of diagnosis x sex.

df = (2,68)

the entire group of hyperactive subjects would be highest in the social domain, followed by the physical and cognitive domains, respectively. The t-tests for the post hoc analyses were computed twice, once for the group of hyperactive subjects with conduct problems (see Table 9) and once for the hyperactive subjects without conduct problems (see Table 10).

The results of the comparisons for the hyperactive subjects with conduct problems indicate that there was a statistically significant difference between the means for the social-unknown and cognitive-unknown scales [$t(df=28) = 2.10$, $p \leq .05$]. There was also a trend between the physical-unknown and cognitive-unknown means [$t(df=28) = 1.83$, $p=.08$]. Both differences found were in the originally predicted direction.

For the hyperactive subjects without conduct problems, none of the differences attained statistical significance. There was a trend between the means for the physical-unknown and cognitive-unknown scales [$t(df=21) = 1.90$, $p=.07$]. However, this difference was in the opposite direction to what had originally been predicted for the entire heterogeneous group of hyperactive children, with the cognitive-unknown mean being greater than the physical-unknown mean.

Further post hoc analyses were computed with the scores from the cognitive-unknown-success and cognitive-internal-failure subscales of the MMCPC, for the three groups of subjects. 3 x 2 ANOVAs (diagnosis x sex) were utilized to examine any possible differences. Table 11 presents the results for the 3 x 2 ANOVA computed for the

Table 9

Results of Comparisons Between the Social-Unknown, Physical-Unknown, and Cognitive-Unknown Scores for the Group of Hyperactive Subjects with Conduct Problems (n=30).

Comparison	Mean	S.D.	t	p
Social-Unknown X Physical-Unknown				
Social-Unknown	2.66	1.07	t=.57	ns
Physical-Unknown	2.55	1.04		
Physical-Unknown x Cognitive-Unknown				
Physical-Unknown	2.55	1.04	t=1.83	.08
Cognitive-Unknown	2.26	.93		
Social-Unknown x Cognitive-Unknown				*
Social-Unknown	2.66	1.07	t=2.10	.05
Cognitive-Unknown	2.26	.93		

df=28 * = $p \leq .05$

note. The higher the mean the greater the attribution (range = 0 - 4).

Table 10

Results of Comparisons Between the Social-Unknown, Physical-Unknown, and Cognitive-Unknown Scores for the Group of Hyperactive Subjects Without Conduct Problems (n=22).

Comparison	Mean	S.D.	t	p
Social-Unknown X Physical-Unknown				
Social-Unknown	2.73	.65	t=.64	ns
Physical-Unknown	2.64	.85		
Physical-Unknown x Cognitive-Unknown				
Physical-Unknown	2.64	.85	t=1.90	.07
Cognitive-Unknown	2.97	.85		
Social-Unknown x Cognitive-Unknown				
Social-Unknown	2.73	.65	t=1.33	ns
Cognitive-Unknown	2.97	.85		

df=28 * = $p \leq .05$

note. The higher the mean the greater the attribution (range = 0 - 4).

Table 11

3 x 2 ANOVA (diagnosis x sex) for the Cognitive-Unknown-Success Locus of Control Scores.

Locus of control	N	Mean	S.D.	F	p
Cognitive-Unknown-Success					
Controls					
Males	13	1.96	.95	D=5.22	.01
Females	9	2.28	.87		
Hyperactives without conduct problems.					
Males	18	3.03	1.05		
Females	4	3.38	.48		
Hyperactives with conduct problems.					
Males	18	2.00	1.00		
Females	11	2.64	1.10		

Note. Only those F values achieving a significance level of $p \leq .10$ are reported. D= main effects for diagnosis, S= main effects for sex, and DxS= interaction of diagnosis x sex.

The higher the mean the greater the attribution (range = 0-4).

df = (2,67)

cognitive-unknown-success subscale. There was a statistically significant main effect for diagnosis [$F(2,67) = 5.22$, $p \leq .01$]. Post hoc comparisons using the Student-Newman-Keuls procedure revealed that the mean for hyperactive subjects without conduct problems (3.09) was significantly different from the means for the hyperactive subjects with conduct problems (2.24) and the normal controls (2.09). The difference between the mean for the hyperactive group with conduct problems and the mean for the control group did not attain statistical significance.

The 3 x 2 ANOVA (diagnosis x sex) for the cognitive-internal-failure subscale is presented in Table 12. There were no statistically significant main effects for diagnosis, sex, or diagnosis x sex.

The results of a 3 x 2 ANOVA (diagnosis x sex) for the overall-unknown scale were previously presented in Table 7. There were no statistically significant main effects for diagnosis, sex, or the diagnosis x sex interaction, although there was a trend for diagnosis [$F(2,67) = 2.49$, $p=.09$]. Also shown in Table 7 are the 3 x 2 ANOVAs (diagnosis x sex) for the overall-internal and overall-external scales. Again, the main effects for diagnosis, sex, and the diagnosis x sex interaction did not attain statistical significance.

Table 8 presents the results of the 3 x 2 ANOVA (diagnosis x sex) for the Nowicki-Strickland Locus of Control Scale. The main effects for diagnosis, sex, and the diagnosis x sex interaction did not attain statistical significance for this variable.

Table 12

3 x 2 ANOVA (diagnosis x sex) for the Cognitive-Internal-Failure Locus of Control Scores.

Locus of control	N	Mean	S.D.	F	p
Cognitive-Internal-Failure					
Controls					
Males	13	2.88	1.08		ns
Females	9	3.56	.63		
Hyperactives without conduct problems.					
Males	18	3.44	.86		
Females	4	3.00	.71		
Hyperactives with conduct problems.					
Males	18	3.39	.98		
Females	11	3.09	1.02		

Note. Only those F values achieving a significance level of $p \leq .10$ are reported. D= main effects for diagnosis, S= main effects for sex, and DxS= interaction of diagnosis x sex.

The higher the mean the greater the attribution (range = 0-4).

df = (2,67)

As with the previous set of analyses, it was not possible to compare the main effect sizes for diagnosis from the three overall scores of the MMCPC to the main effect size for diagnosis from the Nowicki-Strickland Locus of Control Scale. None of the four analyses revealed statistically significant differences between the two hyperactive subgroups and the control subjects, for the main effect of diagnosis.

CHAPTER VI

DISCUSSION

The purpose of the present study was to investigate attributions of locus of control in hyperactive children, compared to normal controls. More specifically, it was hypothesized that compared to the normal control children, the hyperactive children would have higher overall-unknown perceptions of control, higher unknown perceptions of control for successes in the cognitive domain, and higher internal perceptions of control for failure experiences in the cognitive domain. It was also hypothesized that within the group of hyperactive subjects, unknown attributions would be highest in the social domain, followed by the physical and cognitive domains, respectively. Finally, it was hypothesized that the effect sizes for the overall-internal, overall-external, and overall-unknown scales of the Multidimensional Measure of Children's Perceptions of Control (MMCPC) would be greater that the effect size for the Nowicki-Strickland Locus of Control Scale.

Hypothesis I

Contrary to what was predicted, compared to the normal control children, the overall group of hyperactive subjects did not display higher overall-unknown scores on the MMCPC. This finding stands in contrast with the results of investigations examining locus of control in other abnormal child populations. For example, Matthews, Barabas, & Ferrari (1982) used the MMCPC to examine the perceptions of control held by epileptic, diabetic, and healthy control children. The authors of

this earlier study found statistically significant differences between the chronically ill and healthy control children, in their overall perceptions of unknown control. Both groups of chronically ill children made significantly greater attributions to unknown sources of control, than the control children. Perhaps, the experience of unpredictability and lack of control of physiological conditions is much more extreme for chronically ill children, compared to hyperactive children, thereby establishing a more solid foundation for attributions to unknown sources of control. It might then be expected that hyperactive children would make less extreme attributions to unknown causes than the chronically ill children. Such a difference in degree of attributions would likely be reflected in the degree to which the chronically ill and hyperactive children acknowledge a lack of understanding regarding outcomes. Therefore, it is possible that the unpredictabilty and lack of control experienced by hyperactive children may not be severe enough to result in significantly different attributions, when compared to those of normal children.

Hypothesis II

The second major hypothesis of the present study was also not supported by the results. It was predicted that the hyperactive subjects would display a differential pattern of unknown perceptions of control that corresponded with the possible variation in clarity of reinforcement contingencies, across domains. More precisely, the hypothesis was that unknown locus of control scores would be highest in the social domain, followed by the physical and cognitive domains,

respectively. However, despite the fact that the three mean scores for the unknown-social, -physical, and -cognitive scales were ordered in the predicted direction, the differences between them were not statistically significant.

Apparently, it appears that as a group, the hyperactive subjects attributed similar levels of control to unknown causes across all three domains. Given evidence indicating a general pervasiveness of difficulties, across a variety of settings for hyperactive children (Sprague & Toppe, 1966; Werry, 1968; Mendelson, Johnson, & Stewart, 1971), it appears that hyperactive children are unable to distinguish differences in the clarity of reinforcement contingencies across domains. Therefore, only a nondifferential pattern of unknown attributions was present for the hyperactive subjects.

Hypothesis III

One hypothesis that the results partially supported was that the hyperactive subjects had higher scores than the normal control subjects on the cognitive-unknown-success subscale. Thus, it appears that the hyperactive subjects made significantly more attributions for their successes in academic situations to unknown causes than did the normal control subjects.

This perception of not understanding why one succeeds is related to similar findings from earlier studies on learning disabled children (Chapman & Boersma, 1979; Fincham & Barling, 1978; Hallahan, Gajar, Cohen, & Tarver, 1978; Hill & Hill, 1982; Pearl, Bryan, & Donahue, 1980). These previous studies generally found that the learning disabled children made significantly more external attributions and

fewer internal attributions than normal children, especially for success outcomes. However, given the fact that none of the previous studies used measures that directly assess unknown attributions, one can only hypothesize that the significant differences in the unknown perceptions of control from the current study may be similar to the significant differences in external perceptions of control from earlier studies. This proposed equating of findings is based on the argument that other measures of locus of control place those items attributing control to unknown sources (e.g. luck, chance, or fate) into the external category. Therefore, a child who does not understand why s/he succeeds may display a pattern of higher external attributions, when assessed by these other measures of locus of control. Thus, one can see that the pattern of higher "external" attributions in the earlier studies with learning disabled children may have also represented higher levels of unknown attributions. However, until additional studies are done to further explore this hypothesis and directly compare the populations of hyperactive and learning disabled children, all conclusions regarding the their similarities must remain tentative.

It was the second part of the above hypothesis that did not receive full support from the results of the current study. Contrary to what was predicted, the entire group of hyperactive subjects did not make significantly greater internal attributions for their failure experiences within the cognitive domain. This lack of significant main effects for diagnosis concurs with the results of several previous studies done with learning disabled children (Hill & Hill, 1982; Chapman & Boersma, 1979; Lynn,1979; Pearl, Bryan, & Donahue, 1980)).

There was however, a statistically significant diagnosis x sex interaction that was found. Examination of the interaction revealed that, as predicted, the male hyperactive subjects made greater internal attributions for their failure experiences than the male control subjects. However, the opposite was true for the female subjects. The female control subjects made greater internal failure attributions than the female hyperactive subjects. Thus, the current findings indicate that only male hyperactive children take more personal responsibility for their failures than normal children. Consequently, even though the overall group of hyperactive children seem to have trouble understanding why they succeed in school (higher cognitive-unknown-success attributions), when they fail only male hyperactives blame themselves.

Hypothesis IV

The final hypothesis that the Multidimensional Measure of Children's Perceptions of Control would better discriminate the group of hyperactive children from the control children, than the Nowicki-Strickland Locus of Control Scale, was not supported in the present investigation. As can be seen in Table 3, the main effect sizes for the three overall scales of the MMCPC and the Nowicki-Strickland scale were not statistically significant.

There was however, a trend for diagnosis for the Nowicki-Strickland Locus of Control Scale [$F(2,70) = 3.74$, $p=.06$]. The preliminary evidence would therefore indicate that the Nowicki-Strickland Locus of Control Scale, and not the MMCPC, seems better able to discriminate between hyperactive and normal control subjects, than the MMCPC.

However, this evidence is based on an observed trend and is by no means conclusive.

Summary of Analyses

This lack of clear evidence, that the sample of hyperactive children differed from the sample of normal control children on measures of locus of control, is also somewhat consistent with the mixed findings of previous studies. Several studies have found significant differences between hyperactive and control subjects (Bolton, 1981; Linn & Hodge, 1982), while others have failed to find such differences (Ackerman, Elardo, & Dykman, 1979; Omizo, 1980). One possible explanation for the few significant differences found in the present study may be related to the somewhat more restrictive focus of this investigation. Rather than examining the attributions of the hyperactive children across all four domains, three sources of control, and both success and failure outcomes, the primary focus was on differences in unknown attributions. This focus was chosen, as unknown attributions appear to play a significant role in the lives of children with attention deficit disorder. Another possible explanation for the few significant results may be a function of the potential heterogeneity of the sample of hyperactive subjects used in this study. It also may be that there are no differences in locus of control between hyperactive and normal children.

Post Hoc Analyses

Given the general lack of differences in locus of control variables between the hyperactive and normal control samples, post hoc analyses were computed to explore the possible utility of separating the group of

hyperactive subjects into more homogeneous subgroups. Consequently, the overall sample of hyperactive subjects was divided into two smaller groups, those hyperactive children with conduct problems (n=30) and those hyperactive children without conduct problems (n=22).

The results of the 2 x 3 ANOVA (sex x diagnosis) for the overall-unknown scores revealed a trend for the main effect of diagnosis. When subsequent t-tests were computed, it was revealed that only the difference between the group of hyperactive subjects without conduct problems and the control group was statistically significant. Therefore, these results would indicate that when comparing a more homogeneous group of hyperactive subjects without conduct problems (possibly more reflective of a primary attention deficit disorder), with a group of control subjects, the findings are more consistent with the original predictions.

These findings are particularly salient in light of the foundation on which the original hypothesis was built, that it is primarily the attentional problems which contribute to the difficulty in learning contingency relationships. Thus, one explanation may be that those hyperactive children with concomitant conduct problems have somehow gained a sense of control over their often unpredictable environments through acting out behavior. While, the remaining hyperactive children without conduct problems could make higher attributions to unknown sources of control, as they may not yet have discovered ways of reducing the amount of unknown control experienced in their daily lives.

On the other hand, those "hyperactive" children who exhibit high levels of conduct problems may actually be conduct disordered children.

Given the evidence that there is often a high degree of overlap between the hyperactive and conduct disordered populations, one might begin to suspect that the two groups of children must be examined separately. Although attentional problems may be present in the children with severe conduct problems, the attentional problems may not be as severe for the hyperactive children with conduct problem, as they are for the hyperactive children without the conduct problems. In fact, problems with impulsivity may be more prevalent in the group of hyperactives with conduct problems than the attentioal problems. If that is the case, the children may understand the contingency relationships, yet choose to act out instead.

Upon reexamination of the unknown locus of control scores for both groups of hyperactive subjects, across the social, physical, and cognitive domains, some interesting findings were discovered. Hyperactive children with conduct problems displayed a pattern of scores in the predicted direction, with the unknown attributions being highest in the social domain, followed by the physical and cognitive domains, respectively. This pattern is consistent with the original theoretical notion that the clarity of reinforcement contingencies varies across domains and thus, should be reflected in the levels of attributions to unknown sources of control. Perhaps the attentional problems are just severe enough for the hyperactive children with conduct problems, that the predicted pattern of attributions appears.

In contrast, the hyperactive subjects without conduct problems evidenced the greatest unknown locus of control in the cognitive domain, relative to either the social or physical domains. It seems likely that

those hyperactive children, for whom attentional problems are the primary source of trouble, have experienced considerable difficulties in the classroom environment on a daily basis and may simply not understand how outcomes can be controlled. This would not only help to explain the significantly higher level of unknown attributions in the cognitive domain, but would also help explain the similar finding for the smaller cognitive-unknown-success subscale.

For the cognitive-unknown-success subscale, the results indicated that the group of hyperactive children without conduct problems made significantly higher attributions to unknown sources of control for success outcomes, than either of the other two groups of children. Therefore, it appears the these hyperactive children without conduct problems may attribute a considerable amount of academic success to unknown causes, whereas those hyperactive children with conduct problems and the normal children do not have as difficult of a time . One might begin to to consider the possible implications for such attributions.

If a child consistently attributes the control of academic outcomes to unknown causes, then they may have difficulty realizing that control might actually be possible. This could further lead to a reduction in motivation to persist in attempts to master academic tasks and an increase in the amount of frustration experienced. Interestingly enough, Harter & Connell (1981) found that it was the normal children's unknown perceptions of control that was a powerful predictor of academic achievement and perceived self-competence. Thus, it is imperative that further research address the important role that such unknown attributions may play in the academic experiences of children,

particularly those children who may have a greater tendency to make such unknown attributions.

Similar to what was found for the overall group of hyperactive children, there were no significant main effects for diagnosis or sex, between any of the three groups, for the cognitive-internal-failure subscale. In addition, the diagnosis x sex interaction that was present from the original analyses did not appear in the post hoc analyses. Therefore, although there is the perception that the hyperactive children cannot control their successes in the classroom, it does not appear that they take personal responsibility for their academic failures.

The final question addressed in the post hoc analyses was whether or not the three overall scales of the Multidimensional Measure of Children's Perceptions of Control would better discriminate each of the groups of hyperactive children from the control children, than the Nowicki-Strickland Locus of Control Scale. As noted before, none of the four analyses revealed statistically significant main effects for diagnosis.

That the hyperactive children without conduct problems were significantly higher than the control subjects in their overall-unknown perceptions of control, indicates that the overall-unknown scale of the MMCPC may be able to reliably discriminate those hyperactive children without concomitant conduct problems from normal control children. The overall-unknown scale does not, however, discriminate the hyperactive subjects with conduct problems from the control subjects.

On the other hand, the results of the present study do not support that the Nowicki-Strickland Scale can accurately discriminate between those hyperactive children with and without conduct problems and normal control children.

Limitations of Present Study

Several notes of caution must be made regarding the results of the present study. First of all, the limited number of items (48) on the Multidimensional Measure of Children's Perceptions of Control (MMCPC) reduces the amount of reliability and increases the amount of sampling error for the different scales of the measure, particularly those scales that are comprised of only two items. Therefore, although the multidimensional nature of the instrument yields valuable information regarding children's perceptions across the four domains, three sources of control, and success and failure experiences, the results need to be replicated through additional studies.

Another methodological limitation was the unequal numbers and proportions of female subjects included as subjects. Although there were few main effects for sex, a more carefully balanced design would be needed in future studies to eliminate any confounding influences from sex differences.

The most significant limitation of the present study arose with the separating of hyperactive subjects into two groups for post hoc analyses. It seems that there is considerable evidence that the often identified population of hyperactive subjects may actually be comprised of several more heterogeneous subgroups of children (Lahey, et. al., 1986; August & Stewart, 1982; August, Stewart, & Holmes, 1983). One

cited division, separates those hyperactive children with conduct problems from the remaining hyperactive subjects without conduct problems (Brown, 1985; Ullmann, Sleator, & Sprague, 1985). However, it is not yet clear whether or not the scores from the Externalizing factor (Factor 1) of the Personality Inventory for Children (Wirt, Lachar, Klinedinst, & Seat, 1977) are the most accurate way to distinguish between these two subgroups of hyperactive children.

A final design problem was related to the division of the overall group of hyperactive subjects. The resulting smaller groups suffered from a lack of subjects, particularly female subjects. In the hyperactive group without conduct problems there were only four females included. Therefore, it is critical that future studies include more female hyperactive subjects in their designs.

Future Directions

In the future, it is clear that this study needs to be replicated with a substantially larger number of subjects. Particular attention also needs to be paid to the criteria used to select subjects. A multimodal approach to identifying subjects can facilitate the identification of several clearly distinct, homogeneous subgroups of hyperactive subjects which will undoubtedly allow for a more accurate examination of individual and group differences.

There is also a need for longitudinal studies to focus on the developmental changes in locus of control within abnormal populations of children, particularly hyperactive children. Such longitudinal data can then be contrasted to normal developmental changes in locus of control.

Finally, one critical area that requires further research is the examination of changes in locus of control due to various treatment approaches. A multimodal approach to the assessment of perceptions of control will enable clinicians to orient their treatment around the specific needs of the hyperactive child.

Summary

In summary, the results of the present study suggest that when attempting to investigate the attributional styles of hyperactive children, it is essential to make a distinction between those hyperactive children with conduct problems and those hyperactive children without conduct problems. It appears that the attributions made by the subgroup of hyperactive children without conduct problems were very different from those made by the hyperactive children with conduct problems.

For the hyperactive children without conduct problems there were significantly higher levels of overall unknown control, than seen in the normal control children. There was also a significantly higher level of unknown control within the cognitive domain, when compared to the other groups. Furthermore, the analyses revealed that the differences in levels of unknown control within the cognitive domain were also statistically significant for success experiences. That is, the hyperactive children without conduct problems do not appear to understand why they succeed in the classroom. However, contrary to what was predicted, neither of the hyperactive groups made higher levels of internal attributions for failure experiences in the cognitive domain.

APPENDICES

Appendix I
Conners' Parent & Teacher Rating Scales -Revised

Instructions: Below is a list of items concerning children's behavior or the problems they sometimes have. Please read each item carefully. After you have done so please fill in one of the numbered spaces to the right that best describes how much you think your child has been bothered by this problem during the past month. Mark ONLY ONE numbered space for each item and do not skip any items. DO NOT USE A BALLPOINT PEN. If you change your mind, erase your first mark completely. Please do not make any extra marks on the sheet. Please read the example before beginning.

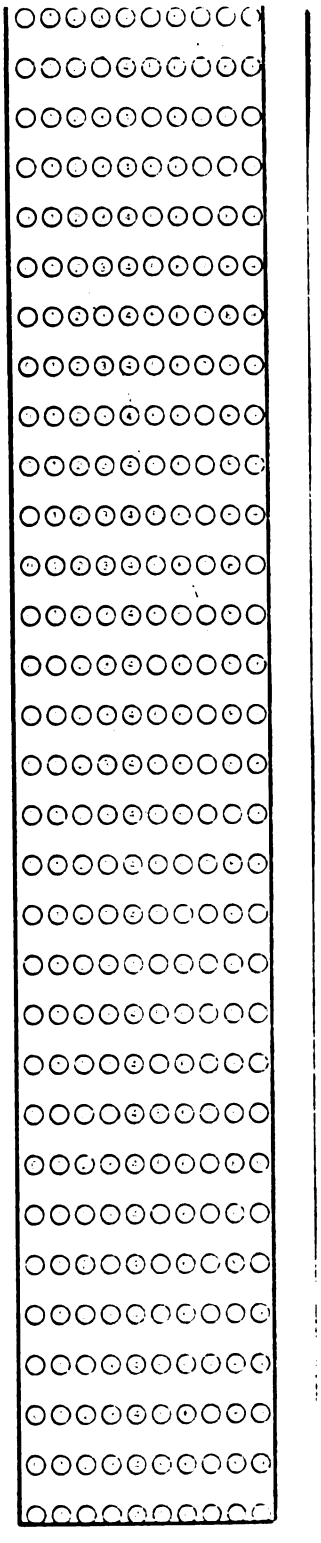
Definition of the Four Scale Points:

0....NOT AT ALL
1....JUST A LITTLE
2....PRETTY MUCH
3....VERY MUCH

Example: Doesn't clean up his/her room.....

By filling in space 1 this person answered that his/her child doesn't clean up his/her room "just a little."

1. Disturbs other children.....
2. Restless or overactive.....
3. Has temper outbursts, explosive and unpredictable..... behavior.
4. Inattentive, easily distracted.....
5. Constantly fidgeting; restless in the "squirmy" sense.....
6. Excitable, impulsive.....
7. Demands must be met immediately; easily frustrated.....
8. Cries often and easily.....
9. Fails to finish things he/she starts; short..... attention span.
10. Mood changes quickly and drastically.....



Instructions: Below is a list of items concerning children's behavior or the problems they sometimes have. Please read each item carefully. After you have done so please fill in one of the numbered spaces to the right that best describes how much you think this child is bothered by this problem. Mark ONLY ONE numbered space for each item and do not skip any items. USE THE ENCLOSED PENCIL ONLY. If you change your mind, erase your first mark completely. Please do not make any extra marks on the sheet. Please read the example before beginning.

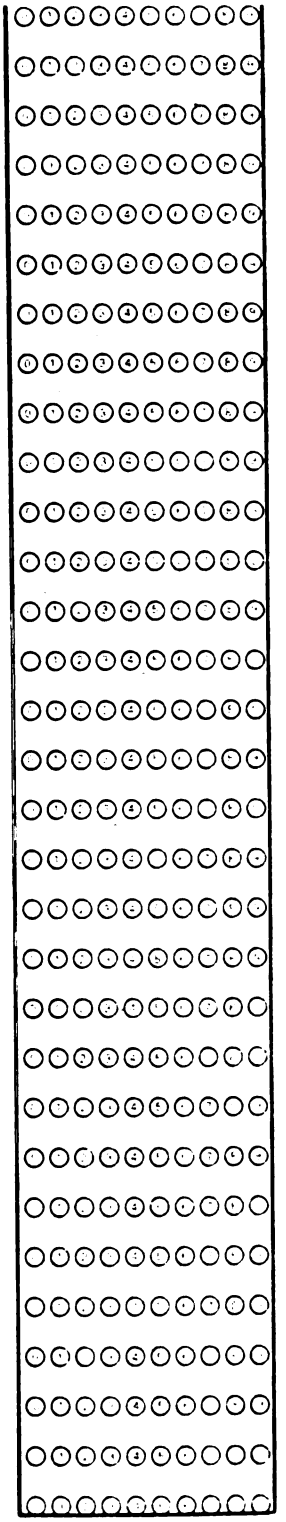
Definition of the Four Scale Points:

0 = NOT AT ALL
1 = JUST A LITTLE
2 = PRETTY MUCH
3 = VERY MUCH

Example: Doesn't clean up his/her desk.....

By filling in space 1 this person answered that this child doesn't clean up his/her desk "just a little."

1. Fidgeting.....
2. Hums and makes other odd noises.....
3. Demands must be met immediately (easily frustrated).....
4. Restless or overactive.....
5. Excitable, impulsive.....
6. Inattentive, distractible.....
7. Fails to finish things he starts.....
8. Cries often and easily.....
9. Disturbs other children.....
10. Quarrelsome.....
11. Mood changes quickly and drastically.....
12. Acts "smart".....
13. Temper outbursts (explosive and unpredictable behavior).....
14. Defiant.....
15. Uncooperative.....



Appendix II
Peabody Picture Vocabulary Test - Revised

Peabody Picture Vocabulary Test—Revised

INDIVIDUAL TEST RECORD

by LLOYD M. DUNN & LEOTA M. DUNN

NAME _____ (last) _____ (first) _____ (middle initial) SEX: M F (circle)

HOME ADDRESS _____ HOME PHONE _____

SCHOOL _____ (or agency) GRADE PLACEMENT _____ (or education)

TEACHER _____ (or counselor) EXAMINER _____

LANGUAGE OF THE HOME: ☐ Standard English; ☐ Other _____ (specify foreign language or type of English dialect spoken)

Date & Age Data

	Year	Month	Day
Date of testing	_____	_____	_____
Date of birth	_____	_____	_____
Chronological age	_____	_____	_____ *

*If the number of days exceeds 15, add a month to the age (see Part I of the Manual)

Notice to Users

The PPVT–R is not intended for use in situations where truth-in-testing legislation stipulates that copies of test items and correct responses be distributed to subjects, parents, or the general public. Such disclosures may make the norms meaningless in future testing.

Reason for Testing (may include referral source and person authorizing testing)

_____

_____

_____

_____

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TEST ITEMS AND ABBREVIATED INSTRUCTIONS

Administering the TRAINING ITEMS

For most subjects under age 8: Use Plates A, B, and C. Administer as many training item series as necessary to secure three consecutive correct responses.
For most subjects age 8 and over: Use Plates D and E. Administer as many training item series as necessary to secure two consecutive correct responses.

Training Plate	INITIAL PRACTICE SERIES WORDS & KEYS	ADDITIONAL PRACTICE WORDS & KEYS Alternate Series X	Alternate Series Y	Alternate Series Z
A	doll (4)	fork (1)	table (2)	car (3)
B	man (2)	comb (3)	sock (4)	mouth (1)
C	swinging (3)	drinking (4)	walking (1)	climbing (2)
D	wheel (4)	zipper (2)	rope (1)	rake (3)
E	giant (1)	bride (3)	witch (4)	royal (2)

(Complete directions are given in Part I of the Manual.)

Administering the TEST ITEMS

Basal: Highest 8 consecutive correct responses
Ceiling: Lowest 8 consecutive responses containing 6 errors
Starting Point: For a subject assumed to be of average ability, find the person's age circled in the margin, and begin the test with that item. Otherwise consult Part I of the Manual for further instructions.
Recording Responses and Errors: Record the subject's response (1, 2, 3, or 4) for each item administered. For each error, draw an oblique line either through the plate number of the item missed, or through the geometric figure, as illustrated below:

32 envelope . . . . (2) 4 Ω or 32 envelope . . . . (2) 4 Ω

Every eighth figure is identical to help determine the basal and ceiling.
(Complete directions are given in Part I of the Manual.)

NOTE:
Ages in circles refer to the lowest age in a 6- or 12-month interval. For example, Item 1 is the starting item for ages 2-6 through 3-5, and Item 30 for ages 5-0 through 5-5. Use Item 110 for ages 16-0 and over.

		Plate Number	Word	Key	Response	Error
2½	3	1	bus	(4)	____	○
		2	hand	(1)	____	□
		3	bed	(3)	____	△
		4	tractor	(2)	____	Ω
		5	closet	(1)	____	♡
		6	snake	(4)	____	☆
		7	boat.	(2)	____	◇
		8	tire.	(3)	____	○
		9	cow	(1)	____	□
3½		10	lamp	(4)	____	△
		11	drum	(3)	____	Ω
		12	knee	(4)	____	♡
		13	helicopter	(2)	____	☆
		14	elbow	(4)	____	◇
4		15	bandage	(4)	____	○
		16	feather	(1)	____	□
		17	empty	(3)	____	△
		18	fence.	(4)	____	Ω
		19	accident	(2)	____	♡
4½		20	net.	(2)	____	☆
		21	tearing.	(4)	____	◇
		22	sail	(1)	____	○
		23	measuring.	(2)	____	□
		24	peeling	(3)	____	△
		25	cage	(1)	____	Ω
		26	tool	(4)	____	♡
		27	square.	(4)	____	☆
		28	stretching	(1)	____	◇
		29	arrow.	(2)	____	○
5		30	tying	(2)	____	□
		31	nest.	(1)	____	△
		32	envelope	(2)	____	Ω
		33	hook	(3)	____	♡
		34	pasting	(4)	____	☆
5½		35	patting.	(1)	____	◇
		36	penguin.	(1)	____	○
		37	sewing	(2)	____	□
		38	delivering	(1)	____	△
		39	diving	(2)	____	Ω
6		40	parachute	(3)	____	♡
		41	furry	(4)	____	☆
		42	vegetable	(4)	____	◇
		43	shoulder	(3)	____	○

Plate Number	Word	Key	Response	Error
	44 dripping	(2)		□
	45 claw	(4)		△
	46 decorated	(3)		Ω
	47 frame	(1)		♡
	48 forest	(3)		☆
	49 faucet	(2)		◇
6½	50 group	(3)		○
	51 stem	(3)		□
	52 vase	(3)		△
	53 pedal	(1)		Ω
	54 capsule	(2)		♡
7	55 surprised	(4)		☆
	56 bark	(2)		◇
	57 mechanic	(2)		○
	58 tambourine	(1)		□
	59 disappointment	(4)		△
	60 awarding	(3)		Ω
	61 pitcher	(3)		♡
	62 reel	(1)		☆
	63 signal	(1)		◇
	64 trunk	(2)		○
8	65 human	(2)		□
	66 nostril	(1)		△
	67 disagreement	(1)		Ω
	68 exhausted	(2)		♡
	69 vine	(4)		☆
9	70 ceremony	(4)		◇
	71 casserole	(2)		○
	72 vehicle	(4)		□
	73 globe	(3)		△
	74 filing	(3)		Ω
	75 clamp	(2)		♡
	76 reptile	(2)		☆
	77 island	(1)		◇

Plate Number	Word	Key	Response	Error
	78 spatula	(3)		○
	79 cooperation	(4)		□
10	80 scalp	(4)		△
	81 twig	(2)		Ω
	82 weasel	(2)		♡
	83 demolishing	(4)		☆
	84 balcony	(1)		◇
11	85 locket	(1)		○
	86 amazed	(3)		□
	87 tubular	(1)		△
	88 tusk	(1)		Ω
	89 bolt	(3)		♡
12	90 communication	(4)		☆
	91 carpenter	(2)		◇
	92 isolation	(1)		○
	93 inflated	(3)		□
	94 coast	(3)		△
13	95 adjustable	(2)		Ω
	96 fragile	(3)		♡
	97 assaulting	(1)		☆
	98 appliance	(1)		◇
	99 pyramid	(4)		○
14	100 blazing	(1)		□
	101 hoisting	(1)		△
	102 arch	(4)		Ω
	103 lecturing	(4)		♡
	104 dilapidated	(4)		☆
15	105 contemplating	(2)		◇
	106 canister	(1)		○
	107 dissecting	(3)		□
	108 link	(4)		△
	109 solemn	(3)		Ω
16	110 archery	(2)		♡
	111 transparent	(3)		☆

Plate Number	Word	Key	Response	Error
112	husk	(1)		◇
113	utensil	(2)		○
114	citrus	(3)		□
115	pedestrian	(2)		△
116	parallelogram	(1)		Ω
117	slumbering	(3)		♡
118	peninsula	(4)		☆
119	upholstery	(2)		◇
120	barricade	(4)		○
121	quartet	(4)		□
122	tranquil	(3)		△
123	abrasive	(1)		Ω
124	fatigued	(3)		♡
125	spherical	(2)		☆
126	syringe	(2)		◇
127	feline	(2)		○
128	arid	(4)		□
129	exterior	(1)		△
130	constellation	(4)		Ω
131	cornea	(2)		♡
132	mercantile	(1)		☆
133	ascending	(3)		◇
134	filtration	(1)		○
135	consuming	(4)		□
136	cascade	(4)		△
137	perpendicular	(3)		Ω
138	replenishing	(1)		♡
139	emission	(3)		☆
140	talon	(3)		◇
141	wrath	(3)		○
142	incandescent	(4)		□
143	arrogant	(2)		△
144	confiding	(3)		Ω
145	rhombus	(3)		♡

Plate Number	Word	Key	Response	Error
146	nautical	(3)		☆
147	tangent	(1)		◇
148	inclement	(4)		○
149	trajectory	(1)		□
150	fettered	(1)		△
151	waif	(3)		Ω
152	jubilant	(2)		♡
153	pilfering	(4)		☆
154	repose	(2)		◇
155	carrion	(3)		○
156	indigent	(2)		□
157	convex	(1)		△
158	emaciated	(2)		Ω
159	divergence	(4)		♡
160	dromedary	(2)		☆
161	embellishing	(2)		◇
162	entomologist	(3)		○
163	constrain	(1)		□
164	infirm	(1)		△
165	anthropoid	(3)		Ω
166	specter	(4)		♡
167	incertitude	(2)		☆
168	vitreous	(1)		◇
169	obelisk	(1)		○
170	embossed	(4)		□
171	ambulation	(2)		△
172	calyx	(2)		Ω
173	osculation	(3)		♡
174	cupola	(4)		☆
175	homunculus	(4)		◇

Calculating Raw Score

Ceiling item .....

minus errors* .....

Raw score .....

*Count errors between highest basal and lowest ceiling only

Obtained Test Scores

Raw score . . . . . (from page 4)

Standard score equivalent . . . . . (from Table 1, Appendix A)

Percentile rank . . . . (from Table 3, Appendix A)

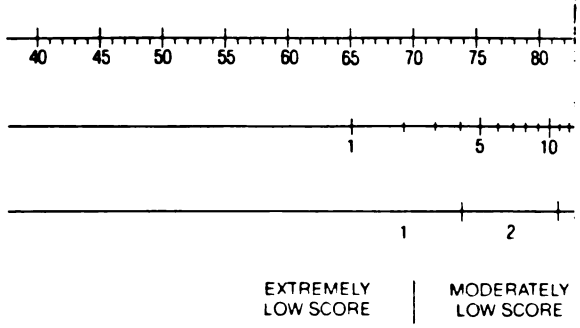
Stanine . . . . . (from Table 3, Appendix A)

Age equivalent . . . . (from Table 4, Appendix A)

TRU

Mark the obtained standard score equivalent on the top scale. Then draw a heavy, straight, vertical line through it, and across the three scales. This line will extend through the three obtained deviation-type test scores. Depending upon the obtained standard score, shade in a band on both sides of the vertical line, using the schedule to the right. An example is given in Figure 1.4 of the Manual.

Obtained Standard Score
Below 6
65-74
75-84
85-89
90-99



Data from Other Tests

Test	Date	Results
PPVT–R FORM M		

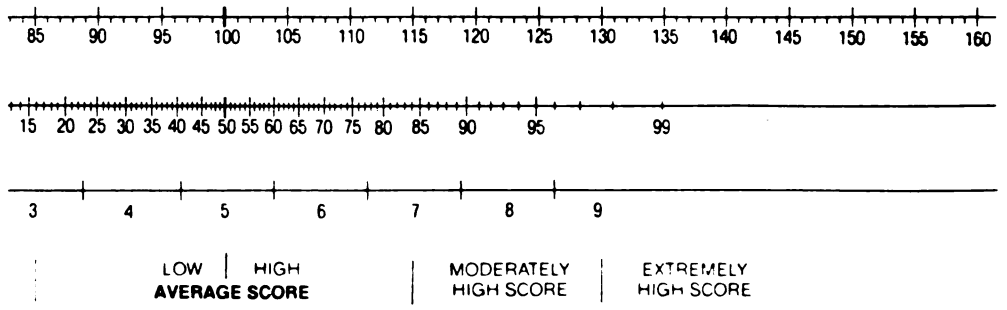
Observations

Briefly describe the subject's test behavior, such as interest in task, quickness of response, signs of perseveration, work habits, etc :

E SCORE CONFIDENCE BAND

AREA TO SHADE		Obtained Standard Score	AREA TO SHADE	
Left of line	Right of line		Left of line	Right of line
0	14	100-109	7	7
2	12	110-114	8	6
4	10	115-124	10	4
6	8	125-134	12	2
7	7	135 & above	14	0

This shaded area provides a confidence band the range of scores within which the subject's true scores can be expected to fall 68 times in 100. (These band width values are based on a median standard error of measurement (SEM) of ± 7, with the band widths made increasingly asymmetrical toward the extremes to allow for *regression to the mean*.) See Part I of the Manual and the Technical Supplement for more precise values and a discussion of SEM confidence bands. Also see the Manual for a discussion of how to calculate the true score confidence band for the *age equivalent*.



Performance Evaluation

This standardized test provides an *estimate* only of this individual's hearing vocabulary in Standard English, as compared with a cross-section of U.S.A. persons of the same age. Do you believe the performance of this subject represents fairly her or his true ability in this area? . . Yes . . No
If not, cite reasons such as rapport problems, poor testing situation, hearing or vision loss, visual-perceptual disorder, test too easy or too hard (automatic basal or ceiling used), etc.

Recommendations

Examiner's signature

Appendix III
Ford Social Desirability Scale for Children

Instructions: "Now I am going to ask you some more questions. Please answer every question even if some are hard to decide. Remember, there are no right or wrong answers.

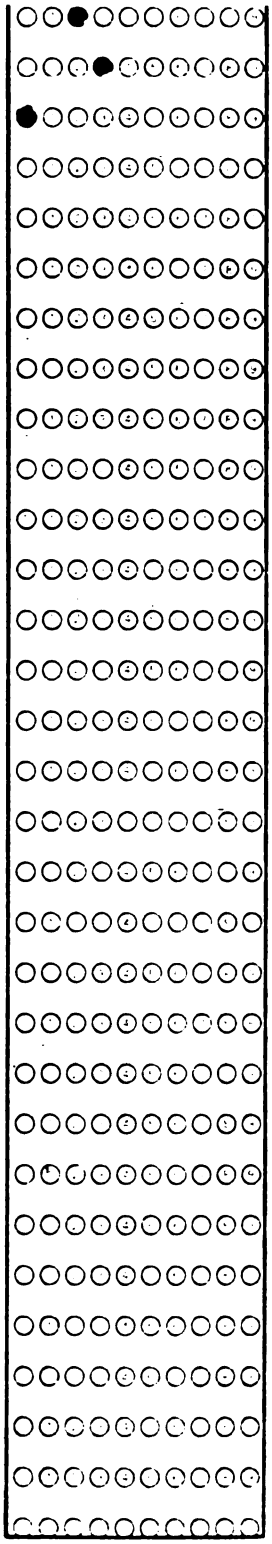
Read each item to the child. If the child agrees with the first statement, fill in the circle numbered "1" at the right hand side of the page. If the child agrees with the second statement, fill in the circle numbered "2" at the right hand side of the page. Mark ONLY ONE numbered circle for each item and do not skip any items. DO NOT USE A BALLPOINT PEN. If you change your mind, erase your first mark completely. Please do not make any extra marks on the sheet.

Definition of the Two Scale Points

1 .....Child agrees with statement "1"
2 .....Child agrees with statement "2"

EXAMPLE: 1. Do you sometimes watch TV?.....
2. Do you never watch TV?
If the child answers "I sometimes watch TV" fill in the circle with the number "1" on it.

1. 1. Do you sometimes play with toys? or.....
2. Do you never play with toys?
2. 1. Do you always play all by yourself? or.....
2. Do you sometimes play with other children?
3. 1. Do you sometimes argue with your mother? or.....
2. Do you never argue with your mother?
4. 1. Are you always polite to older people? or.....
2. Are you sometimes not polite to older people?
5. 1. Do you never shout when you feel angry? or.....
2. Do you sometimes shout when you feel angry?
6. 1. Do you sometimes tell a little lie? or.....
2. Do you never tell a little lie?
7. 1. Do you sometimes hit another boy or girl? or.....
2. Do you never hit another boy or girl?
8. 1. Do you always help people? or.....
2. Do you sometimes not help people?
9. 1. Do you never show off to your friends? or.....
2. Do you sometimes show off to your friends?
10. 1. Do you sometimes say mean things to people? or.....
2. Do you never say mean things to people?
11. 1. Do you sometimes feel like throwing or breaking things? or..
2. Do you never feel like throwing or breaking things?
12. 1. Do you feel that your parents are always right? or.....
2. Do you sometimes feel that your parents are not always right?
13. 1. Do you never act naughty? or.....
2. Do you sometimes act naughty?
14. 1. Do you sometimes do other things instead of what.....
your teacher tels you to do? or Do you always do what your teacher tells you to do?



Definition of the Two Scale Points

1 ... .Child agrees with statement "1"
2 .....Child agrees with statement "2"

.....15. 1. Do you sometimes do things you're not supposed to do? or
2. Do you never do things you're not supposed to do?

.....16. 1. Do you think your teacher knows more than you do? or
2. Do you think you know more than your teacher does?

.....17. 1. Do you sometimes want things your parents don't want you to have? or Do you never want things your parents don't want you to have?

.....18. 1. Does it sometimes bother you when you don't get your way?
2. or Does it never bother you when you don't get your way?

.....19. 1. Do you always listen to your parents? or
2. Do you sometimes not listen to your parents?

.....20. 1. Do you always wash your hands before every meal? or
2. Do you sometimes not wash your hands before every meal?

.....21. 1. Do you never feel like making fun of other people? or
2. Do you sometimes feel like making fun of other people?

.....22. 1. Do you sometimes forget to say "please" and "thank you"?
2. or Do you never forget to say "please" and "thank you"?

.....23. 1. Does it sometimes bother you to share things with your
2. friends? or Does it never bother you to share things with your friends?

.....24. 1. Do you sometimes want to do things your parents tell you
2. not to do? or Do you never want to do things your parents tell you not to do?

.....25. 1. Do you never get angry? or
2. Do you sometimes get angry?

.....26. 1. Are you always nice to people? or
2. Are you sometimes not nice to people?

.....27. 1. Do you sometimes not do the right things? or
2. Do you always do the right things?

.....28. 1. Do you always tell the truth? or
2. Do you sometimes not tell the truth?

Appendix IV
Nowicki-Strickland Locus of Control Scale

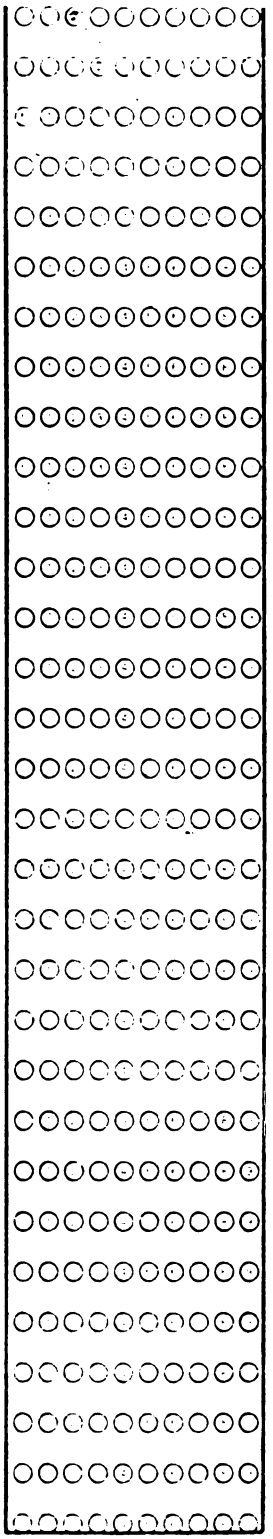
Instructions: " I am going to read to you some more statements. Some of them are true of you and so you will answer yes. Some are not true of you and so you will answer no. Answer every question even if some are hard to decide. Remember, answer yes if the statement is generally like you, or no if the statement is generally not like you. There are no right or wrong answers. Only you can tell us how you feel about things, so we hope you will answer the way you really feel inside."

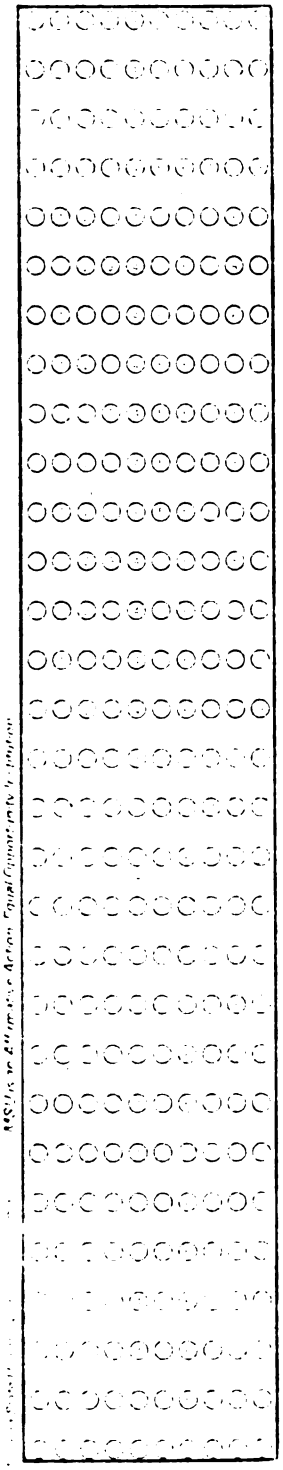
Read each item to the child. If the child answers yes, fill in the circle numbered "0" at the right hand side of the page. If the child answers no, fill in the circle numbered "1" at the right hand side of the page. Mark ONLY ONE numbered circle for each item and do not dkip any items. DO NOT USE A BALLPOINT PEN. If you change your mind, erase your first mark completely. Please do not make any extra marks on the sheet.

Definition of the Two Scale Points

0 .....YES
1 .....NO

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





Definition of the Two Scale Points

0 .....YES
1 .....NO

.....16. Do you feel that when you do something wrong there's very little you can do to make it right?
.....17. Do you believe that most kids are just born good at sports?
.....18. Are most of the other kids your age stronger than you are?
.....19. Do you feel that one of the best ways to handle most problems is just not to think about them?
.....20. Do you feel that you have a lot of choice in deciding who your friends are?
.....21. If you find a four [redacted]leaf clover do you believe that it might bring you good luck?
.....22. Do you often feel that whether you do your homework has much to do with what kind of grades you get?
.....23. Do you feel that when a kid your age decides to hit you, there's little you can do to stop him or her?
.....24. Have you ever had a good luck charm?

.....25. Do you believe that whether or not people like you depends on how you act?
.....26. Will your parents usually help you if you ask them to?

.....27. Have you felt that when people were mean to you it was usually for no reason at all?
.....28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?
.....29. Do you believe that when bad things are going to happen they just are going to happen no matter what you try to do to stop them?

.....30. Do you think that kids can get their own way if they just keep trying?
.....31. Most of the time do you find it useless to try to get your own way at home?
.....32. Do you feel that when good things happen they happen because of hard work?
.....33. Do you feel that when somebody your age wants to be your enemy there's little you can do to change matters?
.....34. Do you feel that it's easy to get friends to do what you want them to?
.....35. Do you usually feel that you have little to say about what you get to eat at home?
.....36. Do you feel that when someone doesn't like you there's little you can do about it?
.....37. Do you usually feel that it's almost useless to try in school because most other children are just plain smarter than you are?

Definition of the Two Scale Points

0 .....YES
1 .....NO

38. Are you the kind of person who believes that..... planning ahead makes things turn out better?
39. Most of the time, do you feel that you have..... little to say about what your family decides to do?
40. Do you think it's better to be smart than to be..... lucky?

Appendix V
Multidimensional Measure of Children's Perceptions of Control

Why Things Happen

Name_____Age_____ Birthday (Month)_____ (Day)_____

Grade_____ Teacher_____School_____ Boy or Girl (Circle one)

Sample Questions

(a) I like chocolate ice cream better than vanilla ice cream

very true sort of true not very true not at all true

(b) I really like spinach

very true sort of true not very true not at all true

---

1. When I win at a sport, a lot of times I can't figure out why I won.

very true sort of true not very true not at all true

2. When I am unsuccessful, it is usually my own fault.

very true sort of true not very true not at all true

3. The best way for me to get good grades is to get the teacher to like me.

very true sort of true not very true not at all true

4. If somebody doesn't like me, I usually can't figure out why.

very true sort of true not very true not at all true

5. I can be good at any sport if I try hard enough.

very true sort of true not very true not at all true

6. If an adult doesn't want me to do something I want to do, I probably won't be able to do it.

very true sort of true not very true not at all true

7. When I do well in school, I usually can't figure out why.

very true sort of true not very true not at all true

8. If somebody doesn't like me, it's usually because of something I did.

very true sort of true not very true not at all true

9. When I win at a sport, it's usually because the person I was playing against played badly.

very true sort of true not very true not at all true

10. When something goes wrong for me, I usually can't figure out why it happened.

very true sort of true not very true not at all true

11. If I want to do wellin school, it's up to me to do it.

very true sort of true not very true not at all true

12. If my teacher doesn't like me, I probably won't be very popular with my classmates.

very true sort of true not very true not at all true

13. Many times I can't figure out why good things happen to me.

very true sort of true not very true not at all true

14. If I don't do well in school, it's my own fault.

very true sort of true not very true not at all true

15. If I want to be an important member of my class, I have to get the popular kids to to like me.

very true sort of true not very true not at all true

16. Most of the time when I lose a game in athletics, I can't figure out why I lost.

very true sort of true not very true not at all true

17. I can pretty much control what will happen in my life.

very true sort of true not very true not at all true

18. If I have a bad teacher, I won't do well in school.

very true sort of true not very true not at all true

19. A lot of times I don't know why people like me.

very true sort of true not very true not at all true

20. If I try to catch a ball, and I don't, it is usually because I didn't try hard enough.

very true sort of true not very true not at all true

21. If there is something that I want to get, I usually have to please the people in charge to get it.

very true sort of true not very true not at all true

22. If I get a bad grade in school, I usually don't understand why I got it.

very true sort of true not very true not at all true

23. If somebody likes me, it is usually because of the way that I treat them.

very true sort of true not very true not at all true

24. When I lose in an outdoor game, it is usually because the kid I played against was was much better at that game to begin with.

very true sort of true not very true not at all true

25. When I win at an outdoor game, a lot of times I don't know why I won.

very true sort of true not very true not at all true

26. When I don't do well at something, it is usually my own fault.

very true sort of true not very true not at all true

27. When I do well in school, it's because the teacher likes me.

very true sort of true not very true not at all true

28. When another kid doesn't like me, I usually don't know why.

very true sort of true not very true not at all true

29. I can be good at any sport if I work on it hard enough.

very true sort of true not very true not at all true

30. I don't have much of a chance of doing what I want if adults don't want me to do it.

very true sort of true not very true not at all true

31. When I get a good grade in school, I usually don't understand why I did so well.

very true sort of true not very true not at all true

32. If someone is mean to me, it is usually because of something I did.

very true sort of true not very true not at all true

33. When I play an outdoor game against another kid, and I win, it's probably because the other kid didn't play well.

very true sort of true not very true not at all true

34. A lot of times, I don't know why something goes wrong for me.

very true sort of true not very true not at all true

35. If I want to get good grades in school, it's up to me to do it.

very true sort of true not very true not at all true

36. If the teacher doesn't like me, I probably won't have many friends in that class.

very true sort of true not very true not at all true

37. When good things happen to me, many times there doesn't seem to be any reason why.

very true sort of true not very true not at all true

38. If I get bad grades, it's my own fault.

very true sort of true not very true not at all true

39. If I want my classmates to think that I am an important person, I have to be friends with really popular kids.

very true sort of true not very true not at all true

40. When I don't win at an outdoor game, most of the time I can't figure out why.

very true sort of true not very true not at all true

41. I can pretty much decide what will happen in my life

very true sort of true not very true not at all true

42. If I don't have a good teacher, I won't do well in school.

very true sort of true not very true not at all true

43. A lot of times, there doesn't seem to be any reason why somebody likes me.

very true sort of true not very true not at all true

44. If I try to catch a ball and I miss it, it's usually because I didn't try hard enough.

very true sort of true not very true not at all true

45. To get what I want, I have to please the people in charge.

very true sort of true not very true not at all true

46. When I don't do well in school I usually can't figure out why.

very true sort of true not very true not at all true

47. If somebody is my friend, it is usually because of the way that I treat them.

very true sort of true not very true not at all true

48. When I don't win at an outdoor game, the person I was playing against was probably a lot better than I was.

very true sort of true not very true not at all true

Appendix VI
Public Service Announcements

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
PSYCHOLOGY RESEARCH BUILDING

EAST LANSING · MICHIGAN · 48824-1117

November 11, 1985

To whom it may concern:

Attached please find a copy of a public service announcement regarding a clinical treatment program to be jointly offered through the Michigan State University Psychological Clinic and Clinical Center to parents of children with problem behaviors in the home or at school. I have also attached a general description of this program for your perusal. I would greatly appreciate your helping us inform the public of the availability of this program by airing this PSA.

If you have any questions regarding this matter, please do not hesitate to call me at 355-9564. I thank you in advance for your cooperation.

Sincerely,

Wade F. Horn, Ph.D.
Co-Director, Child Behavior Project
MSU Psychological Clinic

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
PSYCHOLOGY RESEARCH BUILDING

EAST LANSING · MICHIGAN · 48824-1117

PUBLIC SERVICE ANNOUNCEMENT

Does your child have behavior problems at home or at school? Does your child have trouble sitting still, paying attention, or following directions? Does your child behave impulsively or have temper outbursts? If your child has any of these behavior problems and is between the ages of 7 and 11, a new program called the Child Behavior Project may be able to help. Call the Michigan State University Psychology Clinic at 355-9564 for further information. That's 355-9564.

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
PSYCHOLOGY RESEARCH BUILDING

EAST LANSING · MICHIGAN · 48824-1117

Announcement of a Program for Families with Children with Behavioral Problems

A program is currently being jointly offered through the Michigan State University Psychological Clinic and the Michigan State University Clinical Center. This program, called the Child Behavior Project, is designed to help families with children who are having trouble behaving in the home or at school. The particular kinds of problem behaviors the program is designed to help include such things as difficulty paying attention, over-activity, impulsiveness, difficulty following directions, non-compliance to requests, temper outbursts, and rapid mood swings. Some of the families in the program will be involved in a series of parent groups where techniques for managing children with behavior problems are presented and discussed, as well as a series of child groups in which self-control techniques and problem-solving strategies are taught and practiced. In addition, some of the children in the program will receive medication and some will not. This medication is widely prescribed by pediatricians for children with chronic inattention and impulsivity problems. All children taking the medication will be carefully monitored by Dr. John Pascoe, M.D., Director of the Child Health Care Clinic in the College of Human Medicine within the Clinical Center at MSU, as well as other Board certified pediatricians. The reason for having these different types of treatments, all of which are widely used clinical treatment approaches, is that the Child Behavior Project is interested in finding out which type of treatment approach, or combination of approaches, is the most effective with children with chronic inattention and impulsivity problems. We are now in the process of accepting referrals for the 1985-1986 program. The cost of the entire program is a one-time fee of only $50.00. However, if this fee presents a hardship for any family, it can be waived.

Eligibility requirements for inclusion in the program are:

1. Chronic inattention and/or impulsivity problems at school or in the home
2. age between 7 and 11 years old
3. must have normal intelligence & must not be developmentally delayed

Interested parents or health professionals may obtain further information on the Child Behavior Project by calling Dr. Wade F. Horn, Project Co-Director, at 355-9564, or by calling Dr. John M. Pascoe, Project Co-Director, at 353-3002.

Wade F. Horn, Ph.D.
Co-Director, Child Behavior Project
MSU Psychological Clinic

John M. Pascoe, M.D., M.P.H.
Co-Director, Child Behavior Project
MSU Clinical Center

Appendix VII
Consent Forms

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
PSYCHOLOGY RESEARCH BUILDING

EAST LANSING, MICHIGAN 48824-1117

Informed Consent

I, the parent (or legal guardian) of _____
agree to have him/her and myself participate in the Child Behavior Project, a clinical evaluation program examining the effectiveness of a commonly used medication (Ritalin) for chronic inattention problems administered with or without a family therapy program for families with children experiencing chronic inattention and impulse control problems in the home and/or at school. I understand that a lottery will be conducted to randomly assign my child and myself to one of a number of different combinations of these treatment approaches. I further understand that some children may benefit more than others through their participation in this project, and no guarantee has been made that my child's difficulties or other family problems will be cured through participation in this program.

More specifically, I understand that participation in this project will involve:

(1) periodic assessments of my child at the MSU Psychological Clinic, including one assessment prior to treatment, one assessment just after treatment has ended, and one assessment at four to six months following the end of treatment. This clinic assessment will involve approximately 2 hours of psychological testing with my child and a 20 minute observation of my child and myself interacting in a playroom setting;

(2) periodic questionnaires about myself and my family, to be completed by me once before treatment, once just after treatment has ended, and once four to six months following the end of treatment. If my family is chosen to participate in the group treatment sessions, I will also complete some additional questionnaires at several points during the treatment.

(3) a lottery process to determine whether my child will receive medication for management of attentional problems, or an inactive (placebo) pill. A board eligible or board certified pediatrician at the MSU Clinical Center will monitor the administration of the medication to my child, including a minimum of one clinic visit per month at the MSU Clinical Center throughout the course of the study;

(4) a lottery process to determine whether my child and myself will participate in 12 weekly, 2-hour group treatment sessions for my child and myself; and

(5) periodic observations of my family during the evening meal time, one to be completed prior to treatment, one to be completed just after treatment has ended, and one to be completed at four to six months following the end of treatment;

I understand that my child should not participate in this study if he/she is allergic to Ritalin; has marked anxiety, tension or agitation; glaucoma; high blood pressure; depression; motor tics, or a family history of tics.

Should my child and myself be assigned to the child and parent group treatment sessions, I further understand that the parent groups will involve instruction in child management techniques and the child groups will involve instruction in self-control and problem solving techniques. These groups will be co-lead by advanced graduate students in the child and family clinical psychology training program under the supervision of Dr. Wade F. Horn, a fully licensed clinical psychologist and assistant professor in the Department of Psychology at Michigan State University. I understand that in order to supervise the group leaders, each of the treatment groups will be either videotaped or audiotaped. These recordings will be used for supervision of the group co-leaders and will be erased at the end of the treatment program.

Further, I give my consent for representatives of the Child Behavior Project to contact the school my child attends so that an assessment of my child's school behavior can be made through the use of periodic teacher questionnaires. I further understand that at the time of these school contacts, the representative of the Child Behavior Project may discuss ways of best managing my child's school behavior with the classroom teacher.

I understand that participation in this program is completely voluntary, and that my child's assent for participation will also be sought. I further understand that I will be asked to pay a one-time fee of $50.00 to cover administrative costs, and all physician and medication costs. However, I understand that if this fee presents an undue hardship, it can be waived. I am free to decline entrance into the program, and I may withdraw my consent to participate at any time during the program. I understand that I may discontinue participation at any time without jeopardizing current or future treatment at MSU's Clinical Center.

I understand that possible side effects of Ritalin include: (1) changes in appetite; (2) insomnia; (3) abdominal pain; (4) changes in blood pressure and heart rate; and (5) hypersensitivity reactions. I further understand that in the unlikely event of serious side effects resulting from taking the medication, Michigan State University, its agents, and employees will assume the responsibility as required by law. Treatment for serious side effects is available where the side effects are incurred during the treatment program. I have been advised that I should look toward my own health insurance program for payment of said medical expenses.

I understand that all questionnaires and other assessment data are confidential. After the questionnaires have been checked for completeness, I understand that my name will be removed, and I will be identified only by a code number in order to ensure confidentiality. Any reports of this program which are made will be presented only as group averages, and neither myself nor my family will be identified in any way.

I have read this consent form, and all my questions have been answered. I also understand that if I have any further questions I may contact either John M. Pascoe, M.D., (355-2721) or Wade F. Horn, Ph.D. (353-6640). I freely and voluntarily choose to participate. I understand that I may withdraw at any time. I have not been promised any reward, inducement, or payment to participate. I have been told that ample opportunity is available to me now and later to obtain information about this study. I also acknowledge that I have received a copy of this consent form.

Signature _____ Date _____ Witness _____ Date _____

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF PSYCHOLOGY
PSYCHOLOGY RESEARCH BUILDING

EAST LANSING · MICHIGAN · 48824-1117

Informed Consent

I, the parent (or legal guardian) of _____
agree to have him/her and myself participate as a normal-control family in the Child Behavior Project, a clinical evaluation program examining the effectiveness of different treatment approaches with children experiencing behavior problems in the home and/or at school. As a normal-control family, I understand that our participation in this project will involve:

(1) three psychological and cognitive assessments of my child at the MSU Psychological Clinic at approximately 3-4 month intervals. This clinic assessment will involve approximately two hours of psychological testing with my child, and a 20 minute observation of my child and myself interacting in a playroom setting;

(2) a series of parent questionaires regarding my child's behavior at home and my feelings about parenting and home life to be completed at approximately 3-4 month intervals; and

(3) three videotapings of my family during the evening meal time, also at approximatley 3-4 month intervals.

Further, I give my consent for representatives of the Child Behavior Project to contact the school my child attends so that an assessment of my child's school behavior can be made through the use of teacher questionnaires and direct classroom observations. Teachers will be informed that your child is participating in a study of the stability of children's behavior over a school year. These teacher questionnaires and direct classroom observations will also be completed three times during the school year at approximately 3-4 month intervals.

I understand that for my participation in this program, my family will be paid $25.00 after the completion of each assessment period for a total of $75.00. I attest that my participation is completely voluntary, and that my child's assent for participation will also be sought. I understand that I am free to decline entrance into the program, and I may withdraw my consent to participate at any time during the program. However, I understand that if I choose to discontinue participation in this program, that I will not be entitled to payment for any incomplete evaluations.

I further understand that all questionnaires and other assessment data will be kept confidential. I understand that after the questionnaires have been checked for completeness, my name will be removed and I will be identified only by a code number in order to ensure confidentiality. Any reports of this program which are made will be presented only as group averages, and neither myself nor my family will be identified in any way. I further understand that results of all the questionnaires and assessments will be made available to me after completion of all three assessments.

I have read this consent form, and all my questions have been answered. I also understand that if I have any further questions I may contact either John M. Pascoe, M.D. (355-2721), or Wade F. Horn, Ph.D. (353-6640). I freely and voluntarily choose to participate. I understand that I may withdraw at any time. I have been told that ample opportunity is available to me now and later to obtain information about this study.

I further acknowledge that I have received a copy of this consent form.

Signature Date

Witness Date

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LIST OF REFERENCES

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