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ABSTRACT

A multidimensional clinical assessment project was conducted on an at-risk adolescent population (n=78) in a public school setting. The focus of the project was on the identification of specific learning disabilities (LD) and attention deficit hyperactivity disorder (ADHD) as they relate to mental health problems and scholastic difficulties. Results indicated that 11.5% of these at-risk students had a Wechsler Intelligence Scale for Children-III full scale IQ less than 70, indicative of a developmental handicap. Of the remaining students, 39% met criteria for one or more specific LD, 30% met criteria for ADHD, and 13% of these at-risk students met criteria for comorbid ADHD and LD. Those classified as ADHD also exhibited significantly greater levels of psychological distress, evidenced by Minnesota Multiphasic Personality Inventory-A scale elevations, compared to the non-ADHD students, suggesting that even among their at-risk peers, ADHD students warrant greater attention with regard to psychological problems. (Contains 4 figures and 12 references.) (Author/SLD)

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ED 389 817

Intellectual, Achievement, and Mental Health Evaluation of At-Risk Adolescents: Assessing Comorbidity of ADHD, LD, and Conduct Problems

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Abstract

A multi-dimensional clinical assessment project was conducted on an at-risk adolescent population (N=78) in a public school setting. The focus of the project was on the identification of specific learning disabilities and ADHD as they relate to mental health problems and scholastic difficulties. Results indicated that 11.5% of these at-risk students had a WISC-III full scale IQ less than 70, indicative of a developmental handicap. Of the remaining students, 39% met criteria for one or more specific learning disabilities, 30% met criteria for ADHD, and 13% of these at-risk students met criteria for comorbid ADHD and LD. Those classified as ADHD also exhibited significantly greater levels of psychological distress, evidenced by MMPI-A scale elevations, compared to the non-ADHD students – suggesting that even among their at-risk peers ADHD students warrant greater attention with regard to psychological problems.

Intellectual, Achievement, and Mental Health Evaluation of At-Risk Adolescents

Research Problem

As noted by Longman, Inglis, & Lawson (1991), "The most common reasons for the referral of children for psychological evaluation are, first, *behavior disorder* (also known as conduct or emotional disturbance), and second, *learning disabilities*." The complicating problem that frequently arises is that both of these disorders may occur in the same child, especially in children from at-risk populations. The purpose of the current study was to investigate the relationship between cognitive abilities, academic achievement, and mental health problems in a sample of behaviorally-disordered adolescents. The focus was on the identification of ADHD, LD, and comorbid conditions in this at-risk population via a multi-method / multi-informant approach. Of particular interest was the examination of adolescents' WISC-III subscale patterns and factor-based index scores for identifying not only learning disabilities, but also the possible utility of the WISC-III in identifying ADHD. For example, Prifitera & Dersh (1993) reported that nearly 85% of both LD *and* ADHD children had higher scores on the WISC-III Perceptual Organization (PO) Index than the sum of those scales comprising the "SCAD" profile (Symbol Search; Coding; Arithmetic; Digit Span), compared to 48% of the standardization sample with this pattern.

Method

Participants

Participants were 78 seventh and eighth grade adolescents (49 males; 29 females) enrolled in the Jefferson Center junior high school program in Toledo, Ohio. Average age was 14 years 3 months. To be enrolled in the Jefferson Center program, students must be identified as dropouts or potential dropouts by the Toledo Public School system. In the current sample, 98% percent of the students were referred to the program due to significant behavioral problems and/or chronic truancy in their regular academic setting. Sixty-two percent of the students had failed and repeated at least one prior grade. Eighty-nine percent had been suspended three or more times from their regular academic placement prior to entry in the Jefferson Center program. Fifty-four percent of the students had current or previous judicial court involvement. The racial/ethnic composition of the sample was: Caucasian 42%, African/American 44%, Hispanic 11.5%, and Mixed-racial 2.5%.

Despite the manifestly high level of conduct disorder and academic failure evident in this group of students, very few had received any formal psychological or cognitive evaluation prior to referral to the Jefferson Center program to assess for possible learning disabilities, developmental handicaps, or ADHD as contributors to the students' behavioral and academic problems. Neither group base-rates for this special school program, nor individual diagnoses for these at-risk students was available prior to assessment for the purposes of this study.

Procedure

Parents or legal guardians signed written consent to allow their children to participate. Students signed assent forms. Participants were tested individually during the school day at a place and time that did not interfere with regular academic activities. Testing took place over two days, with each testing period consisting of two 45 minute sessions with a break in between. Administration of instruments was counterbalanced across participants.

Measurement Instruments

Students were administered the Wechsler Individual Achievement Test (WIAT) and the Wechsler Intelligence Scale for Children-Third Edition (WISC-III). The WIAT consists of eight academic area subtests and four Composite scores (Reading, Math, Language, and Writing). The WISC-III summarizes the individual's cognitive ability in three composite scores: Verbal, Performance, and Full Scale IQ. Participants also completed the Minnesota Multiphasic Personality Inventory–Adolescent Version (MMPI-A; Butcher, Williams, Graham, Archer, Tellegen, Ben-Porath, & Kaemmer, 1992). Since many of the students were expected to read below the minimum sixth grade reading level necessary to complete the MMPI-A items, examiners individually administered the MMPI-A orally to all participants.

To assess ADHD, a multi-method / multi-informant psychometric battery was used, including reports by teacher, parent or guardian, youth, and direct observation by experimental personnel. Teachers completed both the 28 item Conners' Teacher Rating Scales (CTRS-28; Conners, 1990) and the Child Behavior Checklist-Teacher Report Form (CBCL-TRF; Achenbach & Edelbrock, 1983) for each student. The CTRS-28 produces scores for three subscales: Conduct Problems, Hyperactivity, and Inattentive-Passive, as well as a separate Hyperactivity Index. The CBCL-TRF includes eight problem area subscales (including Attention Problems) and three summary scores (Internalizing, Externalizing, and Total).

Parents or guardians completed the Conners' Parent Rating Scales (CPRS-48), which includes an Impulsive-Hyperactive scale and Hyperactivity Index analogous to those derived for the teacher version. The Child Behavior Checklist-Direct Observation Form (CBCL-DOF; Reed & Edelbrock, 1983) was completed by a trained graduate student observer for each student. One-half of the students also completed the Child Behavior Checklist-Youth Self-Report (CBCL-YSR), which (like the teacher version) includes Attention Problems as one of the eight problem behavior subscales.

Results

General Attributes

Across the entire sample, the average WISC-III Full Scale IQ (FIQ) was 83 (SD=11; Range 62 - 111). (Mean VIQ=83; Mean PIQ=86.) Thus, as a whole, these adolescents evidenced general intellectual abilities in the "Low Average" range (12th percentile). On the WIAT, the average Total WIAT standard score was 84 (SD=10; Range 62 - 117), or about the 5:9 grade level. The consistency between the average WISC-III FIQ and WIAT Total scores suggests that there was no evidence of a general discrepancy between academic achievement and intellectual ability across the sample.

Nine of the 78 adolescents tested (11.5%) were found to have a FIQ less than 70 ("Intellectually Deficient"), which is indicative of a developmental handicap. Of these nine students, six were African-American females, one was a Mixed-race female, and two were Caucasian males. For clinical diagnosis, a FIQ less than 70 generally precludes a designation of either ADHD or a specific learning disability, thus all further analyses included only those adolescents with a FIQ equal or greater than 70.

The racial/ethnic composition of the remaining sample (N=69) was: Caucasian 45%, African/American 40.5%, Hispanic 13%, and Mixed-racial 1.5%. There were no significant differences in FIQ, VIQ, or PIQ as a function of racial/ethnic differences, nor were there any differences in FIQ, VIQ, or PIQ as a function of gender; thus, further analyses were collapsed across gender and ethncity.

Learning Disabilities

Using each student's WISC-III full scale IQ score as the general measure of cognitive ability, a predicted WIAT achievement score was computed for all eight of the WIAT academic subtests and the four Composite Area scores. Then a discrepancy score comparing each student's actual score to his or her predicted achievement score was obtained. Students who exhibited a discrepancy score for a WIAT subtest or Composite area with a probability of occurrence by chance of less than .05 were considered to have a significant learning disability (LD) for that academic subtest or Composite Area.

Of those students with complete WISC-III / WIAT data (N=63), 44 (70%) had a significant discrepancy in at least one of the eight WIAT academic subtests, while 26 (43%) met the criterion for a learning disability in one or more of the Composite academic areas. The relative frequency of LDs in the Composite areas of Reading, Writing, and Math was approximately the same. In contrast to the Reading, Writing, and Math Composite areas, none of the adolescents in the sample presented with a LD in the Composite area of Language (comprised of the Listening Comprehension and Oral Expression subtests). In fact, 22% of the entire sample actually had a significant discrepancy in the direction of a *strength* in the Composite area of Language; that is, language skills that were significantly better than would be predicted given their cognitive ability as measured by the WISC -III. Furthermore, LD students as a group actually performed significantly better ($\underline{M}$=92) on the Listening Comprehension subtest compared to the non-LD students ($\underline{M}$=86). (See Figure 1.)

The WISC-III profiles of LD and non-LD students were compared via $\underline{t}$-tests for independent samples. (A student was only designated LD if they exhibited a significant discrepancy in one or more of the Composite academic areas.) As can be seen from Figure 2, the WISC-III Full Scale, Verbal, and Performance IQ scores were higher for the LD group compared with the non-LD group. These differences were statistically significant for both FIQ ($\underline{M}$=88 for LD vs. $\underline{M}$=83 for non-LD) and PIQ ($\underline{M}$=92 for LD vs. $\underline{M}$=86 for non-LD). The factor-based PO Index score was also significantly higher for the LD group ($\underline{M}$=95) compared with the non-LD group ($\underline{M}$=87). In addition, the WISC-III "SCAD" profile (Kaufman, 1994) which compares the four subtests that compose the Freedom from Distractibility (FD) and Processing Speed (PS) Index scores to the PO Index score was found to significantly distinguish the LD from non-LD adolescents. Specifically, the PO Index score was found to exceed the SCAD score for a significantly greater majority of the LD adolescents (67%) compared to the non-LD group (21%), X^2 (1) = 14.1, $\underline{p} < .001$. (See Figure 2.)

The average MMPI-A profiles for the LD and non-LD groups, as well as their average profiles on the CTRS-28, were also examined. Although moderate levels of pathology were found across both the LD and non-LD students on the MMPI-A, no significant differences were found between the LD and non-LD groups for the wide variety of emotional, psychological, and behavioral pathologies tapped by the MMPI-A and the CTRS-28 subscales. A similar lack of differences was found for the problem areas covered by the CBCL-TRF, with the exception that two scales ("Aggression" and "Externalizing Problems") were found to be significantly lower for the LD students compared to the non-LD groups.

Attention-deficit Hyperactivity Disorder

Initial classification of an adolescent as ADHD was made by using a criterion of a T-score greater than 70 on the CTRS-28 Hyperactivity subscale and/or a T-score greater than 65 on the CBCL-TRF Attention Problems subscale, both completed by the student's classroom teacher. Since the base rate for general psychopathology was high in this sample, final classification of an adolescent as ADHD was only made if the initial classification was independently confirmed by agreement with diagnostic information independently obtained from one or more of the following sources: parent (CPRS-48 T-Score > 70 on the Impulsivity-Hyperactivity Scale); adolescent (CBCL-YSR T-Score > 65 on the Attention Problems subscale; cf. Chen et al., 1994); or external observer (CBCL-DOF above 94th percentile on the Hyperactive subscale).

Across the sample, 51% met the initial criteria for classification as ADHD, based solely on Conners and/or Achenbach teacher rating scales. However, the addition of independent confirmation from a second source reduced the final designation of ADHD to 30% of the sample. Of this final ADHD group, 13% also met the LD classification criterion. Thus, 13% of the adolescents from this at-risk population met criteria for having both LD and ADHD. With regard to the relationship of conduct disorder and ADHD, 71% of the sample was found to have a clinically significant elevation (T-score >70) on the CTRS-TRF "Conduct Problems" scale (not unexpected given the nature of the sample). Comorbidity ("dual diagnosis") of ADHD and Conduct Disorder was 27.5%. (Both the ADHD/LD and ADHD/CD comorbidity percentages exclude those adolescents with WISC-III FIQ less than 70.)

On the WIAT, both the ADHD and non-ADHD groups performed nearly identically. When the WISC-III profiles of ADHD and non-ADHD students were compared, the only difference that emerged was for the Processing Speed (PS) Index, which is comprised of the Coding and Symbol Search subtests. Adolescents with ADHD were found to score significantly lower on the PS Index ($\underline{M}$=86.5) compared to their non-ADHD peers ($\underline{M}$=96.5), $\underline{t}$ (63) = 2.73, $\underline{p} < .01$. As would be expected, both the Coding and Symbol Search subtest scale scores were also significantly lower for the ADHD group compared to the average scale scores for the non-ADHD group ($\underline{M}$=6.1 vs. $\underline{M}$=7.9, and $\underline{M}$=8.1 vs. $\underline{M}$=10.2, respectively). None of the other WISC-III subtest, summary, or factor-based index scores were different for the ADHD vs. non-ADHD adolescents. In addition, comparison of the adolescent's "SCAD" profile in relation to their PO Index score was not found to differentiate ADHD (48% with PO > SCAD) and non-ADHD (35% with PO > SCAD) adolescents.

In contrast to the relative similarity in WIAT and WISC-III profiles, the average MMPI-A profiles for the ADHD and non-ADHD adolescents were strikingly different. The ADHD adolescents clearly expressed more psychological disturbance compared with their non-ADHD peers across numerous MMPI-A subscales. Statistically significant differences emerged for four of the MMPI-A validity scales (TRIN, F2, F, and K), and for four of the basic clinical scales (Pa, Pt, Sc, and Si). All of these differences were in the direction of greater distress for the ADHD group. Furthermore, two of the basic scales (Pd and Sc) were clinically elevated (T-score > 65), producing a 48/84 two-point code for the ADHD group. (See Figure 3.)

Analyses of the MMPI-A Content and Supplementary scales added clarity to the emergent clinical picture of the ADHD adolescents. Again, the ADHD adolescents clearly express higher levels of distress across all of the Content and Supplementary Scales. In addition, clinically significant elevations were present for the Content scales of "Anger," "Conduct Problems," and "School Problems." Clinically significant elevations were also evident for the Supplementary scales of "MAC-R" and "Immaturity." With the exception of "Conduct Problems" these T-score elevations

were also statistically significantly higher than the average T-Score for the non-ADHD group. By contrast, *none* of the Clinical or Supplementary Scales and only one of Content scales ("Conduct Problems") was clinically elevated for those students not classified as ADHD, even though the non-ADHD group also consisted of behaviorally-disordered, at-risk adolescents. (See Figure 4.)

Discussion

The results of the current study highlight the need to better understand the contributory roles of general cognitive ability, specific learning disabilities, and ADHD in order to understand the phenomenon of academic failure of adolescents who are "behaviorally disordered." While there were some academic and cognitive strengths in this at-risk sample (e.g., preservation of language skills), only a small proportion (37%) of these at-risk students were "untouched" by either limited cognitive ability, a specific learning disability, or ADHD. In this sample of 78 adolescents, 11.5% had a full scale IQ less than 70, indicative of a developmental handicap. Of the remaining students, 39% met criteria for one or more specific learning disabilities, 30% met criteria for ADHD, and 13% of these at-risk adolescents met criteria for comorbid ADHD and LD.

While the 30% prevalence rate of ADHD in this at-risk population is significantly higher than the 3 - 59% estimated in the general population, the current study also highlights the importance of obtaining independent verification of ADHD apart from a teacher report on a behavior rating scale. The need for extra-source verification led to a 21% decrease in the designation of ADHD. The generally high levels of externalizing behaviors of these at-risk adolescents clearly lead to over diagnosis using conventional cutoffs on the Conners and Achenbach scales completed by classroom teachers. In addition, while 71% of the sample was found to have a clinically significant elevation on the CTRS-TRF "Conduct Problems" scale (not unexpected given the nature of the sample), comorbidity (or "dual diagnosis") of ADHD and Conduct Disorder was only 27.5%, so a designation of an adolescent as "hyperactive" did not mean that the student's teacher necessarily perceived that adolescent as "conduct disordered." The 27.5% comorbidity of ADHD with severe conduct problems in the present sample is consistent with other reports in the literature for non-referred samples (Keller, et al., 1991).

The current results suggest that there was no differential MMPI-A profile between at-risk adolescents with or without identified LDs; however, the Achenbach CBCL-TRF results did suggest that LD adolescents may be perceived by their teachers as less aggressive and less externalizing than their non-LD peers. The WISC-III results support the use of the "SCAD" profile in helping to differentiate LD from non-LD adolescents (Prifitera & Dersh, 1993). In the current sample, the PO Index score was found to exceed the SCAD score for a significantly greater majority of the LD adolescents (67%) compared to the non-LD group (21%).

With regard to the use of the WISC-III in the identification of ADHD, the only WISC-III factor that emerged as significantly different was the PS Index, with ADHD adolescents performing significantly more poorly than their non-ADHD peers on both the Coding and Symbol Search subtests that comprise PS. The use of the "SCAD" profile in comparison to the PO Index score was not found to differentiate the ADHD and non-ADHD groups – at least in this sample of at-risk adolescents.

Although all of the students had been referred to this specialized educational program because of behavioral problems and academic failure, the heterogeneity of the sample emerged as specific problem areas were evaluated. This heterogeneity

was especially highlighted by the finding that those adolescents classified as ADHD exhibited significantly greater levels of psychological distress, evidenced by MMPI-A scale elevations, compared to their non-ADHD peers. Those adolescents with ADHD were found to have a clinically elevated 48/84 MMPI-A code type, in addition to significant elevations on the Content Scales of "Anger" and "School Problems" and the Supplementary Scales of "MAC-R" and "Immaturity." These results are consistent with a reports by Barkley and his colleagues (Barkley et al., 1991; 1992) which suggest that even among other at-risk peers adolescents with ADHD have more psychological conflicts and warrant greater attention to their emotional problems, as well as their academic difficulties.

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Figure 1.

Wechsler Individual Achievement Test (WIAT) Results For L.D. and Non-L.D. Adolescents

No L.D. - - - N = 36
L.D.* ——— N = 27

* L.D. adolescents had a significant discrepancy in one or more of the four WIAT Composite Achievement Areas, based on the predicted Composite Achievement using the adolescent's WISC-III Full Scale I.Q. Score

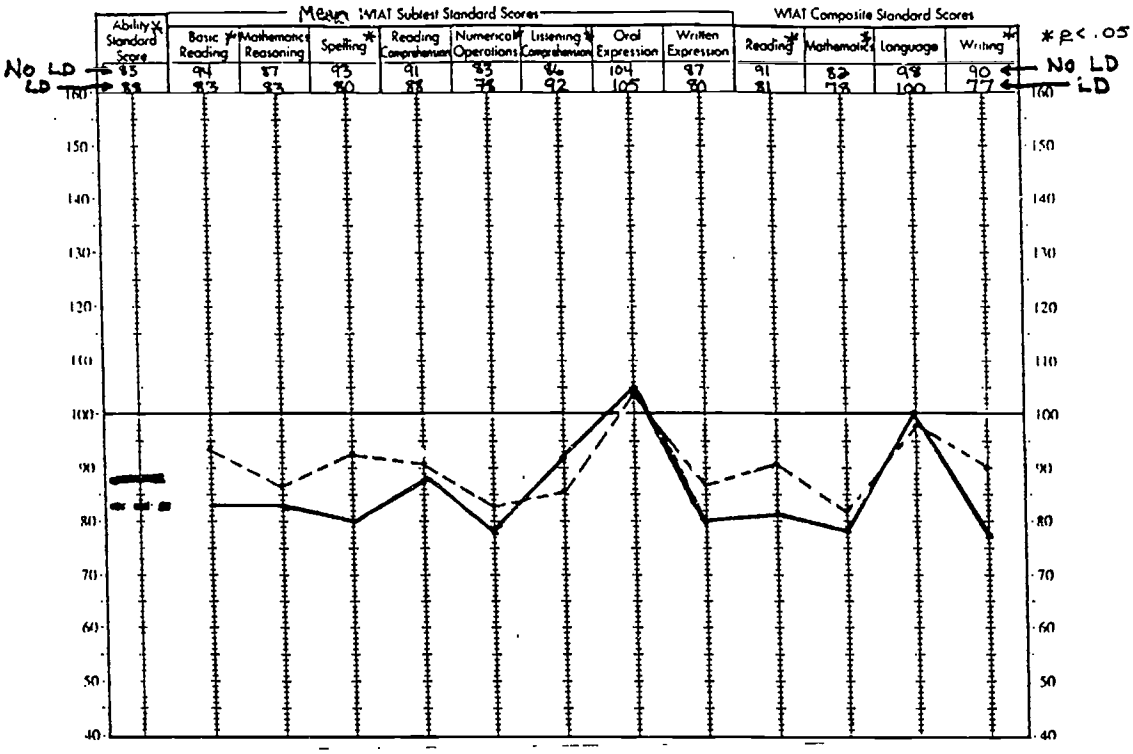


Figure 2.

Wechsler Intelligence Scale for Children – Third Edition (WISC - III) Results For L.D and Non-L.D. Adolescents

No L.D. - - - N = 36
L.D.* ——— N = 27

* LD Adolescents had a significant discrepancy in one or more of the four WIAT Composite Achievement Areas, based on predicted Composite Achievement using the adolescent's Full Scale I.Q. Score

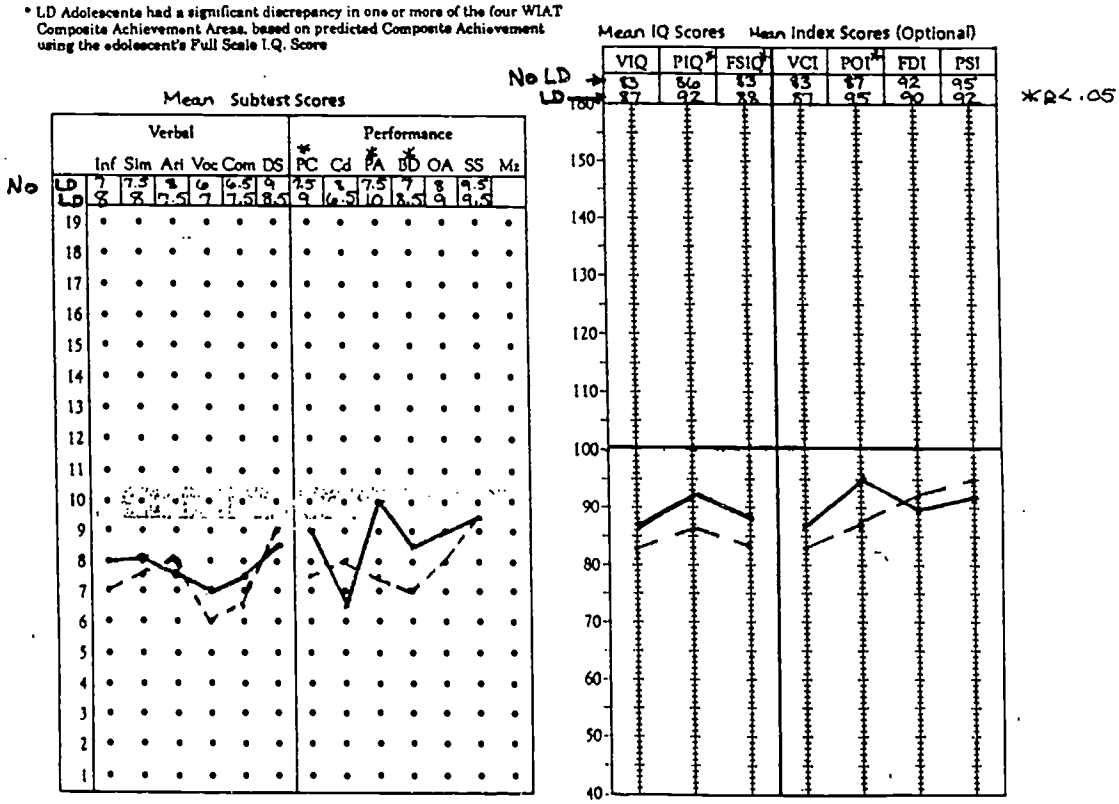
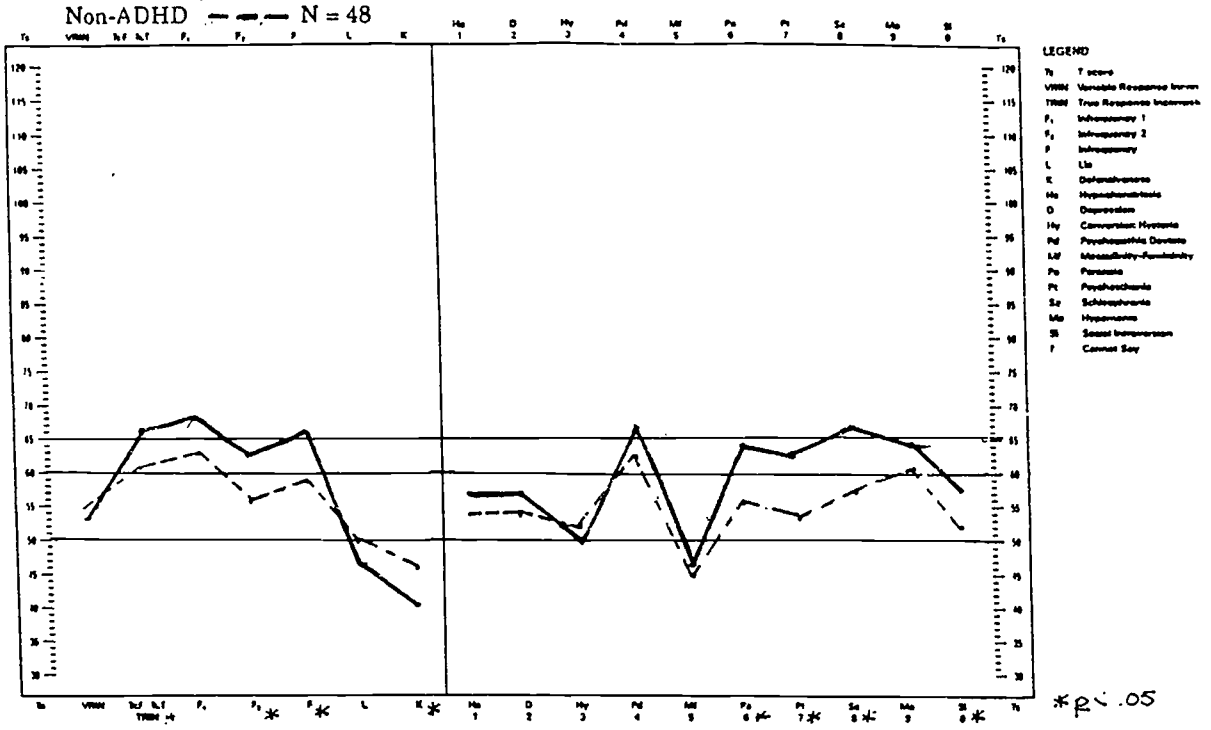


Figure 3.

MMPI-A Profile for Basic Clinical Scales
Comparison of ADHD and Non-ADHD Adolescents Mean T Scores

ADHD ——— N = 20
Non-ADHD — — — N = 48



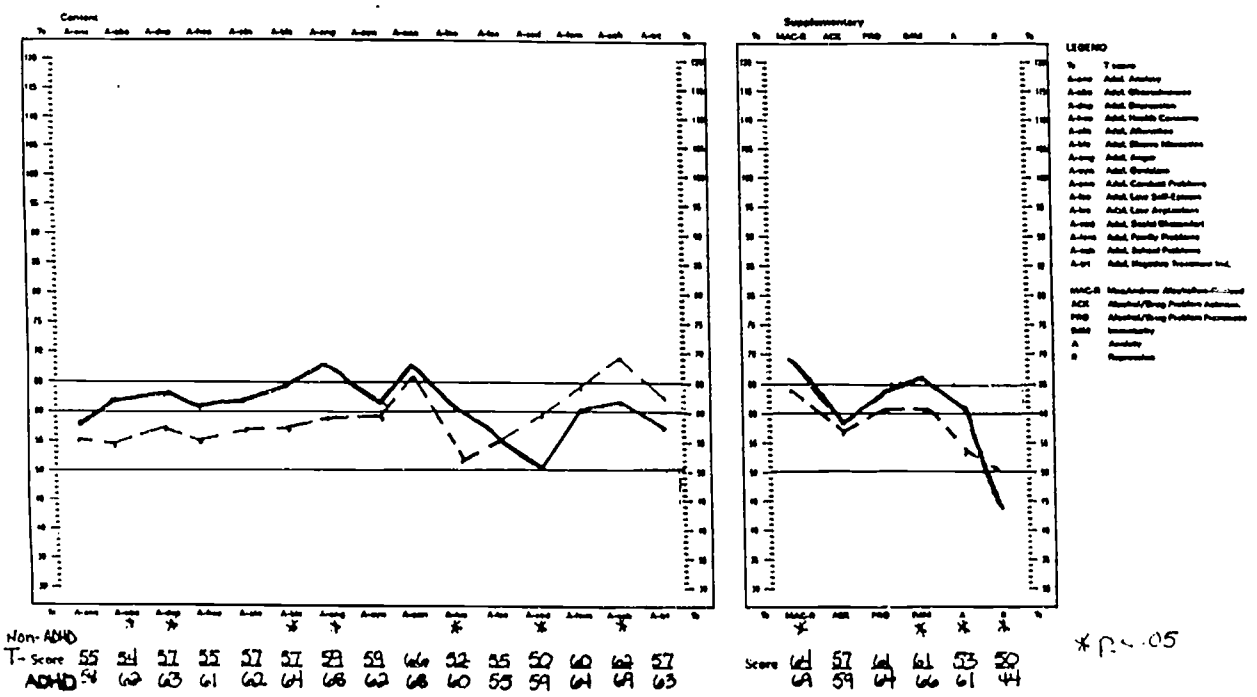
Non ADHD Mean T-Score	54	61	63	55	59	50	47	41	54	52	63	46	56	54	58	61	52
ADHD	53	66	68	63	66	47	41	57	57	50	66	47	61	63	66	64	58

*p < .05

Figure 4.

MMPI-A Profile for Content and Supplementary Scales
Comparison of ADHD and Non-ADHD Adolescents Mean T Scores

ADHD ——— N = 20
Non-ADHD — — — N = 48



Non-ADHD T-Score	55	54	57	55	57	57	58	59	66	52	55	50	60	62	57	Score	61	57	61	61	53	50
ADHD	54	62	63	61	62	61	68	62	68	60	55	59	61	59	63		59	59	64	66	61	44

*p < .05