DIFFERENCES IN IQ SCORES, REFERRAL SOURCE
AND PRESENTING PROBLEM BETWEEN
BOYS AND GIRLS DIAGNOSED
ADD-H

THESIS

Presented to the Graduate Council of the
North Texas State University in Partial
Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

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August, 1986
Harbeitner, Mary Hilado, *Differences in IQ Scores, Referral Source and Presenting Problem Between Boys and Girls Diagnosed ADD-H*. Master of Science (Clinical Psychology), August, 1986, 99 pp., 17 tables, 1 figure, references, 83 titles.

The purpose of this research was to investigate the possibility that there are sex differences between ADD-H boys and girls. ADD-H boys and girls were compared on the four variables of presenting problem, referral source, intelligence test performance on the Wechsler Intelligence Scale for Children-Revised (WISC-R) and WISC-R subtest configuration. General demographics of the ADD-H boys and girls families were also examined. The subjects participating in this study were 39 girls and 41 boys from a large child outpatient facility in the Dallas/Fort Worth metroplex diagnosed as ADD-H between February 1984 and February 1986. No differences were found when comparing ADD-H boys and girls on all four variables. These results may suggest that there are no real differences in regards to presenting problem, referral source, IQ scores and subtest configuration between boys and girls diagnosed ADD-H.
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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

The present study will focus on children referred to the Child Study Center of Fort Worth who carry a diagnosis of Attention Deficit Disorder with Hyperactivity. The purpose of the study is to investigate the possibility that sex differences between ADD-H boys and girls may be found on the following variables: (a) presenting problem (b) referral source (c) intelligence test performance on the Wechsler Intelligence Scale for Children-Revised and subtest configuration differences and (d) general demographics of the ADD-H boys and girls' families such as intact vs. non-intact families, ages of parents, educational and SES levels.

Definition of ADD

The classification of Attention Deficit Disorder is defined by the Diagnostic and Statistical Manual (DSM-III) as:

The child displays, for his or her mental and chronological age, signs of developmentally inappropriate inattention, impulsivity, and hyperactivity. The signs must be reported by adults
in the child's environment, such as parents and
teachers. Because the symptoms are typically
variable, they may not be observed directly by the
clinician. When the reports of teachers and parents
conflict, primary consideration should be given to
the teacher reports because of greater familiarity
with age-appropriate norms. Symptoms typically
worsen in situations that require self-application,
as in the classroom. Signs of the disorder may be
absent when the child is in a new or a one-to-one
situation.

The number of symptoms specified is for
children between the ages of eight and ten, the peak
age range for referral. In younger children, more
severe forms of the symptoms and a greater number
of symptoms are usually present. The opposite is
true of older children.

A. Inattention. At least three of the following:

1. often fails to finish things he or she
starts
2. often doesn't seem to listen
3. easily distracted
4. has difficulty concentrating on schoolwork
   or other tasks requiring sustained
   attention
5. has difficulty sticking to a play activity
B. Impulsivity. At least three of the following:
   1. often acts before thinking
   2. shifts excessively from one activity to another
   3. has difficulty organizing work (this not being due to cognitive impairment)
   4. needs a lot of supervision
   5. frequently call out in class
   6. has difficulty awaiting turn in games or group situations

C. Hyperactivity. At least two of the following:
   1. runs about or climbs on things excessively
   2. has difficulty sitting still or fidgets excessively
   3. has difficulty staying seated
   4. moves about excessively during sleep
   5. is always "on the go" or acts as if "driven by a motor"

D. Onset before the age of seven.

E. Duration of at least six months.

F. Not due to Schizophrenia, Affective Disorder, or Severe or Profound Mental Retardation.
Classification based on the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-III) replaces an earlier classification, "Hyperkinetic Reaction of Childhood" used in DSM-II (American Psychiatric subtypes are Attention Deficit Disorder with Hyperactivity or without Hyperactivity (ADD-H, ADD). The diagnostic criteria for Attention Deficit Disorder without Hyperactivity are:

The criteria for this disorder are the same as those for Attention Deficit Disorder with Hyperactivity except that the individual never had signs of hyperactivity (criterion C). (American Psychiatric Association, 1980, p. 44).

The DSM-III also defines a residual subtype characterizing individuals once diagnosed as having Attention Deficit Disorder with Hyperactivity in which signs of the disorder are present except for hyperactivity. DSM-III defines Attention Deficit Disorder, Residual Type as:

A. The individual once met the criteria for Attention Deficit Disorder with Hyperactivity. This information may come from the individual or from others, such as family members.

B. Signs of hyperactivity are no longer present, but other signs of the illness have
persisted to the present without periods of remission, as evidenced by signs of both attentional deficits and impulsivity (e.g., difficulty organizing work and completing tasks, difficulty concentrating, being easily distracted, making sudden decisions without thought of the consequences).

C. The symptoms of inattention and impulsivity result in some impairment in social or occupational functioning.

D. Not due to Schizophrenia, Affective Disorder, Severe or Profound Mental Retardation, or Schizotypal or Borderline Personality Disorders. (American Psychiatric Association, 1980, pp. 44-45).

According to DSM-III, it is not known whether Attention Deficit Disorder with and without Hyperactivity are two forms of a single disorder or represent two distinct disorders (American Psychiatric Association, 1980). Research by Lahey, Schaughency, Strauss and Frame (1984) discovered distinct differences in behavior and personality of children with Attention Deficit Disorder with and without Hyperactivity. They found different patterns of characteristics when ADD and matched normal control children were compared through a battery of teacher, peer,
and self report ratings. The researchers found that aggressive conduct problems, bizarre behavior, unpopularity, and poor performance at school were characteristics of ADD children with Hyperactivity. On the other hand, ADD children without Hyperactivity were found to be anxious, shy, socially withdrawn, moderately unpopular, poor in sports, and school performance. The authors note that both groups experienced a significantly high degree of depression and poor self concept. These differences support the differential diagnosis of ADD with or without Hyperactivity in DSM-III (American Psychiatric Association, 1980).

Attention Deficit Disorder is a pervasive problem affecting all areas of the child's interaction with the environment (Goldstein & Goldstein, 1985). There seems to be "no 'typical' set of symptoms that every Attention Deficit Disordered child exhibits but rather a long list of behaviors that may or may not accompany the basic problem of not being able to focus their attention on tasks to be completed" (Fort Worth Child Study Center, 1985). The child's behavior problems usually cause academic difficulties and may lead to social problems (American Psychiatric Association, 1980). Other features associated with ADD children which result in problems for the child are aggressive behavior, negativism, low frustration.
tolerance, low self-esteem and non-responsiveness to discipline (American Psychiatric Association, 1980).

A basic definition of observable behavior in attention disordered children offered by Goldstein and Goldstein (1985) describes five broad problem areas that seem to characterize these children. The first area is that of inattention and distractibility in which the child has trouble remaining on task coupled with difficulty screening out distracting stimuli in the environment. Secondly, the child also has difficulty with impulsivity in which the child is unable to control his action and think before he acts. A third area of difficulty is the inability to delay gratification, that is, the child has difficulty working towards a long term goal. Fourth, ADD children appear to be excessively restless and overactive. The child has difficulty controlling his bodily movements especially in situations where sitting still is required for periods of time. Lastly, ADD children also express their emotions much more intensely than is age appropriate.

A History of the Etiology of ADD

Identifying children with ADD seems to have some difficulties. There has been a variety of labels used to describe children with ADD; such labels include: "Hyperkinetic Reaction of Childhood," "Hyperactive Child
Syndrome," "Minimal Brain Dysfunction," "Minimal Cerebral Dysfunction," and other similar labels (American Psychiatric Association, 1980). The relabeling of children with excessive motor activity as having Attention Deficit Disorder seems appropriate since the excessive motor activity in diagnosed individuals often diminishes with adolescence, while the attention difficulties persist (McMahon, 1984).

Along with different labels used to describe children with Attention Deficit Disorder, there are many different explanations for the causality of Attention Deficit Disorder. The focus will be on Attention Deficit with Hyperactivity because many earlier explanations deal with Hyperactivity due to the fact that ADD with Hyperactivity is a new DSM-III category as of 1980. The history of the causality of ADD with Hyperactivity can be divided into four areas. These areas include Biological or Biogenic, Behavioral Learning, Psychological, and Interactive.

The focus of what is now called Attention Deficit Disorder was first based on the hypothesis that hyperkinetic behavior was caused by damage to the brain of the child. The term "brain damage syndrome" was suggested by Still (1902) to describe children with demonstrable gross lesions of the brain. Following an
outbreak of the encephalitis epidemic in 1918, the link between hyperactive patterns and brain damage was suggested (Hohman, 1922; Strecker & Ebaugh, 1924). Subsequent observations of children with encephalitis suggested this connection (Bender, 1942; Gibbs, Spies & Carpenter, 1964; Sabatino & Canblett, 1968). It was hypothesized by Tredgold (1908) that different forms of brain damage such as birth injury or anoxia passed unnoticed at the time but became apparent in the early school years. This laid the foundation for the concept of "minimal brain damage."

A report from the Oxford International Study Group of Child Neurology (Bas & MacKeith, 1963) suggested that brain damage should not be inferred from behavioral signs alone (Strother, 1973) and recommended that the descriptor "minimal brain damage" be replaced with "minimal brain dysfunction". It was also recommended that attempts be made to classify into more homogeneous subgroups the heterogeneous group of children subsumed under the label minimal brain dysfunction (Strother, 1973). A national task force formulated an official definition of the disorder which stated:

The term "minimal brain dysfunction syndrome" refers . . . to children of near average, average, or above average general intelligence with certain
learning or behavioral disabilities ranging from mild to severe, which are associated with deviations of function of the central nervous system. These deviations may manifest themselves by various combinations of impairment in perception, conceptualization, language, memory, and control of attention, impulse, or motor function. During the school years, a variety of learning disabilities is the most prominent manifestation. (Clements, 1966, pp. 9-10).

Stewart and Olds (1973) estimated that less than ten percent of the referrals for hyperactivity have histories suggesting brain injury and the frequency of birth complication is no greater among the hyperactive than the general population. In 1985, Goldstein and Goldstein estimate that three to four percent of the population is considered to be afflicted with Attention Deficit Disorder (the term now used since the introduction of the DSM-III) of which direct brain injury is found in only a very small percentage.

The descriptors "hyperkinetic behavioral syndrome" and "hyperkinetic impulse disorder" were introduced by Laufer and his associates (Laufer & Denhoff, 1957; Laufer, Denhoff & Solomons, 1957). Laufer et al. stated that:
. . . hyperkinetic syndrome is a very specific entity. It does not account for the majority of children's behavior disturbances, and differential diagnosis continues to be just as much needed as heretofore . . . Moreover, hyperactivity as such may reflect an emotional disturbance entirely and not anything of an organic nature. Nevertheless, the entity characterized as the hyperkinetic impulse disorder does seem to exist . . . (p. 48).

Laufer et al. (1957) describe hyperkinetic impulse disorder as one "characterized by hyperactivity; short attention span and poor powers of concentration; irritability; impulsiveness; variability; and poor school work" (p. 48). They further hypothesized that hyperkinetic impulse disorder "may lead to many psychological problems, due to the extremely irritating effect it has upon parents and teacher" (p. 48). Some of the case histories show the existence of organic insult to the central nervous system occurring either before birth, or during the first five years of life. However, children seen with the clinically identical disorder show no organic insult (Laufer, Denhoff & Solomons, 1957). Further support of hyperactivity without a known organic base was shown through clinical descriptions of cases of hyperactivity with no known organic base (Bakwin & Bakwin, 1966; Werry,
1968), which increased the recognition of hyperactivity as an individual concept.

"Syndrome" is a configuration of symptoms which occur together and which constitute a recognizable illness. With hyperactivity being thought of as a syndrome, it can be expected to have certain characteristics that form a framework which can direct the research and treatment of this disorder. Yet, if this disorder is not a syndrome then limitations of the directions of research may be implemented without due cause. The criteria for syndrome status include the existence of a unitary cluster of symptoms, a common cause or having major etiological factors in common, a consistent response to treatment or a predictable course in the absence of treatment, and demonstrable differences between those with the disorder and other diagnostic groups or nonclinical groups (Ross & Ross, 1982). In regards to hyperactivity, the label of syndrome would imply that there is a relatively specific etiology. Further, the assumption would be that such a syndrome, if left untreated, would display a more or less uniform course and, if appropriately treated, would show a relatively homogeneous positive response. (Loney, 1980, p. 30).
Loney, (1980) also states that

Once found, a homogeneous diagnostic group could be contrasted with other psychiatric syndromes of childhood, with a heterogeneous residual group, or with normal comparison groups. Researchers could compare notes. . . Statements could be made which could be true from one hyperactive child to another (p. 30).

The syndrome issue has generated much debate. Stewart, Pitts, Craig and Dieruf (1966) obtained a detailed description of the "hyperactive child syndrome" by comparing the life histories of 37 hyperactive children of relatively normal intelligence and aged five to eleven, with the histories of a like number of control children. The study by Stewart et al. (1966) found that 26 of the patients had a history which suggested probable brain injury, 59 percent of the mothers reported that the start of their child's symptoms was in infancy. The researchers also estimated that one in 25 children have the syndrome of hyperactivity which Stewart et al. (1966) feel agrees with the opinion of most of the kindergarten and first-grade teachers they interviewed. In other words, on the average, there is one hyperactive child in every class. Along with the above findings, no evidence of specific etiologic factors (prenatal or perinatal injury or inheritance) was
found (Stewart, Pitts, Craig & Dieruf, 1966). Hence, no conclusive evidence has been found to support the hyperactive syndrome.

By the 1970's researchers had determined that most children suffering brain injury do not develop hyperactivity and that fewer than five percent of hyperactive children have had any evidence of structural brain damage (Goldstein & Goldstein, 1980). In the Diagnostic and Statistical Manual of Mental Disorders II (1968) of the American Psychiatric Association, the descriptor of "Hyperkinetic Reaction of Childhood" was used to describe children with hyperactivity and impaired attention and were viewed as separate facets of the disorder. DSM-II defines "Hyperkinetic Reaction of Childhood" as:

This disorder is characterized by hyperactivity, restlessness, distractibility, and short attention span, especially in young children; the behavior usually diminishes in adolescence. If this behavior is caused by organic brain damage, it should be diagnosed under the appropriate non-psychotic Organic Brain Syndrome. (American Psychiatric Association, 1968).

The definition did not clearly differentiate from those children with other behavior disorders who may also show the symptoms of hyperactivity.
Models of Explanation of ADD

Biological or Biogenic. The Biological or Biogenic model is one way to describe the causality of Attention Deficit Disorder in children. This model attempts to explain children with Attention Deficit Disorder by considering changes upon or within the physical organism. These explanations include physical arousal levels, genetics, diet, and toxicity.

Two primary Biogenic Models which are thought to be related to Attention Deficit Disorder are the over or under arousal characteristics of the children. Wender (1971) hypothesized that attention deficit disordered children are overaroused. This overarousal may be due to a shortage of dopamine (a neurotransmitter in the brain). This shortage produces the inability to assist the child in focusing attention, inhibiting impulsivity and distractibility and inhibiting excessive body movement. It was suggested that stimulants affect attention deficit disordered children in a manner opposite that of their effect on normal children. Even though there is little data regarding the response of normal children on stimulants, Stroufe (1975) noted that the effects of stimulants on adults are the same as those behaviors in attention disordered children on stimulants, such as improved motor coordination.
and enhanced performance of tasks requiring attentiveness.

The data collected by Laufer, Denhoff, and Solomons (1957) also support the theory of overarousal in hyperactive children. The diencephalon acts as a filter that determines how sensory inputs are projected to various cortical areas. They found that hyperactive children have a low photo-Metrazol threshold which seems to result in difficulty in selectively filtering information; therefore, the child becomes oversensitive to outside stimulation. The effect of amphetamines on the hyperactive child with a low photo-Metrazol threshold is to raise the threshold to the level of the nonhyperactive child. Laufer et al. (1957) hypothesized that the tendency for hyperactivity to decrease with age was due to the fact that the cortex develops with increasing age; hence, cortical control expands to produce more inhibition and discrimination.

It has also been suggested that hyperactivity may be attributable to underarousal rather than overarousal. Satterfield and Dawson (1971) suggest the presence of lower than normal arousal indices (such as lower basal skin conductance and less nonspecific galvanic skin responses (GSR) activity) and insufficient CNS inhibition in hyperactive children. It was argued that the excessive
and seemingly disorganized motor activity seen clinically is associated with low reticular activating system (RAS) excitation and reflects attempts by these children to increase levels of sensory input (Satterfield and Dawson, 1971). Thus, hyperactive children are presumed to have low levels of electrical discharge at the reticular formation; hence, the effect of stimulants is to reduce hyperactivity by increasing arousal. It would appear that some children may be overaroused and hyperactive and others underaroused and hyperactive; therefore, more research is needed.

Genetics has also been implicated in the casuality of hyperactivity. Morrison and Stewart (1971) reported a significantly higher prevalence of retrospectively reported hyperactivity in the parents (particularly fathers). Cantwell (1972) reported similar findings. Yet, with both studies, the weaknesses of the experimental designs, which included no blind interviewing conditions and unacceptable procedures for control group selection, were acknowledged by both investigators (Cantwell, 1975; Stewart, 1980).

According to Goldstein and Goldstein (1985):
Attentional skills, like other skills, often run in the family. It is not surprising that children with attention deficit are often described as
taking after their father or other close relative. It is common to find more than one sibling in a family affected. (p. 24).

Their statement also noted that "some siblings born to two parents with attention deficit disorder may have none of the symptoms" (p. 24).

Diet is an important part of daily life which has been suggested to produce a toxic reaction with behavioral symptoms of those found in Attention Deficit Disorder with Hyperactivity. Feingold (1975) claimed marked improvements of hyperactive children as a result of his diet. Also, on the basis of his own nonempirical data Feingold stated that the diet-induced reduction in hyperactive symptoms was followed by improved academic achievement and motor coordination.

A team of researchers (Harley, Ray, Tomasi, Eichman, Matthews, Chun, Cleeland & Traisman, 1978) studied Feingold's diet and controlled for placebo effects and social environmental effects. Using careful measures to ensure rater blindness, there was no evidence of an advantage for the Feingold diet on all their school-aged boy subjects. Positive diet effects were more frequently reported by parent ratings than teacher ratings. There was no evidence of favorable diet response on objective tests or observational data. It was also found that
favorable parent reports occurred only in the placebo-challenge sequence, not in the challenge-placebo sequence (Harley et al., 1976). More empirical data is needed before the debate on whether Attention Deficit Disorder is caused or can be controlled by diet.

Another explanation of hyperactivity examines the presence of blood lead levels in attention disordered children. David, Clark and Voller (1972) provided the first well-documented evidence that lead absorption at even relatively low levels might be causing hyperactive symptoms. David et al. (1972) have suggested that the hyperactivity may not be an after-effect of lead poisoning, but might instead be a condition dependent upon continuing nontoxic elevations with body lead.

Needleman, Gunnoe, Leviton, Reed, Peresie, Maher, and Barrett (1979) studied dentine lead content rather than blood-lead analysis and found that amounts of lead well below what is considered hazardous could adversely affect the school behavior and intelligence of young children. The nonadaptive classroom behavior such as hyperactivity, impulsivity, distractibility and poor attention span increased in frequency in a dose-related fashion to dentine lead content (Needleman et al., 1979).

There appears to be some controversy over whether hyperactivity is linked to increased body lead levels or
a possible association between more general behavior problems and increased lead levels. Ross and Ross (1982) suggest that there is sufficient research that is methodologically sound to support an assumption that undue lead absorption is implicated in childhood hyperactivity. Taking a middle position, Goldstein and Goldstein (1985) suggest that it would appear that even though a very minute percentage of children with high blood lead levels may be attention disordered, it is unlikely that blood lead levels are the explanation for the majority of attention disordered children.

Overall, in regards to the Biological or Biogenic model, there appears to be no consensus as to whether there is a total biological cause of Attention Deficit Disorder. Over and underarousal, genetics, diet and blood-lead levels have effects on all children but not conclusively to the extent of causing Attention Deficit Disorder in children. Therefore, there is a need for further experimentally sound research in order to produce conclusive evidence that these biological or biogenic factors cause Attention Deficit Disorder in children.

Behavioral Learning. The Behavioral Learning model attempts to explain children with Attention Deficit Disorder by considering the behavioral deficiencies and excesses of the hyperactive child and the effects of learning on the
behavior. Behavioral Learning particularly deals with the ADD-H child's interactions with family members. This model also explains the ADD-H child's societal, teacher and peer interactions.

One of the areas in the research of hyperactive children deals with the socialization of children and the effects of parent-child interactions. The idea was proposed by Baldwin (1897) who stated that a child was both a factor in as well as a product of his socialization and outcome of children (Barkley, 1981). However, Bell (1968) demonstrated that the findings of much of the research on socialization in children which was previously argued as evidence for the effects of parents on their children could be better understood as the effects of children on their parents. The model proposed by Bell (1968) argues that adults, parents in particular, have expectations or thresholds for a child's behavior in a given situation. A child's behavior which is excessive for a given situation may exceed that parent's "upper limit threshold." On the other hand, when a child's behavior is inappropriately inexcessive, this may exceed the parent's "lower limit threshold." The reactions of a parent to a child will differ quite radically, depending on which of these thresholds is violated by the child's behavior (Bell, 1968).
If a child exceeds the parent's "upper limit threshold", the parent is likely to respond with "upper limit controls" (Bell, 1968). These controls may consist initially of ignoring the child's behavior, but they almost always progress to restrictive commands, negative affect, and even physical disciplining of the child (Bell, 1968). Bell (1968) points out that this is to be descriptive and not to address the functions of parent or child behavior. Child behaviors may elicit particular parental responses, but these in turn will affect subsequent child behaviors to some degree. Studies in child development have attempted to isolate the effects of certain characteristics of children on adults, and vice versa, to determine the direction of effects (Barkley, 1981). Barkley (1981) also suggests that this research argues that while both parent and child influence each other, certain behaviors and characteristics of one person may have a disproportionate causal influence on the reactions of the other in certain exchanges.

Campbell (1975) conducted one of the first studies of the parent-child interactions of hyperactive children. Campbell (1975) compared the mother-child interactions of hyperactive children. Campbell (1975) compared the mother-child interactions of hyperactive, learning-disabled, and control children during accomplishment of a series of
tasks. The results suggested that hyperactive children were more likely to request help from their mothers and to be more non-compliant than other groups of children. The mothers of hyperactive children were more likely to engage in commands and directives and to give more help and encouragement than mothers of the other children. Barkley and Cunningham (1980) compared the mother-child interactions of hyperactive and normal children during both a task situation and in free play. The results indicate that hyperactive boys were more negative and less compliant in both situations than normal boys. The mothers of hyperactive boys gave more commands and negatives and were less responsive to their sons' interactions than mothers of normal boys. Barkley and Cunningham (1980) note that the results of these studies cannot address the issue of causality or direction of effects in the interactions.

Cunningham and Barkley (1979) examined effects of stimulant drugs on the mother-child interactions of hyperactive children. They postulated that a child's hyperactivity with stimulant medication would result in little change in parental behaviors. However, if the mother's directiveness is in fact a response to her child's excessive behavior, she should reduce maternal directiveness. Cunningham and Barkley, (1979) studied two hyperactive identical twin boys and their mother. Each boy was observed
individually with his mother in both free-play and task periods on four different occasions. Using a double-blind drug-placebo reversal design, the boys were placed on and off Ritalin, across four observation sessions. Their findings indicated that, in this case, the mother's directiveness was a reaction to her boys' excessive behavior. When medication reduced the hyperactive behavior and increased compliance, the mother dramatically reduced her level of commands. With the ability of this study to be replicated, using larger samples, suggests...

... parent and child behaviors are best viewed as a reciprocal feedback system in which the behavior of one person serves as both a controlling stimulus and a consequating event for the responses of the other. It further serves to underscore the notion that the child's behavior exerts a great deal of control over parental responses, in addition to the traditional view that parental behaviors influence child responses. (Barkley, 1980, p. 60).

Another area of research dealing with hyperactive children examines the effects of teacher-child interactions. Hyperactive children apparently consider attention in any form rewarding. O'Leary, Kaufman, Kass and Drabman (1970) suggest that personalized soft reprimands by the teacher decreased disruptive behavior of
misbehaving school children, whereas, loud, public reprimands increased disruptive behavior. It was noted by O'Leary et al. (1970) that even for soft reprimands, however, the more severely misbehaving children failed to respond and even showed high rates of disruptive behavior. Therefore, some hyperactive children find any teacher attention reinforcing, even though the teacher may intend it to be punishing (O'Leary, Kaufman, Kass & Drabman, 1970).

Campbell, Endman, and Bernfeld (1977) have stated that the hyperactive child generates changes in his behavior settings, which, in turn, have an impact on his subsequent behavior. This cyclical motion begins with the child's behavior which, in turn, elicits controlling behavior from the teacher. As the teacher becomes more intense and controlling, the child becomes more restless and noncompliant so that the child's behavior deteriorates further. This, in turn, leads the teacher to more intensive controlling action.

Poor peer adjustment can be related to the hyperactive child's immature behaviors that are perceived by other children as undesirable. The hyperactive child engages in a considerable amount of negative-attention-getting behavior, such as showing off, which only has temporary appeal to other children (Battle & Lacey, 1972). Battle and Lacy (1972) suggest that the middle childhood peers
reject the explosive responses and pervasive unpredictability of the hyperactive child's behavior. Similarly, the hyperactive child's attempts to dominate peers are rarely tolerated by the child's age group. When these dominating behaviors are rejected, the hyperactive child may then use more antisocial ways to gain attention, such as deliberately bothering other children and teasing.

In general, the Behavioral Learning model describes the hyperactivity of attention deficit disordered children without explaining the cause of the disorder and the poor attention span characteristic of this disorder. Interactions play a major role in the behavior of children but this only explains one aspect of Attention Deficit Disorder. This explanation taken exclusively does not give causality of ADD in children, yet, taken in combination with other models may have application abilities when treating attention deficit disordered children.

**Psychological Factors.** The psychological viewpoint of Attention Deficit Disorder does not treat the symptoms directly but looks at the underlying cause of the behavior. The literature is inconsistent and sometimes contradictory as to whether the underlying psychological problem generally researched in connection with hyperactivity or impulsivity is depression. Yet, there is no consensus as to whether depression is a symptom or a cause of Attention Deficit Disorder.
Goldstein and Goldstein (1985) suggest that there may be an underlying psychological problem such as anxiety, depression, or fearfulness causing the attention disordered behavior. They suggest that a child worrying about his parent's divorce is much less likely to exhibit good ability to concentrate and pay attention. Goldstein and Goldstein (1985) also suggest that as many as 50 percent of children identified as hyperactive can be shown to be experiencing some form of depression. Goldstein and Goldstein, (1985) stated:

Careful evaluation is needed to determine whether the depression is the cause of the attention deficit, or the social effects and feelings of failure resulting from the attention deficit has caused the depression (p. 25).

It was suggested by Zrull, McDermott and Pozanski (1970) that there is a connection between depression and the hyperactive syndrome (the term used previous to ADD-H). They postulated that "the presence of depression may be related to the child's self-image and to his difficulty in controlling aggression and parental rejection, which may or may not be reactive to his organic difficulties" (p. 39). In the study by Zrull et al. (1970), a combination of depressive elements, both from deprivation and later conflicts over aggression, seem to exist as an
intrinsic part of the hyperactivity. These children often have some form of rejection or deprivation in their background history. Zrull et al. (1970) suggest that these elements are present at an early point in the child's development, which sets the stage for the "subsequent evolution of a poor self-image within the child" (p. 38). The child also has difficulty controlling himself, which contributes to his poor self-image (Zrull et al., 1970). This study also suggested that during later development of the child, his conflict over external aggression and aggression turned inward "become part of the picture" (Zrull et al., 1970, p. 38). The parents of this child become directly involved with his control and thus, the child externalized their aggression. Zrull et al. (1970) stated:

His impulsivity and hyperactivity bring on punitive efforts by the others to control him, allowing him to seek this punishment as a control measure or atonement for his "wrongdoing," while he resents those who mete it out. To some extent, one could anticipate that this child's superego development may be distorted, with overreliance on external forces to aid in his control or to sanction his improvements in control. (p. 39).
A study by Burke and Harrison (1962) explored the function of impulsive, antisocial, and aggressive behavior in children as a means of avoiding feelings of depression. They felt that impulsivity is the mode by which the child turns aggression outward, and conversely, depression can be seen as an expression of aggression (Burke & Harrison, 1962). Burke and Harrison (1962) concluded that an understanding of some of the aggressive behavior is enhanced when it is viewed as a means of avoiding feelings of depression. They found this to be true especially in children whose "early years were characterized by some degree of true rejection and deprivation" (p. 421). Burke and Harrison (1962) also stated:

In this group, we regularly encountered a self concept of inadequacy, worthlessness and incompetence which was associated with feelings of depression that were vigorously defended against entering awareness . . . These situations included those where the realities directly threatened the child's adequacy, occasions when the child was threatened by the recognition of his cravings for affection, and situations recalling memories of the past that highlighted the feeling of worthlessness. It is our feeling that the technique of aggressive behavior is one way of avoiding feelings of depression and it may coexist with, but should be
distinguished from, impulsive acts designed to placate feelings of guilt. (p. 421).

Another psychological viewpoint of hyperactivity is the unidirectional view of the socialization process. In this framework, the unidirectional view refers to the direction of effect from the socialization agent to the malleable and informed child, with the child's behavioral characteristics largely attributable to the socializing influence of his parents, and later his teachers. Bettelheim (1973) proposed a unidirectional view called diathesis-stress model. This suggests that when children who are predisposed to hyperactivity are stressed with environmental pressures that exceed their tolerance, they react with hyperactivity. Infants may become increasingly restless and more difficult because their mothers are impatient or resentful of the trouble the infant caused them. Often the relationship becomes a battle in which the infant is fighting back through restlessness and resistance as he finds himself unable to cope with his mother's demands for quiet compliant behavior (Minde, 1977). Ross and Ross (1982) state:

As he moves chaotically through the preschool and school years, his performance elicits increasing anxiety and disapproval, and the demands at school for conformity and compliance, particularly inhibition of
motor movement, are often far beyond the child's capacity, so that he is labeled as a failure by his teacher and peers. The result is an accelerating deterioration in both his behavior and his already battered self-concept. (pp. 109-110).

Interactive Model. In 1980, DSM-III established the descriptor of Attention Deficit Disorder with and without Hyperactivity. This placed impaired attention as the central diagnostic concept that may or may not be accompanied by Hyperactivity. Yet, with this new categorization, Attention Deficit Disorder is still difficult to diagnose if based solely on the DSM-III description and or one particular model. Therefore, the interactive approach to the diagnosis of ADD is emphasized for best results.

In regard to an interactive model, Morrison and Stewart (1973) suggested that there was some sort of polyfactorial transmission in which a sizable number of different hereditary and environmental influences interact to produce the behavior. The hereditary component must also be polygenic, meaning that it reflects the activity of many genes rather than that of a single major gene.

According to Ross and Ross (1982), polyfactorial transmission implies:
a genetic predisposition to hyperactivity that puts the individual at risk so that the extent to which he is affected by hyperactivity, if he is affected at all, is determined by various environmental influences that operate on the substrate of the genetic predisposition. (pp. 71-72).

The polyfactorial hypothesis was thought to be consistent with the sex differences in hyperactivity as well as the variability. Morrison and Stewart (1973) reexamined the data from their previous study (Morrison & Stewart, 1971) which had shown an association between hyperactivity and adult alcoholism, hysteria and sociopathy. One of their hypotheses was that families of secondary cases of hyperactive children would have a higher incidence of alcoholism in their first and second degree relatives. The second hypothesis was that if a hyperactive child's first degree relative was hyperactive it would be more likely to have more remote relatives affected than a family in which there is only the hyperactive child. These hypotheses were all confirmed. The data was thus, consistent with a polygenetic transmission model.

Sandoval, Lambett and Sassone (1980) proposed an interactive model which suggests "that individual differences in the organic and psychological makeup of the child, in his or her family, and in school environments
all interact to determine whether or not a child is labeled 'hyperactive'" (p. 147). Their model which displays the predicted causal relations among a number of factors which were hypothesized to be related to hyperactive behaviors is shown in Figure 1.

Fig. 1--The structural model of interactive system in the labeling of children.

The independent factors which account for hyperactive behavior in various settings are presented by Sandoval et al. (1980) as follows:

Home environment, school environment, and the characteristics of the child. The constitutional makeup of the child, indicated in the hexagon, interacts with environments. Characteristics and attitudes of parents and teachers also influence the
environments. The child's biological systems, in conjunction with family and school factors that appear in home and school environments, interact to determine whether the child eventually manifests observable hyperactive behavior patterns. (pp. 151-152).

In Figure 1, the child's labeling of hyperactivity is influenced not only by the identifiable factors in the child's constitutional makeup but by reports of the child's behavior. The child's behavior in conjunction with the parent and teacher characteristics and attitudes help to determine whether or not the child is labeled hyperactive (Sandoval, Lambett, & Sassone, 1980). Sandoval et al. (1980) note that the arrows in the model are bidirectional in many cases. The Interactive model takes into account all the child's environments (home and school) along with the characteristics of the child. When all these factors interact, the behavior pattern of the child is manifested. None of the previously discussed models (Biological, Behavioral Learning and Psychological) can solely explain the causality of ADD in children, but a combination of their factors can provide a better understanding as to the makeup of the child and the child's interactions with his environment. Therefore, the Interactive model can be useful to clinicians in accurately describing the child.
and his environment and in providing more accurate information to diagnose Attention Deficit Disorder.

**Diagnosis**

It is more difficult to diagnose ADD children without Hyperactivity due to their calm demeanor (Goldstein & Goldstein, 1985). They may not exhibit as many observable behavioral problems or experience difficulty at school during individual work and small group activities (Goldstein & Goldstein, 1985). Problems appear to surface quicker and with more intensity when Hyperactivity accompanies the ADD.

The DSM-III provides criteria that are more specific and that emphasize attentional deficits, as opposed to activity level. However, there is little empirical validity of the ADD criteria, and several items appear subjective and ambiguous (Pelham, 1982). Few studies that have assessed the adequacy of the ADD criteria (Atkins, Pelham, & Licht, 1985). The DSM-III field trials, which were designed to assess the interrater reliability of two clinicians evaluating the same child, found a mean kappa coefficient of only .58 for the ADD diagnosis (early draft of DSM-III criteria) and a mean kappa of .50 (current criteria) (American Psychiatric Association, 1980, p. 471). With accuracy problems using the DSM-III alone, other measures such as teacher and parent ratings and
observations may assist in the diagnosing process. The emphasis on classroom measures is due to the opportunities available in this setting for the assessment of multiple behaviors and situation (Atkins, Pelham, & Licht, 1985). The use of teacher ratings is justified because of the ease and economy of data collection and the importance of information derived from teachers for an understanding of child behavior (Loney, 1982). Teachers are generally more experienced and more objective than the parents and more familiar with the child than the clinicians (Atkins, Pelham, & Licht, 1985). Direct observations have been used to determine the behaviors that differentiate hyperactive from non-hyperactive children (Abikiff, Gittelman-Klein, & Klein, 1977; Whalen, Henker, Collins, Finck, & Doremoto, 1979). Atkins, Pelham and Licht (1985) suggest that "the methodological problems have reduced the contribution of observations toward the development of valid diagnostic criteria" (p. 156). These authors also point out "the interrater reliability often has been low for many observational codes and, typically, each child has been observed for less than one hour" (Atkins, Pelham, & Licht, 1985, p. 156). Whalen et al. (1979) note the restricted sampling of behaviors that may prove critical to teacher judgments. A study done by Atkins, Pelham and Licht (1985) provided preliminary evidence that objective classroom
measures can be used to predict teacher ratings of ADD with a moderate degree of success. The results also supported the use of multiple assessment strategies and multivariate statistical procedures to operationalize the ADD construct. The utilization of data from a number of areas is suggested by Atkins et al. (1985) to yield a more accurate discrimination for diagnosing ADD children than only data from one area. Thus, before a diagnosis of ADD is given, the child should be given a clinical interview and be observed to determine whether the child meets the DSM-III ADD diagnostic criterion. Data should also be collected by the clinician from parent and teacher questionnaires.

**Parent and Teacher Questionnaires.** There are a number of parent and teacher questionnaires used to help in the diagnosis of attention deficit disordered children. Such forms include the Conners Parent and Teacher Rating Scales, The Child Behavior Checklist, the Werry Weiss-Peters Activity Rating Scale and Behavior Rating Scale. The Conners Parent and Teacher Questionnaires includes a 93 item parent and 39 item teacher rating scale which was developed to aid in the identification of hyperkinetic children and to evaluate treatment effectiveness (Conners, 1969, 1970, 1973). Test-retest factor reliabilities of the teacher questionnaire range from .70 to .90 (Conners, 1973), and parent reliabilities have been assumed to be similar
to those for teachers, although, no specific
reliabilities have been reported (Goyette, Conners, &

The Child Behavior Checklist (CBCL), which was designed
to obtain parents' reports of their children's competencies
and problems in standardized format (Achenbach, 1978), is
a 113 item rating scale which provides a profile and
frequency of behaviors within the age group indicated.
Factor analysis of the CBCLs of 450 disturbed boys yielded
nine behavior problem scales labeled Schizoid, Depressed,
Uncommunicative, Obsessive-Compulsive, Somatic Complaints,
Social Withdrawal, Hyperactive, Aggressive, and Delinquent.
The norms were based on a sample of 300. Achenbach (1978)
compared disturbed and normal boys and showed a difference
($p < .001$) on all behavior problems and social competence
scores. Eight-day test-retest correlations averaged .89.
Interparent correlations averaged .74. The test-retest
correlations indicate stability in patterning and the
interparent correlations indicate an agreement between
parents' perceptions of patterning in their children's
behavior.

Another form which is completed by parents is the Werry
Weiss-Peters Activity Rating Scale (Routh & Schroeder,
1974). This is a 31 item questionnaire which screens a
child's behavior across various settings such as homework,
play, school and meals. This scale is much like the Conner's hyperkinesis factor and correlates well with child non-compliant to the commands of parents. The parents are interviewed, and the interviewer checks one of three frequencies as descriptive of the specific behaviors of the child in a number of situations. A correlation of .90 between interviews has been reported for this scale (Werry, Weiss, Douglas, & Martin, 1966).

A teachers' scale which is available to gather more information is The Self Control Rating Scale (SCRS) (Kendall & Wilcox, 1979). This scale consists of 33 items which are rated on a seven point continuum. This scale estimates the child's ability to exert effective self-control and exhibit behavior that is governed by rules. The internal consistency among SCRS was .98. This reliability index suggests that there is a high degree of internal consistency among SCRS items. A study by Kendall and Wilcox (1979) found test-retest reliability for a sample of 24 to be .84.

Sex Differences and Attention Deficit Disorder

Most of the causes reported in the literature investigating attention disordered children with hyperactivity report a higher incidence of boys. This may be due to the fact that the majority of cases dealing with hyperactivity involved more boys than girls. The sex
difference has been reported to be as high as nine to one (Prinz & Loney, 1974) but generally the male to female ratios range from 4:1 to 6:1 (Berry, Shaywitz, & Shaywitz, 1985). Stewart (1970) believes that the sex differences observed in such childhood conditions as hyperactivity are inborn and not the result of sex-biased treatment by parents and teachers. He states: "It appears that some inherited eccentricities of behavior or learning may be sex-linked or that the male nervous system may be peculiarly prone to certain failures in early development; conceivably both of these hypotheses are true" (Stewart, 1970, pp. 97-98).

Socialization practices also have been implicated in explanation of the higher incidence of hyperkinesis in males than females (Whalen & Henker, 1980). With the greater number of hyperactive boys available to study in relation to the girls, researchers find it easier to combine the two and assume homogeneity or omit the hyperactive girls from the study itself (Prinz & Loney, 1974). Prinz and Loney (1974) also suggest that there is little knowledge of hyperactivity in girls and that the generalizations reached "allow little interpretation or extrapolation with respect to hyperactive girls" (p. 246).

Intelligence-Tests, Scores and Profiles

Hyperactive children have been studied to determine whether there are cognitive problems in addition to their
overactivity, distractibility and impulsiveness. One such study (Palkes & Stewart, 1972) examined the level of intelligence, school achievement and perceptual-motor performance in hyperactive children compared to matched normal children. The study did not distinguish between boys or girls. From the 34 subjects used, the hyperactive children performed significantly less well on intelligence tests (WISC) and school achievement and perceptual-motor tests than did their controls. In addition, it was found that the differences in school achievement and perceptual-motor performance disappeared when intelligence was controlled. These findings were generally in agreement with Wikler, Dixon and Parker (1970) who reported significantly lower WISC Full Scale and Performance IQ scores for their hyperactive group than for their controls. Palkes and Stewart (1972) do suggest the "hyperactive children do learn in school at the rate normal for their measured intellectual performance" (p. 39). They also hypothesize that there may be a "gap" between the potential of a hyperactive child and his peers. This and his difficulties in concentrating and finishing school assignments" (p. 39) may be related to the idea that hyperactive children are "underachievers."

There has been past research to identify possible WISC-R profiles of various clinical groups which has
yielded no absolute results. Yet, without these clear cut results some studies have indicated that children of clinical groups such as learning disabled or with emotional problems have lower certain WISC-R subscales than normal children (Lufi & Cohen, 1985). A study done by Peterson and Hart (1979) compared three different groups of children (emotionally handicapped, learning disabled and slow learner). They found that there were differences between normal and clinical populations when compared on the subtests Arithmetic, Digit Span and Coding. Thompson (1980) tried to demonstrate possible diagnostically characteristic differences in WISC-R profiles for children with mental retardation, learning disabilities or psychological disorder. Using various measures of subtest scatter, he concluded that there was only a small significant difference between the groups and that caution should be used with regard to the use of the WISC-R profile to differentiate Israeli children with Attention Deficit Disorder from Israeli children with other problems as was demonstrated by Lufi and Cohen (1985). Lufi and Cohen (1985) found that three subtests differentiated significantly between the two groups. These subtests belong to the "freedom from distractibility" factors (arithmetic, digit span and coding). They also suggested that when diagnosing Attention Deficit Disorder that a
lowering of scores on these three subtests should alert the clinician for a possible Attention Deficit Disorder diagnosis. There is still no conclusive evidence that the children with these profiles have Attention Deficit Disorder.

When comparing ADD-H boys and girls, Kashani, Chapel, Ellis, and Shekim (1979) found that hyperactive girls had a lower Verbal IQ score than the boys. They contribute this fact to be a result of the learning difficulties found in the hyperactive girls in their study. Berry, Shaywitz, and Shaywitz (1985) found that girls and boys with ADD did not differ significantly on the Performance scale, but girls obtained a lower mean Verbal IQ score than boys and a lower mean Full Scale IQ.

**Intelligence and Attention Deficit Disorder**

The inter-relationships between subtests of the WISC-R and intellectual and behavioral impulsivity were examined for boys and girls by Garna, Percy, and Lawson (1971). These inter-relationships were studied in order to confirm that impulsivity is differently related to attainment for the two sexes. They found that behavioral impulsivity was negatively correlated with WISC IQ scores for boys and positively correlated for girls and that intellectual impulsivity is negatively related to the WISC IQ score for both sexes.
ADD and Interpersonal Adjustment

Battle and Lacey (1972) conducted a longitudinal study which analyzed Fels study data and examined environmental and behavioral factors that are associated with hyperactivity over time. The Fels study data was obtained by the Fels Institute in southwestern Ohio for 74 adults between the ages of 18 and 26 who had participated in the Fels Longitudinal Study since birth. Of these 74 subjects, 31 were females and 43 were males. They came from 45 white, predominantly middle-class families, and were reared within a 30-mile radius of the Fels Institute in southwestern Ohio. A portion of the extensive information which had been collected on these Fels subjects consisted of narrative reports of observations made in the home by the Fels home visitors, who were trained clinical psychologists. These subjects also attended the Fels Nursery School semiannually from ages two and one-half to seven and the Fels Day Camp from ages six to twelve for a two week session yearly. Narrative accounts of the behavior observed for each subject during his attendance at nursery school and day camp were recorded by trained observers and included in their Fels file. The Fels files do not include observational data on the adolescent and young adult periods. However, there do exist taped interviews with 60 of these 74 subjects
During adolescence, conducted by members of the Fels senior staff. All data were divided into five age periods: birth to three years, three to six years, six to ten years, the adolescent period of 13 to 17, and the young adult assessment at 18 to 26. Each subject was rated on a seven point scale for each variable examined. Also administered to each subject were a variety of standardized tests: Gesell Developmental Schedule, Stanford-Binet, Wechsler-Bellevue and the SRA Primary Mental Abilities test. After examining this data, Battle and Lacey (1971) found that hyperactivity in boys remains relatively constant over time while hyperactivity in girls fluctuates throughout childhood. During the preschool and elementary school periods, hyperactive boys show a higher proportion of their play time engaged in group social activities than their less active peers. They also showed more physical aggression within the same age group. In contrast to hyperactive boys, Battle and Lacey (1972) stated the "hyperactive three to six year-old girls demonstrated significantly greater achievement approach efforts in childhood and a high estimate of their own intelligence in adolescence" (p. 771). It was also sound that mothers of hyperactive boys were critical, unaffectonate, severe in punishment and disapproving; yet, none of these maternal behaviors were significant correlates of hyperactive girls.
Self-Perception of ADD Children

An exploratory study of elementary school girls described as displaying a "high activity level" by Prinz and Loney (1974) looked at both hyperactive and control samples divided into an older and younger group for a cross-sectional comparison across age levels. The findings of the study showed that there were no differences in self-esteem between younger hyperactive and control groups, although there seemed to be a pattern for the self-esteem of control girls to rise across age and a failing for the self-esteem of hyperactive girls to rise. These findings were compared to Loney's earlier study (1972) of hyperactive boys in which there is no significant difference in ratings of self-esteem between young hyperactive boys and their controls, but there were differences between the older boys of both groups. As with the girls, the older hyperactive boys were rated lower in self-esteem than were the younger hyperactive boys. In explaining their findings, Prinz and Loney (1974) speculated that

... it is possible that hyperactive girls, rather than being judged against an absolute standard of activity, are merely "overactive for a girl." Judging against sex-linked standard would tend to produce groups of hyperactive boys and girls whose levels of activity were dissimilar and one would predict
relatively better adjustment and fewer IQ and self-esteem deficits among hyperactive girls so defined. (p. 256).

Attention Deficit Disorder and Referral Differences

There seems to be a difference why boys and girls are referred to clinics and subsequently diagnosed as Attention Deficit Disorder. A study by Kashani, Chapel, Ellis, and Shekim (1979) looked at the difference between the referral question of boys and girls over a three year period in a Pediatric Developmental Evaluation Clinic. In each child the symptom of hyperactivity had been reported by both the parents and the teachers, and had been present for at least two years. The authors found that more boys were referred because of hyperactivity and/or behavior disorder than girls, while more girls were referred for learning difficulties and speech disorders than boys (Kashani et al., 1979). These results imply that hyperactivity in boys may be associated with aggressive behavior while in girls cognitive deficit is the dominant feature (Kashani et al., 1979). Kashani et al. (1979) hypothesized that "this phenomenon may reflect societal acceptance, and perhaps even encouragement, of aggression and behavior disorders in boys but not in girls" (p. 147).

Purpose

The purpose of this study is to investigate differences in ADD-H children on different variables as they relate to
sex. The first variable examined is a presenting problem difference between ADD-H boys and girls. Are the boys and/or girls that are diagnosed ADD-H referred for reasons other than ADD-H? Secondly, with ADD-H children is there a referral source difference between boys and girls? Where exactly does the referral come from and what possible biases are involved? Lastly, on the Wechsler Intelligence Scale for Children-Revised, is there a Verbal, Performance and Full Scale difference between ADD-H boys and girls and is there a configuration difference? In addition, the general demographics of the ADD-H boys and girls families will be described in terms of intact vs. non-intact homes, age of parents, educational level and SES levels.

Hypotheses

The following hypotheses were tested:

Hypothesis I

There would be a significant difference between the presenting problems of ADD-H boys as compared to ADD-H girls at the time of referral.

This hypothesis was derived from the evidence which suggests that boys are referred for hyperactivity or behavior disorders while girls are referred for learning difficulties and speech disorders (Kashani et al., 1979). It was expected that the subjects referred to the Child Study Center would replicate the previous finding by
Kashani et al. (1979). Thus, boys would be referred for hyperactivity or behavior disorders and girls would be referred for learning difficulties and speech disorders.

**Hypothesis II**

There would be a significant original referral source difference for ADD-H boys as compared to ADD-H girls.

This hypothesis was derived from Hypothesis I in which hyperactivity or behavior disorders in boys and learning difficulties in girls were most likely to be first detected by teachers because of the large sample of children in which to compare behavior.

**Hypothesis III**

There would be a significant difference in the Verbal, Performance and Full Scale IQ scores for ADD-H boys as compared to ADD-H girls.

This hypothesis was derived from evidence suggesting that there was generally a lowering of WISC-R Full Scale and Performance IQ scores for hyperactives than for their controls (Wikler, Dixon, & Parker, 1970). Kashani, et al. (1979) also found that hyperactive girls had a lower Verbal IQ score than the hyperactive boys, which was thought to be a result of the learning difficulties found in the girls.

**Hypothesis IV**

There would be a significant difference between WISC-R subtest configuration of ADD-H boys as compared to ADD-H girls.
This hypothesis was derived from evidence that WISC-R profile research has generally found that the subtests of Arithmetic, Digit Span and Coding were generally lower in hyperactives than their controls (Peterson & Hart, 1979; Lufi & Cohen, 1985). Yet, with the idea in Hypothesis III and evidence of the lowering of Verbal IQ scores in hyperactive girls (Kashani, et al., 1979), the configuration of the girls' profile may show verbal differences.
CHAPTER II

METHOD

Subjects

The subjects participating in this research study were 41 boys and 39 girls referred to the Child Study Center of Fort Worth between February 1984 and February 1986. The subjects' age range was six to twelve with a mean age ± standard deviation (SD) for girls of 8.3 years ± 1.7 and for boys of 8.1 years ± 1.9. This was an archival study in which subjects' clinical charts were randomly selected from a list of identified ADD-H children. Subjects were diagnosed as having ADD-H on the criteria for the DSM-III, childhood history, behavioral rating scales and observations. All subjects were matched for age, race, and socioeconomic status. All subjects were screened by examiners to eliminate those with WISC-R Full Scale scores below 80. All subjects taking medication at the time of admittance were also eliminated from this study.

The Child Study Center is a child outpatient center. The program offers a Psychiatric/Psychological Clinic, Department of Educational Services, Dental Clinic, Child Development Program, Genetic Screening and Counseling Clinic, Department of Patient Services, Pediatric Physical
Restoration and Communication Disorders (Speech and Audiology) and Fire Setters Program. The subjects used were those referred to the Child Study Center and examined in the Psychiatric/Psychological Clinic. The Psychiatric/Psychological Clinic works with children who have emotional or behavioral problems such as hyperactivity, aggressive behavior, temper outbursts, discipline problems and emotional depression as well as adjustment to traumatic events.

**Instruments**

The parents of subjects were required to complete a Child Study Center Data Sheet and request for information form.

**Child Study Center Data Sheet:** (see Appendix A)
The data sheet consists of questions concerning the subject's childhood history along with a behavioral checklist for the parent(s) of the subject to fill out.

**School Information Form:** (see Appendix B) The school information form consists of 21 questions concerning the difficulties each subject may be experiencing in school. It also contains questions concerning the current functioning and potential of each subject. This checklist is filled out by the teacher of each subject.

**Wechsler Intelligence Scale:** A psychological assessment battery consisting of the Wechsler Intelligence
Scale for Children-Revised (WISC-R) was administered to identify characteristics of this group.

WISC-R (Wechsler, 1974): The WISC-R is a measure of general intelligence of children within the age range of 6-0 to 16-11 years and contains twelve subtests. The Verbal Scale contains six of the tests (Information, Similarities, Arithmetic, Vocabulary, Comprehension, and Digit Span). The other six form the Performance Scale (Picture Completion, Picture Arrangement, Block Design, Object Assembly, Coding, and Mazes). The WISC-R provides three separate IQ's: Verbal Scale IQ, Performance Scale IQ, and Full Scale IQ. All three IQ's are obtained by comparing the examinees' scores with scores earned by a representative sample of their own age group. The mean IQ's and standard deviations at each age level are equal. Each of the three IQ's has a mean of 100 and standard deviation of 15.

The WISC-R's three IQ scales has a reliability coefficient of .89 or above in the standardization group over the entire age range covered by the scale (Sattler, 1982). Based on the 11 age groups, the average reliability coefficients are .96 for the Full Scale IQ, .94 for the Verbal Scale IQ, and .90 for the Performance Scale IQ (Sattler, 1982). The average reliability coefficients for the WISC-R subtests are as follows:
Information (.85), Similarities (.81), Arithmetic (.77), Vocabulary (.86), Comprehension (.77), Digit Span (.78), Picture Completion (.77), Picture Arrangement (.73), Block Design (.85), Object Assembly (.70), Coding (.72), Mazes (.72) (Wechsler, 1974).

Criterion validity of the WISC-R has been investigated by correlating it with the WPPSI. The WISC-R manual cites a study in which a representative sample of 50 children (males and females who were six years, zero months of age) who were given the two tests in counterbalanced order. The correlations between each of the three scales on the two tests were .80 for the Verbal Scale, .80 for the Performance Scale, and .82 for the Full Scale (Sattler, 1982). The differences between the mean IQ's on all three scales were higher on the WPPSI than on the WISC-R but only by 1.5, 2.8, and 2.5 IQ points (Sattler, 1982). In another study by Rasbury, McCoy, and Perry (1977) using the WISC-R and WPPSI over a one-year test-retest interval, the correlations between the two tests were .81 for the Verbal Scales, .80 for the Performance Scales, and .94 for the Full Scale.

Procedures

The parents of subjects who have not already signed consent of release of information forms as used by the Child Study Center were required to sign a consent form if
they wished to participate in this study. Three steps were utilized in the data collection:

(a) A data information form and a Request for Information form were administered shortly after admission/referral by subjects' parents.

(b) Subjects' parent(s) and teacher were administered the School Information Form.

(c) A psychological assessment battery was administered after referral was made. Each subject was seen by two examiners. The evaluation process insured the administration of behavioral ratings from observations of the clinical interview, and psychological assessment by examiners. Each subject was administered the WISC-R, and those subjects obtaining Full Scale scores of more than 80 participated in this research study. Both examiners made judgments about the presence, absence, and severity of symptoms from the interview content, behavioral observations and psychological testing.

Examiners

The examiners used in this study were a licensed psychologist (Ph.D.) and several psychological associates (M.A.) in the State of Texas. The licensed psychologist (Ph.D.) has nine years of experience, and the psychological associates have an average of four years' experience. Each psychological associate is under the supervision of the
licensed psychologist (Ph.D). Each examiner has several years of clinical experience in interviewing techniques as they relate to observation, classification, and diagnosis. The examiners, who share a familiarity with and understanding of the various instruments, made judgments about the presence, absence, and severity of symptoms of ADD-H from the interview content and psychological testing.

Experimental Designs/Statistical Analysis

The present research study employed an Analysis of Variance to analyze Verbal IQ and Performance IQ differences in ADD-H boys and girls. A T-test was used to analyze Full Scale IQ differences in ADD-H boys and girls. In order to analyze differences between the presenting problem of ADD-H boys and girls, a Chi-square was used to compute differences between referral source of ADD-H boys and girls. An Analysis of Variance for each subtest was computed to find differences between WISC-R subtests of ADD-H boys and girls. In addition, Chi-square was utilized to analyze intact vs. non-intact families, age of parents, educational level and SES levels.
CHAPTER III

RESULTS

General Demographics of Sample and Family

Table 1 provides a description of the mean age and standard deviation (SD) of the 80 ADD-H boys and girls taking part in the study.

Table 1

Number of Subjects, Mean Age and Standard Deviation For ADD-H Boys and Girls

<table>
<thead>
<tr>
<th>Group</th>
<th># of Subjects</th>
<th>Mean Age</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>41</td>
<td>8.3</td>
<td>1.7</td>
</tr>
<tr>
<td>Girls</td>
<td>39</td>
<td>8.1</td>
<td>1.9</td>
</tr>
</tbody>
</table>

ADD-H girls and boys generally were in the same age range with approximately equal standard deviations.

Table 2 describes the number of ADD-H boys and girls by race as well as percentage of the sample.
Table 2

Sex by Race

<table>
<thead>
<tr>
<th>Group</th>
<th>Race</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Black</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>3</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>4</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td>8.8%</td>
<td>91.3%</td>
<td></td>
</tr>
</tbody>
</table>

The subjects by age levels are included in Appendix C. Of the 80 subjects 22.5 percent were six years of age; 21.2 percent were eight years old; 16.2 percent were seven and ten; 12.5 percent were nine and for ages 11 and 12 were 5.0 percent and 6.3 percent, respectively.

Data on intact vs. non-intact families, ages of parents and education and SES levels are provided in Appendices D, E, and F, respectively. Intact families can be defined as all parents that were married and those who were reconstructed (remarried) at the time of referral. Non-intact families were those in which the parent was single at the time of referral (i.e., divorced, separated,
or single parent). In summary, 67 percent of the families taking part in this study were intact; 31.3 percent were non-intact and one case family was unavailable. The mean age of the fathers was 37 for ADD-H girls and 35 for ADD-H boys. The mean age of the mothers was 33 for ADD-H girls and 31 for ADD-H boys. In terms of the education of the parents, 61 percent of the parents had a high school education or better. The largest single group of parents were lower-middle to lower class socioeconomic status.

**Hypothesis I**

Hypothesis I stated that there would be a significant difference between the presenting problem of ADD-H boys as compared to ADD-H girls. The hypothesis as computed by Chi-square, \( \chi^2(3, N = 80) = 2.01193, p < .05 \), was not confirmed. Furthermore, no significant correlation (Pearson product-moment) between sex and presenting problem was found. Table 3 presents the most frequent presenting problems of ADD-H boys and girls. The most frequent presenting problem for ADD-H boys in this sample was behavioral or conduct difficulty. For ADD-H girls, academic difficulties were the most frequent presenting problem. Overall, behavioral/conduct problems were the most frequent reason for referral.
Table 3
Presenting Problems of ADD-H Boys and Girls

<table>
<thead>
<tr>
<th>Presenting Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Boys</td>
</tr>
<tr>
<td>Girls</td>
</tr>
<tr>
<td>Percentage</td>
</tr>
</tbody>
</table>

Hypothesis II

Hypothesis II stated that there would be a significant difference between the referral source for ADD-H boys as compared to ADD-H girls. The hypothesis, as computed by Chi-square, $\chi^2(3, N = 80) = 2.86758$, was not confirmed. Also, no significant correlation (Pearson product-moment) between sex and referral source was found. Table 4 presents the most frequent source of referral. School/teachers were the most frequent source of referral, comprising 37.5 percent of all the subjects.
Table 4
Referral Source of ADD-H Boys and Girls

<table>
<thead>
<tr>
<th>Group</th>
<th>Parent</th>
<th>School/Teacher</th>
<th>Physician</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>9</td>
<td>15</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Girls</td>
<td>6</td>
<td>15</td>
<td>12</td>
<td>6</td>
</tr>
</tbody>
</table>

Percentage: 18.8% 37.5% 23.8% 20.0%

Note. Other = any relatives, outside agencies or friends of the family.

Hypothesis III

Hypothesis III stated that there would be a significant difference in the Verbal, Performance and Full Scale IQ scores of ADD-H boys as compared to ADD-H girls. The hypothesis, as computed by an ANOVA for Verbal IQ and Performance IQ scores, $F = 1.381$, $df = 33$, $p < .05$, and $F = .928$, $df = 27$, $p < .05$, was not confirmed.

Furthermore, no significant difference was found for Full Scale IQ as computed by a t-test ($T = .76$, $df = 77$, $p < .05$).

Table 5 presents the mean Verbal IQ, Performance IQ and Full Scale IQ scores.
Table 5
Mean Verbal, Performance and Full Scale IQ Scores
For ADD-H Boys and Girls

<table>
<thead>
<tr>
<th>Group</th>
<th>Verbal IQ</th>
<th>Performance IQ</th>
<th>Full Scale IQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>101.5±14</td>
<td>99.2±12</td>
<td>104.4±13</td>
</tr>
<tr>
<td>Girls</td>
<td>100.4±11</td>
<td>104.1±13</td>
<td>102.3±11</td>
</tr>
</tbody>
</table>

Appendix G contains data describing Verbal, Performance and Full Scale IQ scores.

Hypothesis IV

Hypothesis IV stated that there would be as significant difference between WISC-R subtest configuration of ADD-H boys as compared to ADD-H girls on the following subtests: Arithmetic, Digit Span, and Coding. Results of the ANOVA computed; did not reflect significant differences; thus, Hypothesis IV was not confirmed. Table 6 describes the mean scores and standard deviations for the Arithmetic, Digit Span and Coding subtests.
Table 6
Arithmetic, Digit Span and Coding Subtest
Mean Scores and Standard Deviation for
ADD-H Boys and Girls

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Score</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arithmetic Subtest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>9.67</td>
<td>2.1</td>
</tr>
<tr>
<td>Girls</td>
<td>9.64</td>
<td>2.4</td>
</tr>
<tr>
<td>Digit Span Subtest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>8.8</td>
<td>2.3</td>
</tr>
<tr>
<td>Girls</td>
<td>8.6</td>
<td>2.5</td>
</tr>
<tr>
<td>Coding Subtest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>9.0</td>
<td>2.3</td>
</tr>
<tr>
<td>Girls</td>
<td>10.3</td>
<td>3.0</td>
</tr>
</tbody>
</table>

The results of the ANOVA for each subtest (Arithmetic, Digit Span and Coding) are included in Appendix H.
CHAPTER IV

DISCUSSION

None of the four hypotheses generated in this study were confirmed: No significant differences were found between ADD-H boys as compared to ADD-H girls in their presenting problem, referral source, Verbal, Performance and Full Scale IQ scores and WISC-R subtest configuration of Arithmetic, Digit Span and Coding.

The findings of no significant differences between ADD-H boys and girls in regards to presenting problem (Hypothesis I) contradict the findings of Kashani et al. (1979). The authors reported that hyperactive boys were more frequently referred for hyperactive and behavioral disorders and most hyperactive girls were referred for learning disabilities, language and speech disorders (Kashani et al., 1979). The present study found the majority of ADD-H boys and girls were referred for behavioral or conduct problems with no significant difference between the two sexes. This may be due to the fact that when computing the data, all the cases were present while only a partial representation was used in
Kashani et al. (1979) study (a total of 14 hyperactive girls and 15 hyperactive boys out of 28 each). Therefore, the present sample may be a more accurate description that there really are no differences between the presenting problem in ADD-H boys as compared to ADD-H girls. In addition, there seems to be a trend in which the majority of ADD-H children will first be referred for behavioral or conduct problems.

There was no significant difference found between ADD-H boys and girls in regards to referral source (Hypothesis II). These findings were unsurprising due to the fact that the majority of the presenting problems were behavioral/conduct with the second most frequent being academic/learning disabled. These presenting problems are more easily detected by the school principal, teachers and/or school counselors. There were an equal number of ADD-H boys and ADD-H girls who were referred by the school/teachers, which may suggest that there really is no difference as to who refers the child and thus, there may be little to no bias toward the sexes. The parents were the least likely to be the original referral source. Between ADD-H boys as compared to ADD-H girls, the ADD-H boys (9) were more likely to be referred by the parents. Parents may be least likely to refer the ADD-H child because the ADD-H symptoms may be situational (school) and not
pervasive (school and home). The parent may not consider the child's behavior as overactive or distractable because they have no large sample of children to compare their child to. The parent may also have a higher tolerance level as to the child's home behavior since the child is at school most of the day.

Failure to find sex differences in the Verbal, Performance and Full Scale IQ scores (Hypothesis III) suggest that there are no differences between ADD-H boys as compared to ADD-H girls in terms of intelligence. The Verbal IQ score is inconsistent with the IQ scores obtained in previous studies (Kashani, et al., 1979; Berry, Shaywitz & Shaywitz, 1985). The mean IQ scores for Verbal, Performance and Full Scale were all above those found in Kashani, et al. (1979) and Berry, et al. (1985). No significance in the Performance IQ scores is inconsistent with the findings of Kashani et al. (1979) and Berry, et al. (1985) along with no statistical significance found between ADD-H boys and girls in the Full Scale IQ scores. The Verbal IQ score does not fall in line with these studies. This may be the result of the ADD-H girls not being referred significantly more frequently for learning disability and academic problems as was seen in the studies of Kashani, et al. (1979) and Berry, et al. (1985). The lowering of the Verbal IQ scores in ADD-H girls may not
be generally true and may only be related to what the presenting problem was and not due to any differences between the sexes.

The fourth hypothesis expected sex differences on the WISC-R subtests of Arithmetic, Digit Span and Coding. Hypothesis IV was not confirmed and does not fall in line with the findings of earlier studies (Lufi & Cohen, 1985). Yet, Lufi and Cohen (1985) concluded that the lowering of scores on these three subtests should alert the clinician for a possible ADD diagnosis but that there was still no conclusive evidence that children with these profiles have ADD. This study also did not differentiate between the sexes but compared ADD children to children with other problems. The sample Lufi and Cohen (1985) used were of a select population (Israeli children) and thus, their findings cannot be generalized to the rest of the population. Thompson (1980) also did not compare sexes but compared different diagnostic classifications (mental retardation, learning disabilities, psychiatric disorders with ADD). Hence, when comparing WISC-R subtest configurations between ADD-H boys and girls there is no difference between the sexes.

The fact that both groups were matched for age, race and socioeconomic status reduces the possibility of sub-cultural differences. Race was predominantly white, but when computed with the small number of black subjects,
no significant differences were found. The subjects were carefully matched in order to eliminate any unintended variables which might have contaminated the selection of subjects and the results. The high activity level of the subjects was not the only criterion for admission to the Child Study Center for treatment; poor attention and impulsivity were also criteria. Hence, the subjects were selected through a very lengthy diagnostic process to insure an accurate diagnosis of Attention Deficit Disorder with Hyperactivity. These subjects were representative of typical clients at a tertiary facility which seeks out behavior problems from large populations of urban and surrounding rural areas. Thus, the population used may not be able to be generalized to the total population. Nevertheless, due to the great efforts used to equate the ADD-H boys and girls in terms of diagnostics, it can be suggested that there is no real sex differences between ADD-H boys as compared to ADD-H girls on the variables examined.

This can be supported by the fact that no study has found conclusive evidence that there are differences on the variables examined. The earlier studies may have found correlates due to spurious relationships and not actual significant differences. In addition, DSM-III does not have two diagnostic categories in which ADD-H is divided into ADD-H boys and ADD-H girls. This may suggest that
'there is no real evidence to support any differences other studies may have found.

Even though this study found no significant differences between ADD-H boys and girls when compared on the variables of presenting problem, referral source, WISC-R IQ scores and subtest profile configuration, there is further need for extensive investigation. The research on ADD-H children (especially girls) is limited, yet there is a large number of ADD-H girls in the population, despite the boy to girl ratio. ADD-H girls need further investigation to possibly find differences between the ADD-H boys on variables other than the ones that were presently examined or to confirm the fact that there are no sex differences. Whether differences are or are not found, the information gathered will be helpful to clinicians attempting to diagnose children with possible Attention Deficit Disorder with Hyperactivity.
Appendix A

Child Study Center Data Sheet

Parent's Name

Address

Phone

Child's Name Birth Date: Date:

I. PRESENTING PROBLEM: Please describe the problem or problems which prompted your contacting the Child Study Center:

II. Who suggested that you come to the Child Study Center?

III. PROBLEM CHECKLIST: Please check those items below that are of concern to you:

1. Is always on the go or acts as if "driven by a motor".
2. Has difficulty staying seated in school, at church, meals, etc.
3. Difficult to get his/her attention.
4. Has difficulty keeping attention (concentration) on school work or other tasks until completed.
5. Often does not seem to listen.
7. Needs a lot of supervision (one on one attention).
8. Has difficulty in groups, play, or school.
9. Frequently disrupts class.
10. Often speaks or acts before thinking.
11. Has difficulty waiting turn in games or group activities.
12. Sleep problems (resists going to sleep, wakes up in night, restless).
13. Explosive temper or tantrums.
15. Stubborn.
16. Provocative behavior.
17. Difficult to discipline.
18. Destructive.
19. Difficulties in getting along with other children.
20. Socially withdrawn (prefers to be alone).
22. Excessive fears or worries.
23. Seems unhappy or depressed.
24. Doesn't like self.
25. Overly dependent on parents, siblings.
26. Reports unusual or peculiar thoughts.
27. Runaway behavior.
28. Sexual misbehavior.
29. Lies excessively.
30. Stealing.
31. Involvements with drugs, alcohol, etc.
32. May injure other persons or self.
33. Delinquent (involvement with police).
34. Seems to have characteristics of opposite sex.
35. Others
Appendix A—Continued

IV. FAMILY DYNAMICS: (Underline correct answers or fill in correct blank)

1. Is the child adopted? From what agency or source?

2. Child (disrupts, gets along with, seems distant from) family.

3. Parents basically (agree, disagree) on how to discipline child.

4. Discipline has been (strict, lenient, inconsistent, effective, consistent).

5. What disciplinary approaches have been most effective? (Spanking, withholding privileges, grounding, verbal discussion).

6. Child's reaction to discipline: (disregards, rebels, accepts and follows through, effective for a short time).

7. Length of current marriage

8. Are marital problems currently present? Yes No. If so, are they (mild, moderate, severe)?

9. Were marital troubles present in the past? Yes No. If so, to what degree (mild, moderate, severe)?

10. Have there been previous marriages? Yes No. If so, how many for each parent?

11. Please state natural father's height weight.

12. Please state natural mother's height weight.

13. Is step-parent living in home? Yes No. How long has he/she been in the home?

14. Child's parents have problems of (alcoholism, use of drugs, chronic disease)?

15. Other children in the home have problems with (school behavior, grades, illness, emotional adjustment, getting along with family members)?

16. Does your child have difficulty getting along with his brothers/sisters? Yes No. If so, is the difficulty (moderate, severe)?

17. Where does your child sleep? (alone, with brother/sister, parents)?

V. PAST HISTORY OF CHILD

Birth History

1. Please state the number of pregnancies of client's natural mother.

2. How many living children are there?

3. List any stillbirths or miscarriages, which pregnancy, the cause, if known, and when occurred.

4. For any deceased children, give age at time of death and cause of death.

5. Did mother have care by doctor during pregnancy? Yes No. Name of doctor.

6. Did mother have any of the following during pregnancy with patient. (Please check)
   Polyhydramnios (too much fluid in uterus) Bleeding
   Kidney disease Convulsions
   High blood pressure Accidents
   Unusual emotional strain or worries Infections
   Diabetes Eclampsia
   Other

7. Did mother have a healthful diet during pregnancy? If not, what did diet include?

8. Did mother have medications, shots or x-rays during pregnancy? Type.

9. Did mother use alcohol, tobacco, or drugs during pregnancy? Yes No.

10. Were there other difficulties during pregnancy?
Appendix A--Continued

11. Was child born in hospital? Yes____ No____ Please give name and address of hospital________________________

12. Was labor induced?_________ Length of active labor_________  
   Difficult____  Easy____

13. What type of anesthesia, if any, during labor?_________ Premature?____  Overdue?____

14. Was infant full term?_________ Length of pregnancy?_________ Lbs.____  ozs.____

15. Birthweight_________ Apgar score, if known_________  

16. Type of delivery (check one):  Spontaneous____  Caesarean____  Forceps____

17. Was infant born:  Head first____  Feet first____  Breech____

18. Did infant breathe and cry immediately? Yes____  No____

19. Did infant require special treatment? Yes____  No____  Describe________________________

Appearance of Child in First Two Weeks of Life (Please check)

_____ Did the baby appear yellow (jaundiced)?  _____ Did the baby have irritability?
_____ Did the baby have difficulty breathing?  _____ Did the baby have paralysis?
_____ Did the baby have blue lips?  _____ Was the baby listless?
_____ Did the baby have convulsions or twitching?  _____ Did the baby have any obvious malformations or defects?
_____ Did the baby startle to loud sounds?  _____ Any other problems during the first two weeks of life?

Early Infancy

1. Was the infant breast fed?____  How long?____________  If formula fed, what formula?_________

2. Did he/she have problems in sucking, swallowing, drinking, or chewing? Yes____  No____

3. Was there any problem with diarrhea, constipation or colic?________________________

4. Was there normal weight gain?________________________

5. Did he/she have any unusual eating habits?________________________

Developmental History

Please give exact age at which the patient did the following. If you do not remember the exact age, give approximate age. (Check baby books.)

<table>
<thead>
<tr>
<th>Visual and Manual</th>
<th>Motor (Cont.)</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Followed object with eyes</td>
<td>Crawling</td>
<td>Age</td>
</tr>
<tr>
<td>Reached for objects</td>
<td>Stood alone</td>
<td>Age</td>
</tr>
<tr>
<td>Grasp and let go with either hand</td>
<td>Walked alone</td>
<td>Age</td>
</tr>
<tr>
<td>Motor</td>
<td>Climbed steps</td>
<td>Age</td>
</tr>
<tr>
<td>Lifted head when on stomach</td>
<td>Ran</td>
<td>Age</td>
</tr>
<tr>
<td>Balanced head when propped</td>
<td>Rode tricycle</td>
<td>Age</td>
</tr>
<tr>
<td>Sat with support</td>
<td>Which hand does the child prefer to use? Right____ Left____</td>
<td></td>
</tr>
<tr>
<td>Stood with support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rolled over (back to stomach)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sat alone</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix A--Continued

Social/Self-Help | Age | Language | Age
--- | --- | --- | ---
Smiled | | Cooed and laughed | |
Recognizes strangers | | Turned head toward voices | |
Waved bye-bye | | Babbled | |
Toilet trained: | | Said single words (other than Mama and Dada) | |
Bladder: Day | Night | with meaning | |
Bowel: Day | Night | Said short phrases | |
Fed self with spoon | | Used complete sentences | |
Drink from cup | | Reading | |
Dressed self | | | |

Previous Illnesses, Accidents and Surgery

1. Has the child ever had convulsions, seizures, or fainting spells? ____________
2. Has the child ever had serious illnesses or accidents? If so, please list. ____________
3. Has the child ever had a visual or hearing problem? Yes No. Explain ____________
4. Has child had frequent ear infections? Yes No. How many in the past 12 months? ____________
5. Has child had ear tubes? Yes No. Are tubes in place now? Yes No ____________
6. Please list all operations the child has had: ____________

Allergies: Has the child had allergies to: Inhalants Food Medication? ____________

Medication

1. Has the child ever been on medication on a regular basis for a physical or emotional disorder? Yes No. Please specify the name of the medication and how long it was used. ____________
2. Is the child currently on medication? Yes No. Specify the name of the medication, prescribing physician, and how long the child has been taking this particular medication. ____________
3. Has child had any unusual reactions or behavior after taking medication or eating certain foods? Yes No. Please describe ____________

VI. REVIEW OF SYSTEMS: Please list any other problems or complaints of a physical nature which have not been mentioned in previous questions: ____________

VII. FAMILY MEDICAL HISTORY

Have any members of the family (that is, child's parents, grandparents, uncles, aunts, brothers, sisters) had any of the following? If so, please check.

- Hyperactivity
- Learning disabilities
- Hypoglycemia
- Epilepsy (convulsions, fits, blackout spells)
- History of mental illness
- Syphilis or other V.D.
- Allergy
- Diabetes
- Cancer or blood disease
- Cerebral palsy
- Mental retardation
- Other conditions
- Other
Appendix A--Continued

VIII. SCHOOL HISTORY

1. Name of school child attends __________________________. Grade __________________________

2. School district you live in __________________________. Which one?

3. Has child repeated a grade? ________ Who?


5. Has child been tested by school? __________________________. Briefly state what you were told about testing.

6. Has child received Special Education Services? ________ Type of class or classes __________________________. Resource room ________ Tutoring ________ Special therapy ________ Other ________

7. Does child like school? ________

8. Are you satisfied with your child's progress in school? Yes ________ No ________

IX. SOURCES OF REFERENCE AND PREVIOUS STUDIES

1. Has child had diagnostic or psychological studies in the past? If so, please give the date and where the studies were done.

2. Has child had any special treatment for problem you are now concerned with? Yes ________ No ________ Explain ________

X. Please list the strengths you see in your child.

________________________________________________________________________________________________________________________________________

XI. What would you like to accomplish by coming to the Child Study Center.

________________________________________________________________________________________________________________________________________

XII. ADDITIONAL COMMENTS OR REMARKS: (Please use back of page if needed)

________________________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________________________

Data Sheet filled out by: __________________________.

Signature: __________________________.

Relationship to patient: __________________________.
Appendix B

School Information Form

P. C. #:

CHILD STUDY CENTER
REQUEST FOR INFORMATION

I hereby give my permission for (Agency, School, Hospital, etc.) to release information pertaining to medical, psychological, social, vocational, and/or educational evaluations or treatment concerning

Name /DOB

Please send this information to:

Child Study Center
1300 W. Lancaster
Ft. Worth, Tx 76102

This consent is subject to revocation by the client at any time, or without revocation, will expire three months from the date signed below.

Witness

Signature of client/legal representative

Relationship:

Date

Date Signed:

CSC 11-1-82
REQUEST FOR SCHOOL INFORMATION

When a child is referred to us because of "school problems," it is necessary that we have an accurate picture of the child in the school setting. Because of your daily opportunity to observe this child, you are in a unique and knowledgeable position to provide the information which we must have before we can see the child to begin his evaluation. Thank you for your help.

Name of Student: ___________________________ School District: ___________________________

School: ___________________________ Principal: ___________________________

Address: ___________________________ School Tele. No.: ___________________________

Grade: ______ Repeated Grades: ______ Previous School: ___________________________

Standardized test results and dated administered:

1. Intelligence:

2. Achievement:

3. Special Education Program: (Past or Present?) Specify Type: ______

4. Other Special Programs: (Specify) ___________________________

For each category that follows, place a check in the blank which best describes the child's functioning. If the child has a moderate or severe problem, please provide a short description of the child's difficulties.

1. Is it difficult to get child's attention? No Problem Mild Moderate Severe

2. Can child sustain attention long enough to finish assignment? No Problem Mild Moderate Severe

3. Is child easily distracted? No Problem Mild Moderate Severe

4. Does child act or speak before thinking? (Impulsive) No Problem Mild Moderate Severe
## Appendix B--Continued

2.

<table>
<thead>
<tr>
<th>Question</th>
<th>No Problem</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Does child have trouble sitting still? (Excessive motor activity)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Is child disruptive in classroom or playground?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Does child have difficulty awaiting turn in group activities?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Does child have difficulty organizing school work materials?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Does child need a lot of one-to-one attention (supervision)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Does child complete home assignments?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Does child respond well to discipline?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Are there problems with child's temperament?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Is child cooperative?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Does child seem motivated to achieve?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Does child have physical limitations?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix B--Continued

16. Does child have problems with gross or fine motor skills?  
   
<table>
<thead>
<tr>
<th></th>
<th>No Problem</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does child listen well?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does child seem to comprehend oral instructions?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does child have problems with oral expression?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does child have a speech problem?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does child have problems in academics?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Reading (Word recognition)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Reading comprehension?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Spelling?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Arithmetic calculation?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Arithmetic reasoning?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix B--Continued

4.

f. Handwriting?

<table>
<thead>
<tr>
<th>No Problem</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
</table>

g. Copying from blackboard?

<table>
<thead>
<tr>
<th>No Problem</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
</table>

h. Written expression?

<table>
<thead>
<tr>
<th>No Problem</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
</table>

In your opinion, is this child functioning up to capacity: Yes _____ No _____

<table>
<thead>
<tr>
<th>Level of current functioning</th>
<th>Capacity or potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>bright</td>
<td>bright</td>
</tr>
<tr>
<td>high average</td>
<td>high average</td>
</tr>
<tr>
<td>average</td>
<td>average</td>
</tr>
<tr>
<td>low average</td>
<td>low average</td>
</tr>
<tr>
<td>slow learner</td>
<td>slow learner</td>
</tr>
<tr>
<td>educable mentally retarded</td>
<td>educable mentally retarded</td>
</tr>
<tr>
<td>trainable mentally retarded</td>
<td>trainable mentally retarded</td>
</tr>
</tbody>
</table>

ADDITIONAL COMMENTS (Use back of page if necessary)

1. Teacher: (Please give names, subjects taught, school year you taught child)

2. Other Professional: Resource Teacher, Counselor, School Nurse, Principal, Other. (Please indicate which)
### Appendix C

**Table 7**

**Subjects by Age Levels**

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>18</td>
<td>22.5</td>
</tr>
<tr>
<td>7</td>
<td>13</td>
<td>16.2</td>
</tr>
<tr>
<td>8</td>
<td>17</td>
<td>21.2</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>12.5</td>
</tr>
<tr>
<td>10</td>
<td>13</td>
<td>16.2</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td>5.0</td>
</tr>
<tr>
<td>12</td>
<td>5</td>
<td>6.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>80</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
Table 8

Sex by Intact vs. Non-intact

<table>
<thead>
<tr>
<th>Group</th>
<th>Intact</th>
<th>Non-intact</th>
<th>Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>26</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>28</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Percentage</td>
<td>67.5%</td>
<td>31.3%</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

Family
Appendix E  
Table 9  
Sex by Age of Parents

<table>
<thead>
<tr>
<th>Age of Parents</th>
<th>20-25</th>
<th>26-30</th>
<th>31-35</th>
<th>36-40</th>
<th>41-45</th>
<th>45-50</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>4</td>
<td>10</td>
<td>15</td>
<td>7</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>4</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Fathers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>6</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

There were 4 missing observations for age of mothers  
There were 23 missing observations for age of fathers
# Education of Parents by Sex

<table>
<thead>
<tr>
<th>Education</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 12 yrs</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>H.S./ G.E.D.</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>1 yr college</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>1-2 yrs college</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>2-3 yrs college</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>3-4 yrs college</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B.A./B.S.</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Grad School</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>M.A./M.S.</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Ph.D.</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Med School</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Voc School</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
### Table 11

**Socioeconomic Status by Sex**

<table>
<thead>
<tr>
<th>SES</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ up to 10000</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10000–19999</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>20000–24999</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>25000–34999</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>35000–49999</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>50000–74999</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>75000–99999</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>


Appendix G

Table 12

**ANOVA-Sex by Verbal IQ**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>DF</th>
<th>( \bar{X}^2 )</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effects</td>
<td>9.2</td>
<td>33</td>
<td>.301</td>
<td>1.381</td>
<td>.156</td>
</tr>
<tr>
<td>Explained</td>
<td>9.2</td>
<td>33</td>
<td>.301</td>
<td>1.381</td>
<td>.156</td>
</tr>
<tr>
<td>Residual</td>
<td>9.8</td>
<td>45</td>
<td>.218</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\( SS = \) Sum of Squares  
\( DF = \) Degrees of Freedom  
\( \bar{X}^2 = \) Mean square

Table 13

**ANOVA-Sex by Performance IQ**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>DF</th>
<th>( \bar{X}^2 )</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effects</td>
<td>6.5</td>
<td>27</td>
<td>.241</td>
<td>.928</td>
<td>.574</td>
</tr>
<tr>
<td>Explained</td>
<td>6.5</td>
<td>27</td>
<td>.241</td>
<td>.928</td>
<td>.574</td>
</tr>
<tr>
<td>Residual</td>
<td>12.98</td>
<td>50</td>
<td>.260</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\( SS = \) Sum of Squares  
\( DF = \) Degrees of Freedom  
\( \bar{X}^2 = \) Mean square
### Table 14

**T-test-Sex by Full Scale IQ**

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>( \bar{X} )</th>
<th>SD</th>
<th>SE</th>
<th>F</th>
<th>2-tail prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>41</td>
<td>104.4</td>
<td>13.6</td>
<td>2.12</td>
<td>1.38</td>
<td>.319</td>
</tr>
<tr>
<td>Girls</td>
<td>39</td>
<td>102.3</td>
<td>11.5</td>
<td>1.85</td>
<td>1.38</td>
<td>.319</td>
</tr>
</tbody>
</table>

N = Number of Subjects  
\( \bar{X} \) = Mean  
SD = Standard Deviation  
SE = Standard Error
### Appendix H

#### Table 15

ANOVA-Sex by Arithmetic

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>DF</th>
<th>$\bar{X}^2$</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effects</td>
<td>1.05</td>
<td>10</td>
<td>.105</td>
<td>.383</td>
<td>.950</td>
</tr>
<tr>
<td>Explained</td>
<td>1.05</td>
<td>10</td>
<td>.105</td>
<td>.383</td>
<td>.950</td>
</tr>
<tr>
<td>Residual</td>
<td>18.74</td>
<td>68</td>
<td>.275</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SS** = Sum of Squares

**DF** = Degrees of Freedom

**$\bar{X}^2$** = Mean square

1 missing case

#### Table 16

ANOVA-Sex by Digit Span

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>DF</th>
<th>$\bar{X}^2$</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effects</td>
<td>3.63</td>
<td>11</td>
<td>.330</td>
<td>1.38</td>
<td>.206</td>
</tr>
<tr>
<td>Explained</td>
<td>3.63</td>
<td>11</td>
<td>.330</td>
<td>1.38</td>
<td>.206</td>
</tr>
<tr>
<td>Residual</td>
<td>14.35</td>
<td>60</td>
<td>.239</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SS** = Sum of Squares

**DF** = Degrees of Freedom

**$\bar{X}^2$** = Mean square

8 missing cases
Table 17

ANOVA—Sex by Coding

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>DF</th>
<th>$\bar{X}^2$</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effects</td>
<td>3.87</td>
<td>12</td>
<td>.323</td>
<td>1.344</td>
<td>.216</td>
</tr>
<tr>
<td>Explained</td>
<td>3.87</td>
<td>12</td>
<td>.323</td>
<td>1.344</td>
<td>.216</td>
</tr>
<tr>
<td>Residual</td>
<td>15.86</td>
<td>66</td>
<td>.240</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$SS = $ Sum of Squares
$DF = $ Degrees of Freedom
$\bar{X}^2 = $ Mean square

1 missing case
References


Goldstein, M., & Goldstein, S. (1985, October). The multi-disciplinary evaluation and treatment of children with attention deficit disorders. Symposium presented by The Neurology, Learning, and Behavior Center of Salt Lake City, Utah conducted in Dallas, Texas.


Silver, L. (1980). Attention deficit disorders (Formerly called minimal brain dysfunction or hyperkinetic syndrome): A booklet for parents. New Jersey: CIBA.


