

A CORRELATION OF SCORES ON THE
WECHSLER INTELLIGENCE SCALE FOR
CHILDREN - REVISED AND SCORES ON THE
BENDER - GESTALT

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A Correlation of Scores on the Wechsler Intelligence
Scale for Children-Revised and Scores on the
Bender-Gestalt

An Abstract
Presented to
the Graduate Council of
Austin Peay State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in Psychology

by
Janette Davis Lanier

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Abstract

The present study was undertaken to determine the degree of relationship between the scores of the Wechsler Intelligence Scale for Children-Revised (WISC-R) and those of the Bender-Gestalt (B-G). WISC-R and B-G protocols were gathered from 30 third and fourth graders who comprised the sample in the present study. Statistical analysis of the data resulted in zero-order correlation coefficients. These coefficients did not attain statistical significance anticipated in light of a study reported by Koppitz (1958). An attempt was made to explicate the discrepancy in the results of the two studies.

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To the Graduate Council:

I am submitting herewith a Thesis written by Janette Davis Lanier entitled "A Correlation of Scores on the Wechsler Intelligence Scale for Children-Revised and Scores on the Bender-Gestalt." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

John L. Martin
Major Professor

We have read this thesis and
recommend its acceptance:

Garland E. Blair
Second Committee Member

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Third Committee Member

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Chapter I

Introduction

The Bender-Gestalt Test has been used as a psychodiagnostic instrument in working with children. The most frequent uses of the test have been to measure intelligence, school readiness, prediction of school achievement, and to diagnose problems relative to reading and arithmetic (Koppitz, 1963). Koppitz also feels that the test is capable of aiding in diagnosis of brain injury, mental retardation, and emotional disturbances.

Armstrong and Hauch (1960) tested relationships between the Bender-Gestalt (B-G), the Wechsler Intelligence Scale for Children (WISC), the Goodenough-Harris Drawing Test (Draw-A-Man), and age using a sample of ninety-eight normal children ranging in age from six to twelve. No significant correlation was found between scores on the Draw-A-Man test and scores on the B-G. Although the correlation of $-.73$ between the WISC Full Scale scores and the B-G scores was significant, WISC Verbal Scale scores and WISC Performance Scale scores when correlated with the B-G scores failed to achieve statistical significance. Statistical analysis revealed a strong relationship between age and B-G scores for this age group. Sex was found to be unrelated to B-G scores.

Koppitz (1958) used the B-G to locate learning disturbances that are primarily due to problems in visual-motor perception. Her subjects were first to fourth grade students. The seven of the twenty scoring categories found to differentiate significantly disturbed and normal students were distortion of shape, rotation, substitution of circles and dashes for dots, perseveration, failure to integrate parts into wholes, three or more angles in sinusoidal curves, and extra or missing angles on hexagons. Moreover, Koppitz stated, as a result of her research, that the B-G can differentiate significantly above average and below average students in the first four grades of school.

Peek and Storms (1958) studied the possibility of judging intellectual status from the B-G test for adults. Their subjects were one hundred psychiatric non-neurological patients. It was concluded that reliability and validity are not considered to be of sufficient magnitude to estimate intellectual level and intellectual impairment from B-G protocols alone. However, for many judgments statistical significance was found.

Koppitz assumes that performance on the B-G reflects one's maturation level with reference to visual motor ability, which is related to intelligence in young children

(Koppitz, 1963). Pascal and Suttell (1951) have found that scores on the Bender-Gestalt Test have no significant relationship to measured intelligence in adults. Therefore, the Bender is related to intelligence only until approximately nine years of age when maturation of visual-motor ability occurs.

The Wechsler Intelligence Scale for Children-Revised (WISC-R) is based on the premises that intelligence is a global entity and that no single ability is crucial (Wechsler, 1974). Intelligence is not an ability, but is rather the way abilities are utilized in differing situations. Wechsler feels that his test is also capable of diagnosing several problems. The test is designed to "assess a child's performance under a fixed set of conditions, not to test the limits of his knowledge" (Wechsler, 1974).

Lehman and Levy (1971) investigated discrepancies in estimates of children's intelligence using the WISC and Human Figure Drawings. Two groups, one disturbed and one normal, of eight to twelve year old boys were used. Discrepancies in scores were significantly greater in the disturbed group than in the normal group. Nevertheless, all relationships were low.

Altus (1952) compared WISC scores with California Test of Mental Maturity (CTMM) scores and Progressive Reading Test scores for junior high school children. She reversed the customary procedure of validating group tests against individual tests to investigate the value of the WISC. It was found that the WISC Full Scale and the CTMM Total IQ correlated .81. The WISC Verbal Scale correlated .74 with the Progressive Reading Test. It was concluded that the WISC probably has considerable validity in comparable school settings.

Hanvik (1953) tested the hypothesis that there are no significant differences between Goodenough-Harris IQ scores and WISC scores for the same children. He used a sample of emotionally disturbed children. The conclusion was reached that these children do not perform as well on the Goodenough-Harris as they do on the WISC.

Nalven and Bierbryer (1969) investigated the relationship between WISC scores and scores on the Devereux Elementary School Behavior Rating Scale (DESBRS). The DESBRS correlated significantly with the WISC Verbal Performance and Full Scale IQ's. Of the ten WISC subtests, only Digit Span failed to attain significance. The WISC subtests Information (.81), Vocabulary (.81) and the Verbal IQ (.79) seem to be the most effective for predicting elementary school children's classroom comprehension.

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Barratt (1956) correlated WISC scores with scores on Progressive Matrices and on the Columbia Mental Maturity Scale (CMMS) using fourth grade subjects. Significant correlations were found between the CMMS and all WISC subtests except Information, and between the CMMS and the WISC Verbal, Performance, and Full Scale IQ's. The WISC scores, with the exception of Comprehension, correlated significantly with the Progressive Matrices scores. Since the CMMS is designed to yield "an estimate of intellectual ability" (Barratt, 1956), and the Progressive Matrices is considered "as a test of fairly complex intellectual reasoning processes," the correlation of these tests with the WISC validate the WISC as a measure of general intelligence.

Sattler (1974) recommends that the WISC-R and the B-G test be included in the battery for children suspected of having learning disabilities. Koppitz (1958) attempted to discover whether performance on the B-G is a function of intelligence or if it depends on functions different from those measured by the WISC. She tested ninety elementary school children (twenty first graders, twenty second graders, twenty-five third graders, and twenty-five fourth graders) ranging in age from six years and seven months to eleven years and seven months. All of

the subjects had been referred because of learning or discipline problems. From this study Koppitz found a highly significant relationship between the Bender-Gestalt scores and the WISC Performance IQ, the Verbal IQ, and the Full Scale IQ, Arithmetic, and all Performance subtests except for Coding. The B-G was unrelated to Information, Comprehension, and Similarities. She concluded that for third and fourth grade children verbal factors, general intelligence, and visual-motor ability appear to be related to learning problems.

Koppitz conducted her 1958 study before the Developmental Bender Scoring system for children was standardized. Therefore, in her study, the protocols were not scored with that system. She did not feel that this would have altered the results. She concluded that the B-G can be used with some confidence as a short nonverbal intelligence test for young children (1963).

The B-G is a relatively culture-fair test (Koppitz, 1963). Koppitz suggests that when the Bender is used with an intelligence test, if the intelligence test score is low and the B-G score is good, the examiner should be suspicious of the IQ obtained. When the WISC was revised an attempt was made to remove the culturally biased elements of the subtest questions.

The purpose of the present project was to determine whether a significant relationship exists between the Bender-Gestalt Test scores and the WISC-R scores for third and fourth grade children.

Chapter II

Method

The Sample

The sample used in the present study was thirty children referred for testing by the Lawrence County School System, Tennessee. All subjects were third or fourth graders. The ages ranged from 7-0 to 11-6 with a mean age of 10-0. The sample was composed of fifteen males and fifteen females.

Description of Instruments

The Wechsler Intelligence Scale for Children-Revised, (WISC-R) is one of the most widely used intelligence tests for children. It is intended "to assess a child's performance under a fixed set of conditions, not to test the limits of his knowledge" (Wechsler, 1974).

Administration of the WISC-R eventuates in three IQ scores: namely, Verbal IQ, Performance IQ, and Full Scale IQ. The Verbal Scale is composed of six subtests: Information, Similarities, Arithmetic, Vocabulary, Comprehension, and Digit Span. The first five of these subtests are used in calculating the Verbal IQ. The Performance Scale is comprised of six subtests: Picture Completion, Picture Arrangement, Block Design, Object Assembly, Coding, and Mazes. Only the first five of these subtests are used in calculating the Performance IQ.

The Bender-Gestalt Test is composed of nine geometric designs originally used by Wertheimer and adapted by Dr. Lauretta Bender (1938) for use in her test. Koppitz (1963) introduced a developmental scoring system based on twenty outstanding deviations and distortions frequently noted on children's protocols. Her scoring system of the B-G is intended for use with children between the ages of five and ten years whose fine muscle coordination is not fully developed. Maturation limits the capacity of the B-G to pinpoint learning problems.

Administration and Scoring

The WISC was administered individually to each subject by the present researcher during August and September of 1978. The Bender-Gestalt was also administered individually during this same period of time. Both tests were scored according to the manuals of direction.

Chapter III

Results

The Pearson product-moment technique was employed to determine the correlation coefficients. Scores on the Wechsler Full Scale, Verbal Scale, Performance Scale and the subtests were correlated with scores on the Bender-Gestalt. None of the coefficients attained statistical significance. The strongest correlation obtained ($-.315$) was between scores on the Arithmetic subtest and scores on the B-G. Table I shows the inter-correlations of the variables. Table II shows the means and standard deviations.

The Intercorrelations of the Variables

	FS	V	P	I	S	A	V	C	PS	PC	PA	BD	OA	CO	M	BG
FS	1.00	.921	.863	.865	.781	.688	.849	.785	.389	.423	.649	.634	.446	.735	.365	-.026
V		1.00	.603	.872	.827	.712	.824	.765	.428	.262	.473	.523	.325	.619	.258	-.026
P			1.00	.643	.556	.474	.659	.593	.146	.560	.739	.619	.512	.739	.414	.000
I				1.00	.688	.643	.765	.741	.466	.317	.467	.407	.333	.487	.256	-.002
S					1.00	.454	.651	.591	.182	.231	.401	.366	.403	.536	.101	.048
A						1.00	.622	.558	.680	.269	.243	.217	.106	.530	.129	-.315
V							1.00	.783	.448	.176	.528	.516	.271	.423	.301	.041
C								1.00	.543	.262	.328	.340	.225	.411	.202	-.020
DS									1.00	-.129	.004	.084	-.047	.215	.205	-.262
PC										1.00	.158	.171	.239	.396	.216	-.155
PA											1.00	.523	.445	.514	.304	.136
BD												1.00	.207	.554	.541	-.060
OA													1.00	.193	.163	.192
CO														1.00	.335	-.032
M															1.00	.150
BG																1.00

See Appendix A for Meaning of Symbols

Table 2

The Means and Standard Deviations of Variables

Item	M	SD
1. Full Scale IQ	78.0	13.069
2. Verbal IQ	78.5	15.123
3. Performance IQ	80.5	12.107
4. Information	5.867	2.860
5. Similarities	5.767	3.575
6. Arithmetic	7.533	2.377
7. Vocabulary	5.467	2.741
8. Comprehension	7.100	2.773
9. Digit Span	7.700	3.318
10. Picture Completion	8.400	2.375
11. Picture Arrangement	7.133	2.884
12. Block Design	6.267	2.695
13. Object Assembly	8.600	2.043
14. Coding	5.733	3.444
15. Mazes	8.333	2.797
16. Bender-Gestalt	5.133	2.680

Chapter IV

Discussion

Koppitz (1958) concluded from her research on the relationship between the Bender-Gestalt (B-G) and the Wechsler Intelligence Scale for Children (WISC) that performance on the B-G is primarily a function of intelligence as measured by the WISC. The present project was undertaken in order to determine whether her results would be confirmed when correlating the B-G scores with scores on the Wechsler Intelligence Scale for Children-Revised (WISC-R). A statistical analysis of the data derived from the present research failed to reveal any significant relationship between the scores on the previously mentioned instruments.

In an attempt to account for the discrepancy between the results of the Koppitz study and the present study, certain factors need to be considered. For one thing, Koppitz's subjects had a mean IQ score of 95, ranging from 73 to 126. The subjects in the present study had a mean IQ score of 78, ranging from 61 to 127. Additionally, Koppitz's B-G protocols were not scored according to her Developmental Scoring System, which she said would have made no difference in the B-G scores of her subjects. In the present study the Bender protocols were scored according to the Developmental Scoring System (Koppitz 1963).

In the Koppitz study, the relationship between the WISC and the B-G was determined by computing four-fold Chi-squares for the subjects; that is, the number of subjects with good Benders and below or above average IQ's was compared with the number of subjects with poor Benders who had above or below average IQ's. A child was considered to have a good Bender protocol if the obtained composite score was at or below the mean composite score for the child's age level. By using the above method, Bender scores were compared with the WISC Full Scale IQ, Verbal IQ, Performance IQ, and with each of nine WISC subtests; namely, Information, Comprehension, Arithmetic, Similarities, Picture Completion, Picture Arrangement, Block Design, Object Assembly, and Coding. Statistical analysis revealed a highly significant relationship between the Bender and the WISC Full Scale IQ, Performance IQ, Verbal IQ, Arithmetic, and all Performance subtests with the exception of Coding.

The present researcher analyzed her data by means of zero-order correlations. In the Koppitz study, a highly significant relationship existed between the Arithmetic subtest scores and the B-G scores. Though statistical significance was not attained in the present study, the correlation between the scores of the Arithmetic subtest and those of the B-G was the strongest obtained.

In attempting to account for the different results of the two studies, it should also be pointed out that the variances of the two distributions are probably different. The present study had a restricted variance which would contribute to low correlation coefficients. Conceivably, all the variables mentioned to account for the discrepancy between the two studies could have contributed. Nevertheless, further research is indicated.

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APPENDIX

Appendix A

The Meaning of Symbols for Table 1

The meaning of the symbols in order of appearance:

- FS - Full Scale IQ
- V - Verbal IQ
- P - Performance IQ
- I - Information subtest
- S - Similarities subtest
- A - Arithmetic subtest
- V - Vocabulary subtest
- C - Comprehension subtest
- DS - Digit Span subtest
- PC - Picture Completion subtest
- PA - Picture Arrangement subtest
- BD - Block Design subtest
- OA - Object Assembly subtest
- CO - Coding subtest
- M - Mazes subtest
- BG - Bender-Gestalt Test