THE UNIVERSITY OF MANITOBA

AN INVESTIGATION OF VERBAL-PERFORMANCE DIFFERENCES IN CHILDREN OF AVERAGE INTELLIGENCE

BEING A THESIS SUBMITTED TO THE COMMITTEE ON POST-GRADUATE STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION

BY

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WINNIPEG, MANITOBA

MAY, 1962

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ABSTRACT

The Problem

Psychologists in clinical settings have frequently attributed clinical significance to a Verbal-Performance discrepancy on the WISC. The present study was designed to look for personality, educational and environmental differences between a higher Verbal group and a lower Verbal group of elementary school children. All the children were clinic referrals with Full Scale IQ's within the normal range.

The Procedure

The two groups were selected from a population of 373 subjects referred to the Child Guidance Clinic of Greater Winnipeg. There were 65 subjects in the higher Verbal group and 64 subjects in the lower Verbal group. Three factors: clinic record, school record, and home situation were analyzed

by using the chi-square technique. Several personality, educational and environmental differences were found.

The Conclusions

1. The lower Verbal child in this study was academically retarded throughout most of his school career. He was usually referred by the schools because of poor achievement and aggressive behaviour. He required a significant amount of clinical help which consisted of reading therapy, speech therapy and often social work assistance. He was usually a middle child in his family and his parent worked in a non-professional occupation. There was some evidence that boys, rather than girls, had lower Verbal scores.

2. The higher Verbal child did well in school originally but failed to maintain this success in later years. There was a slight tendency for this child to be recommended for psychological assessment by other clinical personnel. The higher Verbal child was usually first-born to parents in the professional and semi-professional occupations. There was some evidence that girls, rather than boys, had higher Verbal scores. Evidence from the literature was used to indicate that the higher Verbal child was usually more neurotically unstable or more inclined to be neurologically impaired.

3. It was concluded that a wide discrepancy between the two scales of the WISC was symptomatic of differences in traits, other than intellectual, between the higher Verbal

child and the lower Verbal child. These differences were considered to be of major importance to the clinician, the educator and the parent when assessing and treating the personal adjustment and school progress of the child.

ACKNOWLEDGEMENTS

The writer gratefully acknowledges the advice and guidance provided by the members of the thesis committee, and the assistance of various members of the Child Guidance Clinic of Greater Winnipeg. It is with gratitude, also, that the writer acknowledges the continued assistance and encouragement of his wife.

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CHAPTER I

INTRODUCTION AND HISTORICAL BACKGROUND

Introduction

The problem. This study investigated a clinical population of elementary school children whose Full Scale IQ's on the Wechsler Intelligence Scale for Children ranged between 90 and 110. The study undertook to determine whether subjects whose Verbal IQ's were significantly higher than their Performance IQ's differed from those whose Verbal IQ's were significantly lower than their Performance IQ's with respect to the following three factors: clinic record, school record, and home situation.

A review of the educational and psychological literature indicated that researchers have devoted considerable attention to sub-test profiles of subjects on the WISC. There was little evidence, however, that the problem of a large difference between the total Verbal Scale and the total Performance Scale had received equal consideration. A few studies touching on this problem have tended to use subjects whose Full Scale IQ's indicate either retardation or giftedness. But the dearth of scientific evidence pertaining to subjects whose Full Scale IQ's fall within the normal range has probably not prevented psychologists

working in an applied setting from attributing clinical significance to a Verbal-Performance discrepancy.

Verbal and performance abilities. - Contending that general intelligence cannot be equated to pure intellectual ability,[1] Wechsler attempted, by means of the Performance Scale,[2] to incorporate into his tests traits generally considered to be aspects of temperament and personality.[3] He claims that an individual "manifests intelligence by his ability to do things, as well as by the way he can talk about them."[4]

He is supported in his global concept of intelligence by other authors. Seashore writes:

> Most of us have advanced to the point of thinking in terms of multiple scores to appraise multiple abilities. We deal today with profiles based on several more or less independent test scores, each of which possesses some validity for clinical diagnosis and educational and vocational prediction.[5]

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[1] David Wechsler, "Cognitive, Conative and Non-Intellective Intelligence," American Psychologist, V, (February, 1950), pp. 78-83.

[2] David Wechsler, The Measurement of Adult Intelligence, (Third Edition; Baltimore: Williams and Wilkins, 1944), p. 10.

[3] David Wechsler, Wechsler Intelligence Scale for Children, (New York: Psychological Corporation, 1949), p. 5.

[4] David Wechsler, The Measurement of Adult Intelligence, (Third Edition; Baltimore: Williams and Wilkins, 1944), p. 137.

[5] Harold G. Seashore, "Differences Between Verbal and Performance IQ's on the WISC," Journal of Consulting Psychology, XV, (February, 1951), p. 62.

L. L. Thurstone notes that a close relation has been found between an individual's mental profile and the way in which he tries to solve his personal and emotional problems.[6] For children, he stresses the need of a mental profile which includes performance ratings as well as verbal ratings because children's ability to reason in the verbal medium is not well developed.

Observing that our educational systems are founded upon the language medium, Thelma G. Thurstone argues that adults frequently fail to take into account the variety of abilities displayed by children. Thus teachers, for the most part, tend to restrict their handling of curricula to verbal techniques. As a result, Thurstone contends, teachers may be inclined to judge as deficient in mentality the pupil who is not apt in verbal comprehension and communication. Consequently, even the child who possesses non-verbal abilities of a high order frequently tends to do poorly in school.[7]

Historical Background

The WISC and clinic record. - With respect to clinic record this study will investigate the difference between a higher Verbal group of children and a lower Verbal group

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[6] L. L. Thurstone, "Primary Mental Abilities," Science, CVIII, (November, 1948), p. 585.

[7] Thelma G. Thurstone, "The Tests of Primary Mental Abilities," The Personnel and Guidance Journal, (May, 1957), p. 569.

in relation to reasons for referral, sources of referral, and contacts with clinical services other than psychological. A search of the literature has revealed no studies relating WISC scores to characteristics of children referred for clinical assistance.

However, Wechsler suggests that in such mental disorders of adults as organicity, schizophrenia, and anxiety reactions, impairment of function is generally greater in the performance than in the verbal sphere.[8] On the other hand, mental defectives, sociopaths, and subjects roughly labelled as "acting-out" individuals, all tend to have a higher performance rating.[9] In a study carried out by Sheldon and Eleanor Glueck delinquents tested with the Wechsler-Bellevue averaged less in verbal intelligence than did non-delinquents although the two groups resembled each other closely in performance intelligence.[10]

The WISC and school record. - The present study will investigate differences between a higher and a lower Verbal group of children with respect to school record as it is reflected in the number of schools attended, overageness at the time of testing, and overageness several years after testing. Most reported studies deal with the relationship

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[8] David Wechsler, The Measurement and Appraisal of Adult Intelligence, (Fourth Edition; Baltimore: Williams and Wilkins, 1958), p. 159.

[9] Ibid., p. 160.

[10] Sheldon and Eleanor Glueck, Unraveling Juvenile Delinquency, (Cambridge: Harvard Univ. Press, 1951), p. 207.

between achievement and specific sub-tests of the WISC or sub-test profiles. It was not possible to locate a study which related school mobility or school progress directly to a Verbal-Performance discrepancy.

Ernest Barratt and Doris Baumgarten reported a study in which 30 achievers and 30 non-achievers, as selected by classroom teachers, were tested with the WISC, the 1937 revision of the Stanford-Binet (Form L), and the Reading and Arithmetic sub-tests of the California Achievement Tests. These children were enrolled in grades IV to VI. The findings of the study were reported as follows:

> For achievers one IQ test was not a better predictor than the other of either Reading or Arithmetic achievement. The same was true for non-achievers except for the WISC Performance which was not as highly related to Arithmetic as the WISC Verbal and Full Scale scores. . . Among the achievers in the study there appeared to be relatively high verbal ability.[11]

J. B. Stroud indicated that non-verbal tests predicted academic achievement quite as well as verbal tests. He found for 800 children in grades III to VI that Arithmetic, Vocabulary, Block Design and Object Assembly accounted for most of the correlation between the WISC and achievement in reading, arithmetic and spelling.[12]

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[11] Ernest S. Barratt and Doris L. Baumgarten, "The Relationship of the WISC and the Stanford-Binet to School Achievement," Journal of Consulting Psychology, XXI, (February, 1957), p. 144.

[12] J. B. Stroud, "The Intelligence Test in School Use - Some Persistent Issues," Journal of Educational Psychology, XLVIII, (February, 1957), p. 77.

Grace T. Altus attempted to determine a WISC profile for retarded readers. She defined a severe reading disability as two years or more between the expected reading level and the actual reading level. All WISC IQ's were above 80 for the 25 children used in the study. She reported the following findings:

> Coding and Arithmetic were significantly lower than Vocabulary, Digit Span, Picture Completion, Object Assembly and Picture Arrangement at the 1% level of confidence. Information was lower than Picture Completion at the 1% level and lower than Vocabulary and Digit Span at the 2% level.[13]

Stroud, Bloomers and Lauber found for 775 pupils in grades III to VI that significant predictors of achievement in reading and spelling were WISC sub-tests Arithmetic, Digit Span, Object Assembly and Coding. For predicting achievement in arithmetic, Comprehension was added to the list. They found the most significant predictors of achievement in the three subject areas to be the sub-tests Arithmetic, Vocabulary, Block Design and Object Assembly.[14]

Burks and Bruce used the WISC to study a group of 31 poor readers in grades III to VIII. They found that the sub-tests Comprehension, Block Design and Picture Arrangement were significantly high. They suggest that there are three

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[13] Grace T. Altus, "A WISC Profile for Retarded Readers," Journal of Consulting Psychology, XX, (February, 1956), pp. 155-56.

[14] James B. Stroud, Paul Bloomers, and Margaret Lauber, "Correlation Analysis of WISC and Achievement Tests," Journal of Educational Psychology, XLVIII, (January, 1957), p. 18.

common factors in these sub-tests: relative lack of need for long or short term symbolic memory, immediate availability of structured stimuli, and less call for abstract behaviour. Finding that Coding, Arithmetic and Information were significantly low for poor readers, they note that memory functions in these tests are most important, and that the given stimulus does not remain immediately available. Coding was the most difficult sub-test for poor readers. Picture Arrangement was the highest sub-test for poor readers and lowest for good readers. As a possible explanation, the authors suggest that good readers may not be so much in need of the concrete approach in learning and are less adept at such tasks.[15]

Littell notes that WISC scores have been shown to correlate highly with scores on achievement tests - the Verbal Scale showing a higher correlation than the Performance Scale. He also points out, however, that many aspects of the relationship between school achievement and WISC scores appear to be highly complex and require much further investigation.[16]

The WISC and home situation. - Regarding the relationship of the home situation to Verbal-Performance

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[15] Harold F. Burks and Paul Bruce, "The Characteristics of Poor and Good Readers as Disclosed by the WISC," Journal of Educational Psychology, XLVI, (December, 1955), p. 492.

[16] W. M. Littell, "Wechsler Intelligence Scale for Children - Review of a Decade of Research," Psychological Bulletin, LVII, (Number 2, 1960), p. 145.

differences on the WISC, differences in sex, position among siblings, and parental occupation will be studied. Relevant studies in this area are, again, limited and none has a direct reference to a Verbal-Performance discrepancy.

On the Verbal Scale, the boys in the standardization population of the WISC excelled the girls by more than three points at ages 8, and 10 through 15. On the Performance Scale, the difference favored the boys by more than three points at ages 8 and 10, while at ages 5, 6, 7 and 9 the girls were superior.[17] It is apparent that some slight sex differences are inherent in the WISC.

The relationship between sibling position and Verbal-Performance discrepancy has not received much attention in the literature. Although they make little interpretation of the relationship, Sheldon and Eleanor Glueck found their delinquent population to have lower Verbal scores on the Wechsler-Bellevue Scale and found these boys to be chiefly middle children in the families. On the other hand, their non-delinquents were most often first-born or youngest children with more neurotic symptoms and higher Verbal scores on the Wechsler-Bellevue.[18]

Focusing on schizophrenic children, Grosz and Miller concluded that no ordinal position in the family appeared to

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[17] Harold Seashore, Alexander Wesman, and Jerome Doppelt, "The Standardization of the Wechsler Intelligence Scale for Children," Journal of Consulting Psychology, XIV, (April, 1950), p. 106.

[18] Glueck and Glueck, op. cit., pp. 120, 205, 240.

carry any specific vulnerability to stress.[19] Hawkes, Burchinal and Gardner made the suggestion that children from smaller families tend to fare better psychologically than children from larger families.[20] Kent and Davis in a British study related discipline in the home to intellectual development. They found that children of excessively demanding parents scored higher on the Stanford-Binet than children of normal parents although reading scores and the WISC Performance showed no difference. Children of over-anxious parents scored lower on the WISC Performance Scale but equal to children of normal parents on the Stanford-Binet and reading tests. Children of neglecting parents scored lower on the Stanford-Binet and the reading tests but equal on the WISC Performance to children of normal parents. The authors conclude that intellectual development as measured by the Stanford-Binet and WISC Performance is influenced to an important degree by the discipline in the home.[21]

In a longitudinal study of the relation of socio-economic status to WISC scores, Betsy Worth Estes used two groups of children in the second grade, one upper and one lower in socio-economic status, and a similar pair of groups

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[19] Hanus J. Cross and Irving Miller, "Sibling Patterns in Schizophrenia," Science, CXXVIII, (January, 1958), p. 30.

[20] C. R. Hawkes, Lee Burchinal, and B. Gardner, "Size of Family and Adjustment of Children," Marriage and Family Living, XX, (Number 1, 1958), p. 68.

[21] Norma Kent and Russell D. Davis, "Discipline in the Home and Intellectual Development," British Journal of Medical Psychology, XXX, (Number, 1, 1957), p. 33.

in the fifth grade. The mean scores on the WISC were found to vary with the socio-economic level in the second grade but not in the fifth. Three years later she repeated the study and found a general increase in the mean IQ for both groups but, at this point, no significant difference between the groups. Concluding that there was a decrease in the effects of socio-economic status with an increase in grade and age, she suggests that this might be due to selective factors in promotion, factors within the WISC which operate to reduce the effects of socio-economic status with age, or the increasing influence of commonly shared experiences such as public schools, movies, radio and television.[22]

In another study of the effects of socio-economic status, Dorothy Laird tested two groups of 11-year old boys matched for age, intelligence, residence, school attendance, family unit, race, nationality, physical status and health. Three cultural factors were used for indices of socio-economic status: parental occupation, education and income. She found that Information, Vocabulary, Similarities and Arithmetic showed greater differences than any of the Performance tests. The higher socio-economic group scored higher in these Verbal tests and also on the Full Scale of the WISC.[23]

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[22] Betsy Worth Estes, "Influence of Socio-Economic Status on the WISC," Journal of Consulting Psychology, XIX, (March, 1955), p. 225.

[23] Dorothy S. Laird, "Performance of Two Groups of Eleven Year Old Boys on the WISC," Journal of Educational Research, LI, (October, 1957), p. 101.

With respect to the relationship between Verbal-Performance differences and parental occupation, it is of interest to note that in the standardization population of the WISC there was a preponderance of higher Verbal scores for the children whose parents were in the professional and semi-professional categories only.[24] Claiming that occupation is frequently an important factor in Verbal-Performance differences, Wechsler notes that carpenters, mechanics and engineers do better on the Performance Scale of his adult tests while clerical workers, school teachers and lawyers do better on the Verbal Scale.[25]

Summary

No conclusive scientific evidence was located to show that, for children with average WISC Full Scale IQ's, there are significant differences between a group characterized by relative Verbal superiority and a group marked by relative Performance superiority. There appears ample evidence to suggest that several factors affect WISC scores, but the nature of these factors and their relation to a Verbal-Performance discrepancy were largely undetermined. The following study undertook to determine whether a higher

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[24] Harold C. Seashore, "Differences Between Verbal and Performance IQ's on the WISC," Journal of Consulting Psychology, XV, (February, 1951), p. 67.

[25] David Wechsler, The Measurement and Appraisal of Adult Intelligence, (Fourth Edition; Baltimore: Williams and Wilkins, 1958), p. 160.

Verbal group of children differed significantly from a lower Verbal group with respect to clinic record, school record, and home situation.

CHAPTER II

PROCEDURE FOR THE STUDY

The Total Population

The subjects used in this study were selected from the files of the Child Guidance Clinic of Greater Winnipeg. This agency is a diagnostic and treatment center serving the metropolitan area of Greater Winnipeg. It offers a co-ordinated service to Greater Winnipeg school children by providing the services of five professional disciplines: psychiatry, social work, psychology, speech and hearing, and reading.

Criteria for selection. - The three criteria were:

1. All Full Scale WISC IQ's were between 90 and 110, indicating average general intelligence as defined by Wechsler.[1]

2. Chronological age at the time of testing was restricted to a range from 9 years, 0 months, to 11 years, 11 months, thereby ensuring for each subject a minimum of three years of primary education. Barring unusual circumstances the child would still be registered in the elementary school, but he would likely be

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[1] David Wechsler, Wechsler Intelligence Scale for Children, (New York: Psychological Corporation, 1949), p. 16.

functioning at a grade level where stress on basic skills has given way, to some extent, to an emphasis on subject content. Another reason for the selection of this age range pertains to the WISC itself. The period from 9 years to 12 years constitutes the middle three years of the range of ages for which the WISC was standardized.

3. All subjects had been tested during the three year period from September 1, 1952 to June 30, 1955. In September, 1958 (three years after the last test administration) a follow-up study of overageness was undertaken.

Description of the total population. - The total population used in the study consisted of 373 children. The approximate mean chronological age was 9 years, 10 months. Boys constituted 67.3% of the population. (See Appendix A for frequency distributions.) The mean IQ scores were: Full Scale 98.57, Verbal Scale 97.27, and Performance Scale 100.28. (See Table I.)

The Higher and the Lower Verbal Sub-Groups

Verbal-Performance discrepancy. - The 373 subjects constituting the total population were placed in a frequency distribution according to their Verbal-Performance discrepancy scores. Seashore formulated the concept of discrepancy score used in this study. He explains:

> By a discrepancy score on the WISC we mean the numerical difference between a child's Verbal IQ and his Performance IQ. We will always subtract his Performance IQ from his Verbal IQ. If the Verbal

TABLE I

MEANS AND STANDARD DEVIATIONS FOR THE DISTRIBUTIONS OF THE TOTAL POPULATION OF 373 CASES

	Mean	S. D.
Full Scale	98.57	5.74
Verbal Scale	97.27	8.01
Performance Scale	100.28	8.64

exceeds the Performance the sign is plus; if the Performance exceeds the Verbal the sign is minus.[2]

The distribution of discrepancy scores produced a mean discrepancy of -2.9 points, and a standard deviation of 12.9 IQ points. Table II presents this frequency distribution, and indicates the percentage of subjects falling in each interval. Table III gives a comparison of the population under study with the standardization population of the WISC, showing the direction of Verbal and Performance IQ differences. Realizing that the WISC population represents a complete range of Full Scale IQ scores while the population under study contains only subjects whose Full Scale scores were average, it is of interest to note that the population under study had a greater proportion of lower Verbal subjects.

Wechsler found that, for 10½ year old subjects, the standard error of the Verbal mean was 3.00; the standard error of the Performance mean was 4.98; and the correlation between the Verbal and Performance Scales was .68.[3] This information from the standardization data of the WISC was used in the present study to calculate a significant difference between a Verbal and a Performance score. The standard error of the difference was calculated as 3.67, and an observed difference of 9.47 IQ points was found to be

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[2] Harold G. Seashore, "Differences Between Verbal and Performance IQ's on the WISC," Journal of Consulting Psychology, XV, (February, 1951), p. 63.

[3] Wechsler, op. cit., p. 13. (Note: reliability coefficients computed by the split-half technique with appropriate correction for full length of the test: Verbal Scale - .96; Performance Scale - .89).

TABLE II

DISTRIBUTION OF THE DISCREPANCY SCORES AND THE PERCENTAGE OF THE SUBJECTS IN EACH INTERVAL

Score Interval			Frequency	% of Total
38	-	42	1	0.3
33	-	37	0	0.0
28	-	32	4	1.0
23	-	27	7	1.9
18	-	22	10	2.7
13	-	17	23	6.2
8	-	12	30	8.0
3	-	7	37	9.9
-2	-	2	68	18.5
-7	-	-3	60	16.0
-12	-	-8	49	13.1
-17	-	-13	37	9.9
-22	-	-18	28	7.5
-27	-	-23	12	3.2
-32	-	-28	2	0.5
-37	-	-33	2	0.5
-42	-	-38	3	0.8

N = 373
Mean = -2.9
S. D. = 12.90

TABLE III

A COMPARISON OF THE POPULATION UNDER STUDY WITH THE WISC POPULATION SHOWING THE DIRECTION OF VERBAL AND PERFORMANCE IQ DIFFERENCES

	V > P	V = P	V < P	Totals
Population Under Study (Ages 9 to 12)	139	15	219	373
Percentages	37%	4%	59%	100%
WISC Population (Ages 8 to 11)	392	32	376	800
Percentages	49%	4%	47%	100%

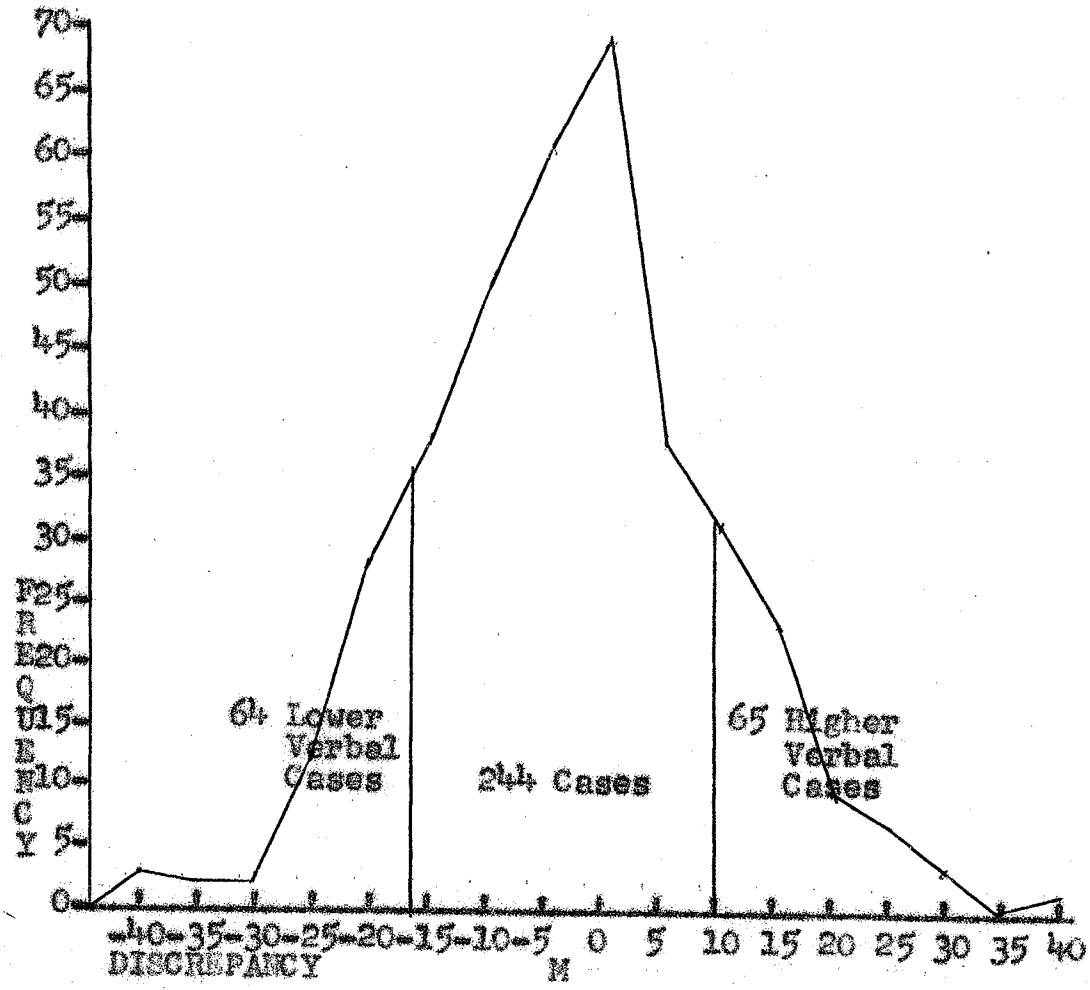
significant at the .01 level for 10½ year olds.

Selection of the Higher and Lower Verbal Groups

Figure 1. presents graphically the distribution of the 373 discrepancy scores. It was evident that all the subjects lying outside one standard deviation on either side of the mean had discrepancy scores that were significant at the .01 level. The mean of -2.9 plus or minus one standard deviation of 12.9 produced two points: a plus score at 10.00 and a minus score at 15.80 (or 16). There were 65 subjects whose discrepancy scores were greater than plus 10 IQ points (higher Verbal group), and 64 subjects whose discrepancy scores were more than minus 16 IQ points (lower Verbal group). These 65 higher Verbal subjects and the 64 lower Verbal subjects included all who lay outside plus or minus one standard deviation from the mean of the total distribution, and the difference between the Verbal and Performance scores for all subjects was significant at the .01 level.

The higher Verbal group. - The higher Verbal group contained 40 boys and 25 girls. The mean chronological age was approximately 10 years, 3 months, and the mean grade placement was grade 5 and 0 months. The discrepancy scores ranged from 10 to 41 IQ points. The chronological age was calculated in years and months at the time of the psychological examination. The grade was determined by taking the grade placement and adding the number of months since the opening of the school year.

Frequency distributions for the quotient scores were



N = 373
Mean = -2.9
S. D. = 12.90

Figure 1. - Showing the distribution of the discrepancy scores and the relative positions of the higher and lower Verbal groups.

constructed for the higher Verbal group and these may be found in Appendix B. Table IV presents the means and standard deviations of these distributions. The mean Full Scale score was 98.14 and the standard deviation was 5.55. The mean Verbal Scale IQ for the higher Verbal group was approximately 9 points above the mean for the total population, and the mean Performance IQ was 10 points below the mean for the total population.

The lower Verbal group. - There were 48 boys and 16 girls in the lower Verbal group of 64 subjects. The mean chronological age was approximately 10 years, 4 months and the mean grade placement was grade 4 and 4 months. The discrepancy scores ranged from 16 to 42 IQ points. Table IV contains the means and standard deviations for this group also.

The mean Full Scale score for the group was 98.41 approximating the mean of the higher Verbal group (98.14). The mean of the Verbal Scale for the lower Verbal group was slightly lower than the mean of the Performance Scale for the higher Verbal group - 88.37 and 89.65 respectively. On the other hand, the mean of the Performance Scale for the lower Verbal group was somewhat higher than the mean of the Verbal Scale for the higher Verbal group - 109.44 and 106.32 respectively.

Analysis of Clinic Record

Reasons for referral. - The referral forms and psychological reports for the subjects in the higher and

TABLE IV

MEANS AND STANDARD DEVIATIONS FOR THE DISTRIBUTIONS OF THE GROUPS

	Means		S. D.	
	H. V.	L. V.	H. V.	L. V.
Full Scale	98.14	98.41	5.55	5.31
Verbal Scale	106.32	88.56	5.98	5.33
Performance Scale	89.65	109.44	5.85	5.71
Discrepancy Scores	16.54	21.05	6.14	5.43
Number of Cases	65	64	65	64

lower Verbal groups were studied to determine the reason for referral for psychological assessment. These reasons were divided into four categories:

1. Achievement - This classification included those subjects who were referred because there was concern over academic progress to the extent that level of general intelligence was under question.

2. Aggressive Behaviour - This category included subjects who displayed symptoms such as defiance of authority, delinquency, fighting, stealing, truancy and running away. Academic reasons may have been mentioned as well, but for the sake of classification the personality problems were given precedence.

3. Neurotic Behaviour - Children referred for symptoms such as anxiety, fearfulness, insecurity, withdrawal, day-dreaming and distractibility were placed in this category. Again, personality problems were given precedence over academic problems.

4. Physical Conditions - This category included those subjects where speech, hearing, vision, or other extreme physical limitations were the chief concern of the referring persons.

The tabulations were placed in a contingency table and the chi-square test of independence was applied as outlined by Garrett.[4] In cases where the expected

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[4] Henry E. Garrett, Statistics in Psychology and Education, (New York: Longmans, Green and Co., 1953), pp. 254-65.

frequencies of the cells were found to be smaller than five, cells were combined before the chi-square test was employed. A probability at the .05 level was accepted as indicating a significant difference between the two groups. In several instances the direction of the difference was predicted.

With respect to the reasons for referral it was predicted that there would be a greater number of subjects in the lower Verbal group referred for poor achievement and aggressive behaviour. It was also predicted that more of the higher Verbal group would be referred for neurotic behaviour.

Sources of referral. - Persons requesting psychological service were classified into five groups:

1. School Personnel - Teachers, principals, supervisors and superintendents.

2. Medical Personnel - Pediatricians, psychiatrists, general practitioners and nurses.

3. Clinic Personnel - Other members of the Child Guidance Clinic: school social workers, reading therapists, speech and hearing therapists, and psychiatrists.

4. Parents.

5. Community Agencies - Children's Aid Societies, Family Bureau, Juvenile Court, and others.

It was predicted that more of the lower Verbal group would have been referred by school personnel while more of the higher Verbal group would have been referred by other clinic personnel.

Contacts with other clinical services. - The contacts with other clinical services were classified according to the departments of the Child Guidance Clinic:

1. Psychiatry.
2. Reading.
3. School Social Work.
4. Speech and Hearing.
5. No contacts other than Psychology.

It was predicted that the lower Verbal group would have had a greater number of contacts with the departments of Reading, Speech and Hearing, and School Social Work.

Analysis of School Record

Number of schools attended. - Since the psychologists of the Child Guidance Clinic see most of their cases in the schools, they have access to the school records. As a part of the routine of their examination they record the names of the various schools attended by the children. Some of the children used in this study had attended as many as seven schools. It was predicted that the lower Verbal group would have attended a greater number of schools.

Overageness at the time of testing. - The arithmetical difference between a child's chronological age in years and months and the optimum chronological age in years and months for grade expectancy provides an index of overageness or academic retardation. This index was calculated for each subject in the groups. Three classifications were established:

1. If the overageness index was plus or minus one year, the child was not considered overage. This interval allowed for the difference in age between a child whose birthdate preceded November 30, and the child whose birthdate followed this date. November 30 is the birthdate after which a child is normally required to wait until the next year to enter school in the Greater Winnipeg area.

2. The second classification contained those children who were more than one year overage but less than two years.

3. The third classification contained those who were two years or more overage for their grade placement.

It was predicted that the lower Verbal group would be more overage than the higher Verbal group.

Overageness several years after testing. - The factor of overageness was calculated again on September 1, 1958, for as many of the children in the groups as could be located. This date terminated a period of three years from the date of the last psychological assessment. The same three classifications of overageness were used for the follow-up study. It was predicted that the lower Verbal group would still be significantly more overage than the higher Verbal group.

Analysis of the Home Situation

Sex. - It was predicted that there would be a higher ratio of boys in the lower Verbal group and a higher ratio of girls in the higher Verbal group.

Position among siblings in the family. - As a part of the routine of the psychological examination a record is kept of the siblings in the family. The children in the groups were classified according to their position in the family. Tabulations were made for the following categories:

1. Only Children.
2. Youngest.
3. Eldest.
4. Middle Children.

It was predicted that there would be more first-born children in the higher Verbal group and more middle children in the lower Verbal group.

Parental occupations. - School records or information from the child provided these data and tabulations were made according to the classifications Wechsler used for the standardization population of the WISC.[5] Wechsler's second category was omitted (farmers and farm managers) because the groups contained urban children only. The categories were designated as follows:

1. Professional and semi-professional workers.
2. Proprietors, managers and officials.
3. Clerical, sales and kindred workers.
4. Craftsmen, foremen and kindred workers.
5. Operatives and kindred workers.
6. Domestic, protective and other service workers.

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[5] Wechsler, op. cit., p. 9.

7. Labourers.

8. Occupation not reported or no parent working.

It was predicted that there would be more of the higher Verbal group whose parents were working in the upper categories and more of the lower Verbal group whose parents were working in the lower categories.

CHAPTER III

THE FINDINGS

Clinic Record

The clinic record of each child was studied under the following headings: reasons for referral, sources of referral, and other clinic contacts. Table IV presents the frequencies of each category for the lower and higher Verbal groups. The chi-squares, degrees of freedom and the probabilities are also included for each category unless the observed difference between the groups was obviously not significant.

Reasons for referral. - As predicted, a greater number of the lower Verbal group was referred for aggressive behaviour ($P < .02$). Contrary to prediction, there was no difference between the groups with respect to the number of subjects referred for poor achievement ($P < .25$), nor was there any difference between the groups with respect to the number referred because of neurotic behaviour ($P < .35$).

Sources of referral. - There was a slight tendency in the predicted direction for the lower Verbal group to be referred by school personnel ($P < .10$), and the higher Verbal group to be referred by other clinical personnel ($P < .10$).

TABLE V

SUMMARY OF THE FINDINGS FOR CLINIC RECORD

	Category	fH.V.	fL.V.	Chi-Sq.	df	Prob.
1.	Reasons for Referral	65	64	4.504	3	.30
	Achievement !	37	31	.776	1	.25
	Aggressive Behaviour !	7	16	4.478	1	.02#
	Neurotic Behaviour !	17	14	.332	1	.35
	Physical	4	3			
2.	Sources of Referral	65	64	2.325	2	.50
	School !	38	45	1.950	1	.10
	Medical	5	4			
	Clinic !	18	11	2.055	1	.10
	Parents	2	0			
	Agencies	2	4			
3.	Other Clinic Contacts	77	93	7.699	4	.20
	Psychiatry	6	7	.123	1	.80
	Reading !	7	17	5.326	1	.02#
	Social Work !	24	31	1.735	1	.10
	Speech and Hearing !	6	13	3.200	1	.05#
	Psychology Only	34	25	2.308	1	.20

! One-tailed test
Significant at .05 level

Other clinic contacts. - It should be noted in Table V that the frequencies for this factor represent registered contacts rather than subjects. The same subject may have had several contacts with the various departments of the Child Guidance Clinic.

As predicted, the lower Verbal group had more contact with the Reading Department ($P < .02$) and the Speech and Hearing Department ($P < .05$). There was a slight tendency for the lower Verbal group to have had more contact with the School Social Work Department ($P < .10$).

School Record

The school record of each child was investigated under the following headings: number of schools attended, overageness at the time of testing, and overageness several years after testing. Table VI presents a summary of the findings for each of these factors.

Number of schools attended. - Contrary to prediction, there was no significant difference between the groups with respect to the number of schools attended by the children ($P < .40$).

Overageness at the time of testing. - There was a significant difference between the groups for the factor of overageness. Sixty of the 65 higher Verbal subjects showed no evidence of overageness while half of the lower Verbal group was found to be overage. Without an exception, all differences between the groups were significant at, or beyond,

TABLE VI

SUMMARY OF THE FINDINGS FOR SCHOOL RECORD

	Category	fH.V.	fL.V.	Chi-Sq.	df	Prob.
1.	No. of Schools Attended!	65	64	1.187	3	.40
	1	18	19			
	2	19	23			
	3	15	11			
	4	10	6			
	5	1	4			
	6	0	0			
	7	2	1			
2.	Overageness	65	64	28.058	2	.001##
	Within 1 Year !	60	32	28.038	1	.001##
	1 to 2 Years !	4	24	18.612	1	.001##
	2 Years or More !	1	8	5.851	1	.01 ##
3.	Overageness (Follow-Up)	25	26	12.589	2	.01 ##
	Within 1 Year !	13	5	6.059	1	.01 ##
	1 to 2 Years !	7	3	2.194	1	.10
	2 Years or More !	5	18	12.576	1	.001##
	Cannot Trace	40	38			

! One-tailed test
Significant at .01 level

the .01 level. As had been predicted, in each classification the lower Verbal group was significantly more overage.

Overageness several years after testing. - Only 40% of the subjects in the groups could be traced in September, 1958 (three years after the last psychological assessment). The number that could not be traced was approximately the same for both groups.

Although the results probably indicate little more than a trend, the groups were still significantly different ($P < .01$). There were still almost twice as many lower Verbal subjects who were overage. However, the higher Verbal group was more overage in the follow-up study than might be expected from their earlier achievement record.

Home Situation

With respect to home situation the following factors were studied: sex of the children, position among siblings in the family, and parental occupations. Table VII presents a summary of the findings for these factors.

Sex. - There was a tendency in the predicted direction for a higher ratio of boys in the lower Verbal group and a higher ratio of girls in the higher Verbal group ($P < .10$).

Position among siblings. - As predicted, there were more first-born children in the higher Verbal group ($P < .01$) and more middle children in the lower Verbal group ($P < .02$).

TABLE VII

SUMMARY OF THE FINDINGS FOR HOME SITUATION

	Category	fH.V.	fL.V.	Chi-Sq.	df	Prob.
1.	Sex !	65	64	2.645	1	.10
	Boys	40	48			
	Girls	25	16			
2.	Position Among Siblings	65	64	6.441	3	.10
	Only Child	15	9	1.720	1	.20
	Youngest	17	20	.387	1	.70
	Oldest	19	11	2.640	1	.20
	Middle !	14	24	3.879	1	.02#
	First-Born !	34	20	5.891	1	.01##
3.	Parental Occupations	65	64	6.492	5	.30
	Prof. and Semiprof.	5	2			
	Prop., Man., Offic.	10	5			
	Clerical, Sales, etc.	9	5			
	Crafts., Foremen, etc.	8	14			
	Operatives, etc.	15	15			
	Service Occupations	8	9			
	Labourers	0	3			
	No Report, No Occup.	10	11			
	Top Three Classes !	24	12	5.416	1	.01##

! One-tailed test
Significant at .05 level
Significant at .01 level

Parental occupations. - There was no difference between the groups until the top three classifications were combined. Then, as predicted, the higher Verbal group had more parents who were working in these classifications.

CHAPTER IV

DISCUSSION AND CONCLUSIONS

Clinic Record

Reasons for referral. - There was no difference between the lower Verbal and higher Verbal groups with respect to the number of children referred because of academic difficulties. Thelma G. Thurstone suggested that, even though non-verbal abilities may be of a high order, low verbal children tend to do poorly in school.[1] Thus, it seemed logical to expect that a greater number of the lower Verbal group would be referred for reasons related to poor achievement. However, this expectation was not supported by the findings.

There are two possible reasons for this lack of support. First, the data from the referral forms may have been too inadequate to make an objective decision. Second, giving precedence to personality difficulties as a method of handling the data may have obscured the number of children who were also referred because of academic problems.

A greater number of the lower Verbal group was referred

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[1] Thelma G. Thurstone, "The Tests of Primary Mental Abilities," The Personnel and Guidance Journal, (May, 1957), p. 569.

because of aggressive behaviour problems. The relationship between low verbal ability and "acting out" behaviour was suggested by Wechsler.[2] Sheldon and Eleanor Glueck also found that their delinquent group had lower Verbal scores on the Wechsler-Bellevue Scale.[3] The present study adds additional support to the idea of relating low verbal ability and aggressive behaviour. No previous evidence was located in the literature to indicate that this relationship existed for younger elementary school children who were tested with the WISC.

There was no difference between the lower and higher Verbal groups with respect to the number referred because of neurotic or neurological symptoms. In spite of Wechsler's suggestion that persons suffering from anxiety reactions and neurological impairment have greater deficits in the Performance area,[4] the schools apparently placed more emphasis on poor achievement and aggressive behaviour when making their referrals to the Child Guidance Clinic.

Sources of referral. - There was no difference between the lower and higher Verbal groups with respect to the sources of referral. There was, however, a tendency ($P < .10$)

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[2] David Wechsler, The Measurement and Appraisal of Adult Intelligence, (Fourth Edition; Baltimore: Williams and Wilkins, 1958), p. 160.

[3] Sheldon and Eleanor Glueck, Unraveling Juvenile Delinquency, (Cambridge: Harvard University Press, 1951), p. 207.

[4] Wechsler, op. cit., p. 159.

for more of the lower Verbal group to be referred by school personnel and a tendency ($P < .10$) for more of the higher Verbal group to be referred by other clinical personnel. Because of the impact of behaviour disorders and probable poor achievement among the children of the lower Verbal group it was anticipated that most of them would be referred by the schools. Teachers would also be more inclined to question the general ability level of the lower Verbal group and, as a result, request psychological assessment. On the other hand, schools would be less aware of the greater incidence of emotional and organic problems of higher verbal persons. These referrals would more likely come from other clinical personnel.

Since the evidence is not conclusive it can only be suggested that, when the problems are overtly expressed, as in the case of poor achievement and aggressive behaviour, the request for psychological service originates with school personnel; when the problems are internalized and expressed emotionally there is a tendency for the request for psychological assistance to originate with clinical personnel.

Other clinic contacts. - There was a difference between the lower and higher Verbal groups with respect to the number of contacts with other clinical personnel. More of the lower Verbal group required diagnosis and treatment from the reading therapists of the Child Guidance Clinic. These children also required more assistance from speech therapists. There was a tendency for more of this lower Verbal group to be known to

the school social workers, although the probability was not great.

It was apparent from the findings that the lower Verbal children made more demands than the higher Verbal children on the services of the Child Guidance Clinic. They also required a greater variety of the services. Evidently, both groups required service from the school social workers for their personality and behaviour difficulties, although there was a slight tendency for more of the lower Verbal group to be known to these workers.

School Record

Number of schools attended. - There was no difference between the two groups with respect to the number of schools attended by the children. Other studies suggest that there is a relationship between the residential mobility of the parents and the lower Verbal ability of their children. Seashore found a preponderance of lower Verbal scores in children whose parents were working at non-professional levels.[5] Laird found more lower Verbal scores among children who came from lower socio-economic homes.[6] It is generally conceded that the lower socio-economic levels show more

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[5] Harold G. Seashore, "Differences Between Verbal and Performance IQ's on the WISC," Journal of Consulting Psychology, XV, (February, 1951), p. 67.

[6] Dorothy S. Laird, "Performance of Two Groups of Eleven Year Old Boys on the WISC," Journal of Educational Research, LI, (October, 1957), p. 101.

residential mobility. Therefore, it was expected that the lower Verbal group would have attended a greater number of schools than the higher Verbal group.

However, according to the findings of the present study, the higher Verbal group appeared to be just as mobile as the lower Verbal group. In fact, more than one-third of the children in each group had attended three or more elementary schools. Request for psychological service was, perhaps, more related to the difficulties of assessing the general ability, school progress and adjustment of the child who had attended several schools rather than to socio-economic and cultural factors.

Overageness. - One of the most important findings of the study was probably the significant academic retardation of the lower Verbal group. Exactly 50% of this group was more than one year overage for grade placement at the time of testing, while only 7.7% of the higher Verbal group was in the same situation. For those who could be traced in September, 1958, 81% of the lower Verbal group was more than one year overage and 45% of the higher Verbal group was in a similar position.

A greater degree of overageness can be expected for both groups as schooling progresses. As a child continues through the grades he finds the school program becoming more abstract and complex. For the child of average ability some degree of academic retardation is highly likely. When the average child has encountered difficulties sufficient to

warrant referral for psychological service the degree of overageness is likely to increase as he continues in school.

The significance of the overageness factor in this study seems to be related to the earliness with which it appeared in the school careers of the children with lower Verbal scores on the WISC. It is also important to note that, although the lower Verbal group became consistently more overage for the grade, the higher Verbal group tended to become more overage at a rate that was accelerated beyond expectancy. It is suggested that this clinical higher Verbal group was unable to maintain its earlier academic success because of emotional instability. The Gluecks found their higher Verbal group more neurotic than their lower Verbal group.[7] Both Wechsler[8] and Schafer[9] support the idea that disturbed higher verbal people have more emotional disabilities while disturbed lower verbal people have more social and behaviour disabilities.

In conclusion, verbal ability as measured by the WISC appeared to have a direct relationship to the ability to achieve in elementary school. The findings of the present study tend to conflict with Stroud's contention that non-verbal tests predict academic achievement as adequately as

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[7] Glueck and Glueck, on. cit., p. 240.

[8] Wechsler, on. cit., p. 159.

[9] Roy Schafer, The Clinical Application of Psychological Tests, (New York: International Universities Press, Incorporated, 1948), pp. 23-96.

verbal tests.[10] Perhaps, as Littell suggests, the relationship between school achievement and WISC scores is a highly complex matter.[11]

Home Situation

Sex. - There was no difference between the groups with respect to the sex of the children. However, there was a tendency towards a higher ratio of boys in the lower Verbal group and a higher ratio of girls in the higher Verbal group ($P < .10$). There were more boys in both groups, which is consistent with the general case load of the Psychology Department of the Clinic (63.5% boys).[12]

Since boys, more frequently than girls, show aggressive behaviour, and since most educational clinics find more boys than girls with academic difficulties, it was expected that there would be a greater proportion of boys in the lower Verbal group. This expectation was probably not supported by the findings because of the atypical nature of the clinical population. A significant number of the girls may have been referred because of aggressive behaviour or because of academic difficulties. The fact

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[10] J. B. Stroud, "The Intelligence Test in School Use - Some Persistent Issues," Journal of Educational Psychology, XLVIII, (February, 1957), p. 77.

[11] W. M. Littell, "Wechsler Intelligence Scale for Children - Review of a Decade of Research," Psychological Bulletin, LVII, (Number 2, 1960), p. 145.

[12] Annual Report of the Child Guidance Clinic of Greater Winnipeg, 1956-57, p. 8. (Mimeographed).

that the WISC as a test of general intelligence tends to favor boys,[13] may also have had some influence on these findings.

Position among siblings. - There were more first-born children in the higher Verbal group and more middle children in the lower Verbal group. The Glueecks found more middle children with lower verbal intelligence among the aggressive behaviour problems and more first-born children with higher verbal intelligence and neurotic symptoms among the non-delinquent group.[14] Grosz and Miller also suggest that first-born children tend to be more vulnerable to emotional difficulties, although position in the family had no relation to the incidence of childhood schizophrenia.[15] There is reason to believe that the first-born child has more ready access to the adults who are responsible for his care. This proximity to adults appears to have both positive and negative aspects for children of average ability who require clinical service. Verbal abilities tend to be higher for the first-born child and more useful to him in his early achievement in school. On the other hand, his first-born position probably makes him more vulnerable to emotional

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[13] Harold Seashore, Alexander Wesman, and Jerome Doppelt, "The Standardization of the Wechsler Intelligence Scale for Children," Journal of Consulting Psychology, XIV, (April, 1950), p. 106.

[14] Glueck and Glueck, op. cit., p. 120.

[15] Hanus J. Grosz and Irving Miller, "Sibling Patterns in Schizophrenia," Science, CXXVIII, (January, 1958), p. 30.

difficulties because of the inexperience of his parents in handling him and the possibilities of greater pressure for earlier development and achievement. If he has difficulties that require clinical service it appears that he is unable to maintain an adequate record of achievement in school.

The middle child who requires clinical service apparently fails to develop adequate verbal abilities, does poorly in school from an early age, tends to become an aggressive behaviour problem and requires a greater variety of special school services.

Parental occupations. - There was a difference between the lower and higher Verbal group with respect to parental occupations. More of the higher Verbal group had parents who were in the upper occupational categories. This finding is supported by Seashore who found a preponderance of higher Verbal scores for the children of professional and semi-professional parents.[16]

It is interesting to speculate on the drive for achievement to which children of average intelligence may be subjected in professional and semi-professional families. Are these children over-motivated and therefore, tense, anxious and emotionally unstable? Do they compensate by developing verbal facility at the expense of performance ability so that early achievement records are not maintained because of the lack of balance in ability and the lack of

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[16] Seashore, op. cit.

emotional stability?

Are average children, whose parents work in the lower occupational categories, under-motivated to the extent that they repress their verbal potentialities and become afraid to reach out into the area of academic learning? Are these children negatively-motivated so that they express themselves through aggressive behaviour?

It is evident that further study is necessary to determine specifically the relationships between cultural, socio-economic factors and the mental abilities, personality and achievement of elementary school children.

Conclusions

1. For a clinical population of elementary school children with average Full Scale scores on the WISC, this study found a number of clinical, school and environmental differences between the lower Verbal child and the higher Verbal child. The findings appear to be more definite with respect to the lower Verbal child.

2. The lower Verbal child was academically retarded throughout most of his school career. He was usually referred by the schools because of poor achievement and aggressive behaviour. He required a significant amount of clinical help which consisted of reading therapy, speech therapy and often school social work. He was usually a middle child in his family and his parents worked in a non-professional occupation. There was some slight evidence that boys tended to be in the lower Verbal group. Other studies have supported

the relationship between lower Verbal ability, middle position in the family, aggressive behaviour, non-professional parents, and poor school achievement. These studies, however, did not use the WISC nor did they deal with younger elementary school children.

3. The higher Verbal child did well in school originally but failed to maintain this success in later years. There was a slight tendency for this child to be referred for psychological service by other clinical personnel. The higher Verbal child was usually first-born to parents in the professional or semi-professional occupations. There was some slight evidence that girls tended to be in the higher Verbal group. Other studies have found the higher Verbal child to be first-born to parents in the upper occupational categories. There is some rather marked support in the literature for the idea that the higher Verbal person is inclined to be neurotically unstable or neurologically impaired. These studies did not use the WISC nor did they deal with younger elementary school children.

4. It seems apparent that a wide discrepancy on the two scales of the WISC is symptomatic of significant differences between a higher Verbal child and a lower Verbal child when the Full Scale is average and the child is a clinic case. The characteristic differences appear to be of considerable importance to the clinician, the educator and the parent when assessing the personal adjustment and school progress of the child.

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APPENDIX A

DISTRIBUTIONS OF THE TOTAL POPULATION

TABLE VIII

DISTRIBUTION OF THE FULL SCALE IQ SCORES

Score	Frequency
110	11
109	12
108	5
107	20
106	9
105	10
104	21
103	14
102	13
101	26
100	10
99	34
98	18
97	14
96	25
95	12
94	22
93	28
92	25
91	28
90	16

N = 373
Mean = 98.57
S. D. = 5.74

TABLE IX

DISTRIBUTION OF VERBAL SCALE IQ SCORES

Score Interval	Frequency
123-125	1
120-122	1
117-119	1
114-116	5
111-113	9
108-110	24
105-107	34
102-104	35
99-101	54
96-98	45
93-95	45
90-92	62
87-89	26
84-86	22
81-83	4
78-80	3
75-77	2

N = 373
Mean = 97.27
S. D. = 8.01

TABLE X

DISTRIBUTION OF PERFORMANCE SCALE IQ SCORES

Score Interval	Frequency
127-129	3
124-126	1
121-123	0
118-120	2
115-117	7
112-114	15
109-111	28
106-108	64
103-105	34
100-102	49
97-99	40
94-96	46
91-93	36
88-90	19
85-87	17
82-84	8
79-81	3
76-78	1

N = 373
Mean = 100.28
S. D. = 8.64

APPENDIX B

CASE DATA AND DISTRIBUTIONS OF THE HIGHER VERBAL GROUP

TABLE XI

SUBJECTS REPRESENTING HIGHER VERBAL PROFICIENCY ARRANGED IN ORDER OF THE SIZE OF THE DISCREPANCY

No.	Sex	C.A.	Grade	WISC			Discrepancy
				VS	PS	FS	
1.	M	11- 5	6.8	124	83	105	41
2.	M	9- 6	3.3	109	79	94	30
3.	F	9- 9	4.8	105	76	91	29
4.	M	11- 6	6.6	108	80	94	28
5.	M	9- 4	4.10	110	82	96	28
6.	M	10- 4	4.10	120	93	108	27
7.	M	11- 3	5.4	115	90	104	25
8.	M	11- 0	5.6	108	83	96	25
9.	M	11- 5	5.6	106	82	94	24
10.	M	9-11	4.9	111	87	100	24
11.	F	10- 3	4.9	119	96	109	23
12.	M	9- 1	4.4	115	92	104	23
13.	M	10-10	5.5	106	85	95	21
14.	M	10- 7	3.4	106	85	96	21
15.	M	11-11	6.4	109	89	99	20
16.	F	9- 6	4.7	100	80	90	20
17.	F	9-11	4.5	104	85	94	19
18.	M	10- 2	4.4	106	87	97	19
19.	F	10- 4	5.6	110	92	101	18
20.	F	9- 5	4.3	101	83	92	18
21.	M	10-11	5.5	101	83	92	18
22.	M	9- 1	3.1	111	93	103	18
23.	F	11- 5	6.7	111	94	104	17
24.	M	9-11	4.1	106	89	97	17
25.	M	10- 1	4.4	103	86	94	17
26.	F	10- 7	5.5	109	93	101	16
27.	F	9- 2	3.8	99	83	91	16
28.	M	10- 6	5.1	103	87	95	16
29.	M	9- 8	5.8	114	99	107	15
30.	M	9- 6	3.9	111	96	104	15
31.	M	10- 7	5.5	116	101	110	15
32.	F	10- 5	3.8	100	85	92	15
33.	F	10- 6	5.9	100	85	92	15
34.	M	11- 7	6.7	103	89	96	14
35.	M	11- 3	6.6	104	90	97	14

TABLE XI - Continued

No.	Sex	C. A.	Grade	WISC			Discrepancy
				VS	PS	FS	
36.	F	11- 6	6.4	108	94	101	14
37.	M	9- 4	4.6	99	85	91	14
38.	M	10- 1	5.8	108	94	101	14
39.	M	10-10	4.10	111	97	105	14
40.	F	10- 1	4.2	99	85	91	14
41.	F	9-10	5.0	97	83	90	14
42.	M	10- 4	5.1	106	92	99	14
43.	M	9- 8	3.9	103	89	96	14
44.	F	9- 4	4.5	99	86	92	13
45.	M	9-10	4.5	106	93	100	13
46.	M	9- 6	4.5	104	92	98	12
47.	M	10- 4	4.3	108	96	102	12
48.	M	10- 1	4.9	105	93	99	12
49.	F	9-11	4.2	106	94	101	12
50.	F	10- 5	5.3	100	89	94	11
51.	F	9- 2	4.4	96	85	90	11
52.	F	11- 4	6.7	97	86	91	11
53.	F	11- 2	6.4	103	92	97	11
54.	F	11- 5	6.8	104	93	99	11
55.	M	10- 5	5.1	103	92	97	11
56.	F	10- 5	5.10	104	93	99	11
57.	M	11- 4	6.8	114	104	110	10
58.	M	11- 7	5.7	104	94	99	10
59.	M	9- 6	4.4	109	99	104	10
60.	M	9- 4	3.5	103	93	98	10
61.	F	9- 4	4.7	97	87	92	10
62.	M	9- 4	4.3	113	103	109	10
63.	F	9- 1	4.8	97	87	92	10
64.	M	9- 5	3.6	111	101	107	10
65.	F	10- 4	5.1	106	96	101	10

TABLE XII

FREQUENCY DISTRIBUTION OF THE FULL SCALE IQ'S OF THE HIGHER VERBAL GROUP

Score	Frequency
110	2
109	2
108	1
107	2
106	0
105	2
104	5
103	1
102	1
101	6
100	2
99	6
98	2
97	5
96	5
95	2
94	6
93	0
92	7
91	5
90	3
N =	65
Mean =	98.14
S. D.	5.554

TABLE XIII

FREQUENCY DISTRIBUTION OF THE VERBAL SCALE IQ'S OF THE HIGHER VERBAL GROUP

Score Interval	Frequency
123-125	1
120-122	1
117-119	1
114-116	5
111-113	7
108-110	11
105-107	11
102-104	13
99-101	10
96-98	5
N =	65
Mean =	106.324
S. D. =	5.979

TABLE XIV

FREQUENCY DISTRIBUTION OF THE PERFORMANCE SCALE IQ'S OF THE HIGHER VERBAL GROUP

Score Interval	Frequency
103-105	2
100-102	2
97-99	3
94-96	9
91-93	14
88-90	7
85-87	16
82-84	8
79-81	3
76-78	1
N =	65
Mean =	89.645
S. D. =	5.847

TABLE XV

FREQUENCY DISTRIBUTION OF THE DISCREPANCY SCORES OF THE HIGHER VERBAL GROUP

Score Interval	Frequency
40-42	1
37-39	0
34-36	0
31-33	0
28-30	4
25-27	3
22-24	4
19-21	6
16-18	10
13-15	17
10-12	20
N =	65
Mean =	16.538
S. D. =	6.141

APPENDIX C

CASE DATA AND DISTRIBUTIONS OF THE LOWER VERBAL GROUP

TABLE XVI

CASES REPRESENTING LOWER VERBAL PROFICIENCY ARRANGED IN ORDER OF THE SIZE OF THE DISCREPANCY

No.	Sex	C. A.	Grade	WISC			Discrepancy
				VS	PS	FS	
1.	M	9- 3	3.7	86	128	107	42
2.	M	9- 5	4.3	87	127	107	40
3.	M	9- 4	3.6	86	124	104	38
4.	M	11- 2	4.5	77	111	93	34
5.	M	9-11	2.7	75	108	90	33
6.	M	9- 0	2.1	92	124	108	32
7.	F	11- 7	5.7	90	120	104	30
8.	F	9- 2	3.6	80	107	92	27
9.	M	9- 1	2.7	79	104	90	25
10.	M	11- 4	5.3	81	106	92	25
11.	M	9-10	3.4	81	106	92	25
12.	M	11- 0	4.4	80	104	91	24
13.	M	9- 6	3.8	87	111	99	24
14.	M	11- 8	5.8	87	111	99	24
15.	M	11- 7	4.7	81	104	91	23
16.	M	11-11	5.3	85	108	96	23
17.	F	11- 8	5.4	85	108	96	23
18.	F	10- 3	5.2	91	114	102	23
19.	M	9- 4	3.6	90	113	101	23
20.	M	9- 1	2.1	89	111	99	22
21.	M	10- 5	3.7	84	106	93	22
22.	M	9- 8	3.9	85	107	95	22
23.	M	9- 6	3.2	84	106	93	22
24.	F	9- 8	2.9	85	106	94	21
25.	M	11- 7	5.9	92	113	102	21
26.	M	9- 1	Unq.3	92	113	102	21
27.	F	11- 4	5.10	84	104	93	20
28.	M	11- 0	5.7	95	115	105	20
29.	M	9- 5	3.8	94	114	104	20
30.	M	10-10	5.2	90	110	99	20
31.	M	9- 6	2.4	95	115	105	20
32.	F	11- 4	6.9	87	107	96	20
33.	F	11-10	5.10	94	113	103	19
34.	F	9- 3	2.7	82	101	91	19
35.	M	9- 8	4.6	96	115	106	19

TABLE XVI - Continued

No.	Sex	C. A.	Grade	WISC			Discrepancy
				VS	PS	FS	
36.	F	11- 6	5.7	87	106	96	19
37.	M	11- 8	4.3	85	104	93	19
38.	M	10- 9	4.4	92	111	101	19
39.	M	10- 7	5.4	85	104	93	19
40.	M	10- 7	4.3	92	111	101	19
41.	F	9- 5	2.5	86	104	95	18
42.	M	9- 6	3.6	90	108	99	18
43.	M	10- 6	4.9	85	103	93	18
44.	M	11- 7	6.3	90	108	99	18
45.	M	11- 6	4.9	90	108	99	18
46.	M	9- 1	2.6	92	110	101	18
47.	F	11- 0	5.2	90	108	99	18
48.	M	11- 9	5.8	89	106	96	17
49.	F	10- 6	3.8	97	114	106	17
50.	M	9- 9	3.8	97	114	106	17
51.	M	11- 7	6.6	91	108	99	17
52.	F	9- 9	4.9	94	111	102	17
53.	F	9-11	4.6	94	111	102	17
54.	M	9- 7	2.6	91	108	99	17
55.	M	9- 7	3.7	89	106	96	17
56.	M	10- 1	3.9	91	108	99	17
57.	M	11- 6	4.3	101	118	110	17
58.	F	9- 1	3.4	87	103	94	16
59.	M	11- 1	5.5	99	115	107	16
60.	M	10- 3	3.6	84	100	91	16
61.	M	9- 7	3.9	89	105	93	16
62.	M	11- 4	5.5	97	113	105	16
63.	M	9- 6	3.5	85	101	92	16
64.	M	10- 9	4.8	95	111	103	16

TABLE XVII

FREQUENCY DISTRIBUTION OF THE FULL SCALE IQ'S OF THE LOWER VERBAL GROUP

Score	Frequency
110	1
109	0
108	1
107	3
106	3
105	3
104	2
103	2
102	5
101	4
100	0
99	12
98	0
97	0
96	6
95	2
94	2
93	8
92	4
91	4
90	2
N =	64
Mean =	98.406
S. D.	5.314

TABLE XVIII

FREQUENCY DISTRIBUTION OF THE VERBAL SCALE IQ'S OF THE LOWER VERBAL GROUP

Score Interval	Frequency
99-101	2
96-98	4
93-95	7
90-92	18
87-89	9
84-86	15
81-83	4
78-80	3
75-77	2
N =	64
Mean =	88.563
S. D. =	5.325

TABLE XIX

FREQUENCY DISTRIBUTION OF THE PERFORMANCE SCALE IQ'S OF THE LOWER VERBAL GROUP

Score Interval	Frequency
127-129	2
124-126	1
121-123	0
118-120	2
115-117	4
112-114	9
109-111	11
106-108	22
103-105	9
100-102	4
N =	64
Mean =	109.44
S. D. =	5.709

TABLE XX

FREQUENCY DISTRIBUTION OF THE DISCREPANCY SCORES OF THE LOWER VERBAL GROUP

Score Interval	Frequency
41-43	1
38-40	1
35-37	0
32-34	3
29-31	1
26-28	1
23-25	11
20-22	13
17-19	26
14-16	7
N =	64
Mean =	21.047
S. D. =	5.427

APPENDIX D

FOLLOW-UP STUDY RECORD FORM

AND

THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN

FOLLOW-UP STUDY

Name_____Birthdate_____

Date of Psychological Test_____

School Attending at time of Psychological Test_____

Present School_____

If child has left school: Date of Leaving_____

Reason: Transferred_____Where_____
Dropped Out_____Why_____

Present Placement:

If in Elementary School: Grade_____Regular_____
Slow Learning_____
Accelerated_____
Ungraded_____
Other(Specify)_____

If in Junior High School: Grade_____Regular_____
Slow Learning_____
Ungraded_____
Other(Specify)_____

If in High School: Grade_____Matriculation_____
High School Leaving_____
Commercial_____
Technical(Specify)_____
Other(Specify)_____

If now working: Place of Work_____
Type of Job_____
Length of Employment_____

Academic Progress: Comments_____

_____

Personal-Social Adjustment: Comments_____

_____

Job Progress: Comments_____

_____

Any Additional Information: Comments_____

_____

THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN

The Wechsler Intelligence Scale for Children (WISC), published in 1949, was "standardized with exceptional care over a five-year period of experimental tryouts, field testing, and statistical analysis."[1] It was prepared as a downward extension of the Wechsler-Bellevue Scale and consists of twelve tests which are divided into two sub-groups identified as Verbal and Performance. The sub-tests are listed below with one Verbal test and one Performance test bracketed to indicate that in an ordinary administration these are generally omitted or considered as alternates:

General Information	Picture Completion
General Comprehension	Picture Arrangement
Arithmetic	Block Design
Similarities	Object Assembly
Vocabulary	Coding
(Digit Span)	(Mazes)

The WISC was standardized on a sample of 100 boys and 100 girls at each age from five through fifteen years. Each child was tested within one and one-half months of his mid-year. There were 1100 boys and 1100 girls in eleven age groups, a total of 2200 cases. Only white children were examined. Controls were established for geographic area, parental occupation, and urban-rural population proportions

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[1] Harold Seashore, Alexander Wesman, and Jerome Doppelt, "The Standardization of the Wechsler Intelligence Scale for Children," Journal of Consulting Psychology, XIV, (April, 1950), p. 99.

according to the 1940 United States census.[2]

The deviation IQ ratings for the Verbal, Performance, and Full Scales were obtained by comparing each subject's test performance with the scores obtained by individuals in his own age group. The standard deviations were kept identical at 15 for each age group and an IQ of 100 was set equal to the mean total score for each age. Thus, if any differences are observed in successive retests, these alterations are due to changes in the subject and are not due to changes in the structure of the test or its standardization.

Several studies report correlations from .60 to .90 between the Stanford-Binet and the WISC.[3] These correlations vary with the age, intellectual level, and heterogeneity of the samples. The Verbal Scale of the WISC correlates more highly with the Stanford-Binet than does the Performance Scale. The Performance Scale correlates more highly with the Grace Arthur Performance Scale than does the WISC Verbal Scale.

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[2] David Wechsler, Wechsler Intelligence Scale for Children, (New York: Psychological Corporation, 1949), p. 7.

[3] Anne Anastasi, Psychological Testing, (New York: The Macmillan Company, 1955), pp. 324-25.