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A COMPARATIVE ANALYSIS OF THE SOCIAL SKILLS OF CHILDREN WITH ATTENTION DEFICIT/HYPERACTIVITY DISORDER

BY

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A dissertation submitted to the Graduate faculty in Education Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

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Abstract

A COMPARATIVE ANALYSIS OF THE SOCIAL SKILLS OF CHILDREN WITH ATTENTION DEFICIT/HYPERACTIVITY DISORDER

by

Maureen Kennedy

Advisor: Professor Philip Saigh

The Diagnostic Interview for Children and Adolescents-Revised-Parent was administered to teachers and parents to identify three groups of educationally referred public school children in grades 1 through 6. The first group met diagnostic criteria for Attention Deficit/Hyperactivity Disorder (ADHD) Combined Type (ADHD-C) (n = 21). The second group met diagnostic criteria for ADHD Inattentive Type (ADHD-I) (n = 21). The third group consisted of controls who did not meet criteria for any of the ADHD subtypes (n = 21). The social skills of the groups were compared using teacher ratings on the Social Skills Questionnaire (SSQ). An ANOVA and Bonferroni post hoc comparisons found non-significant differences between the Total SSQ scores of the ADHD-I and ADHD-C groups. The Total SSQ scores of the ADHD-C group were

significantly lower than the scores of the control group. In contrast, non-significant differences were observed between the Total SSQ scores of the ADHD-I and control groups. A MANOVA based on Wilks' Lambda, univariate tests and Bonferroni post hoc comparisons tested for group differences on the SSQ Cooperation, Assertion, and Self-Control subscales. The ADHD-I and ADHD-C groups were rated by teachers as having significantly fewer cooperative class related behaviors than the control group. Behavioral ratings related to positive social assertion did not significantly differ across groups. The ADHD-C group had significantly fewer social skills related to self-control than the ADHD-I and control groups. In effect, a modicum of support for the differential validity of the DSM IV ADHD subtypes was established. A general discussion regarding the observed results, significance of the study, limitations of the study, and directions for future research are presented.

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A Comparative Analysis of the Social Skills of Children with Attention Deficit/Hyperactivity Disorder

CHAPTER 1: ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

History of ADHD

Attention-Deficit/Hyperactivity Disorder (ADHD) is a diagnostic label given to children who present with developmentally inappropriate levels of inattention, impulsivity and hyperactivity, or both (APA, 1994). ADHD symptoms were first described in the medical literature by George Still in a series of lectures published in 1902. Still (1902) theorized a neurological basis for the deficits in inhibitory volition, moral control and sustained attention that he observed in children in his clinical practice. Interest in the syndrome was sparked in North America following an outbreak of encephalitis in 1917 that seemingly induced symptoms of ADHD in many youth (Barkley, 1990). At the time, the syndrome was referred to as postencephalitic behavior disorder (Barkley, 1990) and was attributed to central nervous system damage.

From the 1930s through the 1950s investigators attempted to identify the etiology of brain damage associated with behavioral change. A number of terms (e.g., brain injured child [Strauss & Lehtinen, 1947]; organic drivenness [Kahn & Cohen, 1934]) were used to describe children who presented with signs of neurological involvement and symptoms of what is currently referred to as ADHD. Eventually, terms

suggestive of brain injury were replaced by more specific labels that related to observable deficits. For example, Laufer, Denhoff and Solomons (1957) referred to children presenting with symptoms characteristic of ADHD as having hyperkinetic impulse disorder.

Chess (1960) emphasized activity as the defining feature of the disorder. The hyperactive child was described "as one who carries out activities at a higher than normal rate of speed than the average child, or who is in constant motion or both" (Chess, 1960, p. 2379). Compatible with Chess' conceptualization of the disorder, the American Psychiatric Association (APA) included the syndrome in the second edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM II, APA, 1968) under the classification of Hyperkinetic Reaction of Childhood. As suggested by the label, hyperactivity was viewed as the hallmark of the disorder. According to the DSM-II, the disorder was characterized by overactivity, restlessness, distractibility, and a short attention span. Although DSM-II formally recognized the disorder, it did not provide operational criteria and offered only a modicum of useful details to make a reliable diagnosis.

Research on the disorder burgeoned in the 1970s. By the early part of the decade the defining features of the hyperkinetic syndrome had expanded to include impulsivity, short attention span, low frustration tolerance, distractibility, and aggressiveness (Barkley, 1990). Sparked

by the influential research of Douglas (1972) who posited that deficits in sustained attention and impulse control were the central features of the condition, a radical reconceptualization of the disorder took place.

In synchrony with Douglas' conceptualization, the disorder was renamed Attention Deficit Disorder (ADD) in the third edition of the DSM (DSM-III, APA, 1980). Viewed as a multidimensional disorder, the diagnostic criteria included three lists of polymorphic symptoms denoting inattention, impulsivity and hyperactivity. Operationally defined criteria were delineated, including specific symptom lists, numerical cutoff scores for symptoms, and guidelines for age of onset and duration. Greater emphasis was placed on inattention and impulsivity as the defining features of the disorder, and subtypes of ADD were created: Whereas Attention Deficit Disorder with Hyperactivity (ADDH) included a specified number of symptoms from all three dimensions, Attention Deficit Disorder without Hyperactivity (ADD) included a designated number of symptoms from only the inattention and impulsivity dimensions. Although the operational criteria that were provided in the DSM-III increased the reliability of ADD diagnoses, Barkley (1990) argued that the inclusion of the subtypes was controversial as a modicum of empirical research could be cited in their support.

The presentation of ADHD in the DSM-III-R (APA, 1987) provided a number of significant changes. First, as a result of a continued lack of empirical validation, the subtype of

ADD was relegated to a vaguely defined category of Undifferentiated ADD (UADD). Unfortunately, no formal diagnostic criteria were delineated to facilitate UADD research. Second, the syndrome was renamed Attention-Deficit Hyperactivity Disorder (ADHD). In contrast to the DSM-III criteria that emphasized inattention and impulsivity as the predominant features of the disorder, the DSM-III-R criteria reasserted the significance of hyperactivity. Goodyear and Hynd (1992) emphasized this shift in focus by observing that the DSM-III-R criteria made it possible to diagnose ADHD in the absence of attention deficits. Third, unidimensional criteria replaced the multidimensional criteria that were evident in the DSM-III.

The DSM-III-R criteria set consisted of a single empirically derived list of fourteen items that tapped ADHD dimensions as reflected in the DSM-III (i.e., inattention, impulsivity and hyperactivity). The items and a diagnostic threshold were subjected to field trials to determine sensitivity, specificity and the ability to distinguish children with ADHD from youth with different psychiatric disorders and non-clinical controls (Spitzer, Davies, & Barkley, 1990). Among other changes, the exclusionary criteria for ADHD no longer included Affective Disorder, and ADHD was listed under the Disruptive Behavior Disorders category with Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD).

The change from a multidimensional DSM-III definition to a single dimension as denoted by DSM-III-R provided the impetus that sought to determine the underlying dimensions of the disorder. For example, Lahey and colleagues (1988) examined clinic-referred and non-referred children and observed that the DSM-III items clustered along two dimensions (i.e., hyperactivity-impulsivity and inattention-disorganization). Lahey et al.(1988) reported that these clusters did not support the unidimensional framework of the DSM-III-R criteria. Furthermore, the items grouped under impulsivity in the DSM-III did not form an independent factor. These results were replicated by Healey and her colleagues (1993) who reported that the factor structure of both DSM-III items and DSM-III-R items fit a two factor solution characterized by inattention and hyperactivity-impulsivity.

Most recently, the DSM-IV field trials (Lahey et al., 1994) validated two underlying dimensions of ADHD, namely inattention and hyperactivity-impulsivity. The empirical findings of the field trials are reflected in the most recent edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM IV, APA, 1994), which reinstated a multidimensional conceptualization of the disorder. According to the DSM-IV, ADHD may present in one of three types. The first type involves predominantly inattentive symptoms (i.e., Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type [ADHD-I]). The second type involves primarily symptoms of hyperactivity-impulsivity (i.e.,

Attention-Deficit/Hyperactivity Disorder, Predominantly Hyperactive -Impulsive Type [ADHD-HI]). The combined type encompasses symptoms of both inattention and hyperactivity-impulsivity (i.e., Attention-Deficit/Hyperactivity Disorder, Combined Type [ADHD-C]). The results of the field trials determined that ADHD types differ regarding age, gender ratio, global impairment, academic impairment and social impairment.

It is of importance to note that the multidimensional criteria that were adopted by the DSM-IV differ from the criteria that were used to denote the disorder in the DSM-III. Impulsivity-hyperactivity now reflects a single dimension whereas impulsivity and hyperactivity were viewed as separate dimensions under the DSM-III criteria. Furthermore, children diagnosed with ADD based on the DSM-III criteria were required to demonstrate significant symptoms of inattention and impulsivity. In contrast, a DSM-IV diagnosis of ADHD-I requires that a diagnostic threshold be met solely on the inattentive dimension. As a result, children diagnosed with ADD will likely present with greater behavioral manifestations of impulsivity than children who meet criteria for DSM-IV ADHD-I.

The DSM-IV field trials (Lahey et al., 1994) examined prevalence estimates as denoted by DSM-III, DSM-III-R and DSM-IV criteria. Among clinic-referred cases, a 15% increase in case identification was reported when DSM-III-R criteria were compared to DSM-IV criteria. Similarly, a 23.2% increase

in point prevalence was observed when DSM-IV criteria were compared to DSM-III criteria. Although a strong correspondence between the DSM-III and DSM-IV subtypes was observed, a substantial number of youth who met criteria for the DSM-IV subtypes of ADHD-I and ADHD-HI did not meet DSM-III criteria for ADDH or ADD.

In summary, symptoms of ADHD were first documented in the medical literature by George Still in 1902. The disorder first appeared in the DSM-II as Hyperkinetic Reaction of Childhood. The DSM-III renamed the syndrome ADD, provided diagnostic criteria that encompassed symptoms of inattention, impulsivity and hyperactivity, and established subtypes of ADD (i.e., ADD with and without hyperactivity). The disorder was renamed ADHD in the DSM-III-R, and the subtype of ADD without hyperactivity was eliminated. The modifications in the DSM-III-R reflected a change from a multidimensional definition to a single dimension criteria set. Recently, the DSM-IV field trials revealed two underlying dimensions of ADHD, namely inattention and hyperactivity-impulsivity. The most recent revision of ADHD nosology reflected in the DSM-IV has established three subtypes of the disorder (i.e., ADHD-I; ADHD-HI and ADHD-C). The DSM-IV ADHD criteria differ from that of previous diagnostic systems (i.e., DSM-III, DSM-III-R). These differences have been associated with divergent prevalence estimates.

Current Nosology

The DSM-IV states that "the essential feature of ADHD is a persistent pattern of inattention and/or hyperactivity that is more frequent and severe than is typically observed in individuals at a comparable level of development" (APA, 1994, p. 78). According to the DSM-IV, parents may first observe excessive motor activity in children with ADHD as toddlers; however, the disorder is usually not diagnosed until the elementary school years when school adjustment is compromised. The DSM-IV states that the disorder is relatively stable through early adolescence, and that most symptoms attenuate during late adolescence and adulthood. However, some individuals experience either the full complement of symptoms or some of the symptoms into mid-adulthood.

The associated features of the disorder may "vary with age and development and may include a low frustration tolerance, temper outbursts, bossiness, stubbornness, excessive and frequent insistence that requests be met, mood lability, demoralization, dysphoria, rejection by peers, and poor self-esteem" (APA, 1994, p. 80). The DSM-IV also specifies that "a substantial proportion of children referred to clinics with ADHD also have Oppositional Defiant Disorder (ODD) or Conduct Disorder (CD)... and there may be a higher prevalence of Mood Disorders, Anxiety Disorders, Learning Disorders, and Communication Disorders in children with ADHD"

(APA, 1994, p. 82). Table 1 presents the DSM-IV criteria for ADHD.

Table 1

Diagnostic Criteria for Attention-Deficit/Hyperactivity Disorder

A. Either (1) or (2):

(1) six (or more) of the following symptoms of **inattention** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

Inattention

(a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities

(b) often has difficulty sustaining attention in tasks or play activities

(c) often does not seem to listen when spoken to directly

(d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior of failure to understand instructions)

(e) often has difficulty organizing tasks and activities

(f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)

(g) often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)

(h) is often easily distracted by extraneous stimuli

(i) is often forgetful in daily activities

(2) six (or more) of the following symptoms of **hyperactivity-impulsivity** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

Hyperactivity

(a) often fidgets with hands or feet or squirms in seat

(b) often leaves seat in classroom or in other situations in which remaining seated is expected

(c) often runs about or climbs excessively in situations in which remaining seated is expected

(d) often has difficulty playing or engaging in leisure activities quietly

(e) is often "on the go" or often acts as if "driven by a motor"

(f) often talks excessively

Impulsivity

(g) often blurts out answers before questions have been completed

(h) often has difficulty awaiting turn

(i) often interrupts or intrudes on others (e.g., butts into conversations or games)

B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.

C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).

D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.

E. The symptoms do not occur exclusively during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder and are not better accounted for by another mental disorder (e.g., Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

Code based on type:

314.01 Attention-Deficit/Hyperactivity Disorder, Combined Type: if both criteria A1 and A2 are met for the past 6 months

314.00 Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type: if criterion A1 is met but criterion A2 is not met for the past 6 months

314.01 Attention-Deficit/Hyperactivity Disorder, Predominantly Hyperactive-Impulsive Type: if criterion A2 is met but criterion A1 is not met for the past 6 months

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Epidemiology

In the DSM-IV, the prevalence of ADHD is estimated to range between 3% - 5% in school-aged children (APA, 1994). Given these prevalence rates, Goodyear and Hynd (1992) estimated that at least one child in every classroom could have ADHD. The epidemiology of a disorder is determined

through sampling of community and at-risk (e.g., clinical) populations. As these populations afford different prevalence estimates, this section will review the prevalence of ADHD as denoted by community and at-risk studies.

Community Studies

Szatmari, Offord and Boyle (1989) reviewed eleven studies that documented the prevalence of ADD or hyperactivity in community samples, and reported rates that ranged from 1% to 14.3%. The wide variability in prevalence rates was attributed to differences in symptoms used to define the disorder, variations in the thresholds of symptoms required to meet the disorder, diverse methods used to collect information, varying sources of information (i.e., parent, teacher, child), and differences in sample characteristics.

The Ontario Child Health Study (Szatmari et al., 1989) was conducted to determine an estimate of the prevalence of psychiatric disorders among youth (age range: 4-16 years). Diagnoses were established on the basis of information that was gathered through behavioral checklists that were administered to parents, teachers and youth. The checklists were indicative of the DSM-III criteria for ADD. The sampling unit consisted of all household dwellings listed in the 1981 Census of Population, and sample selection was conducted by stratified random sampling. Given this methodology, the authors determined that 9% of boys and 3.3% of girls met criteria for ADDH. Furthermore, ADD was found to be less prevalent than ADDH. Between the ages of six and eleven

years, 1.4% of boys and 1.3% of girls met criteria for ADD, and 9.4% of boys and 2.8% of girls met criteria for ADDH. Throughout adolescence, the prevalence of ADD remained constant while the prevalence of ADDH decreased. More specifically, in the adolescent age group, 1.4% of males and 1% of females met criteria for ADD, while 2.9% of males and 1.4% of females met criteria for ADDH.

August and Garfinkel (1989) examined the prevalence of teacher rated ADHD symptoms in a school population of 1,038 male and female students in kindergarten through seventh grade. ADHD symptoms, as identified by scores on the Hyperactivity Index of the Conners Teacher Rating Scale (CTRS; Conners, 1969), were observed by teachers in 9.2% of the sample. When the students were screened for conduct related problems, the prevalence of children presenting with ADHD symptoms without severe behavior problems declined to 4.2%.

Kanbayashi, Nakata, Fujii, Kita, and Wada (1994) reported the prevalence of ADHD in 1,022 Japanese school children. According to parent ratings of DSM-III-R symptoms, 7.7% of the sample met the criteria for ADHD. Baumgaertel, Wolraich and Dietrich (1995) compared teacher reported prevalence rates for disruptive behavior disorders in 1,077 German students using DSM-IV, DSM III-R and DSM-III criteria. The prevalence rates for attention deficit disorders were reported to be 9.6%, 10.9% and 17.8% according to DSM-III, DSM-III-R and DSM-IV criteria respectively. The authors

attributed the increase in prevalence to a greater number of cases identified by the DSM-IV subtypes (i.e., ADHD-I and ADHD-HI). Of those students meeting DSM IV-ADHD criteria, 9%, 3.9% and 4.8% were diagnosed as ADHD-I, ADHD-HI and ADHD-C respectively.

At-risk Studies

Pelham, Evans, Gnagy and Greenslade (1992) reported the prevalence of teacher rated DSM-III-R ADHD according to the Disruptive Behavior Disorders Rating Scale (Pelham, Gnagy, Greenslade & Milich, 1992) in a sample of 365 boys in special education classes to be approximately 37%. Approximately 21% of the students who met criteria for ADHD also met criteria for ODD and or CD. Cohen, Riccio, and Gonzalez (1994) examined the prevalence of ADHD symptomology in 581 special education students and 135 children referred to a clinic for learning disabilities. Teacher ratings equal to or exceeding two standard deviations above age means on subscales of the CTRS were used as diagnostic thresholds for ADHD symptoms and other forms of psychopathology (i.e., depression, anxiety, conduct disorder, and psychosomatic complaints). The prevalence of "pure" ADHD (i.e., clinically significant scores on the ADHD subscale only) was found to be 15.8% in the special education sample and 35.6% in the clinic sample. Furthermore, 27.2% of the special education sample and 28.1% of the clinic-referred sample were found to have clinically significant scores on the ADHD subscale and at least one other subscale.

In summary, the DSM-IV indicates that the prevalence of ADHD ranges from 3-5% in school aged children (APA, 1994). Data from a large scale epidemiological study in Canada reported prevalence rates of 9% in boys and 3% in girls according to DSM-III criteria (Szatmari et al., 1989). The overall prevalence of attention deficit disorders in a sample of German school children was found to be 9.6% and 17.8% according to DSM-III and DSM-IV criteria respectively (Baumgaertel et al., 1995). In a Japanese school sample, the prevalence of DSM-III-R ADHD was found to be 7.7% (Kanbayashi et al., 1994). Investigations in the United States reported that teacher rated ADHD symptoms occurred in 9% of a non-referred population (August & Garfinkel, 1989) and in 27% (Cohen et al., 1994) to 37% (Pelham et al., 1992) of special education populations.

Comorbidity of ADHD with Other Psychiatric Disorders

Comorbidity with other psychiatric disorders is quite common. Indeed, Szatmari and colleagues (1989) determined that 44% of ADHD youth met criteria for at least one other psychiatric disorder, 32% had two additional disorders, and 11% had at least three other disorders.

Comorbid Mood, Anxiety and Disruptive Behavior Disorders

According to an extensive literature review by Biederman, Newcorn and Sprich (1991), ADHD and mood disorders co-occurred in 15 to 75% of the cases in epidemiological and clinical samples. ADHD and anxiety disorders were estimated to co-occur in approximately 25% of the cases. Munir,

Biederman and Knee (1987) compared 22 clinic referred ADDH children with a community sample. Compared with community youth, the subjects who met DSM-III criteria for ADDH had significantly higher rates of CD (36%), ODD (59%), and major affective disorder (32%). On the other hand, the groups did not significantly differ with regard to rates of comorbid anxiety disorders. Jensen, Shervette, Xenakis and Richters (1993) examined the prevalence of anxiety and affective disorder in a group of 47 clinic-referred children who met DSM-III criteria for ADDH. Jensen et al. observed that 48% of these ADDH youth met criteria for an additional diagnosis (i.e., depressive disorder, anxiety disorder, or both).

According to the literature review conducted by Biederman and colleagues (1991), ADHD and CD were observed to coexist in 30 to 50% of cases in both epidemiological and clinical samples of children and adolescents. Barkley (1990) estimated that up to 40% of ADHD children and 65% of ADHD adolescents will meet diagnostic criteria for ODD; and between 21 to 45% of ADHD children and 44 to 50% of adolescents will meet criteria for CD. Baumgaertel and colleagues (1995) reported that ODD and attention deficit disorders coexisted in 37, 28 and 19% of a non-referred sample according to DSM-III, DSM-III-R and DSM-IV criteria respectively.

Comorbid Learning Disorders

The coexistence of learning disabilities (LD) and ADHD has been well documented. Biederman and his colleagues (1991) reported comorbid estimates that ranged from 10% to 92%.

According to Riccio, Gonzalez and Hynd (1994) variability is attributed to differences in sampling techniques, measurement instruments and the criteria used to define both LD and ADHD.

Frick et al. (1991) examined the co-occurrence of underachievement in 177 clinic-referred boys (age 7-12 years). On the basis of structured clinical interviews with multiple informants, 111 boys met DSM-III-R criteria for ADHD and 68 boys met criteria for CD. When underachievement was defined by a discrepancy between a standardized IQ and achievement score while controlling for regression and age effects, 13% of ADHD children met criteria for a reading disability, and 14% met criteria for a math disability. When a simple discrepancy formula wherein a difference of 20 points or more exists between a standardized IQ and achievement score was used, learning disability rates increased to 16% in reading, and 21% in math. The lowest rates of learning disabilities were reported when subjects were required to score one standard deviation below age means in either math or reading, and demonstrate a 20 point discrepancy between ability and achievement. Based on the latter formula, 8% of children qualified for a reading disability, and 12% qualified for a math disability. Although Frick et al. (1991) observed that underachievement was associated with CD, this relationship was observed to be due to the co-occurrence of ADHD with CD.

Semrud-Clikeman et al. (1992) also investigated the prevalence of comorbid learning disabilities among 60 clinic-

referred children who met DSM-III ADDH criteria. The comparison groups consisted of 30 children who were referred for academic problems (AP), and 36 normal control children (NC). The prevalence of learning disabilities was examined according to three different discrepancy formulas. Based on a 10 point discrepancy between standardized achievement and IQ scores, 38% of an ADDH group, 43% of an AP group, and 8% of a community control group were diagnosed as having a reading disability. The second method, which required a 20 point discrepancy between achievement and IQ scores, found that 23, 10 and 2% of the respective ADDH, AP and normal controls met the criterion for a reading disability. The third method, which required a 15 point discrepancy between achievement and IQ scores, and a score of at least one standard deviation below the mean on an achievement test, found that 15, 3, and 0% of the respective ADDH, AP and normal controls met criteria for a reading disability.

Regarding math disability, the first method determined that 55, 53 and 33% of the respective ADDH, AP and normal controls met criterion. The second method identified 30, 33 and 22% of the respective ADDH, AP, and normal controls as having a math disability. According to the third method, 33, 33 and 0% of the respective ADDH, AP and normal controls met criteria. Semrud and colleagues (1992) advocated the use of a 20 point discrepancy between IQ and achievement scores to screen for learning disabilities

Differences in Psychiatric Comorbidity Among ADHD Subtypes

Lahey, Schaughency, Hynd, Carlson, and Nieves (1987) examined the prevalence of comorbid psychiatric disorders in clinic referred children with ADDH (n = 41) and ADD (n = 22). DSM-III diagnoses were formulated on information that was obtained from multiple sources (i.e., semistructured parent, teacher and child interviews, and teacher and parent rating scales). Lahey et al.(1987) observed that 68% of ADD youth and 61% of ADDH youth received a dual diagnosis. In regard to comorbid disruptive behavior disorders, children in the ADDH group met criteria for CD more frequently than children in the ADD group. ADD youth with comorbid CD showed less severe CD symptoms than ADDH youth with CD. In regard to comorbid internalizing disorders, the subtypes did not significantly differ when the point prevalence of specific affective and anxiety disorders (i.e., Major Depressive Disorder [MDD] or Separation Anxiety Disorder [SAD]) was separately analyzed. However, when affective and anxiety disorders were combined, the ADD group received a significantly greater number of internalizing diagnoses as compared to the ADDH group.

Cantwell and Baker (1992) examined groups of ADDH (n = 40) and ADD (n = 40) children who were referred to a speech and language clinic. Information regarding psychiatric symptomology and comorbid diagnoses was obtained for each subject through child and parent structured interviews that were based on DSM-III criteria, as well as parent and teacher

questionnaires. In regard to comorbid DSM-III diagnoses, the ADDH and ADD groups significantly differed in relation to the prevalence of comorbid ODD. More specifically, 15% and 2% of the respective ADDH and ADD cohorts met criteria for ODD. Significant differences between groups were not detected in relation to comorbid anxiety and affective disorders. However, a trend toward more affective disorder among ADDH youth (15% vs. 5%) and more anxiety disorder among ADD youth (23% vs. 12%) was observed.

Barkley, DuPaul and McMurray (1990) also examined the prevalence of comorbid psychiatric conditions among ADHD subtypes. Barkley et al. compared four groups of children (age range: 6-12 years): clinic-referred ADD youth without hyperactivity (ADD-H; n = 48); ADD youth with hyperactivity (ADD+H; n = 42); learning disabled youth (LD; n = 16); and youth without psychiatric disturbance (n = 36). ADHD subjects were classified as ADD-H or ADD+H based on a cutoff score on the Child Attention Profile (Achenbach & Edelbrock, 1986).

Prevalence estimates were determined based on information from structured parent interviews. The number of symptoms presented by youth in each DSM-III-R diagnostic category was recorded. The ADD+H group had a significantly higher rate of comorbid CD and ODD as compared to the ADD-H group. Forty percent of the ADD+H group met criteria for ODD, and more than 21% received a CD diagnosis. In contrast, 18% of the ADD-H group had ODD, and 6% had CD. Relative to the control

groups, the ADD-H group had a significantly higher prevalence of comorbid ODD (Barkley et al., 1990).

In regard to anxiety disorders, the percentages of children in all groups receiving diagnoses of SAD and Overanxious Disorder (OAD) were quite low and did not significantly differ across groups. However, the ADD+H group had a significantly greater number of SAD symptoms as compared to the other groups. Furthermore, the ADD+H, ADD-H and LD groups had significantly more OAD symptoms as compared to the control group. Finally, the ADD-H group had significantly more MDD symptoms as compared to the other three groups (Barkley, et al., 1990).

Summary

The comorbidity of ADHD with other psychiatric disorders is quite common. The frequent co-occurrence of learning disabilities among ADHD populations has been well established (Frick et al., 1991; Semrud-Clikeman et al., 1992). A high rate of comorbid disruptive behavior disorders (i.e., CD and ODD) in ADHD children has also been consistently documented (Barkley et al., 1990; Baumgaertel et al., 1995; Munir et al., 1987). However, there is less consensus regarding the proportion of ADHD youth who have comorbid internalizing disorders (Jensen et al., 1993; Munir et al., 1987). In regard to the ADHD subtypes, trends in the research consistently support the presence of a higher rate of disruptive behavior disorders in ADD+H youth relative to ADD-H youth. On the other hand, the findings related to the

differences in internalizing disorders are less consistent across studies (Barkley et al., 1990; Cantwell & Baker, 1992; Lahey et al., 1987).

CHAPTER 2: DIFFERENTIAL VALIDITY OF THE ADHD SUBTYPES

To distinguish among the subtypes of ADHD, important differences must be apparent between the subtypes in regard to correlates, etiology, prognosis and response to treatment (Lahey & Carlson, 1991). Many researchers have examined the differences between ADD-H and ADD+H. An early retrospective study by Maurer and Stewart (1980) concluded that the subtypes were similar with the exception of the presence or absence of hyperactivity. In contrast, subsequent investigations have consistently documented differences between ADD-H and ADD+H children. Differences have been reported in regard to behavioral and emotional problems, comorbid psychiatric diagnoses, social functioning, peer relations, attentional problems, cognitive style, neuropsychological functioning, special education placements, family history, prevalence, sex ratio, course and outcome of the disorder (Barkley, 1990; Barkley et al., 1990; Biederman et al., 1991; Cantwell & Baker, 1992; Goodyear & Hynd, 1992; Lahey & Carlson, 1991; Lahey et al., 1987; Lahey et al., 1988; Lahey et al., 1994; Szatmari et al., 1989).

As evidence of the unique psychiatric qualities of the subtypes accumulates, a number of authorities have suggested that ADD-H and ADD+H may be separate disorders (Barkley, 1990; Lahey et al., 1987). Barkley (1990) stated that "the evidence available to date compels us to begin considering ADD+H and ADD-H as separate and unique childhood disorders and not as subtypes of an identical attention disturbance"

(p. 91). The following selected literature review will focus on the differences among the ADHD subtypes in regard to social and behavioral features.

Social and Behavioral Features Among ADHD Subtypes

A number of investigators have documented the differences among the subtypes in regard to social-emotional and behavioral features. For example, a review of the literature involving the differential validity of ADD-H by Lahey and Carlson (1991) concluded that in comparison to children with ADD-H, youth with ADD+H were more likely to be characterized by aggression, conduct problems and peer rejection. In contrast, youth with ADD-H were more likely to be shy, unhappy, anxious, and socially withdrawn. Similarly, a literature review by Goodyear and Hynd (1992) concluded that:

> children with ADD+H have more behavioral problems, are less popular, are more self-destructive and are more likely to have a diagnosis of conduct disorder, and children with ADD-H seem more socially withdrawn, have a slower cognitive tempo, are more self-conscious, and have a greater incidence of developmental learning disorders" (p. 273).

King and Young (1982) compared the peer perceptions of groups of ADD+H (n = 22), ADD-H (n = 9) and non-clinical control boys (n = 27), age 7 through 10 years. ADHD subjects were assigned to groups based on their scores on an ADD teacher rating scale based on DSM-III criteria (i.e., SNAP Checklist; Pelham, 1980). Sociometric peer ratings and

teacher ratings on the CTRS were used as outcome measures. King and Young observed that the number of "most liked" and "least liked" nominations did not significantly differ between the ADD-H and ADD+H groups. However, both ADD groups were more negatively perceived by their peers as compared to the control group. Although ADD groups were equally rejected, differences between the groups emerged on the CTRS. Whereas the ADD+H group evidenced significantly greater scores than the control group on the inattentive-passive, hyperactivity and conduct problems factors, the ADD-H group differed from the control group solely on the inattentive-passive factor.

Similarly, Lahey, Schaughency, Strauss and Frame (1984) examined differences in teacher ratings, and peer sociometric status ratings among ADD subtypes. Twenty children were classified as ADD-H and 10 were diagnosed as ADD+H based on their scores on the attention problems-immaturity and the motor excess factors of the Revised Behavior Problem Checklist (RBPC; Quay & Peterson, 1983). Twenty randomly selected non-clinical controls were matched with the ADD subjects on the basis of grade placement, sex and race.

Lahey et al. (1984) observed that the ADD+H group had significantly higher scores than the control group on the RBPC conduct disorder, socialized aggression, and psychotic behavior scales. In contrast, the ADD-H group differed from the control group solely on the anxiety/withdrawal scale. Both ADD groups were rated as significantly less popular than the control group. However, the ADD+H group received

significantly more "like least" nominations from peers than the ADD-H group. In addition, the groups were compared on self-reported ratings of depression, as denoted by the Children's Depression Inventory (CDI; Kovacs & Beck, 1977), and self concept as measured by the Piers Harris Self-Concept Scale (PHSCS; Piers & Harris, 1964). In regard to self-concept, both ADD groups "demonstrated poor self-concepts on the academic status scale, but the ADD+H group also exhibited low self-esteem in the areas of behavior, and popularity, whereas the ADD-H group indicated problems of self-concept concerning physical appearance, anxiety and general unhappiness" (p. 307). ADD groups endorsed more symptoms of depression on the CDI than controls. However, in a three way comparison, significant differences were not evident between the CDI scores of the ADD-H, ADD+H and the control groups.

Edelbrock, Costello, and Kessler (1984) analyzed the teacher ratings of clinic-referred boys (age range: 6-11 years) diagnosed with ADD-H (n = 7) and ADD+H (n = 18). A group of 62 clinic-referred boys without ADD served as a comparison group. Participants were rated by teachers using the Teacher Report Form (TRF; Achenbach, 1978). Edelbrock et al. observed that boys with ADD+H were rated by teachers as less socially withdrawn, but more unpopular, aggressive and hyperactive than boys in the ADD-H group. Both groups were rated as equally inattentive.

Carlson, Lahey, Frame, Walker and Hynd (1987) examined the peer social status of clinic-referred youth with ADD+H (n =

16), ADD-H (n = 11), and a non-clinical control group (n =45). DSM-III diagnoses were made on the basis of information obtained from child, parent and teacher interviews using an updated version of the Schedule for Affective Disorders and Schizophrenia for school aged children (K-SADS; Puig-Antich & Chambers, 1978) and standardized teacher and parent rating scales. ADD youth with comorbid major psychiatric disorders were excluded from the study. Carson et al. observed that the control group received significantly higher "liked most" ratings and significantly less "liked least" ratings as compared to ADD+H and ADD-H groups. However, the sociometric ratings of the ADD-H and ADD+H groups did not significantly differ. In effect, both ADD groups were associated with low peer status.

Barkley et al. (1990) examined differences in social competence among ADHD subtypes. Participants were clinic-referred youth with ADD-H (n = 48), ADD+H (n = 42), learning disabilities (n = 16), and youth without psychiatric morbidity (n = 32). Teachers rated the subjects according to the Taxonomy of Problem Situations (TOPS; Dodge, Petit, McLaskey & Brown, 1986), a teacher rating scale that measures children's peer and social relationships. According to the TOPS ratings, the ADD+H group exhibited significantly more problems than the ADD-H and control groups in most areas of social competence, particularly in areas of peer relations, peer provocation and meeting teacher expectations. The ADD-H group exhibited significantly more problems than the control

groups in areas related to peer provocation, meeting social expectations and teacher expectations.

In addition, teachers rated the subjects according to the TRF and the School Situations Questionnaire (Barkley, 1990). In comparison to the ADD-H group, the ADD+H group had significantly higher ratings on indices of pervasiveness and severity of conduct problems, aggression, and self-destructive behaviors. However, in comparison to the learning disabled and control groups, the ADD-H group had significantly higher teacher ratings on all areas with the exception of the TRF aggression index. Barkley et al.(1990) concluded that:

> it appears that greater inattention at school is associated with a significantly greater variety of behavioral and social problems. However, the additional presence of hyperactivity is associated with considerably more severe problems and with a unique risk for the presence and severity of aggression or conduct problems (p. 782).

Stanford and Hynd (1994) compared parent and teacher behavioral ratings among groups of clinic referred ADD+H (n = 35), ADD-H (n = 25) and learning disabled boys and girls (n = 17), aged 5-16 years. Diagnoses were based on information obtained from behavioral checklists, observations, teacher reports, and clinical interviews. The outcome measures included the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983), the SNAP Checklist, and items from an

updated version of the K-SADS. Based on the endorsement of items, Stanford and Hynd concluded that:

> the ADD-H group was described as more withdrawn, prone to daydreaming, underactive, and shy whereas the ADD+H group was more frequently endorsed as acting without thinking, excessively shifting from one activity to another, calling out in class and having difficulty taking turns appropriately" (p.250).

The DSM-IV field trials (Lahey et al., 1994) examined differences in global, academic, and social impairment among the DSM-IV ADHD subtypes. Three-hundred-eighty clinic-referred youth obtained from a variety of sites in the United States were studied. Diagnostic information was obtained through administrations of a version of the Diagnostic Interview Schedule for Children (DISC; Shaffer, Fisher, Piacentini, Schwab-Stone & Wicks, 1992) specifically modified to reflect the diagnostic guidelines of the DSM-III, DSM-III-R and a number of alternative DSM-IV diagnostic criteria. Information was obtained by parent interview and supplemented with information from a teacher or child interview.

A multiple regression analysis determined that hyperactive-impulsive symptoms predicted global impairment, as measured by ratings on the Children's Global Assessment Scale (Setterberg, Bird, & Gould, 1992). Conversely, inattentive symptoms predicted academic impairment, as denoted by teacher ratings on the Academic Performance Rating Scale (DuPaul, Rapport, & Perriello, 1991). When groups were

compared, the ADHD-C group had a significantly higher level of global impairment than the ADHD-I and clinical control groups. In contrast, the ADHD-I and ADHD-C groups did not significantly differ from one another relative to academic impairment. The ADHD-I and ADHD-C groups evidenced greater academic impairment than the ADHD-HI and clinical control groups. Similarly, the ADHD-C and ADHD-I groups evidenced significantly higher ratings of peer rejection than the ADHD-HI and clinical control groups. The ADHD-C and ADHD-I groups did not significantly differ from one another on an index of social preference suggesting that both of these groups were associated with low peer status (Lahey et al., 1994).

Chapter Summary

ADD with hyperactivity (ADD+H) and ADD without hyperactivity (ADD-H) have been associated with different social-emotional and behavioral correlates. As indicated by teacher ratings, ADD+H youth have higher rates of aggressive behavior and conduct problems, whereas ADD-H youth evidence significantly higher rates of social withdrawal (Edelbrock et al., 1984; Lahey et al., 1984). Despite their unique psychological characteristics, the peer rejection ratings of these subtypes have not significantly differed. However, their ratings have been found to be well below the base rates of non-clinical controls (Carlson et al., 1987; King & Young, 1982; Lahey et al. 1984; Lahey et al., 1994). Despite these well documented findings, it is of considerable interest to

note that the deficits in social skills that may predispose ADD-H youth to social rejection have not been explored (Wheeler & Carlson, 1994). In contrast, research efforts have examined the social skills deficits of ADD+H youth (Frederick & Olmi, 1994; Guevremont & Dumas, 1994; Landau & Moore, 1991; Wheeler & Carlson, 1994).

CHAPTER 3: THE SOCIAL FUNCTIONING OF ADHD YOUTH

A number of literature reviews have provided evidence to support the existence of significant social problems in youth with ADHD (Frederick & Olmi, 1994; Guevremont & Dumas, 1994; Landau & Moore, 1991; Wheeler & Carlson, 1994). In an effort to identify factors that mediate the social difficulties of ADHD youth, researchers have examined behavioral, non-behavioral, cognitive, and academic correlates of peer status in these children. Other investigators have relied on direct observation to explore specific social skills deficits that may predispose ADHD youth to peer rejection. Studies to this effect are reviewed below.

Correlates of Social Deficits in ADHD

Flicek (1992) examined the relationship between achievement and social problems of ADHD boys. Six groups were compared: ADHD-learning disabled (ADHD/LD; n = 18), ADHD-low achieving (ADHD/LA; n = 19), ADHD-academically competent (ADHD; n = 33), learning disabled without ADHD (LD; n = 34), low achieving without ADHD (LA; n = 29), and academically competent controls without ADHD (C; n = 116). Subjects were assigned to academic status categories (i.e., learning disabled (LD), low achieving (LA) or academically competent(AC)) based on teacher ratings of academic performance, and a discrepancy analysis between ability and achievement scores. Assignment to behavioral categories (i.e., ADHD or non-ADHD) was based on IOWA Conners Teacher Rating Scale (TRS; Loney & Milich, 1982)

inattention/hyperactivity scores. Teachers rated the social skills of subjects according to the Social Skills Questionnaire (SSQ; Gresham & Elliot, 1990). Subjects were rated by peers in regard to popularity, and behaviors associated with peer status (i.e., cooperative, disruptive, acts shy, starts fights, leader).

Flicek (1992) found that ADHD, LD and LA are associated with social problems in unique ways. Specifically, the LD group received significantly lower ratings on peer popularity and peer-nominated cooperative and leader variables relative to the LA group. ADHD boys received significantly higher peer ratings on the disruptive variable, significantly higher scores on the SSQ oppositional/defiant or externalizing scale, and significantly lower scores on SSQ cooperation and self-control scales relative to LD or LA boys. Whereas the peer rejection ratings of the LD, LA, ADHD and control groups did not significantly differ, the ADHD/LD and ADHD/LA groups received significantly higher peer rejection ratings relative to the controls. Flicek concluded that comorbid ADHD and LD was associated with the greatest risk for social status problems.

Sandler et al. (1993) studied the relationship between inattention and peer problems among ADHD youth. Ninety-nine clinic-referred children with attention and learning problems were divided into two groups. The "cognitive inattention" (CI) cohort (n = 32) received teacher ratings greater than one standard deviation above age means on the cognitive

inattention factor of the Anser 2S Questionnaire (Levine, 1980). This instrument also contained a hyperactivity and peer problem factor. The comparison group (n = 67) consisted of the remaining participants who scored less than one standard deviation above age means on the cognitive inattentive factor. All the subjects in the CI group, and approximately 37% of the comparison group met DSM-III-R criteria for ADHD.

The CI group received higher teacher ratings of peer problem than the comparison group. A regression analysis found that among children in the CI group, both the cognitive inattention factor and the hyperactivity factor were positively related to peer problems. However, the effect of the cognitive inattention factor was significant above that of the hyperactivity factor. The authors speculated that "the independent contribution of inattention to peer problems, over and above hyperactivity, suggests that inattention alone may be a social risk" (Sandler et al., 1993, p. 949).

Erhardt and Hinshaw (1994) examined the social behavior and the sociometric ratings of 25 ADHD boys and 24 boys without behavior disorders. ADHD diagnoses were based on the DSM-III-R criteria. Of the 25 boys with ADHD, 12 met criteria for ODD and 4 met criteria for CD. Subjects were not screened for internalizing disorders. Erhardt and Hinshaw observed higher rates of noncompliant-disruptive behaviors, verbal aggression, and physical aggression among ADHD boys relative to comparison boys. On the other hand, the groups did not

differ with respect to prosocial behavior or social isolation (i.e., initiation of social contacts, norm setting, leadership and mediation of conflict). As expected, boys without disruptive behavior disorders received higher friendship ratings, more positive nominations and fewer negative nominations than boys with ADHD. Although diagnostic status (i.e., ADHD vs. control) predicted peer rejection, the results of a regression analysis found that "aggressive and noncompliant-disruptive behavior accounted for a significant proportion of the variance in negative nominations beyond the group composition variable" (p. 839).

Observational Studies

A number of investigations have utilized observational methods to explore the specific social deficits of ADHD youth. A frequently used method compares the interaction of a dyad composed of an ADHD child and a non-clinical control child (i.e., ADHD/normal) with a dyad composed of two non-clinical control children (i.e., normal/normal). Studies of this nature are reviewed below.

Hubbard and Newcomb (1991) examined the social interaction of eight ADHD/normal dyads and eight normal/normal dyads during free play. ADHD boys scored above age means on the Hyperactivity Index of the parent and teacher versions of the Conners Rating Scale (CPRS, CTRS; Goyette, Conners, & Ulrich, 1978) and were previously diagnosed with ADHD by a physician. ADHD/normal dyads engaged in significantly more solitary play and significantly less

associative play than the normal/normal dyads. Furthermore, significantly lower levels of affective expression and verbal reciprocity were observed in the ADHD/normal dyads relative to the normal/normal dyads.

Cunningham and Siegel (1987) compared the social interaction of thirty normal/normal dyads and thirty ADDH/normal dyads. ADDH boys scored two standard deviations above age means on the Hyperactivity Index of the CPRS and were given a prior ADDH diagnosis according to DSM-III criteria. The interaction within the dyads was observed during free play, a highly structured cooperative task, and a simulated classroom situation that involved independent work.

The ADDH/normal dyads, relative to the normal/normal dyads, elicited significantly higher rates of controlling behaviors in the free play and classroom situation. They also complied significantly less with peers during the classroom situation. Interestingly, within the mixed dyad, the number of controlling interactions denoted non-significant differences between the ADDH subjects and the controls. Furthermore, the number of positive social interactions of the ADDH boys and controls was not significantly different. Cunningham and Siegel (1987) argued that these finding suggest that the social difficulties of ADDH children may represent a performance deficit, and that ADDH youth may elicit an increase in the controlling behavior of normal peers.

Grenell, Glass and Katz (1987) compared the social skills of ADDH boys (n = 15) and non-clinical control boys (n = 15) aged 7-11 years. ADDH subjects were previously diagnosed with hyperactivity or ADDH by a pediatrician or psychologist. Knowledge of socially appropriate behavior was assessed according to the Social Knowledge Interview (SKI; Geraci & Asher, 1980). In addition, subjects were paired with unfamiliar boys from the community, and the interaction within the dyads was observed. Discrete social skills were coded and rated during a free play situation, a persuasion task, and a cooperative task that required members to take turns in the roles of "worker" and "helper".

On the SKI, the ADDH group evidenced less friendly, more assertive, more impulsive, less effective, and less relationship-enhancing responses relative to the control group. Interestingly, ADDH boys did not differ from controls in describing strategies for initiating relationships. Rather, ADDH boys were less effective in regard to generating strategies to maintain relationships and resolve interpersonal conflict. Grenell et al.(1987) suggested that the skills needed for initiating a relationship may be less complex and require less active problem solving than the skills that are needed for relationship maintenance and conflict resolution.

The observational data determined that the social behavior of ADDH children did not differ from controls during the free play and persuasion situations. Similarly, during

the cooperative task, the social behavior of the ADDH and control subjects did not differ when subjects were in the role of "worker". However, ADDH subjects were observed to engage in significantly more noncommunicative speech and rule breaking than controls when they adopted the passive role of "helper". Interestingly, in the role of helper, ADDH boys did not differ from controls in the amount of help and praise they gave to their partners (Grenell et al., 1987).

Landau and Milich (1988) examined social communication patterns of ADD boys (n = 17) and boys without psychiatric impairment (n = 18). ADD status was determined by an elevated score on the inattention/overactivity factor of the CTRS. Thirty-five dyads were created by pairing ADD subjects with non-clinical peers. Members of the dyads took turns playing the roles of "host" and "guest" on a "TV Talk Show Game". Landau and Milich found that ADD boys, unlike the controls, offered essentially the same number of answers as both guest and host, and asked fewer questions in the role of host as compared to controls. Landau and Milich argued that ADD boys failed to modify their behavior in accordance with the role requirement, and may have difficulty attending to or making use of salient social cues.

Chapter Summary

The literature supports the notion that ADHD children are significantly more rejected and unpopular than their peers. Inattention (Sandler et al., 1993) and conduct problems (Erhardt & Hinshaw, 1994) have been associated with peer

rejection in ADHD youth. There is evidence to suggest that, compared with non-clinical peers, ADHD children may be (a) less adaptive in their ability to adjust social communication behaviors (Landau & Milich, 1988), (b) less attentive to the process of social interaction (Hubbard & Newcomb, 1991), (c) more controlling in their interactions and (d) less compliant with peers (Cunningham & Siegel, 1987). Furthermore, these children were found to have deficits in social knowledge and performance of social skills (Grenell et al., 1987). Non-significant differences in the rates of positive social interactions among ADHD youth and normative peers have been reported (Cunningham & Siegel, 1987; Erhardt & Hinshaw, 1994). These findings provide support for the notion that ADHD children may have a performance deficit rather than a skills deficit in the social arena.

Summary

ADHD is the diagnostic label given to youth who present with developmentally inappropriate levels of inattention, impulsivity and hyperactivity, or all. Historically, ADHD has been subjected to many conceptual revisions. Most recently, the DSM-IV has reinstated a multidimensional conceptualization of ADHD, and subtypes of the disorder (i.e., ADHD-I, ADHD-HI and ADHD-C) have been reestablished. The ADHD DSM-IV diagnostic criteria differ from previous diagnostic descriptions (i.e., DSM-III and DSM-II-R), and the new criteria are associated with an increase in the prevalence rate of the disorder (Lahey et al., 1994). In

light of these differences, the research findings generated through the application of the DSM-IV ADHD criteria will not be directly comparable to findings obtained on the basis of previous diagnostic criteria. In view of these points, research opportunities have been provided to conduct investigations pertaining to the validity of the DSM IV-ADHD subtypes.

Differences in the social-emotional and behavioral correlates among ADD-H and ADD+H subtypes have been documented. ADD+H has been associated with greater externalizing problems whereas ADD-H has been associated with greater internalizing symptomology (Goodyear & Hynd, 1992; Lahey & Carlson, 1991; Stanford & Hynd, 1994). Despite the unique psychological characteristics associated with the subtypes, both groups have been found to be significantly more socially rejected than their non-clinical counterparts (Carlson et al., 1987; King & Young, 1982; Lahey et al., 1994; Lahey et al., 1984). Researchers have begun to explore the social deficits of ADD+H youth that may predispose them to peer rejection (Cunningham & Siegel, 1987; Grenell et al., 1987; Hubbard & Newcomb, 1991; Landau & Milich, 1988). In contrast, there is a modicum of information regarding the social skills deficits among children with ADD-H (Wheeler & Carlson, 1994).

CHAPTER 4: METHODOLOGY

This chapter presents the statement of the problem and purpose of the study. It also includes a description of the research design, subject selection process, procedure, diagnostic measure, dependent measure, hypotheses and rationale.

Statement of the Problem and Purpose of the Study.

To date, a comparative analysis of the social skills of ADHD Inattentive and Combined subtypes has not been effected (Wheeler & Carlson, 1994). In view of this, this investigation compared teacher derived social skills ratings of three groups of elementary school children (i.e., ADHD-Predominantly Inattentive Type, ADHD-Combined Type, and a comparison group).

Design.

A three group case-control design was utilized. Inasmuch as data from Cohen's (1992) power analysis indicates that 21 subjects per cell are sufficient to denote statistically significant effects for this design at the $p < .05$ level, 21 subjects per group were selected. The first group consisted of youth with ADHD-Predominantly Inattentive Type (ADHD-I) ($n = 21$). The second group consisted of youth with ADHD-Combined Type (ADHD-C) ($n = 21$). The third group involved a comparative control group ($n = 21$). The Predominantly Hyperactive-Impulsive Type (ADHD-HI) was excluded due to the low prevalence rates of this subtype in latency age children

(Lahey et al., 1994). The scores on the Social Skills Questionnaire (SSQ; Gresham & Elliot, 1990) constituted the dependent variables. Figure 1 presents a schematic representation of the data collection design.

Figure 1: Schematic representation of the design

	Diagnostic Groups		
	ADHD-I	ADHD-C	Control
	(n = 21)	(n = 21)	(n = 21)
Social Skills Questionnaire			
Subscales:			
Cooperation			
Assertion			
Self-Control			
Social Skills Total Score			

Selection Process

The participants in this study consisted of 63 New York City public school students. Subjects were enrolled in grades 1-6. Their ages ranged from 6 years 1 month to 12 years 9 months. All of the subjects were recruited from a population of youth who had been evaluated by the Committee on Special Education (CSE). The principal investigator obtained the informed written consent of the parents/guardians and teachers who participated in this study (see Appendices A1, A2 and A3). A general letter that indicated the nature of the

research and requested teacher participation was distributed to general and special education teachers. In classes where teachers agreed to participate, parent consent letters were distributed to students who had been evaluated by CSE. All students whose parents gave informed written consent were considered for the study. Based on information obtained from an initial review of CSE records, students who presented with an exclusionary criteria were immediately dropped from the study. After a student's eligibility was established, the student was assigned to one of three groups according to the criteria denoted below. Subjects were selected for the study in the order in which they were recruited. Subject recruitment was completed after 21 subjects were obtained for each group.

Procedure

After informed parental consent was established, CSE records were reviewed and student IQ and achievement scores were obtained. The investigator administered the ADHD, ODD and CD modules of the Diagnostic Interview for Children and Adolescents-Revised-Parent Version (DICA-R-P; Reich, Leacock & Shanfeld, 1995) to the parents. Each participant's primary teacher rated his/her behavior according to the Social Skills Questionnaire standardized directions (SSQ; Gresham & Elliot, 1990). Secondary teachers (i.e., reading, math or resource room teachers, or related services providers) rated the conduct of the subjects according to an adapted version of the DICA-R-P ADHD module (see Appendix B). All teachers were

blind to the purpose of the study and the diagnostic status of the subjects. Based on the criteria stated below, subjects were assigned to one of the following groups:

ADHD-Inattentive Type. As based on the administration of the DICA-R-P to parents and teachers, youth who received two independent ADHD-Inattentive Type diagnoses were selected. By obtaining parent and teacher ratings, the DSM-IV ADHD provision denoting that impairment from symptoms must be evident in at least two settings was satisfied. Students with a DICA-R-P generated diagnosis for conduct disorder (CD) (based on the parent interview) were excluded. In addition, children who met DSM-IV criteria for a pervasive developmental disorder (PDD) as established through a parental interview or on the basis of extant CSE records were excluded. In a similar vein, youth with ADHD-Inattentive Type who were taking stimulant medication for the treatment of ADHD, as well as youth who had a history involving traumatic brain injury or cerebral palsy were also excluded. To avoid the confounding effects of mental retardation, students with an IQ below 75 were not included in the study.

Students who met criteria for a learning disorder (LD) were also excluded. The DSM IV states that an IQ - academic achievement discrepancy between one and two standard deviations is sometimes used to identify LD cases especially in cases where an individual's performance on an IQ test may have been compromised by an associated disorder in cognitive processing, a comorbid mental disorder or general medical

condition, or the individual's ethnic or cultural background. For this study, LD cases were identified when a discrepancy of 23 points or greater was observed between an IQ and a standard score on an individually administered math or reading test. Table 2 presents the demographic characteristics of the ADHD-I cohort.

ADHD-Combined Type Subjects. As based on the administration of the DICA-R-P to parents and teachers, students who received two independent ADHD-Combined Type (ADHD-C) diagnoses were selected. Youth who met DSM-IV criteria for CD or PDD, as well as youth who were taking stimulant medication were excluded. Youth who had a history involving traumatic brain injury or cerebral palsy, a LD (as specified by the investigator's criteria of a 23 point discrepancy between IQ and academic achievement), or an IQ below 75 were also excluded. Table 2 presents the demographic characteristics of the ADHD-C cohort.

Control Subjects.[1] As based on the administration of the DICA-R-P to parents and teachers, youth who received negative ADHD diagnoses were selected. Youth who met DSM-IV criteria for CD and PDD, as well as youth with a history involving traumatic brain injury or cerebral palsy, LD (as specified by the investigator's criteria of a 23 point discrepancy between IQ and academic achievement) or an IQ below 75 were excluded. Table 2 presents the demographic characteristics of the control group.

[1] The investigator initially proposed the inclusion of a non-referred control group in the current study; however, the request was denied by the New York City Board of Education Office of Educational Research.

Table 2

Characteristics of Subjects by Group

		Group		
		ADHD-I (n = 21)	ADHD-C (n = 21)	Control (n = 21)
Age				
	M	9.4	9.1	9.2
	SD	2.09	1.91	1.96
	Range	6.1-12.6	6.3-12.9	6.1-12.5
IQ				
	M	90.29	88.33	84.48
	SD	8.64	12.79	10.55
	Range	79-109	75-125	75-108
Hollingshead				
Index	M	37.20	32.41	32.61
	SD	12.63	12.51	10.92
	Range	20-58	11-58	17-58

Table 2 continued

	Group		
	ADHD-I (n = 21)	ADHD-C (n = 21)	Control (n = 21)
SSQ Teacher Ratings*			
Reading			
M	1.95	2.05	1.95
SD	.80	1.02	.86
Range	1-3	1-4	1-4
Math			
M	2.14	1.90	2.14
SD	.85	.89	.91
Range	1-4	1-3	1-4

Note. Possible ratings ranged from 1-5. A rating of 2 places the student's achievement in the lowest 20th percent of the class.

Table 2 continued

	Group					
	ADHD-I (n = 21)		ADHD-C (n = 21)		Control (n = 21)	
	n	(%)	n	(%)	n	(%)
Gender						
Male	16	(76.2)	16	(76.2)	16	(76.2)
Female	5	(23.8)	5	(23.8)	5	(23.8)
Race						
White	11	(52.4)	6	(28.6)	6	(28.6)
Black	5	(23.8)	5	(23.8)	4	(19.0)
Hispanic	5	(23.8)	9	(42.9)	10	(47.6)
Asian	0	(0)	1	(4.8)	1	(4.8)
Class Placement						
General Education	4	(19.0)	3	(14.3)	1	(4.8)
Related Service	1	(4.8)	1	(4.8)	1	(4.8)
Resource Room	10	(47.6)	5	(23.8)	7	(33.3)
Self-Contained*	6	(28.6)	12	(57.1)	12	(57.1)

Note. *Of the subjects designated for self-contained programs, 3 ADHD-I, 1 ADHD-C and 6 Control subjects were placed in inclusion settings.

Results of analysis of variance (ANOVA) found non-significant age differences between groups (F (2,60) = .069, p < .933). Non-significant differences between the IQs of the respective groups were also apparent (F (2,60) = 1.575, p < .216). The SSQ teacher ratings regarding grade level reading (F (2,60) = .078, p < .925) and math skills (F (2,60) = .507, p < .605) of the groups were not significantly different (see below for a description of the academic ratings). Likewise, non-significant differences between the Hollingshead SES scores of the groups were apparent (F (2, 52) = .962, p < .389). It should be noted that the investigator was not able to obtain Hollingshead ratings on 8 of the subjects (i.e., 1 ADHD-I, 4 ADHD-C and 3 controls). The subjects' grade levels were evenly distributed across groups. Approximately half of the subjects in each group were enrolled in grades 1-3. The remaining half of the subjects were enrolled in grades 4-6.

Subjects in all groups were matched on the basis of gender. Inasmuch as conduct problems have been associated with social skills deficits (Erhardt & Hinshaw, 1994; Flicek, 1992), and as oppositional defiant disorder (ODD) frequently occurs among youth with ADHD (Barkley et al., 1990), the three groups were also matched relative to the number of subjects who met DSM-IV criteria for ODD. ODD cases were identified on the basis of a positive diagnosis according to a DICA-R-P ODD parent interview. Three subjects in each group met criteria for ODD. Matching was accomplished by selecting

three ODD cases and five female subjects in each group in consecutive order. Subsequent ODD and female cases were excluded.

Diagnostic Measure

Diagnostic Interview for Children and Adolescents-Revised-Parent Version (DICA-R-P; Reich, Leacock & Shanfeld, 1995). The DICA-R-P is a structured clinical interview that is intended for parental administration. The instrument presents a series of modules that reflect the DSM-IV diagnostic criteria for disorders that are evident in childhood or adolescence. Each module consists of a number of items that denote DSM-IV diagnostic criteria for a disorder. Standard questions and probes are presented to the parent/guardian in order to determine the presence or absence of symptoms. For illustrative purposes, the ADHD module contains 18 items. Each item consists of a question or set of questions that corresponds to a symptom reflecting inattention (e.g., "Is it hard for your child to do her/his homework slowly and carefully?"), hyperactivity (e.g., "Is s/he continually running around, or climbing on things at times when s/he shouldn't be?") or impulsivity (e.g., "Is it hard for her/him to wait her/his turn in games, or in sports?"). Six of the ADHD items are supplemented by standard probes (e.g., "When (s)he's waiting in line does (s)he start clowning around or pushing ahead?").

Welner, Reich, Herjanic, Jung and Amado (1987) previously examined the reliability and validity of a DSM III version of

the DICA. In a sample of psychiatrically hospitalized children, Welner et al. reported inter-interviewer agreement kappa coefficients of 1.0, 1.0 and .79 for ADD, CD and ODD diagnoses respectively on the basis of DICA child interviews. Kappa coefficients of .66, .80, and .52 were reported for the agreement between DICA child and parent interviews for ADD, CD, and ODD diagnoses respectively. When diagnoses determined on the basis of DICA child interviews were compared to psychiatrists' chart diagnoses, kappa coefficients of .50 and .43 were reported for ADD and CD. Meehan (1997) examined the test-retest reliability of the DICA-R-P with a sample of 40 subjects (31 males and 9 females, ages 5-4 to 16-0 years). The test-retest interval ranged from 19 to 25 days. Kappa coefficients of .60, .71, .71 and .88 were reported for ADHD-I, ADHD-H, ADHD-C and ODD respectively.

Test-retest and interrater reliability of the adapted ADHD teacher module of the DICA-R-P (Appendix B) was measured by the investigator. The sample consisted of 30 New York City public school students (20 male, 10 female; 9 White, 6 Black, 13 Hispanic, and 2 Asian) from 2 inclusion classes. The inclusion classes consisted of a combination of general and special education students and were staffed by two teachers. Of the 30 students, 9 were first graders, 5 were second graders, and 16 were fifth graders. Fourteen subjects were general education students and 16 were special education students. Four female teachers with masters degrees in special education rated the students' behavior. Three

teachers had 15 years and one teacher had three years of teaching experience.

The test-retest Pearson correlation coefficients for the number of ADHD symptoms endorsed by the same teacher over a 14 day interval were .98 ($p = < .000$) for inattentive and .86 ($p = < .000$) for hyperactive-impulsive symptoms. The kappa coefficient for test-retest diagnostic agreement for the three subtypes of ADHD was .94. The kappa coefficient for interrater diagnostic agreement based on the assessment of two teachers who observed the students under the same conditions was .44 for the three subtypes of ADHD.

Dependent Measure

Social Skill Rating System: Social Skills Questionnaire, Grades K-6, Teacher Form (SSQ; Gresham & Elliot, 1990). The SSQ is a teacher rating scale intended for use with students in kindergarten through the sixth grade. On the Social Skills scale, thirty items cluster to form three (10 item) subscales. The subscales include cooperation (e.g., "finishes class assignments within time limits"; "follows your directions"; "attends to your instructions"), assertion (e.g., "invites others to join in activities"; "gives compliments to peers"; "volunteers to help peers with classroom tasks"), and self-control (e.g., "controls temper in conflict situations with adults"; "responds appropriately when pushed or hit by other children"; "compromises in conflict situations by changing own ideas to reach agreement"). Items are scored either 0, 1, or 2 reflective of

the perceived frequency values of "never," "sometimes," and "very often". The total social skills score is calculated from the sum of the subscales scores. The SSQ Social Skills scale served as the dependent measure.

The SSQ includes an Academic Competence scale. On this scale, teachers make judgments regarding the academic and learning behaviors of students in comparison to other children in the same classroom. Nine items that reflect reading and math performance, motivation, parental support and general cognitive functioning are rated on a 5 point Likert-type scale. Number values correspond to percentage clusters. A number 1 indicates the lowest or least favorable performance, and places the student in the lowest 10% of the class. In contrast, a rating of 5 places the child in the highest 10% of the class. Items # 52 and #53 reflect information relative to teacher estimates of students' reading and math achievement. Descriptive data relative to these items is presented in Table 2. Test-retest reliability of items #52 and 53 was measured by the investigator. The sample consisted of 30 fifth grade New York City public school students (21 male, 9 female; 6 White, 19 Hispanic, 5 Asian). Of the 30 students, 10 attended general education, 10 received resource room services and 10 participated in self-contained special education classes. Twelve teachers with a mean of 11 years teaching experience rated the student's achievement according to items #52 and 53. The test-retest Pearson correlation coefficient over a 14 day interval was

.92 (p = <.000) for item #52 (teacher estimate of reading ability) and .94 (p = <.000) for item #53 (teacher estimate of math ability).

Demaray et al. (1995) reviewed the SSQ and concluded that the standardization sample size and psychometric properties of the instrument are excellent. Gresham and Elliot (1990) report high coefficient alpha reliabilites of .92, .86, .91, and .94 for the cooperation, assertion and self-control subscales, and the total social skills score respectively. A test-retest correlation of .85 over a four weeks interval was reported for the total social skills score. Moderate to high correlations between the SSQ and Social Behavior Assessment (SBA; Stephens, 1978) scores of 79 elementary age students were found. The observed results suggest that these scales measure similar constructs. Gresham and Elliot (1990) compared the SSQ scores of 769 non-handicapped (NH), 116 learning disabled (LD), and 68 "other" handicapped (OH) elementary school age students. The social skill total scores of NH children were found to be significantly higher than those of the LD and OH groups.

Hypotheses and Rationale:

The literature indicates that social rejection ratings of ADD+H and ADD-H youth have not significantly differed (Carlson et al., 1987; King & Young, 1982; Lahey et al., 1984; Lahey et al., 1994). The literature also indicates that both groups have been rated as significantly more socially rejected than non-clinical controls. In a similar vein, the

results of the DSM-IV field trials found that ADHD-C and ADHD-I groups received significantly higher ratings of peer rejection than clinical controls (Lahey et al., 1994). As such, it was expected that both groups of ADHD youth would present with significantly fewer social skills relative to controls. However, insufficient information exists to speculate about the differences in overall social skills as a function of ADHD subtype. In view of these points, the following hypotheses were predicted.

HO 1: The SSQ total social skills scores of the ADHD-I subjects will be significantly lower than the scores of the control subjects.

HO 2: The SSQ total social skills scores of the ADHD-C subjects will be significantly lower than the scores of the control subjects.

HO 3: The SSQ total social skills scores of the ADHD-I subjects will not be significantly different from the scores of the ADHD-C subjects.

The DSM-IV criteria state that youth with ADHD-I and ADHD-C must present with developmentally inappropriate symptoms of inattention. It is to be noted in this regard that a number of items on the SSQ cooperation scale are incompatible to DSM-IV symptoms denoting inattention. Furthermore, Flicek (1992) found that inattentive and hyperactive children scored lower on the SSQ cooperation scale relative to learning disabled and low achieving youth. In view of these points, the following hypotheses were predicted.

HO 4: The SSQ cooperation scores of the ADHD-I subjects will be significantly lower than the scores of the control subjects.

HO 5: The SSQ cooperation scores of the ADHD-C subjects will be significantly lower than the scores of the control subjects.

HO 6: The SSQ cooperation scores of the ADHD-I subjects will not be significantly different from the scores of the ADHD-C subjects.

Given that ADD-H youth have been found to be more socially withdrawn than ADD+H youth (Edelbrock et al., 1984; Stanford & Hynd, 1994), and that both ADD+H and ADD-H youth present with significantly more internalizing symptoms than LD and non-clinical controls (Barkley et al., 1990), the following hypotheses were predicted.

HO 7: The SSQ assertion scores of the ADHD-I subjects will be significantly lower than the scores of the control subjects.

HO 8: The SSQ assertion scores of the ADHD-C cohort will be significantly lower than the scores of the control group.

HO 9: The SSQ assertion scores of the ADHD-C subjects will be significantly higher than the scores of the ADHD-I subjects.

According to DSM-IV criteria, children diagnosed with ADHD-C must present with developmentally inappropriate symptoms of hyperactivity-impulsivity. Therefore, it is

reasonable to assume that the ADHD-C group will be characterized by less self-control relative to the ADHD-I and control groups. Flicek (1992) found that inattentive and hyperactive children scored lower on the SSQ self-control scale relative to learning disabled and low achieving youth. Moreover, Barkley et al. (1990) observed that ADD-H youth exhibited significantly more problems related to peer provocation as compared to learning disabled and normal controls. In view of these points, the following hypotheses were predicted.

HO 10: The SSQ self-control scores of the ADHD-I subjects will be significantly lower than the scores of the control subjects.

HO 11: The SSQ self-control scores of the ADHD-C subjects will be significantly lower than the scores of the control subjects.

HO 12: The SSQ self-control scores of the ADHD-C subjects will be significantly lower than the scores of the ADHD-I subjects.

CHAPTER 5: RESULTS

This chapter presents information regarding descriptive statistics as well as the results of an ANOVA, a MANOVA, and Bonferroni post hoc comparisons. Table 3 presents the means and standard deviations of the SSQ scores by group.

Table 3

Means and Standard Deviations of the SSQ Raw Scores by Group

	Group		
	ADHD-I (n = 21)	ADHD-C (n = 21)	Control (n = 21)
SSQ Total Score			
M	30.71	22.71	36.29
SD	9.76	7.42	12.28
SSQ Subscales			
Cooperation			
M	8.10	6.90	12.62
SD	3.73	3.53	5.26
Assertion			
M	9.81	8.62	11.00
SD	5.17	3.68	5.16
Self-Control			
M	13.29	8.14	13.76
SD	3.77	3.77	4.17

Note. Average raw scores for the SSQ male standardization sample: Total Score, 28-51; Cooperation, 10-19; Assertion, 8-17; Self-Control, 9-18.
Possible raw score range for the Total Score: 0-60. Possible raw score range for the subscales: 0-20.

It should be noted that the means of the SSQ Total, Cooperation, Assertion and Self-Control scores of the Control group were within the average range (i.e., scores were within one standard deviation of the mean scores of the male standardization sample). In a similar vein, the means of the SSQ Total, Assertion and Self-Control scores of the ADHD-I were within the average range. In contrast, the mean Cooperation score of the ADHD-I group was significantly below the average range. The mean Assertion score of the ADHD-C group fell at the lower limits of the average range. In contrast, the mean SSQ Total, Cooperation and Self-Control scores of the ADHD-C group were significantly below the average range.

An analysis of variance (ANOVA) was performed to test for group differences on the SSQ Total raw scores. The results of the ANOVA determined that the null hypothesis of no significant differences could not be supported, F (2, 60) = 9.736, p. < 000. Given this information, Bonferroni post hoc analyses were conducted to discern the nature of the group differences. Table 4 presents the results.

Table 4

Results of the Bonferroni Post Hoc Analysis of the SSQ Total Score Comparisons

Comparison	Mean Diff.	Std. Error	p
ADHD-I vs. ADHD-C	8.00	3.092	.036
ADHD-I vs. Control	-5.57	3.092	.230
ADHD-C vs. Control*	-13.57	3.092	.000

Note. * denotes the group with a significantly higher score. $p < .01$.

As noted in Table 4, the Bonferroni post hoc results supported the hypothesis that the Total SSQ scores of the ADHD-C and ADHD-I groups would not be significantly different. Moreover, the hypothesis that the Total SSQ scores of the ADHD-C group would be significantly lower than the control group was supported. Unexpected non-significant differences were found between the Total SSQ scores of the ADHD-I and control groups. As such, HO 2 and HO 3 were supported and HO 1 was rejected.

A multi-variate analysis of variance (MANOVA) was performed to test for group differences by SSQ subscale. The Cooperation, Assertion and Self-Control raw scores were entered as dependent variables. The results of the MANOVA revealed that the null hypothesis of no significant

differences could not be supported using Wilks' Lambda test (Wilks' = .548 with a corresponding F (6, 116) = 6.785, p < .000). As a statistically significant value was apparent, univariate F tests were effected for each of the SSQ subscales. Table 5 presents the univariate F test results.

Table 5

Univariate F-tests for SSQ Subtest Scores

Subscales	MSE	F	p
Cooperation	18.01	10.598	.000
Assertion	22.30	1.334	.271
Self-Control	15.28	13.344	.000

As noted from Table 5, significant group variations were apparent on the Cooperation and Self-Control subscales. Non-significant differences were observed on the Assertion subscale. Given this information, a series of joint multivariate Bonferroni post hoc analyses were conducted to discern the nature of the group differences. Joint multivariate comparisons are computed for all parameters controlling for the number of dependent variables. Table 6 presents the results.

Table 6

Joint Multivariate Bonferroni Post Hoc Analysis for SSQ Subtest Scores

Comparison	Mean Diff.	Std. Error	p
Cooperation			
ADHD-I vs. ADHD-C	1.19	1.310	.663
ADHD-I vs. Control*	-4.52	1.310	.003
ADHD-C vs. Control*	-5.71	1.310	.000
Self-Control			
ADHD-I* vs. ADHD-C	5.14	1.206	.000
ADHD-I vs. Control	-.48	1.206	1.000
ADHD-C vs. Control*	-5.62	1.206	.000

Note. * denotes the group with a significantly higher score. $p < .01$.

As anticipated in HO 4 and HO 5, the joint multivariate Bonferroni post hoc results indicate that the Cooperation scores of the control group were significantly higher than the scores of the ADHD-I and ADHD-C groups. Furthermore, as predicted in HO 6, non-significant differences were observed between the Cooperation scores of the ADHD groups. It was predicted in HO 7, HO 8, and HO 9 that the Assertion scores of the ADHD groups would be significantly lower than the

Assertion scores of the control group. It was also anticipated that the Assertion scores of the ADHD-C group would be significantly greater than the scores of the ADHD-I group. These hypotheses were not supported as the Assertion scores of the three groups were not significantly different. The prediction in HO 10 that the Self-Control scores of the ADHD-I group would be significantly lower than the Self-Control scores of the control group was not supported. As predicted in HO 11 and HO 12, the Self-Control scores of the ADHD-C group were significantly lower than the Self-Control scores of the control and ADHD- I groups.

Chapter Summary

Table 7 presents a summary of the hypotheses, results and relative significance of the findings.

Table 7

A Summary of Test Hypotheses, Results, and Effect Sizes

Hypotheses [a,b,c]	HO Supported?	Results	Effect Size
HO Total Scores			
1. ADHD-I < C	no	ADHD-I = C*	.56**[d]
2. ADHD-C < C	yes	ADHD-C < C*	1.36***
3. ADHD-I = ADHD-C	yes	ADHD-I* = ADHD-C	.80***[e]
HO Cooperation			
4. ADHD-I < C	yes	ADHD-I < C*	1.07***
5. ADHD-C < C	yes	ADHD-C < C*	1.35***
6. ADHD-I = ADHD-C	yes	ADHD-I* = ADHD-C	.28
HO Assertion			
7. ADHD-I < C	no	ADHD-I = C*	.25
8. ADHD-C < C	no	ADHD-C < C*	.50**[d]
9. ADHD-C > ADHD-I	no	ADHD-C = ADHD-I*	.25
HO Self-Control			
10. ADHD-I < C	no	ADHD-I = C*	.12
11. ADHD-C < C	yes	ADHD-C < C*	1.43***
12 ADHD-C < I	yes	ADHD-C < I*	1.32***

Note. * denotes the group with the higher score; ** denotes a medium effect size; *** denotes a large effect size; [a] HOs that predict that the means of one group will be significantly higher than those of another are denoted by >; [b] HOs that predict that the means of one group will be lower than those of another are denoted by <; [c] HOs that predict non-significant differences between the group means are denoted by =. [d] denotes HOs that did not reach statistical significance but had medium effect sizes; [e] denotes a supported HO of non-significant differences coexisting with a large effect size indicative of meaningful group differences.

CHAPTER 6: SUMMARY AND CONCLUSIONS

Summary

The present study compared teacher ratings of social skills of three groups (ADHD-I, ADHD-C, and a control group) of children. The subject pool consisted of 63 educationally referred public school students in grades 1-6 with an age range of 6-12 years. Subjects were matched with regard to gender and the number of subjects in each group that met criteria for oppositional defiant disorder. Groups did not significantly differ relative to age, SES ratings, teacher estimates of reading and math skills, or IQ. Children with comorbid conduct disorder, mental retardation, pervasive developmental disorder or a learning disorder were excluded from this study. Children receiving medication for the treatment of ADHD, and those with a history of traumatic brain injury were excluded as well.

Non-significant differences were found between the Total SSQ scores of the ADHD-I and ADHD-C groups. The Total SSQ scores of the ADHD-C group were significantly lower than the scores of the control group. In contrast, non-significant differences were found between the Total SSQ scores of the ADHD-I and control groups. The ADHD-I and ADHD-C groups were rated by teachers as having significantly fewer cooperative class related behaviors than the control group. Behavioral ratings related to positive social assertion did not significantly differ among the three groups. The ADHD-C group

was rated to have significantly fewer social skills related to self-control than the ADHD-I and control groups. A general discussion regarding the observed results, significance of the study, limitations of the study, and directions for future research will be presented in this chapter.

Discussion

The significantly lower SSQ Total scores of the ADHD-C group relative to the scores of the control group suggest that ADHD-C youth may be at greater risk for social problems compared to their non-ADHD educationally referred counterparts. In line with the current findings, the results of the DSM IV field trials found that ADHD-C youth received significantly higher peer rejection ratings than clinical controls (Lahey et al., 1994).

The non-significant differences found between the SSQ Total scores of the ADHD-I and ADHD-C groups are consistent with the finding of the DSM IV field trials. The results of the DSM IV field trials found non-significant differences between the peer rejection ratings of ADHD-C and ADHD-I youth. In contrast, Barkley et al.(1990) observed that ADD+H youth had significantly more peer relationship problems relative to their ADD-H counterparts. Despite the lack of statistical significance that was observed between the SSQ Total scores of the ADHD-I and ADHD-C groups, a large effect size was evident. As such, it may be said that meaningful

differences were apparent in the overall social skills of the ADHD-I and ADHD-C groups.

The results indicate that the overall social skills of the ADHD-I and non-ADHD educationally referred youth were not significantly different. In contrast to the current findings, the DSM IV field trials found that ADHD-I youth received higher peer rejection ratings than clinical controls (Lahey et al., 1994). Likewise, Barkley et al. (1990) observed that ADD-H youth had significantly more peer related problems relative to LD and non-clinical controls. A rationale for the unexpected non-significant differences found between the SSQ Total scores of the ADHD-I and control group may be related to differences in the ADHD populations studied. In the current sample, all three groups had an equal number of subjects who met criteria for ODD. In contrast, the ADD-H sample in the Barkley et al. (1990) study had a significantly higher proportion of comorbid ODD relative to the LD and non-clinical control groups. It should also be noted that the ADD-H and ADD+H subjects in the Barkley et al. study were recruited from outpatient psychiatric and pediatric clinics.

There were substantial differences between the current sample and the DSM IV field trial sample as well. The DSM IV field trial subjects consisted of 380 clinic referred youth. Of this number, 75 were psychiatric inpatients and 177 were psychiatric outpatients. Less than 10 percent of the subjects were obtained from school referrals for psychological evaluations. Furthermore, the exclusionary criteria for the

DSM IV field trial did not exclude ODD, CD, or LD. The comorbidity of ADHD with these psychiatric disorders is quite common (Barkley et al., 1990; Baumgaertel et al., 1995; Frick et al., 1991; Munir et al. 1987; Semrud-Clikeman et al., 1992). It should also be recalled that the educationally referred population that was studied in this investigation was drawn from community based schools. Furthermore, more than half of the ADHD subjects in the current study participated in general education classrooms for most of the school day. As such, it may be said that the subjects in this sample had less severe and pervasive psychopathology relative to the DSM IV field trial participants.

The significantly higher SSQ Cooperation scores of the non-ADHD subjects relative to the scores of the ADHD-I and ADHD-C cohorts were in keeping with expectations inasmuch as a number of the Cooperation items (e.g., finishes class assignments within time limits", "attends to teacher instructions", and "ignores peer distractions") reflect the deficits in attention that are typically ascribed to youth with ADHD. These results are consistent with the findings that were reported by Flicek (1992). Flicek observed that inattentive and hyperactive children scored lower on the SSQ Cooperation subscale relative to learning disabled and low achieving youth.

The non-significant differences that were observed between the SSQ Assertion scores of the three groups were not anticipated. Surprisingly, the mean Assertion scores of all

three groups fell within normal limits. It is possible that the selected subjects did not present with the internalizing symptoms that would influence SSQ Assertion ratings. This explanation is supported by the finding that the SSQ Internalizing Problem Behavior scores of the three groups were within normal limits. Normal levels of internalizing symptoms may be atypical in ADHD youth (Barkley et al., 1990; Jensen, Shervette, Xenakis & Richters, 1993) and youth with learning problems (McConaughy & Achenbach, 1996). Hence, the unexpected findings may be attributed to the unique characteristics of the subjects that were selected for this study.

The non-significant differences that were observed between the SSQ Self-Control scores of the ADHD-I and control groups were inconsistent with the findings of Barkley et al. (1990). Barkley and colleagues found that ADD-H youth had significantly more problems related to peer provocation as compared to learning disabled and normal controls.

The significant differences that were observed between the SSQ Self-Control scores of the ADHD-I and ADHD-C groups provide a degree of support for the differential validity of the ADHD subtypes as listed in the DSM-IV. According to the DSM-IV criteria, children diagnosed with ADHD-C must present with developmentally inappropriate symptoms of hyperactivity-impulsivity. Teacher ratings on the SSQ Self-Control subscale clearly indicated that ADHD-C youth experienced greater difficulty in exerting self-control relative to their ADHD-I

and non-ADHD counterparts. These results are consistent with the research literature that indicates that youth with ADD+H present with significantly more conduct related problems as compared to youth with ADD-H (Barkley et al., 1990; Edelbrock, Costello & Kessler, 1984; King and Young, 1982; Stanford & Hynd; 1994).

Significance

Viewed theoretically, it is of considerable interest to recall that the ADHD diagnostic criteria that appeared in the DSM III (APA, 1980) and the DSM III-R (APA, 1987) were intuitively established (i.e., data based field trials were not conducted). Moreover, the DSM IV field trials did not examine for differences in social skills among the ADHD subtypes. As such, this study presents an initial test of the differential validity of the DSM IV ADHD classification relative to social skills. In effect, it may be said that the significant differences that were observed provide a degree of support for the differential validity of the current ADHD classification.

Social skills deficits and poor peer relationships in childhood and adolescence are powerful predictors of poor social adjustment and psychological problems later in life (Guevremont & Dumas, 1994). This investigation supports the notion that youth with ADHD (especially those with ADHD-C) have more social skills deficits as compared to their educationally referred counterparts. Given that ADHD youth were at greater risk for significant social skills deficits,

it is recommended that school psychologists routinely use reliable and valid measures like the SSQ when assessing inattentive and or overactive youth.

Limitations

The results of the current investigation must be interpreted with the knowledge that the ADHD diagnoses were exclusively based on structured clinical interviews. Structured interviews entail self-reports that are subject to the individual's perception of the situation (Borkovec, Weerts, & Bernstein, 1977, as cited in Saigh, 1992). In view of this, Saigh (1992) recommended the formulation of inferences on the basis of a variety of measures. Perhaps a multirater, multimodal method of assessment such as described by Stanford and Hynd (1994) could increase diagnostic efficiency. Stanford and Hynd formulated diagnoses on the basis of observations, standardized test results, parent and teacher behavioral checklists, as well as the results of a structured clinical parental interview. As the assessment of social skills was based solely on teacher ratings of observed classroom behavior, different outcomes may have been evident if subjects had been rated by multiple observers in a variety of settings. The results should be tempered with the realization that a greater number of special education teachers provided SSQ ratings for ADHD-C subjects relative to ADHD-I and control participants. Finally, as the principle investigator administered the DICA-P-R, the possibility of an examiner effect must be considered (Barber, 1968).

Recommendations

Given the observed results and the need to more fully explore the social skills deficits of youth with ADHD, a number of recommendations for future research are indicated. These recommendations are as follows:

1. It is recommended that a multirater, multimodal, diagnostic process be effected in subsequent studies of this nature.
2. According to Gresham and Elliot (1990), ratings of social behaviors are evaluative judgments affected by the environment and a rater's standard of behavior. As social skills were rated solely by teachers, it would be of interest to conduct a similar study that employed SSQ parent and teacher ratings.
3. Recalling that the control group consisted of educationally referred students, it would be of interest to conduct a similar study that includes a non-clinical control group.
4. The external validity of future investigations would be enhanced by the inclusion of information relative to the specific disorders and characteristics of the individuals who were excluded from the study. In depth knowledge of the subject pool and the subjects that were excluded from the study is necessary when results are generalized to other populations.

Appendix Listing

Appendix A1

Dear _____,

My name is Maureen Kennedy and I am completing my doctorate in Educational Psychology at the Graduate School and University Center of CUNY. I am currently conducting a research project that examines children's social skills. This information will help educators work more effectively with students who are not reaching their potential. Please take a moment to read about this project to see if you are interested in participating.

If you agree to participate, notices will be sent to the parents of the special education students in your class requesting their participation in the study. If a parent agrees to participate, the student's records will be reviewed to determine if the student meets the eligibility requirements necessary to be included in the study. In the event that a student meets the eligibility criteria, his or her parent will be interviewed regarding the child's behavior. In addition, you will be asked to complete a teacher questionnaire that taps the student's social skills and behavior in school. The questionnaire takes no more than 15 minutes to complete.

Participation in this study is entirely voluntary. You will not be affected in any way if you decide not to participate. If you agree to participate now you can always change your mind and withdraw from the study at any time for any reason. Please be assured that all information will be kept confidential, and the names of the participants will not be mentioned in the final research paper.

If you wish to participate, please read and sign the statement below and return this letter in the enclosed envelope. If you would like more information about the study, please call me at 718-457-6436. Thank you very much for taking the time to read and respond to this letter. Your time and cooperation is greatly appreciated.

Sincerely,

Maureen Kennedy

Maureen Kennedy

I agree to participate in the study described above.

_____

(Teacher's signature) (date)

If you have any questions concerning your rights as a participant in this study, you can call Sponsored Research, Graduate School and University Center/CUNY at 212-642-2059.

Appendix A2

Dear Parent/Guardian,

My name is Maureen Kennedy and I am completing my doctorate in Educational Psychology at the Graduate School and University Center of CUNY. As a part of my studies, I am conducting a research project that examines children's social skills. This information will help educators work more effectively with students who are not reaching their potential. Please take a moment to read about this study to see if you are interested in participating.

Participation in this study is voluntary. If you choose to participate, a school psychologist will interview you about your child's behavior and ability to pay attention at a time that is convenient for you. Your child's teacher will be asked to provide information regarding your child's social skills, activity level and ability to pay attention in class.

If you agree to participate, you will be asked to give permission for your child's Committee on Special Education records to be reviewed, and for your child's achievement and ability scores to be used for research purposes. All information will be kept confidential. Please be assured that this study poses no risks to you or your child. The participants in this study will remain anonymous in that the names of the participants in the study will not be mentioned in the final research paper.

Please read and sign the statement below and return this letter in the enclosed envelope if you would like to volunteer to participate in this study. Be assured that you or your child will not be affected in anyway if you decide not to participate or withdraw from the study for any reason. If you would like more information about the study, please call me at 718-457-6436. Thank you very much for taking the time to read and respond to this letter.

Sincerely,

Maureen Kennedy

Maureen Kennedy

I agree to participate in the study described above. I give permission for my child's teacher to provide information regarding my child and for my child's ability and achievement scores to be used for research purposes.

_____

(Parent/guardian's signature) (date)

If you have any questions concerning your rights as a participant in this study, you can call Sponsored Research, Graduate School and University Center/CUNY at 212-642-2059.

Appendix A3

Dear _____, RE: Student _____

My name is Maureen Kennedy and I am completing my doctorate in Educational Psychology at the Graduate School and University Center of CUNY. I am currently conducting a research project that examines children's social skills. This information will help educators work more effectively with students who are not reaching their potential. Please take a moment to read about this project to see if you are interested in participating.

If you choose to volunteer, you will be asked to rate the above named student's social skills according to a questionnaire and to respond to questions regarding the student's activity level and ability to pay attention in class.Participation in this study is entirely voluntary. You will not be affected in any way if you decide not to participate or to withdraw from the study for any reason. All information will be kept confidential, and the names of the participants will not be mentioned in the final research paper.

If you wish to participate, please read and sign the statement below and return this letter in the enclosed envelope. If you would like more information about the study, please call me at 718-457-6436. Thank you very much for taking the time to read and respond to this letter. Your time and cooperation is greatly appreciated.

Sincerely,
Maureen Kennedy
Maureen Kennedy

I agree to participate in the study described above.

_____
(Teacher's signature (date)

If you have any questions concerning your rights as a participant in this study, you can call Sponsored Research, Graduate School and University Center/CUNY at 212-642-2059.

Appendix B

TEACHER QUESTIONNAIRE

Student's Name:_____ Date: _____

Name of Person Completing this Form:_____

Describe your relationship to this student: (i.e., cluster teacher; resource room teacher; classroom paraprofessional; related service provider.)

_____

How much time do you spend with this student per week?
_____ days ___ hrs.

How long have you known this child? _____

How well do you know this child? (circle one)
not well **moderately well** **very well**

DIRECTIONS: Please think about each question carefully before responding. Respond YES if the behavior happens a lot or if it is a big problem for this student.

1a) Is it hard for this student to do his/ her homework slowly and carefully? Do you find that his/her work is messy and careless?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

1b) Does this student make a lot of mistakes in his/her school work, homework or other tasks, because (s)he rushes through them without checking?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

2a) Does this student daydream a lot, or have a hard time concentrating when (s)he is trying to work at school?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

2b) In any kind of activities such as sports or games, does this student have a hard time remembering what to do next, or does (s)he have trouble paying attention to the rules?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

3) Do you often feel that this student doesn't seem to be listening to you even when you are speaking directly to him/her?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

4a) Does this student have difficulty in school because even after you explain a lesson, (s)he is still not sure what to do?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

4b) If you ask this student to do something, does (s)he forget to do it, or does (s)he forget exactly what to do?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

5) Does this student have a hard time getting organized? Is he/she always without pens, papers, and other items he/she needs to complete a task? Does he/she lose things or break things?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

5a) Is it hard for this student to find anything (s)he needs because things are left scattered on the floor or piled up in a heap?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

6) Does this student hate doing school work because (s)he finds it very hard to sit still and pay attention?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

6b) Does (s)he find any excuse to get out of doing school work because (s)he finds it so hard to stay focused on what (s)he is doing?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

7) Is this student continually losing things like pencils, notebooks, papers from school, the pieces for a game, or other items required for an activity?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

8) Is it hard for this student to do work when something else is going on in the same room? Is this student distracted by every little thing?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

9) Is this student often forgetful in his/her day to day activities? For example does (s)he forget to bring his/her work home from school?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

10) Does this student have a very hard time sitting still? Does (s)he squirm and fidget in his/her seat?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

11) Does this student have a hard time staying seated at school? Is this student in and out of his/her seat in school?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

12) Is this student continually running around or climbing on things at times when (s)he shouldn't be?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

13) Is it really hard for this student to do anything quietly either by herself/himself or with kids?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

14) Do you feel that this student just can't slow down; that (s)he is continually moving or doing something? Would you describe this student as "on the go" as if (s)he is "driven by a motor"?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

15) Does this student often seem to talk "non-stop"? Does (s)he frequently talk "on and on" ?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

16) Does this student often start answering a question before it has been completed? Do you feel that (s)he can't wait until the question has been finished before (s)he blurts out the answer?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

17) Is it hard for this student to wait his/her turn in games, or in sports? Does (s)he break in before it's her/his turn? Does (s)he find it difficult to wait in line? When this student is waiting in line, does (s)he start clowning around, or pushing ahead?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

18a) Does this student often jump in and start talking to you at inappropriate times? For example, when you're busy, or when you're talking to someone else?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

18b) When other kids are playing games or involved in an activity, is this child likely to butt in without being asked?

YES or **NO** **If "YES," how frequently does it happen?**
Sometimes **Often** **Very Often**

Have any of the behaviors you noted in questions 1-18:

a) Made it difficult for this student to get good grades in school?

not at all **not too much** **somewhat** **quite a bit**

b) Caused problems with how this student gets along with classmates?

not at all **not too much** **somewhat** **quite a bit**

c) Caused problems with how this student gets along with teachers?

not at all **not too much** **somewhat** **quite a bit**

Appendix C

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Fax: 202.682.6114

August 14, 1996

Maureen Kennedy
60-63 84th St.
Elmhurst, NY 11373

Dear Ms. Kennedy:

I am responding to your recent request to reprint diagnostic criteria for **Attention Deficit Hyperactivity Disorder** from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition.

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Sincerely,

Ronald E. McMillen

Ronald E. McMillen
Director of Publications & Marketing

Enclosure

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IMAGE EVALUATION
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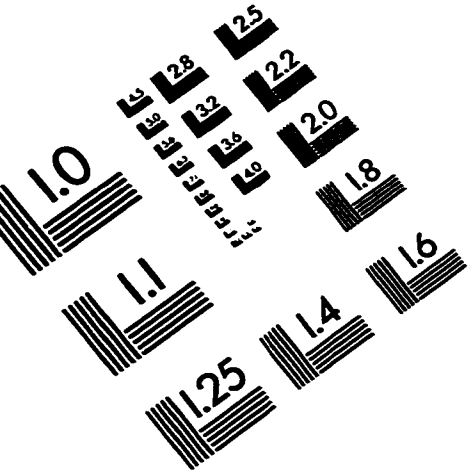

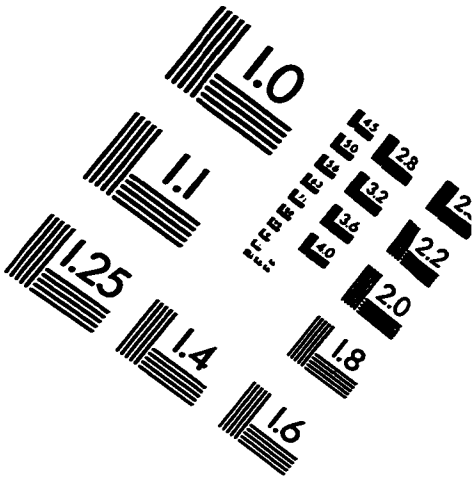

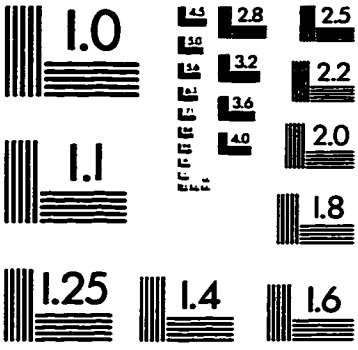

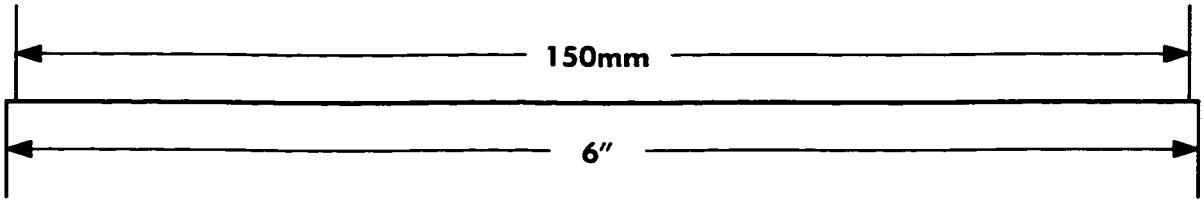

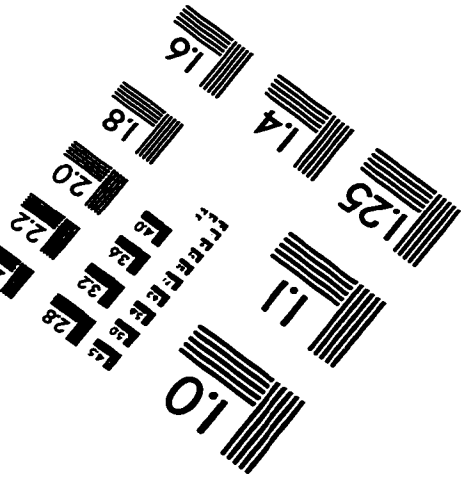

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