A Comparison of the Sub-Types and Specific Learning Disabilities of Attention Deficit Disordered Children

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A COMPARISON OF THE SUB-TYPES AND SPECIFIC LEARNING DISABILITIES OF ATTENTION DEFICIT DISORDERED CHILDREN

by

George D. Pommer

A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Education
Department of Counselor Education and Counseling Psychology

Western Michigan University
Kalamazoo, Michigan
April 1986
A COMPARISON OF THE SUB-TYPES AND SPECIFIC LEARNING DISABILITIES OF ATTENTION DEFICIT DISORDERED CHILDREN

George D. Pommer, Ed.D.
Western Michigan University, 1986

Children who have an Attention Deficit Disorder (ADD) are typically reported by parents and teachers to be poor in attending and concentrating on tasks, function below academic potential, and display numerous impulsive behaviors. Although research indicates a significant number of these children may have specific learning disabilities, the identification of the specific type and an accompanying treatment modality is necessary for effective treatment.

The purpose of this research was to survey the clinical relationships between ADD, learning disabilities, and emotional problems. Subjects (N=28) were outpatient clients of a private psychiatric clinic who were free of visual or auditory handicaps. The Weschler Intelligence Scale for Children-Revised (WISC-R), the Wide Range Achievement Test (WRAT), a clinical interview and parent questionnaires were used. Analysis included the subtests of the WISC-R, WRAT, and results of the clinical interviews and parent questionnaires.

Four research questions were addressed: (a) the overlap of specific learning disabilities and emotional disturbance, (b) the frequency of learning and emotional problems, (c) the implications for treatment, and (d) the needs of each of the sub-types of ADD.
The WISC-R mean sample profile displayed a strong clinical significance in regards to a lowered attention/concentration factor. A significant number of specific learning disabilities was indicated by scores of the WISC-R subtests. Academic achievement as measured by the WRAT was not significantly below grade level. The majority of specific learning disabilities were based in the left hemisphere, indicating verbal and possible auditory processing deficiencies. ADD children rated hyperactive displayed significantly more learning disabilities and emotional disturbance than the non-hyperactive ADD child.

The data's implication for treatment indicated: (a) a need for extensive psychological and educational testing, (b) the recognition of the multiple areas requiring treatment, and (c) the necessity of a multi-modal treatment approach.
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Western Michigan University

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In memory of my beloved father,
and his uncommon virtue of
acknowledging every person's dignity.
ACKNOWLEDGEMENTS

I would like to thank various people who assisted me in the completion of this project and my doctoral degree. Their guidance and support provided me the needed initiative that has greatly influenced my personal and professional development.

Dr. Robert Betz has been a patient mentor and inspiring model throughout these years of graduate education. His insight and confidence have been valuable assets to my development.

Dr. Thomas Spahn, a good friend and colleague, deserves special thanks for his encouragement and support throughout the dissertation process. He has been extremely helpful with his cogent comments and suggestions. To a good friend and excellent clinician go my sincere thanks.

Dr. Grey Larison has been an excellent teacher and provided me considerable assistance and insight into disorders of childhood. His active intelligence and sense of humor have provided me considerable professional growth.

Finally, my wife Nancy deserves special recognition for her unswerving and quiet support throughout all my graduate education. I am indeed fortunate to have such a supportive and understanding partner.

George D. Pommer
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CHAPTER I

THE PROBLEM AND ITS BACKGROUND

Background of the Problem

Mental health professionals have identified a significant number of children and adolescents who are having difficulty in both the home environment and academic setting. Findings from studies have indicated that at least 10 percent of all school age children are not performing at an age-appropriate level because of various disorders. For example, a child may be mentally retarded, emotionally disturbed, or have an Attention Deficit Disorder (ADD). The present study is concerned with children experiencing ADD. Children with Attention Deficit Disorder are typically average or above average in intelligence but often are not functioning age-appropriately in the affective, cognitive, and behavioral areas of development.

ADD children are typically reported by teachers and parents to be poor in attending and concentrating on tasks, functioning below academic potential, and displaying numerous impulsive behaviors. They will often be aggressive and distractible, and many of the children will be described as "hyperactive." Hyperactive behavior is exasperating and frustrating to parents and teachers alike. The wish to reduce or control hyperactivity is often the reason the child is referred to health professionals. Recent research has demonstrated that the majority of children who have an Attention Deficit Disorder also present
specific learning disabilities (Silver, 1981a). For some of these children, a separate emotional disorder can be present.

Pharmacological agents have been used for many years in treating hyperactive or hyperkinetic children. The treatment of choice is the use of stimulant medication. The primary ones in use are dextroamphetamine (Dexedrine), methylphenidate (Ritalin), and pemoline (Cylert). Ritalin is the most popular choice, and studies have displayed that, when administered appropriately, it controls the hyperactivity or the distractibility, or both of the conditions, which are found in ADD. Improvement in the child's behavior, and reduction of acts that exasperate teachers and parents, often create a sense that the problem has been solved. However, these medications do not correct learning disabilities, nor do they cure any emotional or social problems, although the improved behavior may reduce these difficulties. Medication affects the children's attention span, and seems to assist the brain in compensating for what appears to be a neurophysiological dysfunction. A residual effect is not present; thus, once the medication is metabolized, the symptoms reappear.

The reported inability of children to attend and concentrate, to control impulsive behaviors, and to perform academically to ability level often results in a referral to a mental health, educational, or health professional. However, the literature which addresses these issues contains conflicting reports regarding the degree of overlap between hyperactivity and/or distractibility and learning disabilities. The significance of a child having ADD, with or without hyperactivity,
and a learning disability is not clear. In the clinical and educational arenas, it is common to observe emotional problems which are the result of academic difficulties. Research findings indicate that children with emotional difficulties which result in poor academic functioning are susceptible to developing disorders of opposition, conduct, sociopathy, and substance abuse (Laufer & Shetty, 1985).

A separate diagnosis for each aspect of the problem is addressed in the third edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-III) (1980). The diagnosis of Attention Deficit Disorder with or without hyperactivity can be made. Learning disabilities are addressed separately as specific developmental disorders. A third diagnosis can be used to distinguish an emotional problem—Oppositional Disorder, Conduct Disorder, or Borderline Personality. Clinical observations coupled with recent research findings suggest that there is a significant relationship between children who have ADD and children who are learning disabled. This overlap often extends into the area of severe emotional problems (Silver, 1981a).

ADD had many names prior to the publication of the DSM-III (1980). The terms minimal brain damage (MBD), hyperkinetic reaction, and minimal cerebral dysfunction have all been used. Academicians have used terms like dyslexia, dysgraphia, and specific learning disabilities. The term, attention deficit, was implemented because the DSM-III (1980) task force believed it better described the always present deficit in attention.

Two sub-types of ADD were specified in DSM-III (1980): Attention Deficit Disorder with hyperactivity (ADDwH), and Attention Deficit
Disorder without hyperactivity (ADDwoH). These sub-types were specified though it is not known whether they are two forms of a single disorder or represent two distinct disorders. Finally, a residual sub-type was specified for individuals previously diagnosed as ADDwh in which the hyperactivity was no longer present but other signs of the disorder persisted.

The differentiation between the hyperactive syndrome (ADDwh) and other clinical features of the disorder created a separate issue. The DSM-III (1980) distinguishes between ADD and emotional problems such as Conduct Disorder. Despite attempts by authors of the DSM-III to make this distinction, controversy still exists in the separation of these disorders.

Quay (1979) summarized several studies investigating ratings of hyperactivity and conduct disorder manifestations (such as anti-social behaviors) and concluded the disorders were probably not separate. Lahey, Green and Forehand (1980) studied interrelationships among hyperactivity and conduct disorder and concluded that attention difficulties and hyperactivity may be separate behavioral problems but hyperactivity and conduct disorder were not. The Lahey group further argued that hyperactivity does not exist as a separate diagnostic category. August and Stewart (1982) were able to distinguish between children who were only hyperactive or only aggressive. To further confuse the issue, they also found children who were both hyperactive and aggressive.

Cantwell (1973) studied the behavioral dimensions of hyperactivity and conduct disorder and found a high correlation between the two
disorders. Based on this evidence and his own study, Lahey et al. (1980) questioned whether the term hyperactivity is needed as a separate category. The issue became whether hyperactivity as a behavioral syndrome differs from problem behaviors seen in disorders of conduct.

McGee & Silva (1984) investigated behavioral dimensions of aggressiveness and hyperactivity in one-year-old boys. Contrary to earlier studies they found it useful to distinguish between aggressive and hyperactive behaviors. The study indicated that clinical pictures differed among the children. Certain children were aggressive only or hyperactive only. A combination of aggressiveness and hyperactivity were found in other children. A significant finding was that cognitive characteristics of the aggressive-only and hyperactive boys differed. The aggressive-hyperactive and pure hyperactive groups showed evidence of long-term cognitive impairments—learning disabilities—but the aggressive-only group did not display long-term impairment.

Still another area of concern must be addressed. While controversy exists regarding the separate or inclusive clinical entities of ADD, little research evidence is present regarding the two sub-types of ADD.

DSM-III (1980) established the sub-types of ADD "with hyperactivity" and "without hyperactivity." It appears most researchers and clinicians believe that the only difference between ADDwH and ADDwoH is the absence of hyperactivity in the ADDwoH sub-type. Indeed DSM-III indicates "all of the features (ADD) are the same as those of Attention Deficit Disorder with Hyperactivity except the absence of hyperactivity" (p. 44).
It is apparent this is the case as clinicians often refer to a child as having ADD without reference to the qualifiers "with" or "without hyperactivity." Even though the DSM-III makes the reference that "it is not known whether they are two forms of a single disorder or represent two distinct disorders," (p. 41) very little knowledge is available. The limited number of studies published to date on this area of ADD have reached contradictory conclusions.

King and Young (1982) found that both ADD subgroups (with and without hyperactivity) were unpopular with classmates. However, the ADDwH subgroup findings suggested that conduct problems or disorder were present while the results indicated the conduct disorder was not present with the ADDwoH. Edelbrock, Costello & Kessler (1984) studied both sub-types of ADD and found the ADDwH group more aggressive, less popular, and less socially withdrawn than the ADDwoH group. Their findings were consistent with the findings of King and Young (1982). Maurer and Stewart (1980) studied the two sub-types and concluded that they were not separate disorders. This conclusion was based on their findings that the majority of children diagnosed ADDwoH had, in this study, conduct disorders also.

It is evident from the research that much controversy exists regarding what ADD entails and the extent of other disorders also present. Some researchers believe ADD represents a number of separate disorders while others view the disorder more globally which results in treatment addressing a specific problem area.
Statement of Problem

Impetus for the present study is derived from the observation that while much attention has been given to the Attention Deficit Disordered child, each professional group has tended to view the problem from its own conceptual framework. These multiple yet separate approaches tend to confuse the situation and provide for the establishment of various diagnoses. The educational system typically addressed learning disabilities, but not ADD. Emotional problems will typically be addressed in a secondary manner or not at all by educators. Frequently, the medical community addressed the pharmacological aspects of ADD. The psychological community typically works with the emotional disorder present but does not always appreciate the full spectrum of ADD. The problem, then, is that separate areas have been investigated in-depth, but the related clinical entities of this disorder are often treated separately.

The purpose of this research was to explore clinical relationships between ADD, learning disabilities, and emotional problems. The frequency and extent of this overlap was investigated using the Wechsler Intelligence Scale for Children--Revised (WISC-R) and the Wide Range Achievement Test (WRAT). These tests were used to assess the extent and nature of the overlap of disorders once the child has been diagnosed as having ADD. The children sampled were voluntary outpatient mental health referrals whose parents requested evaluation. The diagnosis of ADD occurred by meeting the DSM-III (1980) criteria of ADD following the
taking of a social history, psychological testing, completion of a parent questionnaire, and a psychiatric interview. The thoroughness of the evaluation in addition to the recognized expertise of the diagnostic team in the area of ADD will provide an accurate representation of the ADD population.

The study also investigated issues of treatment regarding children having ADDwoH and ADDwH. A model protocol that recognizes and delineates possible differences between the child with hyperactivity and the child with ADD only was considered a valuable contribution to treatment and program planning for all ADD children.

An additional purpose for conducting this study was to clarify the entire area of problems, deficiencies, and characteristics of the ADD population with reference to treatment issues. A goal of this research was to expand the use of the WISC-R subtest scores, the Bender Gestalt and Wide Range Achievement Test with clinical observations to provide more complete and comprehensive treatment. A model protocol was considered a valuable contribution to treatment and program planning for ADD children.

Limitations of the Study

A limitation of the study was the amount of generalization which could be made to other populations due to the amount of empirical data required to measure the relationship between the diagnosis of ADD and characteristics of the sample population as measured by the WISC-R subtest and the WRAT.
The use of a multi-disciplinary team using DSM-III (1980) diagnostic criteria for the established diagnosis of ADD represents the second limitation of this study. While this limitation was somewhat contained by the presence of standardized testing, subjective reports by teachers and parents, both written and oral, influence the diagnostic team. However, these limits are present in all diagnoses of ADD.

Significance of the Study

The goal of this study was to add information to the present body of literature serving the complete treatment needs of the ADD population. Children who have the disorder are often subjected to treatment that deals only with specific aspects of the disability.

Silver (1981b) stated that the multiple approaches and various diagnostic labels applied to ADD children pose major problems in reviewing the literature and in understanding claims about different treatment efforts. In DSM-III (1980), children can be classified Attention Deficit Disorder or learning disabled--Specific Developmental Disorder. However, previous research still suggests that there is much overlap between these disorders in terms of clinical relationships.

Laufer and Shetty (1971) related the effects learning disabilities have on ADD children. Problems include lowered self-esteem, poor peer relationships, oppositional behavior, and truancy. The child's probable learning disability is to some degree held responsible for certain aspects of present emotional disorders. However, a multi-disciplinary approach is referred to as being helpful in addressing all aspects of the disorder.
Edelbrock et al. (1984) provided some empirical validation for the ADDwH and ADDwoH syndromes. Factor analysis of the Teacher Child Behavior Profile, revealed two factors labeled "inattentive" and "nervous-overactive." These factors corresponded with the clinical description described in DSM-III (1980). Edelbrock et al. compared boys diagnosed ADDwH and ADDwoH, and, found that both groups of ADD boys scored higher on the inattentive scale than non-ADD boys. The boys who had ADDwH and those who were ADDwoH displayed elevated and statistically equivalent scores on the inattentive scales. However, the ADDwH group scored significantly higher on the nervous, overactive scale. The ADDwH boys were rated by teachers as more unpopular, aggressive, and self-destructive than the boys diagnosed ADDwoH. The ADDwoH children were described as being less happy and both sub-types were associated with academic failure.

Lahey et al. (1980) compared both groups of ADD children to matched normal control children. The study found the ADDwH group had aggressive conduct disorder, lack of appropriate guilt and unpopular. They were also performing poorly in the academic area. The ADDwoH group was shy, anxious, and withdrawn and also doing poorly in school. The group was also unpopular but less so that the ADDwH group. While both groups displayed some degree of depression and poor self-concept the specific area of low self-esteem differed for the two groups. The two groups had poor self-concepts related to academics. The ADDwH group displayed low self-esteem in the areas of popularity and behavior. The ADDwoH group had a low self-concept in regards to anxiety, appearance, and happiness. Lahey et al. concluded that ADD with and without hyper-
activity should be considered different disorders rather than sub-types of the same disorder.

Reports as to the incidence of ADD in the United States ranged from 4 to 20 percent of the school age population. DSM-III (1980) cites a conservative number as 3 percent of school age children. This wide range of reported incidence probably reflects a number of variables in the epidemiological data. Some studies equate learning disabilities with a hyperkinetic syndrome while other studies approach only hyperactivity as a factor. Still other studies call for more than one factor to be present, such as intelligence, complicating central nervous system conditions, or impulsive behavior. Inconsistency in procedures creates frequent differential diagnostic problems and reinforces the need for a consistent, complete, and accurate assessment and therapeutic approach, and lends to the significance of the study.

Research Questions

The initial research question of this study was: "Do children who have Attention Deficit Disorder display a significant overlap of problems in areas of learning disabilities and emotional problems, and how can these be approached in clinical relationships?" The presence and degree of ADD was measured by psychological testing, individual histories, parent and teacher questionnaires, and psychiatric examination. The scores on the Weschler Intelligence Scale for Children--Revised assessed with special consideration given to sub-test relating to verbal abilities, perceptual/analytic abilities, and degree of attention and
concentration. The WISC-R was used because of its accepted validity and intrinsic normative data. The WRAT was used to assess current academic functioning.

The second research question was: "What was the frequency with which children with ADD also had learning disabilities and, conversely, which children who were learning disabled also had ADD?" In addition, what was the frequency of emotional problems (conduct disorder, oppositional disorder, etc.) in each group? Previous research indicated that there was a frequent clinical association between ADD and learning disabilities and emotional problems.

A third research question was: "What were the implications for the complete treatment needs of children diagnosed ADD?" Psychological, cognitive, and social-familial dynamics would be assessed by the WISC-R, WRAT, questionnaires, and clinical interviews. These were used to make meaningful inferences about the subject's psychological profile and needs. A model treatment protocol was proposed.

A fourth research question was: "What were the implications of ADDwH and ADDwoH and do these sub-types require different treatment approaches?" Psychological, cognitive, and social functioning of both groups were assessed by the WISC-R, WRAT, questionnaires, and clinical interviews. A limited number of studies suggested that these two sub-types of ADD might be different disorders. This research question will be used to support or refute this controversy.
Overview of Study

Mental health professionals are referred a significant number of children and adolescents who are having difficulty in the home and school environment. Various disorders may be present, among them Attention Deficit Disorder. An ADD child is typically of average or above average intelligence but functioning poorly in cognitive, behavioral, and social areas of development.

Considerable literature is available concerning ADD children which refers to the aspect of the attention deficit, the hyperactivity, and distractibility. The literature also indicates that many ADD children have learning disabilities and, at times, significant emotional problems. The purpose of this research will be to survey the overlap and clinical relationships of these separate disabilities which are often contained within ADD. WISC-R profiles, WRAT profiles, the child's history, parent and teacher questionnaires and psychiatric and psychological clinical interviews will be the primary sources of information.

In the second chapter, the professional literature concerning ADD will be exhaustively reviewed. Major studies reporting history, definition, epidemiology, cause, clinical features, diagnosis, and treatment will be discussed. The third chapter will describe the survey research design, operational definitions, and operational hypotheses along with the means for data collection and analysis. The fourth chapter will describe and summarize the collected data. The final chapter will discuss the research questions and the data's implication
for diagnosis and treatment strategies. It is projected that this information will be a valuable asset in diagnosis and treatment approaches for ADD children.
CHAPTER II

REVIEW OF THE LITERATURE

Research concerning hyperactive children has been discussed from behavioral, medical, and psychological viewpoints. The disorder of hyperactivity is one of the most studied of all childhood disorders. Early writings were influenced by a medical viewpoint and are reviewed in the first section of this chapter. Research addressing etiological and terminology is reviewed prior to the section on treatment approaches. Writings that occurred at the time new treatment modalities were proliferating suggesting other modes of treatment for the hyperactive child is reviewed in the section on treatment. The varied themes that emerged from the most recent writings are presented in the section on recent research.

Early Research

The disorder was first described in children who had developed behavioral problems after infection or injury of the brain. The World War I epidemic of vonEconomo's encephalitis caused many children to be brought to physicians for behavior abnormalities. Hohman (1922) reported that after recovery from the illness, some children displayed radical changes in behavior. These were characterized as restless, quarrelsome, irritable, and disobedient. Bond (1932) described these children as emotionally unstable, truant, and lying. Stocker and Ebaugh (1924) produced a study that described the development of behavioral
problems following head injuries. Blau (1937) reported psychological changes in twelve cases. He reported that hyperkinesis was the outstanding symptom in addition to stealing, aggressiveness, and emotional instability. Thurston, Middelkamp & Maso (1955) associated the syndrome with lead poisoning. Strauss & Lehtinen (1947) noted that hyperactivity and impulsivity were more common among brain damaged mentally retarded individuals than among non-brain damaged individuals. He postulated such traits may be due to "minimal brain damage" (MBD). An earlier finding by Bradley (1948) established that hyperactive children responded to amphetamines and these became the treatment of choice. Methylphenidate (Ritalin) quickly established itself as the most commonly used drug. The drug improved attention, behavior, and it was thought also to improve academic performance. It did not lead to complete improvement and experts began to search for a more complete treatment modality.

Theories on Etiology

Knobel (1958) found that approximately fifty percent of children referred with MBD and school difficulties had mild (soft) signs of neurological damage. This correlated closely with a study done by Daryn (1960) that found 50% of MBD children had "organic" characteristics. A notabled deficiency in both the Knobel (1958) and Daryn (1960) study was the lack of a control group. Therefore, the prevalence of mild neurological or organic signs in the normal population was not reported.

Knobloch and Pasamanick (1965) demonstrated an association between prematurity, prenatal difficulties, and perinatal complications and
behavioral and neurological problems in children. These included behavior disorders, reading problems, epilepsy, and mental deficiencies. The authors felt that there was strong circumstantial evidence that behavior disorders seen in children associated with pre- or peri-natal complications were caused by small degrees of brain damage. This study was one of a large number of studies regarding the influence of prematurity and complications of pregnancy, birth or early development.

The relation between problems and later development received much attention. An association between complications of pregnancy and birth and MBD was felt to be present. However, it was also evident that most infants at risk did not later display symptoms of MBD. Why certain children were affected and others were not remained to be learned.

Though actual brain damage in MBD individuals could not be shown to exist, Clements (1966) concluded the disorder reflected a neuro-physiological process rather than brain damage. He characterized it as "minimal brain dysfunction." The dysfunction consisted of hyperactivity, impulsivity, learning disorders, and emotional problems. Werry (1968) studied a group of MBD children in a child guidance clinic and found sixty-four percent had abnormal EEG's or complications during early (pre- or peri-natal) development. Abnormal neurological signs were also present. A factor analytic study (with no control group) displayed two neurological factors which were uncorrelated with cognitive dysfunction and psychopathology in the child. Werry (1968) concluded the data refuted the brain damage theory and felt the majority of hyperactive children did not suffer from brain damage. This study reinforced
findings by Rutter and Graham (1968) that most brain damaged children did not present with the hyperactive symptomatology.

Research done in the 1960s provided evidence that the MBD syndrome possibly had several separate etiologies. Wender (1971) described six possible etiologies:

1. Organic brain damage
2. Genetic transmission
3. Intrauterine variation in biological development
4. Fetal maldevelopment
5. Psychogenic determinants (deviant psychological development)
6. Interaction of subthreshold amounts of the etiological components (p. 71)

Wender (1971) related that clinical observations displayed possible genetic transmission. He observed pronounced clustering of MBD in the same family. There also appeared to be a higher prevalence of severe psychopathology (schizophrenic, depressive, sociopathic) among the parents of MBD children who did not present a history of brain damage. Wender (1971) also had observed a few instances of the syndrome in foster children whose biological parents had been psychotic.

While there were no studies at this point in history that documented his clinical findings, data were available that displayed a familial clustering in dyslexia (a specific reading disorder). This disorder was often associated with (overlapped) the MBD syndrome. Hallgren (1950) had studied 112 cases of dyslexia and found that ninety-three percent of the parents or siblings of the referred children had problems similar to dyslexia while in the control group only ten percent displayed problems. He found that thirty percent of the dyslexic children were
characterized as aggressive, and oppositional, and experiencing difficulties in concentration.

Frisk, Wegelius, Tenhunen, and Hortling (1957) found dyslexia in sixty-five percent of the parents of teenage dyslexics. He also found symptomology of MBD evidenced by clumsiness, distractibility, and enuresis.

A nature-nurture issue regarding the etiology began to develop at this point in time. It was questioned whether the data indicated transmission of aberrant rearing techniques or genetic transmission of an organic neurological deficit that was associated with psychopathology in the parent. Rosen, Downs & Swartz (1968) had found that mothers of premature children (who were at greater risk for MBD) and physically abused children were often from lower socioeconomic homes. Additionally, parents of lower socioeconomic status displayed above average prevalence of psychopathology.

Safer (1969) addressed this controversy by studying siblings of MBD children who had been reared separately in different foster homes. The study found that approximately fifty percent of the full siblings had hyperactivity, a short attention span, and behavioral problems. Only fourteen percent of step-brothers or sisters (half siblings) were characterized in a like manner. The study suggested the presence of genetic factors in the MBD syndrome. Safer (1969) hypothesized that genetic transmission was "poly-genetic" (affecting one child to a greater degree than another of the same family) and believed it was caused by multiple interacting genes.
Wender (1971) also suggested a non-genetic but rather, a congenital prenatal variation that played a role in MBD. This variation was viewed as separate from the genetic transmission theory. He cited studies of premature infants and monozygotic twins in which increased incidence of MBD was seen in the smaller members of these groups. Wender (1971) cited a study by Williams (1969) of monozygous quadruplets in armadillos. Williams (1969) found that at birth the brain weights of the armadillo quadruplets varied by sixty-three percent. He also observed brain amino acids differed up to fifty percent and brain norepinephrine levels varied up to sixty percent. While an obvious weakness of this study is the conceptual gap between brain amines and norepinephrine of armadillos and man, the study did provide the suggestion of a congenital, nongenetic variation in the chemical precursors of these amines.

An additional, separate etiological factor of MBD cited by Wender (1971) was fetal maldevelopment. A study by Daryn (1960) indicated that from a sample of 170 children seen at a child guidance clinic, eighty-four were found to have organic neurological signs on the basis of psychological tests. Wender (1971) concluded from this and other studies that children with increased anatomical abnormalities displayed an increased prevalence for disorders such as MBD.

Wender (1971) also studied the possibility of psychogenetic determinants as they related to the MBD syndrome. His research responded to a controversy that existed at this time regarding the possibility of "psychogenic (environmental) hyperactivity." Wender (1971) stated that
while severe deprivation and psychological trauma in children can create a "neurotic hyperactivity," the manifestation of MBD symptoms differed with environmentally deprived children. "Neurotic hyperactivity" was characterized by the lack of evidence for brain injury, no evidence of hyperactivity in early infancy, and behavioral patterns that were the result of coping with neurotic conflicts. The children who displayed MBD behaviors were felt to do so as a defense against depressive symptoms, low self-esteem, or loss of a loved one. An insightful argument that Wender (1971) proposed was that depressive symptoms in MBD children were a reaction to the psychological problems that result from having the disorder. Therefore, MBD created a fertile ground for psychological problems. Conversely, psychological problems did not cause MBD. While psychological stress could certainly enhance MBD behavior, Wender (1971) argued other predisposing factors (possibly physiological) must exist.

Wender (1971) concluded that the MBD syndrome may be "multidetermined." He felt that studies and clinical observations indicated an interaction of relatively small deviations such as brain damage, genetic transmission, fetal maldevelopment, and psychological trauma could produce the MBD syndrome. Therefore, "inadequacies" in different areas of development (both physiological and psychological) could produce MBD. The importance of this observation was the reference to the subtle but complex interaction between physiological characteristics and their interplay with psychological development of the child.
Theories on Natural History

The natural history of the ADDwH syndrome changed over the years as more data became available. The earliest view was a "developmental delay" theory. It was postulated that ADD children would "grow out of the problem" about the time of puberty. A second theory postulated that symptoms of the ADD syndrome were modified but continue into late adolescence and adulthood. The provision for the diagnosis of ADD residual state in DSM-III (1980) addresses this concept. A third theory developed and postulated that the ADD with hyperactivity syndrome could cause serious types of psychopathology in adolescence and adult life.

Gittelman, Manuzza, Shenker, and Bonagura (1985) conducted a study on longitudinal assessment of hyperactive children. The current DSM-III (1980) diagnostic criteria was applied to outcome status of the children. The results suggested that the late adolescent psychiatric status of the children was significantly worse than that of nonhyperactive children. Approximately one third of the group revealed a continuation of the full syndrome.

The study found that if the original symptoms of the hyperactivity had not remitted, the chances of developing a conduct disorder were almost fourfold greater that if the hyperactivity had remitted. Overall, the results of the Gittelman et al. (1985) study indicated a reduction in functional problems for hyperactive children between average ages of thirteen to eighteen years.
However, Hechtman, Weiss, Milroy, and Perlman (1985) found an excess of antisocial personality disorders in adults who were hyperactive children. Results of a study by Cantwell (1985) indicated that a substantial number of children experience an abatement in symptoms with age. He also found a significant number demonstrate symptoms in later life and are at risk for the development of antisocial behavior and (to a lesser extent) substance abuse.

Terminology

The voluminous research that occurred in the 1950s and 1960s provided a setting for greater insights into MBD in the 1970s. The research of the 1950s and 1960s had effectively displayed that the syndrome of MBD was not due to early or traumatic experiences in early childhood. Prior to 1950 psychoanalytic thinking had prevailed in the approach to childhood emotional problems. The rapid discovery of anti-psychotic drugs and technological advances in the chemistry of the brain led to expanded thinking regarding certain psychiatric disorders. An interest in the relationship between the internal (biological) environment of the person as well as the external environment grew in popularity. The external environment (parents, siblings, culture) were still viewed as very important in the development of the child. However, the external environment was no longer seen as the sole factor in the etiology of psychological problems.

The similarities between behavioral problems exhibited by children with a known brain malfunction (dysplasia or brain damage) and the large
group of children with problems of behavior or learning had led to the concept of "minimal brain dysfunction."

Bender (1959, 1961) provided enormous contributions to the knowledge of the relationship between the brain and behavior in children. Her studies and testing established the occurrence of "soft" neurologic disturbances such as clumsiness, confused laterality, and nystagmus. Thomas, Chess, and Birch (1968) demonstrated how temperament of the child affects relationships with other family members in an ongoing basis. They believed temperament was an inborn trait rather than the sole result of a rejecting mother who caused psychological impairment to the child. The increasing sophistication of addressing etiological factors began to foster better and more extensive research in regards to etiology and treatment of the MBD syndrome. This research created a major change in how professionals viewed certain childhood disorders. By 1970 many pediatricians, child psychologists, and psychiatrists had accepted the possibility that a child may have a minimal brain dysfunction.

The early research also created many terms that were often used synonymously with the term MBD. These included terms such as "brain damage syndrome" (Strauss and Lehtinen, 1947), "minimal brain dysfunction" (Clements, 1966), and "minimal brain damage" (Gessel & Amatruda, 1947). Individual investigators used the different terms in widely divergent ways and, concomitantly, created difficulty in comparing research findings. Also, the designations implied brain damage as being present to an unknown degree in all MBD children.
The publication of the second edition of *Diagnostic and Statistical Manual of Mental Disorders* (1978) used the label "Hyperkinetic Syndrome of Childhood" for children who displayed hyperactive behavior and MBD characteristics. This classification led to increased studies in regard to hyperactivity.

For example, Werry (1972) found that while some hyperactive children have brain damage, the majority did not. Likewise (Rutter & Graham, 1968), established that most brain damaged children did not present the hyperactive child syndrome.

The term "brain dysfunction" became viewed as a more accurate term than "brain damage" in describing children with more subtle neurological signs. Rutter et al. (1968) reported that the more subtle defects in coordination, perception, or language were only occasionally associated with actual damage to the brain. Cantwell (1973) found that many hyperactive children did not demonstrate even subtle neurologic signs. Therefore the terms "brain dysfunction" and "minimal brain damage" became more inappropriate as labels for the disorder.

Research continued to indicate that the term "minimal brain dysfunction" was not an accurate label for children experiencing hyperactivity, learning disabilities, and distractibility. Central nervous system dysfunction appeared to be involved, however, it became apparent that emotional problems occurred in these children that were a result of frustrations and failures experienced in school and with family and peers. Research was also providing insight concerning children who displayed distractibility and impulsive behaviors but were not hyperactive. Some children displayed one problem, others displayed two or more (Silver, 1981b).
The third edition of the Diagnostic and Statistical Manual of Mental Disorders (1980) approached this problem by requiring a separate diagnosis for each aspect of the problem the child was experiencing. A child or adolescent could be classified as having a learning disability (specific developmental disorder), or as being distractible or hyperactive or both. This was labeled "attention deficit disorder" (ADD). A third diagnosis could be used to clarify any related emotional disorder (conduct disorder or oppositional disorder).

DSM-III (1980) differentiated ADD into two subgroups: Attention Deficit Disorder with Hyperactivity (ADDwH) and Attention Deficit Disorder without Hyperactivity (ADDwoH). The establishment of subcategories permitted the clinician to indicate the presence or absence of hyperkinesis. It also assumed the disorders of the two subgroups were the same, but one subgroup was hyperkinetic.

Pharmacological Treatment

An epidemic of viral encephalitis in 1937 caused a significant number of parents to refer children to pediatricians. Central among the complaints was the hyperactivity and attention problems their children were experiencing. A pediatrician, Bradley (1948), tried a stimulant medication (methylbenze-thanamine) and found that this medication decreased major activity and improved attention. The stimulant medications have been used since that time. The primary stimulant medications used have been methyphenidate (Ritalin), pemoline (Cylert), and dextroamphetamine (Dexedrine). Ritalin has been the most popular choice
and studies have displayed that it improves the hyperactivity or the
distractibility or both of the conditions (Conners and Eisenberg, 1963;
Conners, 1969).

The early 1960s was a time in history that treatment drugs became
an established part of medical treatment. It was concluded that a
"stimulant is the drug for the hyperactive child" (Fish, 1971, p. 196).
This attitude of receptivity created a climate in which indiscriminate
use of medication occurred. The use of stimulants to treat hyperactiv­
ity became the subject of controversy and debate.

Studies (Hentoff, 1972; Maynard, 1970) reported that as many as
ten percent of all elementary school children were being given stimulant
medication for behavior disorders and academic difficulties. The con­
troversy regarding stimulant medication escalated despite subsequent
statements that the reportedly high prevalence rates were in error.

The lack of consensus on the issue of stimulant medication was due
in part to the inadequate and conflicting research of the 1950s and
1960s. This resulted in reactions that were extremes of approval or
disapproval. Wender (1971) stated: "To those who have seen the results
of such treatment (stimulant medication) in minimal brain dysfunction
children, the present limited use of drug therapy is as upsetting as it
is unbelievable" (p. 130).

Walker (1974) stated, "I have never prescribed stimulants for these
children, and I never will. Stimulants merely mask the symptoms without
curing the disease" (p. 91).
A Congressional investigation ensued and in 1971 the Department of Health, Education and Welfare and the Office of Child Development convened a panel to investigate. The findings of the panel were that in sixty to seventy percent of hyperactive children, the hyperactivity will respond to stimulant medication.

The controversy of the late 1960s and early 1970s had some very beneficial effects on the field of knowledge regarding ADD children. It became clearer that there were many different kinds of hyperactive children and stimulants were beneficial for only certain children. It became more apparent that stimulant medication was not a cure-all and additional remediation was necessary to address the many needs of the ADD child.

**Stimulant Drug Effects**

Kinsbourne and Swanson (1979) provided empirical support for a generalized overall improvement in about two-thirds of hyperactive children who were given stimulant medication. Barkley (1977) found that three out of four children respond positively to stimulant medication. Some children were found not to respond to the first trial of medication but did respond on the second administration (Weiss, 1975). This delayed response was suggested to be due to metabolic change during the period between administration of the medication and the first positive results (Wender, 1971). One-third to one-half of the children experienced immediate and positive response to the medication (Fish, 1971). The remainder of the children displayed moderate responses.
Three kinds of negative responses to medication were reported (Gross and Wilson, 1974):

1. The symptoms were exacerbated but disappeared within forty-eight hours when the medication was discontinued.

2. The child became withdrawn and appeared depressed. Social relations began to deteriorate. This behavior stopped when medication was withdrawn.

3. A rapid tolerance for the medication occurred. A different medication was sometimes successful. (p. 87)

Evidence from the studies have displayed that the stimulant medication has a positive effect on disruptive, impulsive, and socially inappropriate behaviors (Barkley, 1977). Stimulants have not been effective in improving performance on intelligence tests (Barkley, 1977). Connors and Werry (1979) found there was a general improvement to self-regulate behavior, particularly in structured settings. The quality of social interactions with parents and teachers also improved with medication (Barkley & Cunningham, 1979; Humphries, Kinsbourne, & Swanson, 1978). Douglas (1972, 1980) found medication increased the child's ability to attend to tasks and inhibit impulsive behaviors. Cantwell and Carlson (1978) and Barkley (1977) provided evidence of improvement in memory and learning for ADD children placed on stimulant medication. However, long term gains in social, academic, and cognitive functioning have not been found (Barkley, 1977; Cantwell & Carlson, 1978).

While the positive effects of individualized and closely monitored administration of medication became apparent it was also realized that there are areas the medication does not address. Certain tests (Conners,
1969) displayed an improvement in impulsivity but did not show changes in established patterns of disabilities. It was established that the drug may reduce aggressiveness and excitability but will not change the child's feelings about themself. Stimulant medication will not alter perceptual problems and learning disabilities (Conners, 1969). Attention span may be improved, however, specific remedial help is still needed.

Barkley and Cunningham (1978) surveyed 17 studies that reviewed the effects of stimulant medication on academic achievement. Though the studies had varying methodological procedures it was established that of 52 dependent achievement measures, 43 were not improved by stimulant medication. Even when drug effects were present they were scattered. Barkley and Cunningham (1978) concluded that attention was improved with medication but achievement was not. They speculated that stimulants were unable to influence etiologic variables.

Long term studies have failed to display achievement gains (Werry, 1977; Minde, Weiss, & Mendelson, 1972; Huessy, Metoyer, & Townsend, 1974). Cantwell and Carlson (1978) described the methodological difficulties of such a study and concluded a drug-achievement effect has neither been proven or disproven.

**Psychological Treatment**

The research regarding the long term effects and the side effects of stimulant drugs also created the need to look beyond medication to the behavioral strategies.
Roche, Lipman, Overall, and Hung (1979) found that long term use of stimulant medication reduced physical growth moderately when used at high-normal dosage levels. The initial study that pointed to growth suppression by stimulants was performed by Safer and Allen (1973). Methyphenidate was found to provide little growth retardation; the effects were more pronounced for dextroamphetamine.

Arnold, Wender, McCloskey, and Synder (1972) found the use of amphetamines and methyphenidate increased blood pressure or pulse rate. Allen and Safer (1979) reported that tolerance develops within two to five months and other studies have confirmed these findings (Weiss, Kruger, Danielson & Ulman, 1975).

The behavioral repertoire of hyperactive children and their responses to the environment also created the need for behavioral intervention. The fact that the children interact with a complex environment (family, peers, school) displayed a need for management controls. Also, a proportion of the hyperactive population did not respond to medication (Jacob, O'Leary, and Rosenblad, 1973). Therefore, many problems emanated from the child's environment that drug management could not control.

One of the major behavior therapy techniques, operant conditioning, has been used with ADD children. The main thrust of operant conditioning is to eliminate maladaptive behaviors, remedy behavior problems, and strengthen existing positive behaviors. Allen, Henke, Harris, Baer, and Reynolds (1967) used the ABAAB procedure of operant conditioning to increase the attention span in a hyperactive four year old boy.
The goal was to increase the amount of time attending to a task using teacher attention as the reinforcement. The reinforcement was contingent on continuous attention of one minute of activity. Overall the child's attending behaviors were extended successfully.

Several other studies have proven the efficacy of operant conditioning in hyperactive children (Barnard & Collar, 1973; Frazier & Schneider, 1975; Pihl, 1967). The majority of studies have been single-subject design so the procedure can be precisely designed for the environment and problems of the individual.

Behavioral intervention also began to be used in the home. Frazier and Schneider (1975) taught reinforcement procedures to parents of a three year old boy to eliminate his hyperactivity before and after meals. The Werry-Weiss-Peters Activity Scale (Werry, 1968) was used to establish a baseline of hyperactivity. The child's behavior improved steadily and hyperactivity before and after meals decreased. Barnard and Collar (1973) were successful in training parents in the use of operant conditioning to reduce hyperactive behaviors.

Treatment evolved into the next logical step of combining stimulant medication and behavior modification. Firestone, Kelly, Goodman, and Davey (1981) reviewed the literature of studies comparing behavioral therapy to pharmacological intervention and found three paradigms prominent in the literature. These were: systematic case studies (Pelham & O'Leary, 1978; Stableford, Butz, Hasazi, Leitenberg, & Peyser, 1976); single subject experiments (Ayllon, Layman, & Kandel, 1975; Shaft & Sulzbecker, 1977) and group outcome studies (Wolraich, Drummond, Saloman, O'Brien, & Sivage, 1978; Christensen, 1973).
Firestone et al. (1981) reported the procedures of these studies required student-teacher ratios of one-to-one to one-to-three. The programs were also rather elaborate and required extensive training. An additional criticism was the selection procedure on many of the studies was questioned as was the proper administration of the groups on stimulant medications. These studies also displayed lack of generalization and follow-up data.

Firestone et al. (1981) found the most meaningful data comparing the effectiveness of behavior therapy and stimulant medication on hyperactive children from the group outcome studies. These studies indicated that stimulant medication was the most effective treatment when the goal was improved behavior.

The authors summarized behavioral and pharmacological interaction studies as lacking in realistic clinical procedures and not cost-beneficial in implementation. They also cited a paucity of data concerning the long term effect of treatment on the behavior and academic progress of the children studied.

Firestone et al. (1981) presented research comparing the merits of behavioral and pharmacological intervention with hyperactive children. The study reported the results of a two-year study of 80 hyperactive children and their families. Included in the data collection were parental characteristics, demographic data, medical data, educational progress and behavioral data. Since this was an ongoing study, they reported only academic achievement and behavioral data.
The findings of the Firestone et al. (1981) study lended significant knowledge to the existing body of literature. They found that parent training did affect some positive change in the behavior of hyperactives. Stimulant medication was also demonstrated as being effective in addressing the problems manifested by hyperactivity. Academic achievement was found in all groups whether medication was used or not used. However, the academic gains were greater for the groups with medication. Attention and impulse control also improved for all groups. The authors also concluded that the improved attention and impulse control would disappear once the children were no longer on medication. This supported an earlier study by Firestone, Wright and Douglas (1978).

An interesting development in the study was the replacement of medication with a placebo in one group. This was done without the parents or teachers knowledge. The parents and teachers of 7 out of 8 of these children complained about the reemergence of impulsive and disruptive behaviors. The children were placed on medication again and the behaviors improved.

Firestone et al. (1981) concluded that both behavioral and pharmacological interventions were of some benefit to the child. They believed that an effective intervention would include a combination of therapeutic techniques using medication, parent training and educational services.
Multi-Dimensional Treatment Approaches

The Firestone et al. (1981) study strongly reinforced a study done by Satterfield, Cantwell, and Satterfield (1971). This study was the first prospective long term study of hyperactive children that evaluated all subjects from a multi-dimensional viewpoint. The authors formulated a multi-modality treatment program for each child and family. Eighty-four subjects were used in the study. Behavioral changes at home and at school were measured by the Connors Teacher Behavioral Rating Scale and Connors Parent Behavioral Rating Scale.

All factors of both rating scales were statistically significantly improved at the end of one year of multi-modality treatment. The greatest improvement was on the hyperactivity and inattentive factors. Significant improvement was also found on conduct problems and tension-anxiety factors. Parents reported significant improvement on the hyperactivity, learning problem, and conduct problem factors.

The children were rated a moderately to markedly improved on a global rating scale at the end of one year. They were found to be improved behaviorally as rated by teachers, physicians, and parents. Significantly, the children themselves reported they had improved. Better self-concepts and peer interactions were present and less anti-social behavior was reported. The children felt they were able to pay better attention at school.

The outcome of this study differed from earlier long term studies. Weiss et al. (1975), Huessy, Metoyer, and Townsend (1974), Quinn and Rapoport (1975) conducted long term studies and did not find
significant improvement in academic performance, self-concept, and attention problems. However, the subjects in these studies were not as heterogeneous in regards to selection as the Satterfield et al. (1979) study. Also, multi-modality treatment was not used in the earlier studies.

The significance of the Satterfield et al. (1978) study was that multi-modality treatment had been employed with tentative but positive results. Prior to this, long term studies had used treatment of stimulant medication only or medication combined with behavioral therapy. The Satterfield et al. (1979) study had introduced the additional treatment modality of psychoeducational intervention. The multi-modality, individualized treatment plans used for each child had achieved positive results. The Satterfield et al. (1979) study directed attention to the possible use of cognitive training for ADD children. Additionally, it more clearly delineated the learning disability aspect of the disorder.

That children with learning disabilities often had attentional deficits had been well documented by earlier literature (Dykman, Ackerman, Clements, & Peters, 1971; Hallahan & Reeve, 1980; Krupski, 1980). These authors had suggested that the learning disabled child was ineffective in attending to relevant stimuli. The lack of attention was thought to produce the learning disorder (Hallahan, 1975; Ross, 1976). Douglas and Peters (1979) implied that children not attending and selecting relevant tasks developed limited response repertoires that impeded later learning. An attentional deficit was present with poor impulse control so that children failed to reflect and consider
alternatives. Rather, they seized upon the first response that came to mind (Brown and Quay, 1977; Quay and Brown, 1980).

Douglas and Firestone (1975) expressed concern regarding the exclusive use of contingency management to treat attentional disorders. They believed that positive reinforcement actually increased impulsivity and attracted attention away from the task.

Earlier studies employing cognitive approaches with normal children had been effective in increasing attention and reducing impulsivity. A great deal of studies had addressed cognitive training with learning disabled children and the results were speculative (Reed and Hresko, 1981). It was also difficult to generalize the results from laboratory to classroom settings.

Brown and Alford (1984) investigated the use of cognitive training procedures for ameliorating attentional deficits in twelve year old learning disabled children. The training consisted of matching, component and detail analysis training, memory tasks, and visual sequence training. The study provided substantial evidence of cognitive training ameliorating attentional difficulties of learning disabled children. It was also found that their academic performance improved. Small sample size precluded wide generalization; however, it did suggest cognitive training techniques were effective.

Copeland and Weissbrod (1983) compared the maturity and style of problem solving of learning disabled (LD) children to that of children not learning disabled. The LD group also contained a sub-group of hyperactive children. The authors found that LD children did not
perform as well as the non-LD children on tasks requiring internal strategies or plans. Hyperactive, LD children and non-hyperactive, LD children performed the same with one notable exception. The hyperactive LD children used a less mature strategy than the non-hyperactive LD children. Also, the greater the behavioral problems present the less mature was the cognitive strategy.

Abikoff and Gittelman (1985) studied the use of cognitive training with hyperactive children receiving stimulant medication. They examined the advantage of a 16 week cognitive training program to improve problem-solving style. Their findings indicated that the training program did not create strategies that enhanced academic performance. Additionally, it did not improve behavior of children. The authors also concluded that stimulant dosages could not be lowered as a result of cognitive training. This study reflected the findings of earlier studies (Watson and Hall unpublished). However, an important insight was that the absence of behavioral gains may be due to lack of generalization outside the training setting. This observation appeared to be especially true of social problem solving.

Earlier studies (Elardo & Cantwell, 1979; Spivack & Shure, 1974) had also failed to document gains associated with social problem-solving training. Abikoff and Gittelman (1985) believed that their findings plus findings from previous studies suggested direct training in generalization would possibly be helpful to enhance transfer effects of learning.
The decade of the 1980s provided increased research and study regarding the relationship between hyperactivity (ADDH) and learning disabilities.

Earlier Tanfer & Deuhoff (1957), Stewart, Pitts, Craig, and Dieruf (1966); and Palkes and Stewart (1972) had reported most hyperkinetic children were of normal intelligence but frequently had "specific learning disabilities." Safer and Allen (1976) estimated that 80 percent of hyperactive children were learning disabled. Silver (1981b) found that 92 percent had some type of learning disability. However, other investigators (Akerman, Elardo & Dykman, 1979; Loney, 1980) had demonstrated that as a group hyperactive children were not characteristic of the LD population. The conflicting data seemed to be due to the lack of homogeneous groups. An additional problem was whether academic underachievement was linked with hyperactivity through a cognitive-based learning deficit or through the effects of poor attention, conduct disturbance, or some other factor.

August and Holmes (1985) compared a group of hyperactive boys with and without conduct disorder with a group of boys with a specific reading disorder. The groups were compared on behavior ratings and academic achievement 6 years after their initial diagnosis. The comparison was to clarify the relationship between hyperactivity and LD. The authors found both hyperactive groups were rated as problematic in overactivity, inattention, and impulsivity. The hyperactive "only" boys did not continue to have problems with aggression. The children originally diagnosed as hyperactive, undersocialized and aggressive
continued to have problems with aggression. Academic achievement showed performance to be normal for both subgroups and the incidence of LD was only 8 percent. The reading-disabled youngsters displayed only a behavior problem with inattention but did have significant achievement delays. The authors suggested that hyperactivity and LD may coexist but the overlap was much less than previously expected.

**Diagnostic Distinctions Between Subtypes of ADD**

A significant issue also addressed in the August and Holmes (1984) study concerned the diagnostic distinction between sub-types of childhood hyperactivity.

Earlier, August and Stewart (1983) had distinguished "pure" hyperactive boys from hyperactive, undersocialized aggressive boys on the basis of clinical features. These included natural history, family history of psychiatric disturbance, and clinical features. They also found "pure" hyperactive boys experienced more learning problems than the conduct disordered boys. They hypothesized this difference may reflect different mental abilities and not hyperactivity.

These studies point out the possibility of an overinclusive definition of ADD. DSM-III (1980) replaced the label of hyperkinetic reaction of childhood with ADD (with or without hyperactivity). This change reflected an awareness that the primary problems hyperactive youngsters experience are attention and impulse problems rather than overactivity and excitability. However, little research has been done to investigate if subcategorization of the disorder on the basis of
absence of presence of hyperactivity results in differential treatment recommendations.

DSM-III (1980) specified the two sub-types of ADD though it is not known if they are two separate disorders. A residual subtype was also specified for individuals previously diagnosed ADD with hyperactivity in which the hyperactivity was no longer present but other signs of the disorder persisted.

Quay (1979) summarized several studies investigating ratings of hyperactivity and conduct disorder manifestations (such as anti-social behaviors). The author concluded the disorders were probably not separate. Lahey et al. (1980), studied interrelationships among hyperactivity and conduct disorder and concluded that attention difficulties and hyperactivity may be separate behavior problems. However, they hypothesized that hyperactivity and conduct disorder were the same. The Lahey (1980) group felt hyperactivity does not exist as a separate diagnostic category. August and Stewart (1982) distinguished between children who were only hyperactive or only aggressive. They also found children who were both hyperactive and aggressive.

McGee and Silver (1984) investigated behavioral dimensions of aggressiveness in 7 year old boys. Unlike earlier studies they found it useful to distinguish between hyperactive and aggressive behaviors. The study indicated that clinical pictures differed among the children. McGee and Silver (1984) also found cognitive characteristics of the two groups differed. The aggressive-hyperactive and pure hyperactive groups displayed evidence of long term learning disabilities. The aggressive-only group did not display long term impairment.
The establishment of the sub-types of "with or without hyperactivity" (DSM-III, 1980) created a new area of controversy regarding the sub-types themselves.

In the DSM-III (1980) Manual it is stated: "All of the features of ADD are the same as those of Attention Deficit Disorder with Hyperactivity except the absence of hyperactivity" (p. 44). And, "it is not known whether they are two forms of a single disorder or represent two distinct disorders" (p. 41). The small number of studies published to date have reached contradictory conclusions.

King and Young (1982) found that both ADD subgroups were unpopular with classmates. However, the ADDwH findings suggested that conduct disorder was present in the ADDwH subgroup but not the ADDwoH subgroup.

Edelbrock et al. (1984) studied both sub-types and found the ADDwH group more aggressive, less popular, and less socially withdrawn than the ADDwoH group.

Maurer and Stewart (1980) studied the two subgroups and concluded that they were not separate disorders. They found a majority of children that were diagnosed ADDwoH had conduct disorders also.

A thorough review of the research consistently indicates differing viewpoints regarding treatment of ADD children. Medical, psychological and educational approaches often differ to the extent that treatment is less than complete. It appears that greater knowledge is needed concerning the nature of the various disorders present in the ADD population.

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The purpose of this study was to survey and describe, through the use of the WISC-R, WRAT, parent questionnaires and clinical interviews, the psychological, educational, and social problems experienced by an Attention Deficit Disordered population. To achieve the desired results a descriptive research design was used. A descriptive design achieved the purpose of the study which was to formulate a greater understanding of the ADD population and determine what is necessary to provide a complete treatment approach.

Any research design selected has strengths and weaknesses and the application of the design in the present study was no exception. The standardization of the testing battery used provided objectivity and decreased the influence of observer bias in affecting the outcome. The standardization and recognized validity of the tests used supported their inclusion in the study and the subtest and test scores provided much information. The design's lack of statistical validity as defined by Cook and Cambell (1979) limited the study's responsiveness to the relationship between the ADD diagnosis and the WISC-R and WRAT characteristics. In addition, establishment of the particular cause-effect construct of the relationship and generalization of the findings to other populations was restricted by the design.

This study's design also lacked a control group. However, WISC-R and WRAT results did not contain intrinsic normative data concerning
the presence of learning disabilities as indicated by subtest scores and standard scores. Inherent normative data of the WISC-R and WRAT was consistent with the study's goal of understanding the nature of the disorder rather than to develop a causal relationship. The limits present in the survey design used in this study supported the use of the WISC-R and WRAT as research instruments. These tests provided objectivity and quantification to the understanding of ADD and were used adjunctively with an interview technique. The standardization of the WISC-R and WRAT reduced observer and interpreter bias influencing the final data analysis. Testing batteries were administered in the same manner and interpreted following standardization procedure. The use of the WISC-R and WRAT, the subtests of the WISC-R, parent questionnaires and clinical interview were directed at obtaining maximum information.

The sample was comprised of all children meeting the selection criteria and seeking mental health services from Psychiatric Consultation Services, Grand Rapids, Michigan, between January 1983 and August 1985. Although the sample was not randomized, it was believed, due to the 32 month research period, that the sample provided an adequate representation of an ADD population seeking services. The use of expert opinion concerning the selection of research subjects increased the study's validity. The ability to generalize the findings beyond the specific research area was limited by the lack of a randomized sample.

The standardization and widely accepted use of the WISC-R and WRAT as research tools allowed for the comparison of this study's WISC-R and
WRAT profiles with other sample profiles of ADD children. The factor of standardization and common use allowed for discussion of concurrence between this research sample and other samples reported in the literature.

Population and Sample

Subjects (N-34) for this research were children and adolescents referred by parents and teachers to a mental health agency (Psychiatric Consultation Services, Grand Rapids, Michigan). All subjects had a primary diagnosis of Attention Deficit Disorder (ADD), with or without hyperactivity; DSM-III, 314.01, 314.00 (American Psychiatric Association, 1980). The diagnoses were established by a multi-disciplinary team of psychologists, social workers, and psychiatrists according to DSM-III (1980) criteria. Two of the team members, a psychologist and psychiatrist were specialists in the area of ADD. Patients who presented a history of psychosis, inpatient hospitalization, or substance abuse were not included in the sample. None of the subjects had visual or hearing handicaps as determined by a school health screening.

Diagnostic Criteria

All subjects were diagnosed as ADD with hyperactivity (314.01) or without hyperactivity (314.00) according to the Diagnostic and Statistical Manual for Mental Disorders, (American Psychiatric Association, 1980).
Diagnostic Criteria for Attention Deficit Disorder with Hyperactivity

This 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 teachers' 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 8 and 10, 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 calls 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."

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D. Onset before the age of 7.
E. Duration of at least 6 months.
F. Not due to schizophrenia, affective disorder, or severe profound mental retardation. (DSM-III, 1980, p. 26)

Diagnostic Criteria for Attention Deficit Disorder without Hyperactivity

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).

Diagnostic Criteria for Attention Deficit Disorder Residual Type

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 disorder. (DSM-III (1980), p. 28)

Variables

Variables included the WISC-R, its subtests, the WRAT, the parent questionnaire and the clinical interview taken on each child. The
primary interpretive resource for the WISC-R profile and subtests was Kaufman (1979). The WISC-R was used to assess if scores on verbal, perceptual/analytic, and attention/concentration differed in a statistically significant manner, using a standardized procedure developed by Kaufman (1979). The procedure assessed the amount of difference and pointed out areas of consistent deviation.

Individual profile development required tabulation of raw scores on the subtests of each WISC-R administered. These were converted to scaled scores to establish mean scores for areas of attention/concentration, verbal, and perceptual/analytic functioning. The verbal means measured left hemisphere functioning while the perceptual analytic means measured right hemisphere functioning. The scores were viewed significant when a 3, or more, point spread existed between any of the three (3) areas. This procedure has been recognized in the literature as statistically significant (Kaufman, 1979). The WRAT was used to measure current academic achievement using the ratings of standard scores. The parent questionnaire and clinical interview further documented hyperactivity, emotional and academic problems.

The present study concluded the child was hyperactive if the parent answered four out of five of the following questions on the parent questionnaire affirmatively:

1. Has your child been called hyperactive?
2. Has your child been in a special class for behavior problems?
3. Response to a question regarding problems at school that indicated overactivity and aggressiveness.
4. Response to a question that the child was different from siblings or other children by level of activity, impulsivity, and aggressiveness.

5. Response to a question about hyperactivity of the child being the most difficult area to manage.

The child psychiatrist also had to diagnose the child as hyperactive for the subject to be included in the sample.

The child was rated emotionally disturbed if the parent questionnaire yielded responses on the following questions that indicated emotional problems:

1. Has your child ever had emotional problems?
2. What do you find most difficult about the child?
3. Has this child been in a special class for behavior problems?
4. Does this child get along well with peers, siblings, parents?
5. Do you think this child is different than your other children or children you know?

The child psychiatrist also had to diagnose an emotional disturbance for the subject to be included in the sample.

Operational Hypothesis

An experimental hypothesis was not applicable because of the descriptive nature of this research. The diagnostic criteria, testing battery, parent questionnaires and clinical interview were expected to reflect:

A. Low average intelligence with clinically significant attention/distactibility problems indicated by statistically significant differences in scores on the WISC-R between left and right hemispheric
functioning and/or attention concentration. This was indicated by a 3.0 or more mean difference between the three areas.

B. Learning disabilities indicated by statistically significant differences in WISC-R scores between left and right hemispheric functioning and/or attention/concentration indicated by a 3.0 mean difference between the three factors.

C. Evidence of the WRAT standard scores of below average academic achievement in either reading, spelling, or arithmetic.

D. Clinical significant ratings from the parent questionnaires and clinical interview indicating:
   1. Hyperactivity
   2. Distractibility/Impulsivity
   3. Emotional difficulties
   4. Academic deficiencies

E. Differing characteristics for subjects diagnosed ADDwH versus ADDwoH.

Data Collection

Testing profiles, parent questionnaires, and the findings of clinical interviews were obtained from existing psychological data administered at a private mental health agency. The data used were obtained from children referred to the agency by parents or teachers for psychological evaluation. The data surveyed were collected during a period from January 1983 to August 1985. Patients with a history of psychosis, impatient psychiatric hospitalization, extensive substance
abuse, and visual or hearing handicaps were not included. The 34 subjects used for this research were voluntary outpatient mental health clients. Six subjects were found to be significantly below average intelligence and were excluded. This reduced the number of subjects to 28 (N=28). All subjects had received a primary diagnosis of Attention Deficit Disorder. The diagnoses were established by a multi-disciplinary diagnostic team in accordance with DSM-III criteria as presented in Chapter III section on diagnostic criteria. The subjects were all caucasian males except for one female and one black male. Subjects' average age was 10.25 with a standard deviation of 2.39 and a range from 6 to 17 years of age. All subjects were provided outpatient psychological treatment.

Data Analysis

Due to the survey nature of this research, data analysis was limited to the use of descriptive statistics. The means and standard deviations of scaled and standard scores were calculated. A mean profile based upon sample scaled scores was established, and mean values achieved on the WRAT and WISC-R were calculated. The parent questionnaire and clinical interview provided data concerning the number and percent of children with hyperactivity, academic achievement problems, distractibility/impulsivity, and emotional difficulties. The assessment of the WISC-R and WRAT profiles, the parent questionnaire and clinical interview was expected to provide valuable input concerning
the extent and nature of learning disabilities and emotional problems that children diagnosed ADD with or without hyperactivity were experiencing. The WISC-R profiles, WRAT profiles, and the parent questionnaire/clinical interview obtained from the 28 subjects were computer analyzed. Scaled WISC-R scores and the standard scores of the WRAT were tabulated and mean and standard deviations were derived for each scale. The mean scores of the WISC-R subtests were utilized to measure statistically significant differences in areas of right and left hemispheric functioning and attention concentration. The WRAT standard scores were utilized for comparison and further documentation of learning disabilities. The parent questionnaire/clinical interviews provided documentation of hyperactivity or distractibility, emotional problems, and additional documentation of a learning disability.

Figure 1 represented a mean sample profile of the WISC-R. Table 1 contained the means, standard deviations and indications of statistically significant scores on the WISC-R subtests. Table 2 contained the number and percentage of subjects found to have a learning disability. Table 3 listed the mean values and standard deviations of the WISC-R and WRAT scores and indicated significant deviations regarding intelligence classification. Table 4 contained the findings of the parent questionnaire and clinical interview in regard to hyperactivity, academic problems, distractibility/impulsivity, and emotional problems. Table 5 contained clinical data regarding the number and percentage of children who had learning disabilities, hyperactivity, distractibility/impulsivity, hyperactivity and distractibility, and emotional
disturbances. The characteristics of children diagnosed ADDwH and ADDwoH were presented.
CHAPTER IV

RESULTS

A complete description of the data contained within the tables is described in the following sections. The extent to which the data supports or reflects the expected outcomes is also discussed.

WISC-R Mean Sample Profile

The WISC-R Mean Sample Profile of scaled scores was compiled and is presented in Figure 1.

The profile did not support the expected outcome of low average intelligence. The scaled scores converted to mean scores for factor of verbal (left hemisphere), perceptual/analytic (right hemisphere) and attention concentration are noted in Table 1. Significant differences between these mean scores are indicated. The mean and standard deviation of scaled scores on the WISC-R were as follows: verbal, 53.643 ±9.015; performance, 55.464 ±8.809; and full scale, 109 ±12.803. The mean scores and standard deviations for verbal, perceptual/analytic and attention/concentration lacked significance in supporting the first expected outcome described in Chapter III. A 2.808 difference was calculated between the perceptual/analytical mean and the attention/concentration mean. The 2.808 difference has clinical significance even though a difference of 3.0 is required for statistical significance.
WISC-R RECORD FORM

NAME __________________ AGE ________ SEX ________

ADDRESS __________________

PARENT'S NAME __________________

SCHOOL __________________ GRADE ________

PLACE OF TESTING __________________ TESTED BY __________________

REFERRED BY __________________

---

WISC-R PROFILE

Clinicians who wish to draw a profile should first transfer the child's scaled scores to the row of boxes below. Then mark an X on the dot corresponding to the scaled score for each test, and draw a line connecting the X's.

<table>
<thead>
<tr>
<th>VERAL TESTS</th>
<th>PERFORMANCE TESTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>Picture Completion</td>
</tr>
<tr>
<td>Similarities</td>
<td>Block Design</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>Object Assembly</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>Coding</td>
</tr>
<tr>
<td>Comprehension</td>
<td>(Digit Span)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scaled Score</th>
<th>Scaled Score</th>
<th>Scaled Score</th>
<th>Scaled Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>19</td>
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<td>18</td>
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<tr>
<td>11</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>

*See Chapter 4 in the manual for a discussion of the significance of differences between scores on the tests.

NOTES

Figure 1. WISC-R Profile for Children (N=28)
Diagnosed as Attention Deficit Disorder

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Table 1
WISC-R Results of Verbal, Perceptual/Analytic, Attention Concentration for Children (N=28) Diagnosed as Attention Deficit Disorder.

<table>
<thead>
<tr>
<th>Scaled Scores</th>
<th>Means (Scaled Scores)</th>
<th>Standard Deviations (Scaled Scores)</th>
<th>Statistical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal</td>
<td>53.643</td>
<td>9.015</td>
<td>N/A</td>
</tr>
<tr>
<td>Performance</td>
<td>55.464</td>
<td>8.809</td>
<td>N/A</td>
</tr>
<tr>
<td>Full Scale</td>
<td>109.000</td>
<td>12.803</td>
<td>N/A</td>
</tr>
<tr>
<td>Verbal Factor</td>
<td>10.704</td>
<td>2.154</td>
<td></td>
</tr>
<tr>
<td>Perceptual/Analytic Factor</td>
<td>11.698</td>
<td>1.969</td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>.994</td>
<td></td>
<td>No Significance</td>
</tr>
<tr>
<td>Verbal factor</td>
<td>10.744</td>
<td>2.154</td>
<td></td>
</tr>
<tr>
<td>Attention/Concentration Factor</td>
<td>8.890</td>
<td>2.129</td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>.844</td>
<td></td>
<td>No Significance</td>
</tr>
<tr>
<td>Perceptual/Analytic Factor</td>
<td>11.698</td>
<td>1.969</td>
<td></td>
</tr>
<tr>
<td>Attention/Concentration Factor</td>
<td>8.890</td>
<td>2.129</td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>2.808</td>
<td></td>
<td>No Significance</td>
</tr>
</tbody>
</table>

In Table 2, the number and percent of subjects found through formal testing to have a learning disability is displayed. The number and percent of subjects that were found to have a specific left or right hemisphere learning disability is also contained in Table 2. The
results supported the second expected outcome described in Chapter III. Forty-three percent (12) of the subjects were found to have a specific left or right hemisphere learning disability. Thirty-two percent (9) had a left hemisphere learning disability and 11 percent (3) were found to have a right hemisphere learning disability.

Table 2

<table>
<thead>
<tr>
<th>Learning Disabilities</th>
<th>Neurologically Based Learning Disabilities (Percent) (Number)</th>
<th>Left Hemisphere Learning Disabilities (Percent) (Number)</th>
<th>Right Hemisphere Learning Disabilities (Percent) (Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>71% 43%</td>
<td>32% 9</td>
<td>11% 3</td>
</tr>
</tbody>
</table>

Mean Values on Academic Achievement (WRAT) and Psychological Tests (WISC-R)

The compiled results on the mean values and standard deviations for the WRAT and WISC-R are presented in Table 3. The scores did not support the expected result of low average or below average achievement as indicated by the test results. The cut off score for designating average on the WRAT is a standard score of 90. The cut off full scaled scores for average on the WISC-R is 87. Standard scores on the WRAT and full scaled scores on the WISC-R were well above the low average designation.
Table 3
Mean Values and Standard Deviations on Academic Achievement and Psychological Tests for Children (N=28) Diagnosed as Attention Deficit Disorder.

<table>
<thead>
<tr>
<th>Test</th>
<th>Mean (Scaled Scores)</th>
<th>Standard Deviations</th>
<th>Intelligence Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WISC-R (Standard Scores)</td>
<td>WRAT</td>
<td></td>
</tr>
<tr>
<td>Wide Range</td>
<td>109.97</td>
<td>11.84</td>
<td>Average</td>
</tr>
<tr>
<td>Achievement Test</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>99.67</td>
<td>10.96</td>
<td>Average</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>103.93</td>
<td>9.89</td>
<td>Average</td>
</tr>
<tr>
<td>WISC-R</td>
<td>53.643</td>
<td>9.015</td>
<td>Average</td>
</tr>
<tr>
<td>Verbal</td>
<td>55.464</td>
<td>8.809</td>
<td>Average</td>
</tr>
<tr>
<td>Performance</td>
<td>109.00</td>
<td>12.803</td>
<td>Average</td>
</tr>
</tbody>
</table>

Parent Questionnaire/Clinical Interview

The results of the parent questionnaire and clinical interview are presented in Table 4.

The results supported the third expected outcome. The data from the rating scales showed 71 percent (20) were hyperactive, 96 percent (27) were distractible/impulsive, and 75 percent (21) were experiencing academic difficulties. Forty-six percent (13) were found to be emotionally disturbed.
Table 4
Characteristics of Children (N=28) Diagnosed Attention Deficit Disorder.

<table>
<thead>
<tr>
<th>Hyperactive (Percent) (Number)</th>
<th>Distractable/Impulsive (Percent) (Number)</th>
<th>Academic Difficulties (Percent) (Number)</th>
<th>Emotionally Disturbed (Percent) (Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>71% 20</td>
<td>96% 27</td>
<td>75% 21</td>
<td>46% 13</td>
</tr>
</tbody>
</table>

The number and percent of subjects that were diagnosed ADDwH and ADDwoH and who showed a specific neurological based learning disability—as indicated by formal testing—is depicted in Table 5. The number and percent of subjects found to have an emotional disturbance is also shown in Table 5.

Table 5
Characteristics of Children Diagnosed Attention Deficit Disorder with Hyperactivity and Attention Deficit Disorder Without Hyperactivity (N=28)

<table>
<thead>
<tr>
<th>ADD With Hyperactivity vs. ADD without Hyperactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1. ADDwH</td>
</tr>
<tr>
<td>2. ADDwoH</td>
</tr>
</tbody>
</table>

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Sixty-four percent (18) were diagnosed hyperactive (ADDwH). Forty-two percent (10) ADD but not hyperactive (ADDwoH). Sixty-one percent (11) of the hyperactive group had specific neurologically based learning disabilities. Ten percent (1) of the non-hyperactive group displayed a neurological based learning disability. The ratings of the parent questionnaire and clinical interview established 13 of 18 (72%) subjects diagnosed hyperactive also had an emotional disturbance. None of the subjects rated non-hyperactive (ADDwoH) were found to be emotionally disturbed.

Summary

The specific data obtained from the WISC-R, WRAT, the parent questionnaires and clinical interviews were contained in this chapter. To summarize the results at this point, it is necessary to review the conclusions drawn from the five Tables.

First, the mean profile did not support the expected outcome of low average intelligence. The mean scores of the perceptual/analytic and attention/concentration means were clinically significant. Nearly three-fourths of the subjects had learning disabilities and 42 percent had a neurologically based learning disability. The mean values on academic achievement and psychological tests were well above the expected outcome of low average intellectual functioning. Three-fourths of the subjects were experiencing academic difficulties, 46 percent were emotionally disturbed, 71 percent were hyperactive and 96 percent were rated as distractible/impulsive. The ADDwH group contained eleven
of the twelve subjects who had neurologically based learning disabilities, 94 percent of the group were rated distractible/impulsive and 72 percent emotionally disturbed. The ADDwoH group contained one subject with a neurologically based learning disability and while 83 percent were rated distractible/impulsive, none were emotionally disturbed.

The final chapter will assess and discuss the data's implications, treatment planning, and future research.
CHAPTER V

SUMMARY AND DISCUSSION

The purpose of this research was to survey a sample of children diagnosed as Attention Deficit Disorder (ADD) who sought voluntary outpatient mental health treatment. Information was collected using the Weschler Intelligence Scale for children (WISC-R), the Wide Range Achievement Test (WRAT), parent questionnaire and clinical interviews. Of particular concern were the learning disabilities and emotional problems these children and their parents were experiencing.

Four research questions were developed. The initial question concerned the extent of learning disabilities and emotional problems present in the ADD population indicated by formal testing and surveys. The second question focused on the frequency and nature of learning disabilities and emotional problems of children with ADD. Study of this question was accomplished by the assessment of the WISC-R, WRAT, parent questionnaires and clinical interviews. The third question addressed the data's implication for treatment intervention with the ADD child. A final research question concentrated on the data's implications for differing treatment approaches for children who are ADD and hyperactive compared to the child diagnosed ADD without hyperactivity.

Degree of Learning Disabilities and Emotional Problems

The presence of learning disabilities was operationalized in Chapter III as a 3.0 mean difference between verbal, perceptual/
analytic or attention/concentration scores measured by the WISC-R. The 2.808 mean difference on the WISC-R between the attention/concentration factor and the perceptual/analytic factors in the sample tested indicated clinical significance, but its magnitude was not substantial enough to be statistically significant. No other differences approached significance.

Silver (1984) reported that the emotional problems experienced by ADD children were a result of the frustrations and failures experienced in the academic setting, the family, and peers. He also reported that 85 percent of the sample of ADD children were emotionally disturbed and 92 percent were learning disabled. The majority of studies on ADD subjects have indicated a learning disability the existence of emotional problems partially due to the lowered ability of the child to attend and concentrate.

The sample presented in this research was consistent including descriptions provided on samples presented in the research. It was concluded that the sample profile manifested a significant level of attention and concentration problems. The sample profile indicated that ADD children experience significant problems with attending and concentrating to the environment and tasks.

Testing and Survey Characteristics

The results obtained from standardized testing indicated that the majority of ADD children experience a significant degree of learning disabilities due to lowered ability to attend and concentrate.
More specifically, over half of the children with a learning disability due to the poor attention/concentration factor also had a specific left or right hemisphere learning disability. The presence of a neurologically based left or right hemisphere problem dramatically affects children who are already experiencing academic and social difficulties due to a poor attention span. Subjects with attention and concentration problems often display lowered self-esteem, depression, and anxiety. Those characteristics will be further compounded when an additional learning disability hinders their academic achievement and understanding of the environment.

Nearly half (43%) of the youngsters in this sample who displayed learning disabilities due to poor attention and concentration factor also had left hemisphere (verbal) learning disabilities. This result is indicative of a learning disability that is based in overall language development. Children with such a disability experience problems in normal language development and do not integrate or comprehend communication in the typical manner. Subtle but significant receptive and expressive language deficits cause difficulty with learning requiring extended concentration, auditory memory, and verbal formulation. Word retrieval problems—often the retrieval of nouns—further handicap the subject who already has difficulty monitoring themself. The significant presence of the specific verbal learning disabilities further supported the development of emotional problems manifested by aggressiveness, withdrawal, depression, or oppositional behavior.
Subtest analysis of the WISC-R profile indicated that only three (approximately 10 percent) of this study's subjects had a specific learning disability of the right hemisphere. While the left hemisphere processes linguistic stimuli, the right hemisphere handles visual-spatial stimuli (Kaufman, 1979). The majority of this study's subjects who had specific, neurologically based learning disabilities displayed difficulties processing linguistic stimuli and were more adept in processing visual-spatial stimuli. The stronger visual-spatial abilities were also supported by the clinically significant 2.8 difference between the mean performance and verbal scaled score on the sample profile.

It was expected that the subject would be experiencing significant lags in achievement and functioning at appropriate grade level. However, mean standard scores attained by the subjects on the WRAT were all within the average range of intelligence classification. Standard scores for arithmetic, which requires relatively good concentration and attention abilities, was the lowest of the three areas measured. Surprisingly, mean standard scores on the WRAT for reading were 10 points higher than the mean score for arithmetic. Differences of this magnitude may be due to the small number of subjects in the sample that scored above average and superior range of intelligence classification. These high scores contributed to the higher than expected mean standard scores for arithmetic and reading. Additionally, WRAT mean standard scores for reading were at the highest levels of average intelligence classification and may be due to the nature of reading subtest which
requires identification (reading) of individual words aloud. It is possible that reading individual words is less difficult for these children in areas of word retrieval and comprehension and reading scores on the WRAT may have indicated artificially high levels. The full scale score attained on the WISC-R mean profile was also in the upper limits of the average range of intelligence classification. The sample contained a small number of bright, superior, and one very superior score. These scores raised the mean full scaled score. Significantly, even though the mean scale score was 109.00, 71 percent of the subjects had learning disabilities.

Nearly three-fourths (71%) of the subjects in the sample were rated as hyperactive by the survey and child psychiatrists. All but four of this study's 28 subjects were rated distractible and impulsive. The hyperactive group were described as displaying problematic behavior more frequently and at an earlier age. Problematic behavior reflects the disruptive behavioral components of hyperactivity which is more evident to parents, teachers, and clinicians. The fact that all but one of the subjects was rated distractible and impulsive while 8 subjects were rated not hyperactive probably reflects a degree of differences in diagnostic interpretation. The label hyperactivity seems to mean different things to different clinicians. This problem will be addressed in the implications for future research section of this chapter.

Exactly three-fourths of the subjects were rated as experiencing academic difficulties. Results correlate strongly with the 71 percent found, by formal testing, to have hearing disabilities. Reports of
academic underachievement displayed a wide variation concerning the extent of academic problems. The subjects rated distractible and not emotionally disturbed were reported as experiencing fewer and less intense academic achievement difficulties that children rated hyperactive or hyperactive and emotionally disturbed.

Nearly half of the subjects in this study were found to be emotionally disturbed. Significantly, no subjects who were rated non-hyperactive were found to be emotionally disturbed. This finding strongly supports previous research findings which indicate that children with hyperactivity are more likely to develop emotional disturbance than their non-hyperactive peers (Hechtman et al., 1983; Gittleman et al., 1985). Subjects in this sample who were not emotionally disturbed were rated as experiencing varying problems with family and peers but the extent of these problems were far less dramatic.

Finally, 21 out of 28 of the subjects were found to have a learning disability. Prior research generally has reported similar findings, though a study by August and Holmes (1985) reported low incidence of learning disabilities in hyperactive children. Silver (1981a) reported results very similar to this study; however, children having ADDwoH were not addressed in his research.

Children diagnosed ADD but non-hyperactive (ADDwoH) in this study displayed a very small percentage of specific, neurologically based learning disabilities. The majority were rated as distractible and none were found to be emotionally disturbed.
Treatment Implications

The third research question concerned the formal testing and implications for treatment of children with ADD. The final research question which addressed possible differences in the two sub-types of the disorder and resulting need for different treatment approaches will also be discussed in this section.

Analysis of the data supports a frequent clinical association between ADD, learning disabilities, distractibility, and, when hyperactivity is present, emotional problems. A prerequisite of any child thought to have a possible Attention Deficit Disorder should include an extensive assessment for possible learning disabilities. Psychological testing should also include projective testing in addition to an accurate developmental and social history to investigate the possibility of emotional disturbance.

The need for extensive psychological and educational testing is only one of the issues that requires assessment. It appears that treatment conclusions reached in some of the studies have not assessed all the issues. Possibly the major problems found in ADD is the multiple areas of the disorder that present the need for intervention. This appears to be especially true for children who are hyperactive. A thorough review of the literature reported on hyperactivity suggests that these children suffer from several different handicaps.

The treatment of choice by the medical profession for hyperactivity has been the use of psychostimulants. Decreased impulsivity and behavior
problems, as well as an increase in attention span have been reported on short-term studies (Satterfield et al., 1979). However, longer term studies, 1 to 5 years duration, have indicated poorer outcomes regarding the reduction of behavioral problems and increased attention span. A review of these studies suggests that difficulties in performing long-term studies and weaknesses in the designs renders the outcomes produced as questionable.

Clinical experience and observations by the researcher plus the majority of the findings in literature supports closely monitored use of stimulant medication for improving attention span, reducing impulsivity and distractibility, and, marginally, reducing aggressive behavior. However, stimulant medication alone is not sufficient to alter the various problems the ADD child experiences. While stimulant medication may impact dysfunction of the central nervous system and improve inattention and excessive motor activity, it does not alter or "cure" other problems. ADD children may also have learning disabilities, depression, and live in a chaotic environment. All of the problems may exist together causing academic, social, and personal failures. Additionally, when hyperactivity is reduced due to the medication, teachers, parents, and clinicians can easily be seduced into thinking the problem has markedly improved. Therefore, stimulant medication has displayed its effectiveness in reducing overacting and distractibility but attends to only one area of the problem.

Behavior modification has been applied to the problems manifested by ADD with varying results. Operant conditioning techniques have
proven to be successful in extending the attending behaviors of hyperactive children (Allen et al., 1967). Training parents in the use of operant conditioning to reduce hyperactive behaviors has also been successful (Barnard & Collar, 1973). However, as Firestone (1981) has reported, these studies lacked realistic clinical procedures and were not cost beneficial in implementation. The Firestone et al. (1978, 1981) studies did indicate that behavioral and pharmacological interventions were of some benefit to the child. They concluded that an effective intervention would include a combination of therapeutic techniques using medication, parent training in operant conditioning, and educational services.

A multi-dimensional viewpoint helped formulate a multi-modality treatment approach to address the different aspects on ADD. Pharmacological treatment alone did not remediate learning problems or social inadequacies. Behavioral therapy had displayed it could be effective in a laboratory setting but was cost ineffective and required extensive training. Behavior modification training for parents has been shown to be effective in the home setting (Firestone et al., 1978). The use of multi-modality treatment was reported by Satterfied et al. (1971). Tentative results were positive and in a 1979 study the authors added a psychoeducational component to treatment. The treatment plan consisted of medication, dynamic psychotherapy for the understandings of family interaction and the child's intrapsychic operations. Behavior modification techniques were included for stabilizing the home environment. The therapeutic modalities included individual therapy, parent therapy.
and training, group psychotherapy, and educational therapy. The subjects, when seen at follow-up at one year were rated improved behaviorally by teachers, parents, physicians, and the children themselves.

A review of literature and history of treatment of ADD displays refinement in therapeutic approach from early pharmacological treatment to multi-modal intervention. Greater awareness of the differing aspects of the problem created broader and more effective treatment approaches. Included in these approaches in the past few years has been the use of cognitive training. Cognitive training attempted to instill reflective, self-regulatory skills in the child. The manner in which a child responded to the environment and tasks was hoped to be improved by an altered cognitive state. Studies investigating cognitive therapy as an adjunct have found differing results (Abikoff & Gittleman, 1985; Brown and Alford, 1984). The studies have provided additional information about the attentional difficulties and learning styles of ADD children.

Cognitive strategies have not been successfully generalized outside the treatment setting especially in social problem solving. Certain studies also indicate that the greater the behavioral problems present the less mature the cognitive strategy. Abikoff and Gittleman (1985) concluded that direct training in generalization would be helpful to enhance transfer effects of learning.

It appears that treatment for the ADD child has evolved to a point where the therapeutic modalities are present to effectively intervene and be of substantial benefit to the child who has an Attention Deficit Disorder. Perhaps what is needed is more closely initiated treatment.
for the varying aspects of ADD. A team approach is certainly required. Effective therapeutic intervention is needed in pharmacological, behavioral, insight and supportive, cognitive, family, and educational areas. The many and complex issues that must be addressed can only be done effectively by a team of professionals working closely with the parents and child. This group should also include the child's teacher, school psychologist and social worker. Too often the educational community addresses only the behavioral components and certain learning disabilities of ADD. Once the child's overactivity and aggressiveness are reduced due to medication, it becomes very easy to feel the problems have been addressed. Certain learning disabilities will continue to be given remediative help but unless an appreciation for the multidimensional aspect of the disorder is present, less than complete educational input will occur.

The understanding and implementation of effective educational objectives requires a team effort by the educational, psychological, and psychiatric personnel involved. The psychological and psychiatric disciplines must also insure a team or multi-dimensional approach to treatment. Cognitive treatment can prove effective if proper generalizing techniques are taught to the child. Teaching of strategies for selecting and developing attention more effectively many significantly benefit the child. This would appear to be true in the educational and social areas. Generalization training can be accomplished in the school and home environment provided the proper input is received from the child's primary therapist. Obviously, this will be most beneficial if the home
environment is not extremely chaotic or disorganized and the child's teacher is responsive to helping the child.

Results obtained in the present study indicate that a significant number of ADDwH children have specific, neurologically based learning disabilities. These disabilities produce academic and social failures that often, in turn, create emotional disturbance in the child. The extent and nature of these disabilities must be realized and effectively addressed for a complete treatment approach.

The effective treatment of these specific learning disabilities requires an appreciation of the various aspects of ADD. Effective treatment requires intervention for the specific learning disability as well as the lowered attention/concentration exhibited by the child. It is often difficult to draw conclusions about whether academic underachievement is linked to hyperactivity through a specific cognitive based learning disability or the effects of inattention and resulting poor effort.

The findings of this study indicate that the attention and concentration area needs to be addressed with virtually all children who are ADD. Treatment can be approached using medication, behavioral and cognitive therapy. However, comprehensive psychoeducational testing is needed for further identification of specific learning disabilities. The number of ADD children experiencing specific learning disabilities is significant enough to merit psychoeducational testing with each child. A team approach involving various professionals working with the child will be the most effective in implementing objectives aimed at remediating the learning disabilities.
The results of this study indicate that a high percentage of ADDW children experience a specific learning disability of the left hemisphere. The left hemisphere of the brain is responsible for language growth and development. It would follow that impaired verbal hemisphere functioning creates language deficits which may be subtle but have major ramifications for the child.

A history of chronic otitis media has been associated with ADD and delayed language development and auditory memory deficits (Zinkus & Gottlieb, 1980). Copeland and Weissbrod (1983) have reported that children with attention deficits have difficulty separating selective attention from memory functioning. This condition can cause a language problem notably in the areas of extended verbal formulation. Children with attention problems have been found to have receptive and expressive language deficits (Zinkus & Gottlieb, 1980).

ADD children have problems with organizing and sequencing tasks at hand. Language studies have indicated that ADD children also have reduced abilities in sequencing and organization for discourse, word retrieval, and therefore, appropriate responding (Zinkus and Gottlieb, 1980). These subtle language deficits are instrumental in causing learning disabilities the child experiences. A language based problem that includes word retrieval, organization and sequencing, and auditory memory problems will impact the child's ability to progress, learn, and acquire a healthy self-concept.

A complete treatment plan for ADD youngsters requires, at minimum, a thorough language assessment. The auditory processing problem, word
retrieval and organization and sequencing difficulties may underlie the verbal learning disabilities. Until the language problem is addressed, progress may be minimal.

The issue of treatment for the ADD child is complex. The nature of the disorder requires a number of professional disciplines to provide competent and closely monitored treatment. The parents and family must be actively involved. The multi-modality treatment should also include a thorough language assessment and, if a language deficit is found, intervention and remediation required for optimal gains. A team approach, involving as many areas of the child's environment as possible will offer the child greater opportunity for gain and reduced frustration due to the consistent, appropriately targeted treatment plan.

Diagnostic Distinctions Between Sub-TYPES of ADD

The DSM-III (1980) replaced the label of hyperkinetic reaction of childhood with ADD—with or without hyperactivity. An awareness that the primary problems hyperactive youngsters experience are attention and impulse problems rather than overactivity and excitability was reflected by this change. "All of the features of ADD are the same as those of Attention Deficit Disorder with Hyperactivity except the absence of hyperactivity" (DSM-III 1980, p. 44) and "it is not known whether they are two forms of a single disorder or represent two distinct disorders" (DSM-III 1980, p. 41). The small number of studies to date have reached contradictory conclusions. The subjects diagnosed ADD without hyperactivity (ADDwoH) in this study differed in a number of areas from their ADD hyperactivity (ADDwH) peers.
The children diagnosed ADDwoH did not present an emotional disturbance. All of the children diagnosed emotionally disturbed were ADD and hyperactive. Only one of the ADDwoH group were found to have a specific, neurologically based learning disability. The majority of the children diagnosed ADDwoH were rated "distractible" and "impulsive" but to lesser extent than the ADDwh group. Academic achievement was found to be slightly better and closer to appropriate grade levels in the ADDwoH group.

Perhaps the area of greatest difference was the social area. The ADDwoH group was rated by parents and clinicians as having better peer relationships, more popular, and less aggressive than the ADDwh group. While the distractibility of the ADDwoH group was a problem in the home and school settings it was reported as less frustrating and not as encompassing as distractibility in the ADDwh group.

The previously mentioned limitations of the study's design and the small number of subjects require these results to be viewed as suggestive rather than firm. However, the findings are consistent with a number of previous studies.

King and Young (1982) found that both ADD subgroups were unpopular with classmates but found conduct disorder only in the ADDwh subgroup. Edelbrock et al. (1984) reported that the ADDwh sub-type was more aggressive, less popular, and less socially withdrawn than the ADDwoH subgroup.

The findings of this study and those reported in the literature suggest that the two subgroups may be dissimilar. Provided this is
accurate, it may be inefficient and ineffective to provide the same types of treatment to the two subgroups. This study's findings suggest that the ADDwoH child experiences less severe learning disabilities, fewer emotional problems, and a different type of self-esteem problem. Therefore, treatment of ADD globally, and without delineation of hyperactivity or lack of hyperactivity, may be inaccurate and ineffective both diagnostically and therapeutically.

Implications for Future Research

A striking feature of the ADD research was the paucity of studies that clearly display the population sampled was entirely homogeneous. The question of the purity of the sample is often present.

A central reason for this problem are the varying measures used to gauge the amount of distractibility and hyperactivity in the child. Teachers reports, parents reports and clinicians' judgment often are in conjunction with personal observation to diagnose hyperactivity. The Connors Parents Rating Scale and Connors Teachers Rating Scale had been used with good results. More empirical measures are beginning to be used. Future research that presents clearly homogeneous populations is needed. Hopefully, the revision fo DSM-III (1980) will address the issue of diagnosing ADDwH and ADDwoH more definitively.

The establishments of the ADD sub-types in DSM-III (1980) has created the need to further study and research in regard to possible differences between the two groups. Personal clinical experience of the researcher and, currently, a small number of studies suggest the differences may be
much more than the absence of hyperactivity in one group. These studies would also create a greater awareness that children who are "ADD" may differ substantially and more attention needs to be given to the sub-types.

An additional viable area of research is in the use of various behavioral or cognitive approaches to teaching generalization skills. Further studies are needed to address the issue of poor generalizing by the ADD child of skills learned beyond the training session. Cognitive training and other areas of a multi-modality approach need further investigation by studies with homogeneous samples.

A final factor underlining the importance of research into ADD and learning disabilities is the prevalence of subtle language problems. Auditory processing problems have been associated with the ADD population. The presence of auditory processing difficulties often results in higher or more mature expressive language than receptive language system within the child.

Severe otitis media is a childhood disease in which fluid in the ear consolidates and causes a hearing loss. This disease usually occurs with very young children. It is not unusual to find that in the developmental history of the ADD child that otitis media has been present for lingering periods of time. Research addressing the language difficulties that may be present in the ADD population would lend significantly to the multi-dimensional treatments necessary. These studies may point to a major source of the many frustrations the ADD child experiences.
APPENDIX

Questions About Your Child
Right now we don't know very much about your child's life. It would be helpful to get a picture of the good and bad things that have happened. These are things you know. The questions are about your child now and when he/she was little. Please consider the questionnaire a tool to communicate information to us. Feel free to write as much as you wish.

We think that answering these questions is a fast way to get a picture of many important parts of your child's life. Then we can look at some of these together.

Today's Date _______________________

Name of Child ________________________________ Male ___ Female ___

Child's Birthdate ____________________________

Questionnaire filled out by: mother ___ father ___ both ___ other _______

Did this child arrive in your family through birth ___ adoption ___ or foster care? ___ If adopted or placed in your home, at what age was this child then? ___

Who this child lives with now _______________________________________

I. General Questions

A. Is this child generally healthy now? Yes ___ No ___

If no, explain. ____________________________________________________

_________________________________________________________________

B. What things worry you about this child? __________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

C. What do you like most about this child? __________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

D. What do you find most difficult about this child? __________________

_________________________________________________________________
II. Pregnancy

A. How old was mother during the pregnancy with this baby? ________ years
   No information ______

B. How old was father during the pregnancy with this baby? ________ years
   No information ______

C. Was this baby born at a difficult time in parents' life?
   Yes ___ No ___ No information __
   Please describe (if you want to). _______________________________________
   ________________________________________________________________
   ________________________________________________________________

D. During the pregnancy, how was mother's health? (Check as many as you need to.)
   1. Had no problems ____
   2. Sick ______
   3. Had infection ______
   4. Had operation ______
   5. Had accident ______
   6. Had to spend time in bed ______
   7. Emotionally upset ______
   8. Bleeding ______
   9. High blood pressure ______
   10. Swelling of legs ______
   11. Large weight gain ______
   12. Sugar or protein in urine ______
   13. A lot of vomiting ______
   14. Other ______
   15. No information ______
   Describe any of the above as well as you can remember._____________________
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

E. During the pregnancy, did mother (check as many as you need to):
   1. Smoke cigarettes ____ How many each day? ____________________________
   2. Get any new medications ____ What kind(s)? __________________________
   3. Continue medication(s) she was already taking ____ What kind(s)? ______
4. Drink alcohol ___ How much each day? _____________________________
5. Use drugs ___ Which one(s)? _____________________________
   How much each day? _____________________________
6. No information ____
   Describe any of the above as well as you can remember. _____________________________

F. How would you compare the pregnancy for this baby with mother's other pregnancies? (Check one.)
   1. About the same ______
   2. Easier ______
   3. More difficult ______
   4. No other pregnancy ______
   5. No information ______
   Describe as well as you can remember. _____________________________

III. Labor and Delivery

A. Baby was born at:
   1. Hospital ______
   2. Home ______
   3. Other ______
   4. No information ______

B. Who delivered the baby?
   1. Obstetrician ______
   2. Family doctor ______
   3. Nurse ______
   4. Midwife ______
   5. Someone else ______
   6. No information ______

C. Was anyone with mother during labor and delivery? (Check as many as you need to.)
   1. Father of baby ______
   2. Relative ______
   3. Friend ______
   4. Alone ______
   5. Someone else ______
   6. No information ______
D. How long was the labor? ______ hours  No information____
E. Did labor start by itself?  Yes____ No____  No information____
   If no, describe how labor was started as well as you can remember. ____________________________
   ____________________________
   ____________________________

F. Were any of the following used during labor or delivery? (Check as many as you need to.)
   1. Medicine (shots or pills)  ______
   2. Spinal  ______
   3. Gas  ______
   4. Saddle block  ______
   5. Shot that put mother to sleep  ______
   6. None of the above  ______
   7. Other  ______
   Describe as well as you can remember. ___________________________________________________
   __________________________________________________
   __________________________________________________

G. Was mother awake when the baby was born?  yes ____ no ____
H. Were forceps used?  Yes ____ No ____  No information____
I. Was the baby born by Caesarean section (operation)?
   Yes ____  No ____  No information____
J. Part of baby born first:
   1. Head  ______  Was face up ____ or down ____
   2. Bottom  ______
   3. Other  ______
   4. No information  ______
K. How much did the baby weigh at birth? _________________________________________________
   No information____
L. Length of pregnancy  ____________________________  No information____
M. Did the baby have any problems just after delivery or during the first days of life?

1. None
2. Breathing trouble
3. Yellow skin
4. Blue
5. Vomiting
6. Convulsions or seizures
7. Blood transfusions
8. Needed extra oxygen
9. Injury(s)
10. Incubator (special crib)
11. Birth defect(s)
12. Feeding
13. Lost too much weight
14. Other
15. No information

Describe as well as you can remember.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

N. How did the baby react to mother?

No information

O. How did mother feel about the baby?

No information

P. How would you compare the labor and delivery of this baby with mother's other babies (children)?

1. About the same
2. Easier
3. More difficult
4. No other deliveries

Describe as well as you can remember.

________________________________________________________________________
________________________________________________________________________

Q. How many days in the hospital?

1. Mother
2. Baby
3. Born at home

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R. How long did it take you as the mother to feel your normal self again?

1. Length of time in weeks _____
2. Length of time in months _____
3. Length of time in years _____

Describe as well as you can remember. ________________________________________

S. How old was the baby when you as mother returned to school or work?

1. Age of baby _______________
2. Part-time _______________
3. Full-time _______________
4. Stayed home _______________

IV. Infancy and Early Childhood (0 - 24 Years of Age)

A. Who took care of this child most of the day during the first few months of life?

1. Mother _____
2. Father _____
3. Grandmother _____
4. Relative _____
5. Friend _____
6. Brother/sister _____
7. Day care center _____
8. Babysitter _____

Describe as well as you can remember how well this worked. ______________________

B. At what age in months did this child?

1. Smile _____
2. Sit alone _____
3. Have first tooth _____
4. Crawl _____
5. Say "mama" _____
6. Stand alone _____
7. Walk without holding _____
8. Use 2 to 3 word phrases _____

Describe any of the above if you want to. ________________________________________

____________________________________

____________________________________

____________________________________

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C. How was this child's eating?

1. No problem
2. Needed to be pushed
3. Enjoyed eating
4. Too hungry
5. Refused milk
6. Refused solid food
7. Vomiting
8. Did not gain enough weight
9. Gained too much weight
10. Colic
11. Constipation
12. Allergy
13. Other

Describe if you want to.

D. Age in months when weaned:

1. From breast to bottle
2. From bottle to cup
3. From breast to cup

E. During the first year, do you think the child was (check one that best describes):

1. Very active
2. Average
3. Quiet

Describe if you want to.

F. During the first year, this child was (check as many as you want to):

1. Slow
2. Sad
3. Angry
4. Happy
5. Nervous
6. Restless
7. Lovable
8. Hard to satisfy
9. Cried a lot
10. Good baby
11. Other

Describe if you want to.
G. During the first few years, this child (check as many as you want to):

1. Had no sleeping problems
2. Was hard to get to sleep
3. Slept a lot
4. Needed a night light
5. Often woke up crying
6. Shook the crib
7. Slept days, awake nights
8. Banged his head
9. Other

Describe if you want to.


H. Age toilet training started: __________ months

I. Age dry during the day: __________ months

J. Age dry at night: __________ months

K. Age used potty or toilet for bowel movements: __________ months

V. Later Childhood

A. Who took care of this child most of the day after the first year of life?

1. Mother
2. Father
3. Grandmother
4. Relative
5. Friend
6. Brother/sister
7. Day care center
8. Babysitter

Describe as well as you can remember how well this worked.


B. Did this child go to a preschool when he/she was age 3 or 4? yes __ no
C. Did this child have trouble:

1. Running
2. Jumping
3. Skipping
4. Riding a bicycle
5. Throwing and catching a ball
6. Tying shoes
7. Dressing self

D. Has your child (check as many as you want):

<table>
<thead>
<tr>
<th>Age of child if you can remember</th>
<th>Has problem stopped (yes or no)? If yes, at what age?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Held his/her breath</td>
<td></td>
</tr>
<tr>
<td>2. Had temper tantrums</td>
<td></td>
</tr>
<tr>
<td>3. Had many fears</td>
<td></td>
</tr>
<tr>
<td>4. Been bad a lot</td>
<td></td>
</tr>
<tr>
<td>5. Had bad dreams</td>
<td></td>
</tr>
<tr>
<td>6. Eaten poison, pills, plaster, paint</td>
<td></td>
</tr>
<tr>
<td>7. Soiled or wet since potty training</td>
<td></td>
</tr>
<tr>
<td>8. Been overweight</td>
<td></td>
</tr>
<tr>
<td>9. Been underweight</td>
<td></td>
</tr>
<tr>
<td>10. Been too tall</td>
<td></td>
</tr>
<tr>
<td>11. Been too short</td>
<td></td>
</tr>
<tr>
<td>12. Been called hyperactive</td>
<td></td>
</tr>
<tr>
<td>13. Done other things that have worried you</td>
<td></td>
</tr>
<tr>
<td>14. No problems</td>
<td></td>
</tr>
</tbody>
</table>

Describe if you want to. ____________________________________________________________

E. Do you think this child is developing as you hoped? _____________________________

F. At what age did this child (if old enough):

1. Develop a lower voice
2. Develop breasts
3. Start to menstruate
VI. Getting Along In School

A. On the first day of kindergarten, was this child:
   1. Happy
   2. Sad
   3. Cried
   4. Wanted mother to stay
   5. Wanted to go to school
   6. Other

   Describe if you want to. ___________________________________________

B. Did this change in a week or two? Yes ___ No ___

C. Has this child been in a special class for:
   1. Speech yes ___ no ___
   2. Reading yes ___ no ___
   3. Slow learners yes ___ no ___
   4. Behavior problems yes ___ no ___
   5. Physical problems yes ___ no ___
   6. Vision loss yes ___ no ___
   7. Hearing loss yes ___ no ___
   8. Other yes ___ no ___

   Describe any of the above if you want to. ____________________________

   _________________________________________________________________

   _________________________________________________________________

D. How many schools has this child gone to since kindergarten? _______

E. Does this child go to school almost every day? Yes ___ No ___

F. What does this child do well in at school? _________________________

   _________________________________________________________________

   _________________________________________________________________

G. What does this child have problems with at school? _________________

   _________________________________________________________________

   _________________________________________________________________
VII. Child's Health (From Birth to Present Age)

A. Has your child ever had (check as many as needed):

<table>
<thead>
<tr>
<th>Condition</th>
<th>Age of Child (if you can remember)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 7 day or red measles</td>
<td></td>
</tr>
<tr>
<td>2. High fever</td>
<td></td>
</tr>
<tr>
<td>3. Allergies</td>
<td></td>
</tr>
<tr>
<td>4. Diabetes</td>
<td></td>
</tr>
<tr>
<td>5. A broken bone</td>
<td></td>
</tr>
<tr>
<td>6. An operation</td>
<td></td>
</tr>
<tr>
<td>7. To go to the hospital</td>
<td></td>
</tr>
<tr>
<td>8. Serious burns</td>
<td></td>
</tr>
<tr>
<td>9. A head injury</td>
<td></td>
</tr>
<tr>
<td>10. Never sick</td>
<td></td>
</tr>
<tr>
<td>11. Other</td>
<td></td>
</tr>
</tbody>
</table>

Describe any of the above checked. __________________________________________
________________________________________________________
________________________________________________________
________________________________________________________

B. Has this child ever had (check as many as needed):

<table>
<thead>
<tr>
<th>Condition</th>
<th>Age of child when this started, if you can remember</th>
<th>Age of child when problem stopped, or check (✓) if still present</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Asthma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Eczema</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Sickle cell anemia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Many accidents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Ear problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Eye problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Blood problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Speech problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Heart problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Stomach aches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Teeth problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Headaches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Constipation (slow bowels)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Diarrhea (loose bowels)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Weakness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Emotional problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Seizures or convulsions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Describe any of the above checked. ____________________________________________

__________________________________________

__________________________________________

__________________________________________

C. Is this child taking any medicine now? Yes ___  No ___
   If so, what medicine(s)? ____________________________________________
   Why is your child taking this medicine? ________________________________

VIII. Family of This Child
   A. Number of older sisters _______
   B. Number of older brothers _______
   C. Number of younger sisters _______
   D. Number of younger brothers _______
   E. Health of family
      1. Mother well ___ sick or handicapped ___
      2. Father well ___ sick or handicapped ___
      3. Brothers well ___ sick or handicapped ___
      4. Sisters well ___ sick or handicapped ___
      5. Other family members and relatives well ___ sick or handicapped ___
   Describe any of the above if you want to. ________________________________

   ________________________________

   ________________________________

F. Have brothers and/or sisters had any problems? Yes ___  No ___
   Describe if you want to. ______________________________________________

   ________________________________

   ________________________________

G. Language(s) spoken in the home:
   1. English _____
   2. Other _____
IX. Getting Along with Others

A. Does this child get along well with:

1. Sisters  yes __ no __
2. Brothers yes __ no __
3. Others his/her own age yes __ no __
4. Teachers yes __ no __
5. Mother yes __ no __
6. Father yes __ no __
7. New people yes __ no __
8. Other

Describe any of the above if you want to.


B. Does this child talk most freely with (check as many as you want):

1. Mother ________________
2. Father _____
3. Other children _____
4. Relatives who ________________________________
5. No one _____

C. Does this child play with children (check as many as you want):

1. Of the same age ______
2. Older (by two or more years) ______
3. Younger (by two or more years) ______
4. Or spend most of the time with adults ______
5. Or spend most of the time alone ______

D. Does your child have close friends? Yes __ No ____ How many? ______

E. What does this child like to do (check as many as you want):

1. Watch TV _____
2. Collect things _____
3. Bike ride _____
4. Do sports _____
5. Read _____
6. Draw or paint _____
7. Listen to music _____
8. Play music _____
9. Take care of pets _____
10. Grow plants _____
11. Play with trucks or machines _____
12. Play with dolls and/or stuffed animals _____
13. Other (explain) ________________________________
F. Has this child had any upsetting things happen in his/her life?

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Death of a parent</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>2.</td>
<td>Death of a brother or sister</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>3.</td>
<td>Very sick parent</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>4.</td>
<td>Very sick brother or sister</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>5.</td>
<td>Lived away from family</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>6.</td>
<td>Divorce of parents</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>7.</td>
<td>Separation of parents</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>8.</td>
<td>Remarriage of parent(s)</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>9.</td>
<td>Upsetting sexual experience</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>10.</td>
<td>Violent fighting</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>11.</td>
<td>Other</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>12.</td>
<td>None</td>
<td>yes</td>
<td>no</td>
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</tbody>
</table>

Describe any of the above if you want to. ________________________________

______________________________

______________________________

______________________________

G. Do you think this child is different than your other children or children you know?

Yes ___  No ___

If yes, how is he/she different? ________________________________

______________________________

______________________________

______________________________

______________________________
X. **Level of Verbal Functioning**

Describe your child's performance in the following areas: (check one)

<table>
<thead>
<tr>
<th></th>
<th>No Problem</th>
<th>Some Difficulty</th>
<th>Very Difficult</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reading at grade level</td>
<td></td>
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<tr>
<td>2. Grade level skills in math</td>
<td></td>
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<tr>
<td>3. Following directions</td>
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<td></td>
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<tr>
<td>4. Understanding and answering questions</td>
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<tr>
<td>5. Clarity of speech sound productions</td>
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<td></td>
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<tr>
<td>6. Use of complete and grammatically correct sentences</td>
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<tr>
<td>7. Use of varied vocabulary</td>
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<tr>
<td>8. Speaking without stopping, pausing, struggling, repeating and rephrasing.</td>
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<tr>
<td>9. Ability to communicate thoughts and ideas</td>
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<tr>
<td>10. Ability to describe events clearly</td>
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<tr>
<td>11. Remembering directions</td>
<td></td>
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<tr>
<td>12. Concepts of time</td>
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<td></td>
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<tr>
<td>13. Consistency in skills achieved</td>
<td></td>
<td></td>
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<tr>
<td>14. Understanding sayings, proverbs and double word meanings</td>
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<td></td>
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<tr>
<td>15. Understanding abstractions</td>
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<tr>
<td>16. Describing in order a series of events in telling about an incident.</td>
<td></td>
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<tr>
<td>17. Speaking with normal tone and voice quality.</td>
<td></td>
<td></td>
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<tr>
<td>18. Hearing adequately</td>
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<td></td>
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</tbody>
</table>

If your child is experiencing difficulties in speech, language, or academic areas, please describe.
BIBLIOGRAPHY


