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A study of the ability of the Wechsler-Bellevue sub-tests to descriminate between the mental levels of delinquent negro boys

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A STUDY OF THE ABILITY OF THE WECHSLER-BELLEVUE
SUB-TESTS TO DISCRIMINATE BETWEEN THE
MENTAL LEVELS OF DELINQUENT NEGRO BOYS

A Thesis
Presented to
the Faculty of the School of Education
The College of the Pacific

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

by
William Lee Gainer

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CHAPTER I

INTRODUCTION

I. THE PROBLEM

Statement of the problem. It is the purpose of this study to ascertain the degree to which the Wechsler-Bellevue Intelligence Scale Form I sub-tests discriminate between negro delinquent boys of normal, dull normal, and borderline intelligence.

Justification of the problem. It is difficult to apply the Wechsler-Bellevue Intelligence Scale Form I to the negro delinquent population because of the non-standardization of the scale on a negro group. This standardization has been recommended by David Wechsler, the author of the Wechsler-Bellevue Intelligence Scale. The recommendation by Wechsler has not been undertaken to this date.

The sampling of 60 negro delinquent boys used in this study has been taken from the California Youth Authority. The negro delinquents, as a group, represented 11.8 per cent of the California Youth Authority's population at the time of this study.

Limitations of the problem. This problem is limited by the following circumstances: only three of the five mental levels established by David Wechsler are sampled; namely, the normal, dull normal, and borderline intelligence groups. This limitation is due to the following factors: (1) There are not a sufficient number of negro delinquents of superior intelligence institutionalized at the time of this study to furnish an adequate sample; (2) The delinquents considered to be of defective intelligence are usually committed to institutions under the jurisdiction of the State Department of Mental Hygiene.

The study is further limited by the small sampling of 60 negro boys. There are only 19 of normal intelligence, 21 of dull normal intelligence, and 20 of borderline intelligence. The negro delinquent boys in this study are grouped by total test scores according to norms established on a white population.

II. DEFINITIONS OF TERMS USED

Negro boy. A male under the age of 21 years having native born negro parents.

Delinquent boy. A male under the age of 21 years who has been committed to, and institutionalized by the California Youth Authority.

Normal intelligence. A person receiving a Full Scale Wechsler Form I intelligence score ranging between 91-110¹.

Dull normal intelligence. A person receiving a Full Scale Wechsler Form I intelligence score ranging between 80-90¹.

Borderline intelligence. A person receiving a Full Scale Wechsler Form I intelligence score ranging between 66-79¹.

Description of the Wechsler-Bellevue Intelligence Scale Form I. The Wechsler-Bellevue Intelligence Scale Form I comprises eleven sub-tests. The six sub-tests: Information, Comprehension, Digit Span, Arithmetic, Similarities, and Vocabulary (this sub-test is not included in this study) comprise the Verbal Scale. The five sub-tests: Picture Arrangement, Picture Completion, Block Design, Object Assembly and Digit Symbol constitute the Performance Scale.

¹ Weighted scores were obtained in the usual manner as described in the Wechsler manual. The I.Q. scores were assigned according to the Wechsler norms for a white population. David Wechsler, The Measurement of Adult Intelligence (third edition; Baltimore: Williams and Wilkins Co., 1944), 258 pp.

Rosenzweig, Bundas, Lumbry and Davidson describe the sub-tests as follows:

"1. Information: consists of questions formulated to tap the subject's range of information on material that the average person with average opportunity should be able to obtain for himself.

2. Comprehension: measures the use of 'common sense' and judgment in situations described to the subject. Success on this test seemingly depends upon the possession of a certain amount of practical information and a general ability to use past experience.

3. Arithmetical Reasoning: measures mental alertness as well as ability to handle practical calculations.

4. Memory Span for Digits: measures immediate memory for digits forward and backward.

5. Similarities: measures ability to discriminate between essential and superficial likenesses; to generalize and think in abstract terms.

6. Picture Arrangement: detects ability to comprehend or 'size up' a total situation.

7. Picture Completion: measures ability to differentiate essential from unessential details.

8. Block Design: a test of general intellectual functioning, involving both synthetic and analytic ability, but weighted considerably with ability to solve problems in spatial relations.

9. Digit Symbol: measures speed and accuracy of learning new associations.

10. Object Assembly: measures insight into spatial relationships of familiar objects."²

² S. Rosenzweig, L. E. Bundas, K. Lumbry, and Helen Davidson, "An Elementary Syllabus of Psychological Tests," Journal of Psychology, XVIII (May, 1944), 12.

The five sub-tests which comprise the Verbal Scale involve education, past experience, generalization, abstract thinking, and conceptual mental functions. The administration of the Verbal sub-tests and the subject's responses are dependent upon the language factor.

The five sub-tests which constitute the Performance Scale are dependent upon manual manipulation of concrete objects with the exceptions of Picture Completion and Digit Symbol which are dependent upon perceptual factors.

Schafer described the scoring system of the Wechsler-Bellevue Intelligence Scale in the following manner:

"The subject's achievement on each sub-test obtains an independent score from 0 to 17; these scores are equated-scores, that is, they are derived from Z-scores and are therefore intercomparable. Thus, a score of 15 on one subtest and a score of 9 on another indicate a definite superiority of the development and efficiency of the function underlying achievement on the former."³

III. REVIEW OF THE LITERATURE

A review of previous investigations in this field.

Wechsler, Israel, and Balinsky administered the Wechsler-Bellevue Intelligence Scale to a group of 134 mentally

³ Roy Schafer, "The Expression of Personality and Maladjustment in Intelligence Test Results," Annals of the New York Academy of Sciences, XLVI, Art. 7 (July 30, 1946), 611.

defective patients and a group of 198 borderline patients in an attempt to establish the degree to which the Wechsler sub-tests would distinguish between the two groups. The age of the group ranged from 10 years to 49 years. Wechsler and his associates found that each of the sub-tests in the scale, except Digit Span (C.R. = 2.46) and Object Assembly (C.R.=8.88), discriminated effectively between the borderline and the defective intelligence groups. Block Design (C.R. = 10.10) and Similarities (C.R. = 3.79) were discovered to differentiate more sharply than the other sub-tests in the scale.⁴

A similar study was conducted by Lewinski in which he studied the discriminative value of the Wechsler-Bellevue Verbal Scale. In this research the author administered the Wechsler-Bellevue Verbal Scale to 451 naval recruits. The age of the group ranged from 17 years to 37.5 years, with a mean chronological age of 19.9 years. Lewinski found that all of the Verbal Scale sub-tests discriminated effectively between the groups of normal, dull normal, borderline, and defective intelligence.⁵

⁴ David Wechsler, Hyman Israel, and Benjamin Balinsky, "A Study of the Sub-tests of the Bellevue Intelligence Scale in Borderline and Mental Defective Cases," American Journal of Mental Deficiency, XLV, No. 4 (April, 1941), 555-58.

⁵ Robert J. Lewinski, Lt. Comdr., H-V (S), USNR, "Discriminative Value of the Sub-tests of the Bellevue Verbal Scale in the Examination of Naval Recruits," Journal of General Psychology, XXXI (1944), 95-99.

It is well to recognize that the above two studies were conducted with a sampling quite different from the one used in the present study.

The study made by Franklin on the discriminative value of the Wechsler-Bellevue Intelligence Scale sub-tests in the examination of negro delinquent boys is directly related to the present study and differs only in the locale of the sampling. Franklin's negro sampling was derived from the negro delinquent boys institutionalized in Maryland.⁶

Franklin found that all of the Wechsler-Bellevue Intelligence Scale sub-tests distinguished between the normal, dull normal, borderline, and defective intelligence groups with the following exceptions: Picture Arrangement failed to discriminate between the normal and the dull normal intelligence groups; Digit Span failed to discriminate between the normal and the dull normal intelligence groups; and, Digit Symbol failed to discriminate between the dull normal and the borderline intelligence groups.

Franklin also examined the suitability of the Short Form which is not undertaken in this study.

⁶ Joseph Charles Franklin, "Discriminative Value of the Wechsler-Bellevue Scales in the Examination of Delinquent Negro Boys," Educational and Psychological Measurement, V (November, 1945), 71-85.

It is beyond the compass of this study to consider the research concerning the many factors which influence the behavior of a negro population as measured by a scale that has been standardized on a population other than negro.

The Journal of Negro Education⁷ has prepared an excellent bibliography containing articles which discuss the factors which influence the test results of the negro population.

IV. A PREVIEW

The organization of the remainder of the thesis.

Chapter II deals with the source of the data used in this study as well as the presentation of the methods and statistics applied to the problem.

Chapter III deals with the results of the study; the mean age, the mean grade placement, the mean Verbal intelligence, the mean Performance intelligence, and the mean Full Scale intelligence as measured by the Wechsler-Bellevue Intelligence Scale Form I. The chapter also contains a discussion of the discriminative value of each sub-test within the scale, and a comparison of the findings of this investigation to the findings of previous investigations.

⁷ (Anon) "A Selected Bibliography on the Physical and Mental Abilities of the American Negro," Journal of Negro Education, III. (1934), 548-64.

Chapter IV includes a restatement of the findings as expressed in the previous chapters; a statement of the conclusion of the study; and, recommendations for further study in the field.

The Appendix presents: (1) a table showing the Mean Weighted Scores, Standard Deviations, and Standard Errors of the Wechsler-Bellevue Intelligence Scale Form I sub-tests; (2) a table showing the discriminative values of the sub-tests between mental groups as determined by the Full Scale Wechsler-Bellevue Intelligence Scale Form I; and (3) a graph showing the profile of the Mean Weighted Scores for the Borderline, Dull Normal, and Normal intelligence groups.

CHAPTER II

THE PROCEDURE APPLIED TO THE PROBLEM

I. A STATEMENT OF THE SOURCE OF THE DATA

A random sampling of 60 negro delinquent boys of normal, dull normal, and borderline intelligence were administered the Wechsler-Bellevue Intelligence Scale Form I during their confinement at the California Youth Authority Diagnostic Clinic.

The mean age and the mean school grade completion of the negro delinquent group was derived from the individual records of each boy.

II. AN EXPLANATION OF THE PROCEDURE USED

The data taken from the Wechsler-Bellevue Intelligence Scale Form I examinations were analyzed in the following manner; the 60 negro delinquent boys were grouped according to their Full Scale Intelligence Scores as determined by David Wechsler⁸.

The groupings used in this study appear below:

Normal	91-110 I.Q. points
Dull Normal	80-90 I.Q. points
Borderline	66-79 I.Q. points

⁸ David Wechsler, The Measurement of Adult Intelligence (third edition; Baltimore: Williams and Wilkins Co., 1944), p. 40.

The entire group data were treated statistically to find the Mean Verbal Intelligence Quotient, the Mean Performance Intelligence Quotient, and the Mean Full Scale Intelligence Quotient.

The cases were divided into groups according to sub-test results in order to ascertain the mean sub-test weighted scores, the standard deviation of the mean weighted sub-test scores, and the standard error of the mean weighted sub-test scores ($\sigma_m = \frac{\sigma}{\sqrt{N - 1}}$) of each mental group.

In order to determine the degree to which the Wechsler-Bellevue Intelligence Scale Form I sub-tests discriminate between the normal, dull normal, and borderline intelligence groups the significance of the difference was computed among the sub-test mean weighted scores for each mental group. The degree of difference in the mean weighted scores was found by comparing the mean weighted scores of each sub-test in the comparison of the borderline intelligence group to the dull normal intelligence group and the dull normal intelligence group to the normal intelligence group. This comparison was made employing the formula used by McNemar⁹ (page 12):

⁹ Quinn McNemar, Psychological Statistics (John Wiley and Sons, Inc., New York; Chapman and Hall, Ltd., London, 1949), 364 pp.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{s \sqrt{\frac{1}{N_1} + \frac{1}{N_2}}}$$

In the above formula the statistical symbol \bar{X} is equal to the mean score of a small sample.

CHAPTER III

THE RESULTS OF THE STUDY

I. PRESENTATION OF THE DATA

The mean age for the entire group is 17.36 years. The mean school grade placement is 8.93. The mean Verbal, mean Performance, and mean Full Scale intelligence scores for the group are as follows: Verbal, 84.41 I.Q.; Performance, 89.66 I.Q.; and, Full Scale, 86.66 I.Q..

Information. The Information sub-test discriminates effectively between the Borderline--Dull Normal groups with a P score of .02; and, between the Dull Normal--Normal groups with a P score of .01.

Comprehension. The Comprehension sub-test fails to discriminate between the Borderline--Dull Normal groups since the P score is 0.9; however, it does discriminate most effectively between the Dull Normal--Normal groups with a P score of .001.

Digit Span. The Digit Span sub-test, while discriminating effectively between the Borderline--Dull Normal groups with a P score of .02, fails to discriminate between the Dull Normal--Normal groups with a P score of 0.9.

Arithmetic. The Arithmetic sub-test does not discriminate between the Borderline--Dull Normal groups; the P score being 0.9; however, it does discriminate between the Dull Normal--Normal groups effectively with a P score of .01.

Similarities. The Similarities sub-test discriminates between the Borderline--Dull Normal groups effectively with a P score of .01. The sub-test does not discriminate between the Dull Normal--Normal groups; the P score is 0.9.

Picture Arrangement. The Picture Arrangement sub-test discriminates effectively at both the Borderline--Dull Normal and the Dull Normal--Normal levels. The former P score is .05 and the latter P score is .01.

Picture Completion. The Picture Completion sub-test discriminates effectively between the Borderline--Dull Normal and the Dull Normal--Normal levels; the former P score is .01, while the latter P score is .05.

Block Design. The Block Design sub-test discriminates between the Borderline--Dull Normal groups with a P score of .02. It discriminates most effectively between the Dull Normal--Normal groups with a P score of .001.

Object Assembly. The Object Assembly sub-test discriminates effectively between the Borderline--Dull Normal and the Dull Normal--Normal groups. The former P score is .05 and the latter P score is .01.

Digit Symbol. The Digit Symbol sub-test discriminates at both the Borderline--Dull Normal and the Dull Normal--Normal level with a P score of .01 in each case.

The following sub-tests discriminate effectively between the Borderline--Dull Normal intelligence groups and the Dull Normal--Normal intelligence groups: Information, Picture Arrangement, Picture Completion, Block Design, Object Assembly, and Digit Symbol.

Arithmetic and Comprehension differentiate effectively between the Dull Normal--Normal groups; however, they fail to discriminate between the Borderline--Dull Normal intelligence groups.

Digit Span and Similarities differentiate between the Borderline--Dull Normal intelligence groups but fail to differentiate between the Dull Normal--Normal intelligence groups.

The order of difficulty ranging from the easiest to the most difficult sub-test for the Borderline intelligence group is Object Assembly, Picture Arrangement, Picture

Completion, Comprehension, Digit Symbol, Block Design, Digit Span, Information, Similarities, and Arithmetic.

The order of difficulty ranging from the easiest to the most difficult sub-test for the Dull Normal intelligence group is Object Assembly, Picture Arrangement, Picture Completion, Digit Span, Comprehension, Similarities, Block Design, Digit Symbol, Information, and Arithmetic.

The order of difficulty ranging from the easiest to the most difficult sub-test for the Normal intelligence group is Picture Arrangement, Object Assembly, Comprehension, Picture Completion, Block Design, Information, Digit Symbol, Digit Span, Similarities, and Arithmetic.

A comparison of the findings of this investigation to the findings of previous investigations. In comparing this study with the related research conducted by Wechsler¹⁰, Lewinski¹¹, and Franklin¹² it is found that a general

¹⁰ David Wechsler, Hyman Israel, and Benjamin Balinsky, "A Study of the Sub-tests of the Wechsler-Bellevue Scale in Borderline and Mental Defective Cases," American Journal of Mental Deficiency, LXV, No. 4 (April, 1941), 555-58.

¹¹ Robert J. Lewinski, Lt. Comdr., H-V (S) USNR, "Discriminative Value of the Subtests of the Bellevue Verbal Scale in the Examination of Naval Recruits," Journal of General Psychology, XXXI (1944), 95-99.

¹² Joseph Charles Franklin, "Discriminative Value of the Wechsler-Bellevue Scale in the Examination of Negro Delinquent Boys," Educational and Psychological Measurement, V (November, 1945), 71-85.

agreement exists concerning the discriminative effectiveness of the Information, Picture Completion, and Block Design sub-tests.

It is discovered in all of the investigations except Lewinski's¹³ that the Digit Span sub-test fails to distinguish among the mental groups sampled.

The present study is in conflict with the above mentioned investigations concerning the discriminative value of the Comprehension, Arithmetic, and Similarities sub-tests.

It is noted in this investigation that the sub-tests Comprehension and Arithmetic fail to discriminate between the Borderline--Dull Normal intelligence groups and that the Similarities sub-test fails to discriminate between the Dull Normal--Normal intelligence groups.

Wechsler¹⁴ found that the Object Assembly sub-test fails to discriminate between the Defective--Borderline intelligence groups; however, Franklin's study¹⁵ and the

¹³ Robert J. Lewinski, Lt. Comdr., H-V (S), USNR, "Discriminative Value of the Sub-tests of the Bellevue Verbal Scale in the Examination of Naval Recruits," Journal of General Psychology, XXXI (1944), 95-99.

¹⁴ David Wechsler, Hyman Israel, and Benjamin Balinsky, "A Study of the Sub-tests of the Wechsler-Bellevue Scale in Borderline and Mental Defective Cases," American Journal of Mental Deficiency, LXV, No. 4 (April, 1941), 555-58.

¹⁵ Joseph Charles Franklin, "Discriminative Value of the Wechsler-Bellevue Scale in the Examination of Negro Delinquent Boys," Educational and Psychological Measurement, V (November, 1945), 71-85.

present study agree that Object Assembly does have discriminative value when applied to the negro delinquent group.

Franklin¹⁶ indicated that the sub-test Picture Arrangement fails to differentiate between the Dull Normal--Normal intelligence groups; he also stated that the Digit Symbol sub-test fails to discriminate between the Borderline--Dull Normal intelligence groups. This is in disagreement with the findings of the present investigation and those of Wechsler's study¹⁷. It was found that the Digit Symbol sub-test does discriminate effectively between the mental groups sampled in the two studies.

In comparing the related studies to the present investigation the following facts should be kept in mind:

(1) The samplings used by Lewinski¹⁸ and Wechsler¹⁹ were

¹⁶ Joseph Charles Franklin, "Discriminative Value of the Wechsler-Bellevue Scale in the Examination of Negro Delinquent Boys," Educational and Psychological Measurement, V (November, 1945), 71-85.

¹⁷ David Wechsler, Hyman Israel, and Benjamin Balinsky, "A Study of the Sub-tests of the Wechsler-Bellevue Scale in Borderline and Mental Defective Cases," American Journal of Mental Deficiency, LXV, No. 4 (April, 1941), 555-58.

¹⁸ Robert J. Lewinski, Lt. Comdr., H-V (S), USNR, "Discriminative Value of the Sub-tests of the Bellevue Verbal Scale in the Examination of Naval Recruits," Journal of General Psychology, XXXI (1944), 95-99.

¹⁹ Wechsler, loc. cit.

not negro; (2) There is a possibility of a sampling error in the small sample used in this study as compared to the relatively large sampling used by Franklin²⁰.

There does not appear to be any one factor or group of related factors which would explain the discrepancies which exist in the above mentioned studies.

It is interesting to note, at this point, that the Information and Block Design sub-tests discriminated among all mental levels as found by all of the investigators. This is in agreement with the expectation of Wechsler as advanced in the Wechsler-Bellevue manual²¹.

It is the opinion of the writer that some clinician's are somewhat prone to accept the research of Wechsler and his associates²², and to assume that these findings are valid for cultural groups which were not sampled in the validation studies. The error of this assumption can be

²⁰ Joseph Charles Franklin, "Discriminative Value of the Wechsler-Bellevue Scale in the Examination of Negro Delinquent Boys," Educational and Psychological Measurement, V (November, 1945), 71-85.

²¹ David Wechsler, The Measurement of Adult Intelligence (third edition; Baltimore: Williams and Wilkins Co., 1944), 258 pp.

²² David Wechsler, Hyman Israel, and Benjamin Balinsky, "A Study of the Sub-tests of the Wechsler-Bellevue Scale in Borderline and Mental Defective Cases," American Journal of Mental Deficiency, LXV, No. 4 (April, 1941), 555-58.

readily seen in the comparison of the discriminative value of the Object Assembly sub-test when applied to the Wechsler sampling²³ and the sampling used in the present study and in Franklin's study²⁴.

²³ David Wechsler, Hyman Israel, and Benjamin Balinsky, "A Study of the Sub-tests of the Wechsler-Bellevue Scale in Borderline and Mental Defective Cases," American Journal of Mental Deficiency, LXV, No. 4 (April, 1941), 555-58.

²⁴ Joseph Charles Franklin, "Discriminative Value of the Wechsler-Bellevue Scale in the Examination of Negro Delinquent Boys," Educational and Psychological Measurement, V (November, 1945), 71-85.

CHAPTER IV

SUMMARY

It is the intent of this study to ascertain the degree to which the Wechsler-Bellevue Intelligence Scale Form I sub-tests discriminate between negro delinquent boys of borderline, dull normal, and normal intelligence.

The problem is limited by a small sampling of 60 negro delinquent boys who represent only three of the five mental groups as established by David Wechsler.

Several studies have been conducted to discover the discriminative value of the Wechsler-Bellevue Intelligence Scale sub-tests. The studies have generally agreed on the discriminative value of the sub-tests with only minor conflicts.

A sampling of 60 negro delinquent boys of borderline, dull normal, and normal intelligence were grouped according to their Full Scale Intelligence Quotients. The test results of the group were treated statistically to determine the following facts: the mean age of the group, the mean grade placement, the mean Verbal Intelligence Quotient, the mean Performance Intelligence Quotient, the mean Full Scale Intelligence Quotient, and the discriminative value of the scale expressed in t scores.

The mean age of the group is 17.36 years; the mean grade placement, 8.93; the mean Verbal Intelligence Quotient, 84.41; the mean Performance Intelligence Quotient, 89.66; and, the mean Full Scale Intelligence Quotient, 86.66.

All of the Performance sub-tests differentiate effectively between the three mental groups. The Information sub-test is the only Verbal sub-test which discriminates effectively between the Borderline--Dull Normal intelligence groups and between the Dull Normal--Normal intelligence groups.

Arithmetic and Comprehension measure effectively the difference between the Dull Normal--Normal intelligence groups. The two sub-tests fail to discriminate between the Borderline--Dull Normal intelligence groups.

Digit Span and Similarities fail to discriminate between the Dull Normal--Normal intelligence groups. The two sub-tests differentiate effectively between the Borderline--Dull Normal intelligence groups.

Arithmetic is the most difficult sub-test for all of the three mental levels. Object Assembly is the easiest sub-test for the Borderline intelligence group and the Dull Normal intelligence group. Picture Arrangement is the easiest sub-test for the Normal intelligence group.

The Block Design sub-test discriminates the most effectively between the Borderline--Dull Normal intelligence groups ($P = .02$) and the Dull Normal--Normal intelligence groups ($P = .001$).

The Digit Span sub-test proves to be the weakest sub-test in discriminative value. The P score for the Borderline--Dull Normal intelligence groups is .02. The P score for the Dull Normal--Normal intelligence groups on the Digit Span sub-test is 0.9.

I. CONCLUSION

It has been indicated that the Wechsler-Bellevue Intelligence Scale Form I discriminates between the Borderline--Dull Normal and the Dull Normal--Normal intelligence groups with the exception of the following sub-tests: Comprehension, Arithmetic, Digit Span, and Similarities. Comprehension and Arithmetic fail to distinguish between the Borderline--Dull Normal intelligence groups. Digit Span and Similarities fail to differentiate between the Dull Normal--Normal intelligence groups. The P scores for all four of these sub-tests is 0.9.

The fact that the Wechsler-Bellevue Intelligence Scale is not standardized on a negro population should remain foremost in the clinician's mind while applying the results of the scale to a negro group.

II. RECOMMENDATIONS FOR FURTHER STUDY

It is recommended that an extension of this study be done which would include the superior and the defective intelligence groups. A similar study, using a substantially larger sampling, is also recommended.

It would be well to investigate the sub-tests which do not discriminate effectively between the various levels of intelligence.

There is a need for a study of the sub-test's Item Difficulty which would be similar in content to a study made by Rabin²⁵.

There is some conflict in the studies that have been made concerning the socio-psychological factors which effect the negro population. As a result, there is a need for clarification in this field of study.

A study of the comparison of group results of white and negro delinquent boys on the Wechsler-Bellevue Intelligence Scale is recommended.

²⁵ A. I. Rabin, J. C. Davis, and M. H. Sanderson, "Item Difficulty of Some Wechsler-Bellevue Sub-tests," Journal of Applied Psychology, XXX, No. 5 (October, 1946), 493-500.

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(Anon) "A Selected Bibliography on the Physical and Mental Abilities of the American Negro," Journal of Negro Education, III (1934), 548-64.

APPENDIX

TABLE I

MEAN WEIGHTED SCORES, STANDARD DEVIATIONS,
AND STANDARD ERRORS OF THE WECHSLER-BELLEVUE
INTELLIGENCE SCALE FORM I SUB-TESTS

	N	MEAN WEIGHTED SCORE	S.D.	S.E. MEAN
Information				
Borderline	19	5.789	.466	.110
Dull Normal	21	7.238	.624	.213
Normal	20	9.000	1.118	.260
Total	60			
Comprehension				
Borderline	19	7.053	.092	.022
Dull Normal	21	7.714	.579	.133
Normal	20	10.350	.627	.140
Total	60			
Digit Span				
Borderline	19	6.263	.522	.123
Dull Normal	21	8.190	.876	.201
Normal	20	8.950	.778	.174
Total	60			
Arithmetic				
Borderline	19	4.158	.516	.367
Dull Normal	21	4.952	.714	.164
Normal	20	7.350	.888	.198
Total	60			
Similarities				
Borderline	19	5.474	.474	.112
Dull Normal	21	7.714	.885	.203
Normal	20	8.800	.625	.140
Total	60			
Picture Arrangement				
Borderline	19	8.053	.475	.112
Dull Normal	21	9.476	.747	.171
Normal	20	12.200	3.234	.724
Total	60			

TABLE I (continued)

MEAN WEIGHTED SCORES, STANDARD DEVIATIONS,
AND STANDARD ERRORS OF THE WECHSLER-BELLEVUE
INTELLIGENCE SCALE FORM I SUB-TESTS

	N	MEAN WEIGHTED SCORE	S.D.	S.E. MEAN
Picture Completion				
Borderline	19	7.158	.545	.129
Dull Normal	21	9.000	.549	.126
Normal	20	10.350	.635	.142
Total	60			
Block Design				
Borderline	19	6.316	.494	.117
Dull Normal	21	7.619	.483	.111
Normal	20	10.250	.632	.141
Total	60			
Object Assembly				
Borderline	19	8.053	.915	.216
Dull Normal	21	10.000	.923	.212
Normal	20	12.050	.441	.098
Total	60			
Digit Symbol				
Borderline	19	6.526	.088	.021
Dull Normal	21	7.524	.410	.094
Normal	20	9.000	.557	.125
Total	60			

TABLE II

DISCRIMINATIVE VALUES OF SUB-TESTS BETWEEN
 MENTAL GROUPS DETERMINED BY THE FULL SCALE
 WECHSLER-BELLEVUE INTELLIGENCE SCALE FORM I

Sub-test Groups	t score	P score
Information		
Borderline--Dull Normal	2.53	.02
Dull Normal--Normal	3.39	.01
Comprehension		
Borderline--Dull Normal	1.26	.9-
Dull Normal--Normal	4.32	.001
Digit Span		
Borderline--Dull Normal	2.55	.02
Dull Normal--Normal	.90	.9-
Arithmetic		
Borderline--Dull Normal	1.23	.9-
Dull Normal--Normal	2.94	.01
Similarities		
Borderline--Dull Normal	3.47	.01
Dull Normal--Normal	1.39	.9
Picture Arrangement		
Borderline--Dull Normal	2.22	.05
Dull Normal--Normal	3.01	.01
Picture Completion		
Borderline--Dull Normal	3.27	.01
Dull Normal--Normal	2.25	.05
Block Design		
Borderline--Dull Normal	2.59	.02
Dull Normal--Normal	4.62	.001
Object Assembly		
Borderline--Dull Normal	2.05	.05
Dull Normal--Normal	2.77	.01
Digit Symbol		
Borderline--Dull Normal	2.75	.01
Dull Normal--Normal	2.98	.01

TABLE III

PRESENTATION OF THE WEIGHTED RAW SCORES
FOR THE BORDERLINE INTELLIGENCE GROUP

	Case Number						
	1	2	3	4	5	6	7
Age	18	17	17	17	17	17	16
Information	4	5	8	6	6	6	7
Comprehension	8	7	8	7	5	5	10
Digit Span	4	7	7	6	6	9	6
Arithmetic	4	6	3	6	7	6	6
Similarities	6	6	6	5	3	4	5
Picture Arrangement	8	9	11	9	8	6	8
Picture Completion	7	6	6	6	4	10	9
Block Design	5	7	5	6	7	5	10
Object Assembly	7	9	5	7	9	8	3
Digit Symbol	6	7	8	5	8	6	6
Verbal Scale	73	80	81	70	75	79	84
Performance Scale	74	81	77	82	79	77	79
Full Scale	70	78	77	73	74	75	79

TABLE III (continued)

PRESENTATION OF THE WEIGHTED RAW SCORES
FOR THE BORDERLINE INTELLIGENCE GROUP

	Case Number						
	8	9	10	11	12	13	14
Age	19	17	18	16	18	18	16
Information	4	7	4	9	8	6	4
Comprehension	10	6	7	7	8	7	5
Digit Span	6	4	4	6	7	6	9
Arithmetic	4	1	4	4	3	4	6
Similarities	4	4	3	5	5	6	7
Picture Arrangement	9	9	6	7	10	8	7
Picture Completion	9	6	4	8	8	8	8
Block Design	5	10	5	6	7	7	8
Object Assembly	13	15	12	7	4	7	5
Digit Symbol	8	6	6	8	6	7	7
Verbal Scale	76	68	68	80	80	76	80
Performance Scale	75	92	74	79	77	80	77
Full Scale	73	77	67	77	76	75	76

TABLE III (continued)

PRESENTATION OF THE WEIGHTED RAW SCORES
FOR THE BORDERLINE INTELLIGENCE GROUP

	Case Number				
	15	16	17	18	19
Age	17	16	15	19	17
Information	4	6	5	5	6
Comprehension	6	6	6	5	7
Digit Span	11	6	4	6	6
Arithmetic	11	3	4	4	3
Similarities	8	5	8	6	8
Picture Arrangement	11	7	6	7	7
Picture Completion	7	7	9	7	7
Block Design	9	6	6	6	6
Object Assembly	8	8	11	8	7
Digit Symbol	6	6	6	6	6
Verbal Scale	77	73	75	73	79
Performance Scale	72	76	83	74	74
Full Scale	72	72	76	70	73

TABLE IV

PRESENTATION OF THE WEIGHTED RAW SCORES
FOR THE DULL NORMAL INTELLIGENCE GROUP

	Case Number						
	1	2	3	4	5	6	7
Age	18	19	17	16	19	17	18
Information	7	8	6	8	11	6	6
Comprehension	6	5	8	8	7	5	9
Digit Span	6	11	6	6	7	7	9
Arithmetic	10	4	6	1	4	7	7
Similarities	8	5	8	5	8	10	8
Picture Arrangement	8	11	9	13	6	8	13
Picture Completion	8	11	8	9	8	7	4
Block Design	6	7	11	8	7	9	9
Object Assembly	7	12	12	12	12	9	8
Digit Symbol	7	6	7	7	7	7	9
Verbal Scale	85	82	84	76	88	85	90
Performance Scale	78	94	94	99	84	85	88
Full Scale	81	86	87	86	84	83	88

TABLE IV (continued)

PRESENTATION OF THE WEIGHTED RAW SCORES
FOR THE DULL NORMAL INTELLIGENCE GROUP

	Case Number						
	8	9	10	11	12	13	14
Age	17	16	19	18	16	18	17
Information	4	5	5	7	8	6	8
Comprehension	9	11	11	8	10	10	9
Digit Span	9	6	13	13	7	7	9
Arithmetic	6	7	4	7	8	1	3
Similarities	8	9	8	5	9	5	7
Picture Arrangement	11	6	6	10	8	8	9
Picture Completion	10	12	7	9	7	10	10
Block Design	9	5	10	9	7	7	7
Object Assembly	8	11	11	9	8	8	12
Digit Symbol	7	6	6	6	8	8	7
Verbal Scale	82	89	93	91	96	77	86
Performance Scale	88	85	84	88	80	88	91
Full Scale	84	86	87	89	87	80	89

TABLE IV (continued)

PRESENTATION OF THE WEIGHTED RAW SCORES
FOR THE DULL NORMAL INTELLIGENCE GROUP

	Case Number						
	15	16	17	18	19	20	21
Age	17	16	17	18	19	18	17
Information	7	6	9	13	7	7	8
Comprehension	6	7	7	5	6	8	7
Digit Span	4	14	4	11	7	7	8
Arithmetic	3	3	6	3	6	4	6
Similarities	6	11	11	8	8	8	7
Picture Arrangement	9	12	7	14	12	9	11
Picture Completion	10	6	9	8	9	9	8
Block Design	7	7	5	6	9	7	8
Object Assembly	12	6	9	17	12	11	9
Digit Symbol	8	10	11	9	7	7	8
Verbal Scale	73	89	88	75	84	84	86
Performance Scale	92	86	85	95	91	88	89
Full Scale	80	86	86	83	89	84	86

TABLE V

PRESENTATION OF THE WEIGHTED RAW SCORES
FOR THE NORMAL INTELLIGENCE GROUP

	Case Number						
	1	2	3	4	5	6	7
Age	17	17	19	18	17	18	18
Information	8	8	10	7	10	8	10
Comprehension	8	10	14	10	9	10	11
Digit Span	7	7	7	13	7	9	10
Arithmetic	7	4	10	7	7	10	7
Similarities	8	5	11	8	5	11	9
Picture Arrangement	11	15	9	11	10	14	11
Picture Completion	11	10	10	10	12	9	8
Block Design	11	11	11	10	14	11	8
Object Assembly	12	12	12	11	12	12	11
Digit Symbol	10	10	9	6	10	11	8
Verbal Scale	89	84	107	98	89	101	100
Performance Scale	105	109	99	95	109	108	92
Full Scale	96	96	104	96	99	108	96

TABLE V (continued)

PRESENTATION OF THE WEIGHTED RAW SCORES
FOR THE NORMAL INTELLIGENCE GROUP

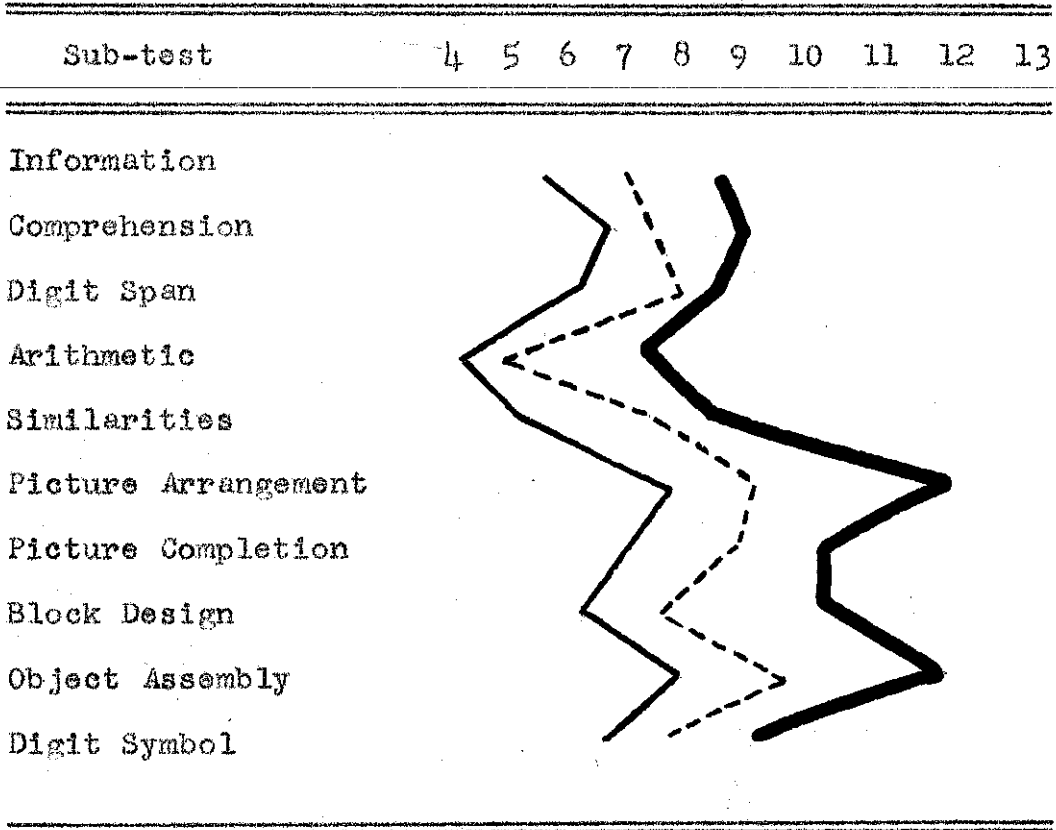
	Case Number						
	8	9	10	11	12	13	14
Age	17	17	17	18	18	16	19
Information	8	10	8	10	9	8	7
Comprehension	8	11	11	10	8	9	9
Digit Span	13	6	9	9	7	9	10
Arithmetic	6	3	6	10	9	10	6
Similarities	7	9	9	7	8	11	9
Picture Arrangement	11	11	11	10	11	11	11
Picture Completion	7	10	10	13	7	9	8
Block Design	8	10	12	7	8	10	8
Object Assembly	12	13	12	12	11	12	10
Digit Symbol	9	5	10	11	9	7	8
Verbal Scale	94	90	96	99	93	100	93
Performance Scale	94	96	100	102	92	96	91
Full Scale	93	93	101	101	92	99	91

TABLE V (continued)

PRESENTATION OF THE WEIGHTED RAW SCORES
FOR THE NORMAL INTELLIGENCE GROUP

	Case Number					
	15	16	17	18	19	20
Age	17	16	17	17	18	19
Information	10	11	9	10	10	9
Comprehension	9	11	11	10	13	11
Digit Span	9	3	11	13	10	10
Arithmetic	9	9	1	13	4	9
Similarities	9	7	10	11	13	9
Picture Arrangement	13	14	17	11	9	13
Picture Completion	12	14	12	10	14	11
Block Design	11	12	11	7	14	11
Object Assembly	16	13	12	9	14	13
Digit Symbol	13	7	10	10	8	9
Verbal Scale	99	93	91	113	101	101
Performance Scale	119	113	115	92	111	108
Full Scale	110	104	103	104	107	106

PROFILE OF MEAN WEIGHTED SCORES
FOR THE BORDERLINE, DULL NORMAL AND
NORMAL INTELLIGENCE GROUPS



Key

- Borderline ———
- Dull Normal - - - - -
- Normal ———