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# A study of the relationship between WISC and school success of emotionally disturbed children

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A STUDY OF THE RELATIONSHIP BETWEEN THE WISC

AND SCHOOL SUCCESS OF EMOTIONALLY DISTURBED CHILDREN

BY

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A STUDY OF THE RELATIONSHIP BETWEEN THE WISC

AND SCHOOL SUCCESS OF EMOTIONALLY DISTURBED CHILDREN


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PAUL DANIEL SHEARER


A THESIS
SUBMITTED TO THE GRADUATE FACULTY
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## PREFACE

The writer gratefully acknowledges Dr. Austin Grigg, Dr. William Leftwich, and Mrs. Jean Dickinson for their advice in preparing this paper. The writer is also indebted to Miss Barbara Vitsky for her computer program by which the data of this study was processed.

# TABLE OF CONTENTS

# TABLE OF TABLES

# CHAPTER I

## INTRODUCTION

Since the publishing of the Wechsler Intelligence Scale for Children in 1949, the majority of the validation procedures have been correlations of the WISC with other intelligence tests or with achievement tests. As Littell (1960) indicated in his review of the research, both methods have yielded high correlations and are responsible in part for the wide acceptance of the WISC. While research has well established the ability of the WISC and other intelligence tests to predict school achievement in a normal population, the generalization of these findings to a population of emotionally disturbed children is in question for several reasons which will be discussed.

The studies cited in this review of the literature are grouped under four main headings and will be presented in this order: The relationship of intelligence and achievement in normal children; Intelligence and the emotionally disturbed; Achievement, intelligence, and the emotionally disturbed; and finally, The effect of therapy on intelligence.

The majority of studies relating intelligence to achievement have relied on scores on achievement tests as the criteria. While primarily interested in comparing the WISC with the Stanford-Binet, Frandsen and Higginson(1951) found a significant correlation of .76 between the WISC Full Scale and the Stanford Achievement Tests(SAT), Intermediate Battery, Form G. Their subjects were a group of 54 unselected fourth graders who had average ability and average achievement. The WISC Verbal scale significantly correlated .65 with achievement and the Performance Scale significantly correlated .62 with achievement. However, correlations between the Full Scale, Performance Scale, and Verbal Scale and achievement subtests yielded middle range figures.

Mussen, Dean, and Rosenberg(1952), used the data from 62 children in grades one to seven from a highly selected population who had taken the WISC and the Metropolitan Achievement Test(MAT) or the SAT. They computed the following correlations:  the WISC Full Scale with the various subtests of the SAT and MAT - from .65 to .81; the Performance Scale with those subtests - from .29(arithmetic) to .76; and the Verbal Scale with the subtests - from .47 to .74.

In a carefully controlled study involving 775 children in grades three to six from twenty-one counties in Iowa, Stroud, Blommers, and Lauber(1957) obtained correlations between the WISC subtests and the Iowa Tests and Basic Skills Battery(ITBS). The children in this study were all in some sort of school difficulty(but not considered emotionally disturbed), were one year retarded in the three achievement areas of the ITBS, and had a mean IQ at the dull normal level. Using a multiple

correlation procedure, the authors assigned beta weights to the WISC subtests and found Arithmetic, Vocabulary, Block Design, and Object Assembly received the highest weights for predicting achievement. They obtained the same results on a cross-validation sample of 129 students. The correlations of the scales of the WISC with the ITBS subtests were significant and in the following ranges: the WISC Full Scale with ITBS subtests - from .66 to .67; the Performance Scale with ITBS subtests - from .52 to .67; and the Verbal Scale with ITBS subtests - from .58 to .62. Other findings were: 1), Digit Span, Picture Completion, and Coding yielded low correlations with all areas of achievement; 2), Block Design and Object Assembly yielded correlations significantly higher with reading than did all other WISC subtests; and 3), WISC Arithmetic with ITBS Arithmetic yielded a higher correlation (.70) than any other combination. They concluded that the use of separate subtest scores for predicting differential performance on achievement tests was not supported and that a combination of subtests is best.

Cooper(1958) found that the best predictor of achievement as measured by the California Achievement Tests for fifth graders in Guam was the WISC Verbal Scale. The correlations, all significant, he found between the WISC scales and the CAT were: Full Scale .77; Verbal Scale .80; and Performance Scale .54.

Barrat and Baumgarten(1957) obtained correlations between all the subtests of the WISC and the reading and arithmetic subtests of the California Achievement Test. Their subjects were 30 nonachievers and 30 achievers in grades four to six, categorized by teachers' ratings of

school performance. The achievers scored significantly higher than non-achievers on the three scales of the WISC. Of pecular interest was the finding that all three scales of the WISC showed almost zero correlation with arithmetic for achievers but showed significant correlations with arithmetic for the nonachievers, indicating other factors were involved. All WISC subtests except two yielded higher correlations for achievers than nonachievers on reading, while all WISC subtests except two yielded higher correlations for nonachievers than achievers on arithmetic. It seems that the WISC subtests predict arithmetic for nonachievers and reading for achievers.

Coleman and Rasof(1963) compared WISC scores for 126 overachievers (functioning one year above their present grade level) and 20 under-achievers(functioning one year below their present grade level). Both groups had serious academic difficulty and were classified as learning disorders. The mean IQ for the overachievers was 119 while the mean IQ for the underachievers was 100. The overachievers did well on Informa-tion and Vocabulary and poorly on Object Assembly, Picture Arrangement, and Comprehension. The underachievers did well on Comprehension, Pic-ture Completion, and Block Design and poorly on Information, Arithmetic, Vocabulary, Digit Span and Coding. The authors concluded that under-achievers did poorly on subtests loaded with school type learning, con-centration and memory factors, but did well on those loaded with percep-tual organization and informal learning. Overachievers did well on sub-tests loaded with school type learning and significantly poorer on the Performance Scale than the Verbal Scale.

Richardson and Surko(1956) obtained correlations between WISC scores and Gray Oral Reading Paragraphs for 105 delinquents, and the Stanford Achievement Tests, Form D(reading and arithmetic) for 65 delinquents. They found the Verbal IQ was lower than the Performance IQ, and there was a tendency for delinquents to be lowest in abilities developed in school on both the achievement tests and the WISC subtests. Vocabulary, Information, Arithmetic, and Coding received lower scores than the other WISC subtests. The authors concluded, "The results are not related to inability to do school work, but nonconformity to standards set by school." Additional and significant findings were: 1), The WISC Full Scale correlated .58 with reading and .64 with arithmetic; 2), The Verbal Scale correlated .59 with reading; 3), The WISC Arithmetic correlated .46 with SAT Arithmetic; 4), The WISC Vocabulary correlated .55 with reading; and 5), The WISC Coding correlated .40 with reading.

Although the research on intelligence and achievement is limited to the WISC, comparable findings occur throughout the literature with other intelligence tests.

Before beginning a discussion of the research that has been done on intelligence and emotionally disturbed children, some light should be thrown on a pertinent article by Pippert and Archer(1963). They compared the populations categorized by two methods of defining achievement - grade point average and an achievement test score. Using cut-off points in both methods, the authors found that with 126 children at the end of the ninth grade, 21 were classified as underachievers by grade point average, 19 were considered underachievers by the Iowa Test of

Educational Development, and only 2 were underachievers by both methods. This finding clearly indicates different types of individuals are under the same classification of "underachievement", and thus, strongly challenges the present definition of "underachievement".

Several investigators have obtained mean IQ scores in studies dealing with an emotionally disturbed population of children. Davis(1958) found a mean IQ on the WISC of 92 using 70 children from ages five to twelve who were undergoing residential treatment. Enburg, Rowley, and Stone(1961), in a study of the value of the short form of the WISC for emotionally disturbed children, found the mean WISC Full Scale, Performance Scale, and Verbal Scale all equaled 97 with a sample of 145 cases. Grossberg(1964) observed a WISC mean IQ of 89 from 132 children in a psychiatric out-patient clinic. Rutter(1964) concludes, "Abnormality of intelligence was not a major factor of importance in the aetiology of childhood behavior and neurotic disorders, but worthy of attention." He examined IQ's of children attending Maudsly Hospital in England and found that the distribution of IQ's differed significantly from that of the general population. From a population of 306 children he noted an excess of mental abnormality in the 80-89 IQ range group, comprising 24 percent of the children, and a deficit of mental abnormality in the 90-99 IQ range group, comprising 17 percent. However, he attributed this abnormal distribution to an artifact of referral policy.

Maxwell(1961b), in an effort to determine if the factor pattern for certain of the WISC subtests were similar for normal children and those in a psychiatric clinic, mentioned the fact that Wechsler omitted means, standard deviations, and frequency distributions for his raw scores.

Using 75 children from a psychiatric clinic between the ages of 9½ and 10½, Maxwell found the standard deviations on scaled scores on all subtests of the WISC were considerably greater than the expected value of 3. Since Maxwell found standard deviations from 3.28 to 3.78, he suggested that the dispersion of raw scores were greater than those found by Wechsler. He concludes, "Conversion tables can be employed only when the population being sampled has the same dispersion of raw scores as the population from which the normative data was drawn."

In another study(Maxwell, 1961a) he observed that scores for 292 neurotic children between the ages of eight and thirteen were lower than normal children(Wechsler's standardized norms) and, again, much more dispersed.

However, Ravenette and Kahn(1962) found a standard deviation lower than Maxwell's when they examined WISC scores for 128 children attending the West Ham Child Guidance Clinic in England. They report that the Verbal scores of older boys was higher than their Performance scores, that Similarities, Vocabulary and Digit Span for boys and Digit Span only for girls were significantly lower than corresponding subtest means for this population, and finally that Picture Arrangement and Object Assembly received higher means than any other subtests for these children.

An interesting study was done by Lessing and Lessing(1963), who attempted to find evidence for the popular notion that the WISC is an underestimate of mental ability when the subtest scores are rather uneven, as the case is for many emotionally disturbed children. Their sample was 188 children who were given the WISC at the Institute for Juvenile

Research. Their rationale was the occurence of a WISC score lower than a group test of intelligence meant that the WISC was an underestimate of a child's potential ability. Their null hypothesis was, "Children with higher subtest variability on the WISC will be no more likely to earn a group test score higher than their IQ than will children showing low subtest variability on the WISC." They divided the children into a high and low subtest variability group, matched for age and IQ, and used the Otis Primary Mental Abilities Test or the Kuhlman Anderson as the criterion. The null hypothesis was not rejected and they concluded that there is no evidence that variability in WISC subtests is an underestimate of a child's potential.

McHugh(1963) reports a study concerning the WISC's predictive power in discriminating two classifications of disturbed children. She separated children with adjustment reactions into a Conduct Disturbance group and a Neurotic Traits group, 28 in each group. She found no significant difference between their respective Verbal and Performance scores, no significant difference in the subtest means of the two groups, and concluded that WISC scores alone cannot distinguish these groups.

Five studies are reported which deal with intelligence and achievement with a population of emotionally disturbed children. Stone and Rowley(1964) examined the scores on the Wide Range Achievement Tests and scores on the WISC for 116 children referred to the Child Psychiatry Service of the State University of Iowa. They discovered the mean WISC Full Scale was 96.52, and the majority of the sample fell below the level of achievement expected on the basis of chronological ages and mental ages.

They also observed that 43.48 percent of the children were in grades below that expected by their chronological age, and all the children had lower arithmetic scores than reading scores.

In a school follow-up study of former child psychiatric patients, Johnson and Rubin(1964) obtained a mean IQ of 87.2. This figure is lower than most of the other IQ scores reported, but on inspection of the data it could be seen that low scores of children with organic brain syndromes depressed the total mean IQ. As part of a larger study teachers were asked to rate the children on academic performance, and children were separated into quartiles on this basis. The WISC Full Scale, Verbal Scale, and Performance Scale of the upper quartile group were 102.7, 98.2, 104.7 respectively, and for the lower quartile group were 76.7, 77.8, 75.2. Hence, for this sample of emotionally disturbed children, intelligence was a significant and major differentiating factor of good and poor academic groups.

Jenkins, et al(1964) divided 61 emotionally disturbed boys, ages 11.6 to 15.10 into high and low intelligence groups on the California Achievement Tests, using the median as the divider in both cases. They found significant achievement group by subtest interaction and noted that the low achievers did poorly on Information and Arithmetic in the Verbal Scale, but did well on all Performance subtests except Digit Span. The authors, like others, conclude that underachievers tend to fail school type tasks.

Salzinger(1957) analyzed WISC scores and Stanford Achievement scores of 26 children, ages 13 to 18 who were emotionally disturbed. He found

no significant difference between disturbed and normal children on all three of the WISC scales. In addition, he reported that disturbed children achieved significantly lower in all areas of achievement except word meaning.

Schroeder(1965) had four teachers force 106 psychiatric cases into five broad categories of psychosomatic problems, aggressive behavior, school difficulty, school phobia, and neurotic-psychotic personality. She used the Jastak Wide Range Achievement Tests(arithmetic and reading) plus the WISC, and reported in an ANOV that intelligence was not a significant factor(mean IQ was 95.95). Furthermore, the mean scores for all five categories were lower in arithmetic than reading, and the school difficulty group had the lowest mean achievement level in both arithmetic and reading. She concluded, "Educational disabilities are frequently concomitant with emotional disturbance or vice-versa."

The following studies are concerned with the change of intellectual functioning after therapy for psychiatric patients. Dulsky(1942) attempted to gain insight into the effect of the "amelioration of emotional adjustment" on Stanford-Binet Form L scores. Using 13 children at the Institute of Juvenile Research he found the mean IQ before therapy was 99.3 with a range of 73 to 139, and after therapy was 103 with a range of 76 to 150. As a whole the mean score did not improve, but eight cases gained on the average 8.6 points, five cases lost on the average 4.2 points and four cases increased 11 or more points.

Hiler(1961) examined WB II scores of 20 cases(average age 13.8) before therapy, again after two to three months, and again after twelve

to twenty-four months. After two to three months, scores rose on the Performance Scale, the Full Scale, the subtest total, Similarities, Block Design, Object Assembly and Digit Span, but the results were partly attributed to practice effect. After twelve to twenty-four months they improved on Information, Comprehension, and Picture Completion. Although Performance, Verbal and Full Scale scores did not improve for the group as a whole, certain cases improved significantly. As a second part of the study, he found that improvement in Verbal Scale, Full Scale and Digit Span was significantly related to over-all clinical improvement as judged by clinicians. He concluded that Performance scores are more accurate measures of intelligence than Verbal scores on first admittance.

In a related study with adults diagnosed as schizophrenics, Haywood and Muelis(1963) found that 20 cases rated as improved had higher IQ scores after therapy versus 20 unimproved cases whose IQ's did not change significantly.

These studies seem to indicate emotional disturbance does depress intelligence scores and those who improve through therapy score higher on intelligence tests than they did previously.

SUMMARY:  The following generalizations can be made concerning the studies cited in this review:

1.  The WISC Full Scale is best at predicting academic achievement, followed by the Verbal Scale and the Performance Scale.

2.  The WISC subtests which predict achievement best are those loaded with school type learning; likewise, poor achievers do poorly on those subtests.

3.  Although achievement has been defined in most cases by achievement test scores, other methods such as grade point average indicate the fallibility of relying on achievement test scores.

4.  Intelligence scores for emotionally disturbed children are either the same or slightly lower than normal children, but the variability of subtest scores is greater than that of normal children.

5.  Emotionally disturbed children do poorer in school achievement than normal children.

6.  Emotionally disturbed children do poorer in arithmetic than reading.

7.  Therapy has a positive effect on intelligence with at least some emotionally disturbed children, the implication being that intelligence tests on admission are not valid indicators of a child's intellectual capacity.

In the present study a criterion of school achievement, which has not heretofore been mentioned and which differs widely from those criteria that have been discussed, was used. The criterion was a dichotomous classification of either a school history of passing or a school history of failing. It has been demonstrated that, although emotionally disturbed children do not have significantly lower IQ's, they perform significantly poorer in school. The assumption is made that emotional problems depress the disturbed child's performance in spite of his intelligence. Such an assumption about the interference of emotional problems is widely accepted, it is the factor of intelligence that is being considered in this study. Some emotionally disturbed children are able to achieve satisfactorily in school in spite of their disturbance, while others have a history of failing. Are these successful children more intelligent and if so, in what areas or subtests, or have their problems not been of such a nature as to depress their school work? This study was an attempt to answer such a question. If intelligence is not a factor which can discriminate an emotionally disturbed child who has passed from one who has failed, the nature of the disturbance is responsible for the school failure. This study sought the relationship between scores on WISC subtests and two categories of achievement - passing or failing.

CHAPTER II

METHOD

Subjects. The Virginia Treatment Center for Children, a child-
ren's psychiatric hospital in Richmond, Virginia provided the subjects
for this study. The Center offers study, evaluation, diagnosis, and
treatment for emotionally disturbed children under sixteen years of age
from throughout the state of Virginia. Since its inception, 375 chil-
dren have been evaluated and diagnosed, some undergoing residential
treatment, others treated on an out-patient basis, and still others
refused treatment for numerous reasons. From the 375 children, only
194 were used in this study due to the following qualifications:  (1),
Since this study investigated the variable of school success, only those
children who were exposed to more than one year of school were consid-
ered; (2), This investigation was concerned with those children who had
the capacity to succeed; thus, only those children with a WISC Full
Scale of 90 or above were used; (3), No child diagnosed as Brain Damage
was used in the sample; and (4), Only children who had taken all the sub-
tests of the WISC, excluding Object Assembly and Mazes which are not
administered at the Center, were used.

In order to control for amount of school, the subjects were broken down into three groups on the basis of age, in addition to one group comprising all the subjects. The ages and sample size for each group were as follows:

GROUP I - ages 6-15 N=194

GROUP II - ages 6-9 N=42

GROUP III - ages 10-12 N=90

GROUP IV - ages 13-15 N=62

Data Collection and Analysis. Every child who is evaluated by the Center undergoes an extensive psychological examination. In most cases the WISC, including all subtests except Object Assembly and Mazes, is administered. However, in some instances, previous intelligence scores or a combination of two or three WISC subtests are used to ascertain intellectual capacity. Only those children receiving the full WISC were considered in this study.

As part of the over-all evaluation, school reports, containing information about school history, are included in each child's file. Children who had passed in one year every grade which they entered were classified as "failing".

A bi-serial correlation between each WISC subtest or scale and the criterion of passing or failing was computed for each group. In addition, two multiple correlations were computed for the total group, using those subtests which allowed for the greatest prediction.

CHAPTER III

RESULTS

Table I shows the bi-serial correlations of the WISC subtests and scales with school success (passing). The analysis yielded, on the whole, low positive correlations with the exception of several negative correlations and several middle range correlations. Verbal intelligence predicts school success better than Performance intelligence, as the higher correlations in both the Verbal Scale and Verbal subtests demonstrate.

There are marked differences in the correlations found at each age level. All Verbal subtests for the 10 to 12 year olds are significant, while only one Verbal subtest is significant for the 6 to 9 and 13 to 15 year olds. Regarding Performance subtests, the 10 to 12 year olds yielded the only significant correlation (-.464) of the three age groups.

There is very little similarity of correlations for the various Verbal subtests across the age groups. No Verbal subtest is significant for all groups and only Comprehension and Arithmetic are significant for two out of the three age groups. However, results from the

Performance subtests indicate several trends. Picture Completion shows negative correlations for all age groups, although one coefficient approaches zero, and Picture Arrangement shows near zero correlations at all age levels.

Considering the total group, eight out of the ten subtests are significant, but the magnitude of the correlations do not equal the highest age group correlation in any subtest, as would be expected from lumping the data into the total group.

Concerning the WISC scales: 1) All correlations are positive with the exception of the Performance Scale for the 10 to 12 year olds; 2) All Verbal Scales are significant except for the 13 to 15 year olds; 3) Only two Full Scale correlations are significant; and 4) No Performance correlation is significant, and one (10 to 12 year olds) is negative.

The proportion of children who passed at each age level is shown in Table II. The split between the two categories was fairly even except for the 10 to 12 year olds. The higher proportion of passing in this group probably resulted from the few number of grades to which these children were exposed.

The overall mean Full Scale score for the entire sample was 104.26. This mean is larger than those reported in the literature for emotionally disturbed children, but the present sample did not include children with Full Scale IQ's lower than 90. Likewise, the standard deviations were lower than those found by Maxwell(1961b) due to the truncated sample.

From the intercorrelations of all ten subtests and scales, two multiple correlations were derived for the total group. Using the Verbal

Scale, and the Picture Completion and Coding subtests, a multiple correlation of .468 was computed. The intercorrelations and regression weights for these three variables are shown in Table III. A second multiple correlation, shown in Table IV, was done using the subtests Arithmetic, Information, Coding, and Picture Completion. The resulting correlation(.460) did not improve to any extent on the former correlation using only three variables, but the latter multiple correlation has more utility for reasons which will be discussed.

## TABLE I

### BI-SERIAL CORRELATIONS OF WISC SUBTESTS

### AND SCALES WITH SCHOOL SUCCESS

| | All Ages (N=194) | Ages 6-9 (N=42) | Ages 10-12 (N=90) | Ages 13-15 (N=62) |
|---|---|---|---|---|
| Information | .296** | .192 | .471** | .160 |
| Comprehension | .142* | .354* | .259* | -.123 |
| Arithmetic | .370** | .168 | .330** | .561** |
| Similarities | .237** | .051 | .430** | .104 |
| Vocabulary | .191** | .182 | .324** | .049 |
| Digit Span | .224** | .200 | .326** | .145 |
| Pict. Complet. | -.165* | -.464** | -.042 | -.184 |
| Pict. Arrange. | -.020 | -.037 | -.070 | .078 |
| Block Design | .103 | -.048 | .166 | .120 |
| Coding | .182* | .154 | .202 | .156 |
| Verbal Scale | .384** | .363* | .520** | .240 |
| Perf. Scale | .038 | -.210 | .113 | .106 |
| Full Scale | .270** | .064 | .411** | .213 |

*P < .05

**P < .01

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## TABLE II

### PROPORTIONS OF SUBJECTS WHO PASSED AND FAILED

|            | PASSED | FAILED |
|------------|--------|--------|
| All Ages   | .55    | .45    |
| Ages 6-9   | .62    | .38    |
| Ages 10-12 | .53    | .47    |
| Ages 13-15 | .52    | .48    |

## TABLE III

INTERCORRELATIONS AND REGRESSION WEIGHTS

OF THE VERBAL SCALE, PICTURE COMPLETION

AND CODING FOR THE TOTAL GROUP

| | Verb.Sc. | Pict. C. | Coding | Criterion | Weights |
|---|---|---|---|---|---|
| Verb. Sc. | 1.000 | .181 | .177 | .384** | .410 |
| Pict. C. | | 1.000 | -.096 | -.165* | -.233 |
| Coding | | | 1.000 | .182* | .132 |

*p < .05                                                    R=.468

**p < .01

TABLE IV

INTERCORRELATIONS AND REGRESSION WEIGHTS

OF ARITHMETIC, INFORMATION, CODING AND

PICTURE COMPLETION FOR THE TOTAL GROUP

|  | Arith. | Infor. | Coding | Pict.C. | Criterion | Weights |
|---|---|---|---|---|---|---|
| Arith. | 1.000 | .423** | .262** | .067 | .370** | .277 |
| Infor. |  | 1.000 | .102 | .181 | .296** | .211 |
| Coding |  |  | 1.000 | -.086 | .182 | .060 |
| Pict. C. |  |  |  | 1.000 | -.165* | -.214 |

*P < .05                                             R=.460

**P < .01

CHAPTER IV

DISCUSSION

The comparability of this study to others involving the same variables is hindered by a lack of agreement as to what constitutes "achievement" or "school success". The majority of the studies deal with achievement scores on various standardized tests. However, some investigators have discriminated criterion groups by grade point average, or teachers' academic ratings. At least two authors(Pippert and Archer, 1963) have shown that the various methods for distinguishing success groups actually classify different populations, with small overlap.

The present study dealt with a more realistic and perhaps more practical means of classifying school success. Although much can be said about lack of control in light of the fact that the subjects used came from different teachers and schools, each with their own standards for passing a child, the actual fact of passing or failing placed each child into one of the two groups. Success, as used in this study, was passing all grades regardless of the circumstances of standards under

which a child was judged. In one sense, this method is lacking in control; in another sense it is purposefully ignoring other variables and is concerned with those children who "made the grade" and those who did not. Thus, this study should be considered in light of the vagueness of the term "achievement" and the type of individuals classified under "passing" or "failing".

The most significant observation of the results is that accurate prediction of school success can not be afforded by individual scale or subtest scores. Although many of the correlations are significant, their magnitude is not great enough to warrant accurate predictions. Whereas, other investigators found correlations generally ranging from .60 to .80, the range in the present study was from .020 to .561. Research has shown that emotionally disturbed children do not have significantly lower IQ's than normal children, but do poorer in school. (In this sample, about one half of the children had failed one or more grades.) This study has demonstrated more conclusively that intelligence is not a major differentiating factor between emotionally disturbed children who have passed and those who have failed. Although there is a slight positive relationship, the lack of high correlations and consistent findings with different age groups, indicates that emotional problems depress school work in spite of intelligence.

With the major objective of the study having been discussed, the trend of the findings will be pursued. Overall, the trend of the results indicates a consistency with the findings of other investigators. From the large number of significant Verbal subtest and scale correlations,

the conclusion is that emotionally disturbed children who have passed

all grades do better on school related WISC subtests than those who

failed one or more grades. This finding is especially relevant to chil-

dren between the ages of ten and twelve.

The occurance of negative correlations on Performance subtests

and one Performance Scale is in agreement with findings of other in-

vestigators(Coleman and Rasof, 1963; Salzinger, 1957) that nonachievers

do well in Performance subtests. Although most of the negative cor-

relations in the present study were not significant, the correlation of

-.464 implies that disturbed six to ten year olds who do well on Pic-

ture Completion have a tendency to fail in school. One explanation of

this phenomenon is that strict and close attention to details inter-

feres with the more global aspect of education typical of the early

grades. Clinically speaking, disturbed children are more apt to be

perfectionistic and oversensitive to details than normal children.

Thus, in this study the Verbal Scale is best at predicting school

success, especially for six to twelve year olds, the Full Scale follows,

although only for ten to twelve year olds, and the Performance Scale

contributed negligibly to prediction.

The results suggest that prediction of school grades by WISC

scores is most applicable to ten to twelve year olds and least appli-

cable to thirteen to fifteen year olds. The marked difference of the

findings of the three age groups suggests that different factors are

related to school success as a child gets older. For six to nine year

olds a common sense understanding of verbal material(Comprehension) plus

hyposensitivity to details(Picture Completion) is descriptive to some extent of a school achiever. There is a tendency for children between the ages of ten and twelve to rely heavily on all facets of verbal skills in order to pass school. Finally, it appears that arithmetical skill is the only intellectual capacity typical of a thirteen to fifteen year old school achiever. While middle age children rely on all verbal skills to attain school success, younger and older children rely on specific verbal skills. However, it must be remembered that these relationships are not strong enough to speak about the results as more than trends.

Several other findings are worthy of discussion. Arithmetic plays an increasingly important role as age increases, whereas Comprehension plays a decreasingly important role as age increases, and is even negatively correlated for thirteen to fifteen year olds. Speculations may vary as to the cause of this diversity but the writer believes that, as these children grow older, common sense grows less important in school work, in place of a more factual and learned skill like arithmetic as the important ability in school success. Educational programs do indeed follow the line of reasoning that factual knowledge is more important in the older grades.

Another interesting finding is that Full Scale intelligence has no predictive power at ages six to nine(.064), but does show some relation to school success at ages ten to twelve. The implication is that overall intelligence plays a more important role for emotionally disturbed ten to twelve year olds than any other ages up to sixteen.

In conclusion, the trend of the results supports the findings of

other investigators concerning the relationships of Verbal and Performance subtests with school success, but individual correlations are not large enough to predict on the basis of a single score. A lack of consistent results across the age groups further subtracts from the reliance on the total group correlations. Finally, a cross validation procedure is necessary to ascertain if the significant correlations would hold up on another sample.

Whereas, the highest correlation of a single test with the criterion was .384(Verbal Scale), the inclusion of two additional tests of Picture Completion and Coding in a multiple correlation procedure increased the coefficient to .468. The multiple correlation did not improve when the Verbal Scale was replaced by the two Verbal subtests of Arithmetic and Information in a second analysis. However, in the latter case, Coding did not contribute significantly to the multiple correlation, and hence, could be excluded in any application of the multiple correlation. Another consideration is that while the latter multiple correlation using two Verbal subtests instead of the Verbal Scale is lower, the difference is not enough to choose one over the other. The advantage of the second multiple correlation is that it relies on three subtests, whereas the first relies on the Verbal Scale which necessitates the use of all Verbal subtests.

Although the predictive coefficient increased from .384 to .468 by the use of a multiple correlation, enough variance is still left unaccountable to limit any practical and reliable prediction of school success based on intelligence test performance. In addition, a shrinkage

of both multiple correlations would probably occur in a cross valida-
tion.

In order to ascertain if the results in this study were accounted
for by the population employed or the criterion used, an addition study
should be conducted in which both variables were included. A multifac-
tor design using various methods of classifying successful students(tea-
cher's ratings, achievement test scores, grade point average, and pass-
ing or failing) on two samples of normal children and emotional dis-
turbed children is suggested. Insight would be gained into the rela-
tionship of the criterion used in the present study with other criteria,
and into the differences between intelligence scores of normals and dis-
turbed classified under these categories.

# CHAPTER V

## SUMMARY

Research has shown that the WISC correlates highly with achieve-
ment test scores of various samples of normal children. It has also
demonstrated that emotionally disturbed children do not differ signi-
ficantly from normals on intelligence but the former do poorer in
school. The present study sought the relationship of the WISC with
school success for 194 emotionally disturbed children from the Virginia
Treatment Center for Children in Richmond, Virginia.

Children were classified as "passing" if they had passed every
grade to which exposed; those who had failed one or more grades were
classified as "failing". Bi-serial correlations were computed for
scores on ten WISC subtests and the three scales with the criterion
of "passing" or "failing" for three age groups plus one group compri-
sing the entire sample. The results showed low positive but signifi-
cant correlations and a trend, consistent with previous research, to-
ward verbal intelligence as the best predictor of school success.
However, the magnitude of the correlations were not enough to justify

prediction on the basis of single scores.

A multiple correlation of .468 was computed by weighing the Verbal Scale, Picture Completion and Coding. A second multiple correlation of .460 was computed by weighing Information, Arithmetic, Picture Completion and Coding. The latter multiple correlation was suggested as more practical because it does not necessitate the administering of all Verbal subtests.

Several specific trends observed in the results were discussed including a negative correlation of Picture Completion and school success. The concept of "achievement" and the different methods of defining "achievement" were discussed, and a future study was suggested involving stricter control of population and criterion variables.

The overall conclusion was that intelligence is a significant but not a major differentiating factor between those emotionally disturbed children who have passed all grades and those who have failed at least one grade.

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APPENDIX

MEANS FOR "PASSING" AND "FAILING" SUBJECTS

AND OVERALL STANDARD DEVIATIONS

|  |  | ALL AGES | | AGES 6-9 | | AGES 10-12 | | AGES 13-15 | |
|---|---|---|---|---|---|---|---|---|---|
|  |  | P' | F" | P | F | P | F | P | F |
| Inf. | M* | 11.6 | 10.1 | 10.7 | 9.8 | 12.1 | 9.9 | 11.5 | 10.6 |
|  | sd+ | 3.1 | | 2.9 | | 2.0 | | 3.3 | |
| Com. | M | 11.1 | 10.5 | 11.0 | 9.4 | 11.6 | 10.3 | 10.4 | 11.0 |
|  | sd | 3.0 | | 2.8 | | 3.0 | | 3.2 | |
| Arith. | M | 10.7 | 9.1 | 9.6 | 9.0 | 10.8 | 9.3 | 11.6 | 8.8 |
|  | sd | 2.8 | | 2.3 | | 2.7 | | 3.1 | |
| Sim. | M | 12.0 | 10.9 | 11.5 | 11.3 | 12.1 | 10.1 | 12.3 | 11.8 |
|  | sd | 2.9 | | 2.8 | | 2.9 | | 3.1 | |
| Voc. | M | 10.7 | 9.7 | 11.3 | 9.6 | 10.8 | 9.4 | 10.9 | 10.7 |
|  | sd | 2.8 | | 2.5 | | 2.8 | | 3.1 | |
| D.Sp. | M | 10.3 | 9.3 | 9.8 | 8.9 | 10.0 | 8.6 | 10.9 | 10.3 |
|  | sd | 2.8 | | 2.7 | | 2.6 | | 2.9 | |
| P.C. | M | 11.0 | 11.7 | 10.4 | 12.1 | 11.6 | 11.8 | 10.6 | 11.4 |
|  | sd | 2.8 | | 2.4 | | 3.0 | | 2.7 | |
| P.A. | M | 10.7 | 10.8 | 10.5 | 10.6 | 10.8 | 11.1 | 10.8 | 10.4 |
|  | sd | 2.7 | | 2.7 | | 2.7 | | 2.5 | |
| B.D. | M | 10.8 | 10.4 | 10.6 | 10.8 | 10.9 | 10.2 | 10.8 | 10.3 |
|  | sd | 2.7 | | 3.0 | | 2.7 | | 2.7 | |
| Cod. | M | 9.9 | 8.9 | 10.3 | 9.4 | 9.7 | 9.7 | 9.9 | 9.1 |
|  | sd | 3.2 | | 3.6 | | 3.1 | | 3.1 | |
| VS | M | 107 | 100 | 104 | 98 | 108 | 98 | 108 | 103 |
|  | sd | 12.0 | | 9.9 | | 12.4 | | 12.7 | |
| PS | M | 104 | 103 | 102 | 106 | 106 | 103 | 104 | 102 |
|  | sd | 12.3 | | 13.2 | | 12.8 | | 11.1 | |
| FS | M | 106 | 102 | 103 | 102 | 108 | 101 | 107 | 103 |
|  | sd | 10.7 | | 10.3 | | 10.8 | | 10.9 | |

'P =Passing    "F =Failing    *M=Mean    +sd=Stand. Dev.

INTERCORRELATIONS OF WISC SUBTESTS

AND SCALES FOR THE TOTAL GROUP

| | Inf | Com | Ari | Sim | Voc | DSp | PC | PA | BD | Cod | VS | PS | FS |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Inf | 1.000 | 313 | 423 | 435 | 514 | 248 | 181 | 160 | 154 | 102 | 749 | 234 | 620 |
| Com | | 1.000 | 205 | 357 | 499 | 188 | 208 | 128 | 101 | -033 | 665 | 132 | 513 |
| Ari | | | 1.000 | 241 | 208 | 391 | 067 | 206 | 290 | 262 | 604 | 338 | 589 |
| Sim | | | | 1.000 | 411 | 221 | 079 | 147 | 185 | 188 | 678 | 231 | 578 |
| Voc | | | | | 1.000 | 199 | 125 | 032 | 077 | -009 | 708 | 089 | 514 |
| DSp | | | | | | 1.000 | 040 | 129 | 237 | 177 | 510 | 229 | 464 |
| PC | | | | | | | 1.000 | 226 | 257 | -086 | 191 | 549 | 445 |
| PA | | | | | | | | 1.000 | 273 | 143 | 195 | 617 | 498 |
| BD | | | | | | | | | 1.000 | 222 | 248 | 697 | 572 |
| Cod | | | | | | | | | | 1.000 | 177 | 555 | 431 |
| VS | | | | | | | | | | | 1.000 | 303 | 825 |
| PS | | | | | | | | | | | | 1.000 | 785 |
| FS | | | | | | | | | | | | | 1.000 |

-36-

VITA

The author was born in Casper, Wyoming on June 2, 1942, but spent the greater part of his childhood in Woodbury, N.J. He attended Woodbury High School in New Jersey and was active in the Key Club and National Honor Society as well as participating in several interscholastic sports. He graduated from high school in 1960 and attended Wake Forest College where he was a member of the varsity football team and Kappa Alpha Order. After graduating from Wake Forest in 1964, as a commissioned officer in the U.S. Army, with a BA in psychology, he entered the University of Richmond's graduate department in psychology. This past year he has been a teacher at the Virginia Treatment Center for Children in Richmond as well as finishing his requirements for an MA in psychology.