

# A COMPARISON OF THE WECHSLER ADULT INTELLIGENCE SCALE AND WECHSLER-BELLEVUE II WITH MENTAL DEFECTIVES

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## INTRODUCTION AND STATEMENT OF THE PROBLEM

THE Wechsler Adult Intelligence Scale (W.A.I.S.) has several features which promise to make the Scale of particular value in the assessment of intellectual ability of adult mentally defective individuals. Its principal advantages appear to be: (1) extension of the subtest scale downward to eliminate subtest scores of zero in a retarded group; (2) the sample of mentally retarded persons has been cross-validated in order to insure greater reliability at the lower range of the scale; and (3) ambiguous items have been eliminated to make scoring less subjective.

An additional feature of the scale worthy of note is the care taken in standardizing it. The inclusion of non-white subjects and consideration of socio-economic standing, residence and geographic distribution of subjects in the standardization population should make the scale more representative than previous scales.

For maximum usefulness, however, new clinical instruments must be compared with previously established techniques to determine similarities and differences. This is particularly important when two tests, such as the W.A.I.S. and W.B. II are clinically thought of as "equivalent" forms. The W.B. II was chosen to be compared with the

W.A.I.S. since the W.A.I.S. is a re-standardization of the W.B. I for which the W.B. II had long been utilized as an alternate form. Specifically, the purpose of this study is to compare the W.A.I.S. and W.B. II Verbal, Performance and Full Scale IQ on a sample of mentally defective adults. Consideration will be given to how the IQ's on the two scales co-vary and to whether the mean IQ's are comparable.

## PROCEDURE

Eighty patients were selected from the files maintained at Lincoln State School who represent the available individuals in the Familial and Idiopathic diagnostic categories in the Institution. Age range was restricted from 16 to 29 years and only patients having IQ's above 50 on previous examinations were selected. Restrictions on the intellectual and age range of subjects were considered desirable to avoid the problem of "correction for age," as discussed in Sloan's article (2) and to avoid subjects obtaining weighted scores of zero on some of the subtests. Familial and Idiopathic diagnostic groups were chosen as they represent the two groups in the institution demonstrating no evidence of brain disease other than that possibly implied by mental deficiency.

The final N was reduced to 72 by conditions beyond the authors' control (escapes, death and conditional discharge).

Male and female samples were selected separately and were alternately assigned to an A or B sub-group. All subjects were given both the W.B. II

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TABLE I  
 DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

Variable	Group	N	Mean	$\sigma$	Range	df	$\tau$ †
Age	Males A	17	21.26	3.99	17-29		
	Females A	19	19.36	3.46	16-28	34	1.54
	Males B	19	19.93	3.20	16-28		
	Females B	17	20.19	2.49	16-25	34	.22
Years in institution	Males A	17	6.12	2.49	2-10		
	Females A	19	4.65	2.19	1-10	34	1.84
	Males B	19	5.47	2.41	2-10		
	Females B	17	3.82	2.21	1-8	34	1.79
Age*	A	36	20.76	3.72	16-29		
	B	36	20.06	2.88	16-28	71	.89
Years institutionalized	A	36	5.32	2.68	1-10		
	B	36	4.69	2.45	1-10	71	1.04

\* As differences between males and females were not significant samples were pooled and re-evaluated to insure comparability of the larger samples.

† No  $\tau$  reached the .05 level of significance.

and the W.A.I.S. with a two month interval intervening. The interval was based on Hays' study (1) in which he found no significant practice effect on the W.B. I and W.B. II beyond a 2 month period. Group A received the W.A.I.S. first and were then retested on the W.B. II. Group B received the tests in opposite order. It was assumed that any practice effect would be minimized by this alteration in the order of test administration and would cancel out in the final analysis.

There were four groups, two A groups of male and female sub-groups and two B groups of male and female sub-groups. Mean age and length of

institutionalization did not differ significantly in the four sub-groups and did not differ significantly when male and female groups were combined (see Table I). To rule out possible sex differences  $\tau$  tests were run between W.A.I.S. mean IQ's and the two sex groups and between the W.B. II mean IQ's and the two sex groups. Neither  $\tau$  reached the .05 level of significance (Table II). Therefore, the sub-groups were combined for all further analysis.

## RESULTS

The main effects were analyzed by Pearson Product-Moment correlation and by tests of significance between

 TABLE II  
 COMPARISON OF IQ'S FOR THE MALE AND FEMALE SUB-SAMPLES

Test	Males		Females		df	$\tau$ *
	Mean IQ	$\sigma$	Mean IQ	$\sigma$		
W.A.I.S.						
Verbal	73.31	4.50	72.47	5.23	35	.07
Performance	77.42	9.56	76.28	9.97	35	.49
Full Scale	74.42	7.19	72.67	5.42	35	1.15
W.B. II						
Verbal	68.19	6.27	68.92	6.56	35	.24
Performance	76.92	13.67	74.31	14.25	35	.77
Full Scale	70.31	8.69	69.42	9.37	35	.78

\* No  $\tau$  reaches the .05 level of confidence.

means since it was considered desirable to know both the degree of co-variation between scores and the numerical comparability of the scores. Table III summarizes the correlations and  $\tau$  tests on these scales. The  $r$ 's of .62 on the verbal scales, .83 on the performance scales and .77 on the full scale IQ's were all significant at beyond the .01 level of confidence. The  $\tau$  for performance scale IQ's was not significant.

The difference between averages for the verbal and Full Scale IQ's were 4.33 and 3.18 respectively, with the W.A.I.S. mean being higher in each case.

In all instances the W.B. II standard deviations were greater than those on the W.A.I.S. This was equally true in

the tests on this type of population and not with the more dubious procedure of estimating the "true" correlation for a sample of mentally retarded persons.

One should keep in mind that the "validation" of one test by correlating it with an earlier scale has limited meaning. The question of comparability is answerable, but the question of which is the better test goes beyond the scope of this study.

Correlations obtained compare favorably with results of previous correlational studies, using other tests on a similar population. Sloan and Schneider (3) obtained  $r$ 's of .47 between the W.B. I and Arthur I; .94 between the W.B. I performance scale and the W.B.

TABLE III  
COMPARISON OF CORRELATIONS AND  $\tau$  TESTS FOR THE W.A.I.S. AND W.B. II

Subtest	W.A.I.S.		W.B. II		$r^*$	$\tau$
	Mean	$\sigma$	Mean	$\sigma$		
Verbal	72.89	4.88	68.56	6.40	.62	7.13†
Performance	74.31	9.53	75.61	13.97	.83	1.38
Full Scale	73.04	6.35	69.86	9.02	.77	4.60†

\* All correlations significant at  $> .01$  level.

† Significant at greater than the .01 level of confidence.

the preliminary comparison of male and female sub-groups.

#### DISCUSSION

Caution must be used in interpreting the results obtained in this study as all subjects were residents of a State School for the mentally defective and therefore are not necessarily representative of all individuals having limited intellectual ability. Further, ability ranges on both scales were restricted; a fact known to produce spuriously low correlations as compared to correlations obtained on a wider ability range. No attempt was made to correct the correlations for restricted range as we were concerned with the degree of relationship between

I Full Scale; and .76, .64, .75 between the Stanford-Binet L and the W.B. I Full, Performance and Verbal Scales respectively.

Similarly, Vanderhost, Sloan and Bensberg (4) correlated the W.I.S.C. and W.B. I IQ's to obtain correlations of .72, .77 and .54 for the Full Scale, Performance and Verbal IQ's of the two tests.

It appears to be a common finding of this and previous studies that Verbal IQ's tend to correlate less well than Performance IQ's on populations of mental defectives. This would suggest that Verbal IQ's are less "reliable" and hence, presumably less "valid" measures of ability in this population. More

work needs to be done in exploring the antecedents of these findings.

The significant differences obtained between means on the two tests may be attributed to the age correction applied to the W.B. II. Hays (1) found that when the correction was dropped from his analysis significant differences between the W.B. I and W.B. II were decreased.

One notes in comparing the two scales that the standard deviations for the W.A.I.S. are consistently smaller than the standard deviations of the W.B. II. The performance scales of both tests yield larger  $\sigma$ 's than either the Verbal or Full Scale subtests. Whether this represents desirable "differentiation" in the W.B. II and in the two Performance scales or whether it reflects greater random error cannot be determined from evidence available here.

The results suggest these techniques may be used as clinical alternatives if proper attention is given to the systematic differences between the tests. The W.A.I.S. tends to yield IQ's 3 to 4 IQ points higher than the W.B. II IQ's on the Verbal and Full Scale tests. The greater variability of the W.B. II needs to be recognized and considered in clinical work with the two instruments.

#### SUMMARY AND CONCLUSIONS

Seventy-two male and female patients, diagnosed as Familial or Idiopathic mental defectives at Lincoln State School were given the W.A.I.S. and W.B. II with a two month interval intervening between tests. Half the group received the W.A.I.S. first and half received the W.B. II first.

Correlations of .62 between Verbal scales; .83 between Performance scales and .77 between Full Scale IQ's were obtained. All correlations were signifi-

cantly greater than zero and beyond the .01 level of confidence.

$\tau$  tests for the significance of the difference between means reached the .01 level of confidence for the Verbal and Full Scale IQ's, the mean W.A.I.S. IQ's being 4.3 and 3.2 IQ points higher on the two scales respectively.

The correlations were discussed in relation to the findings of previous studies using different techniques but similar populations. It was concluded that the correlations were "respectable" considering the restricted ability range of the sample on which the statistics were based.

Some qualitative features of the scales were noted and suggestions made for future study. It was felt that in view of the consistently higher standard deviations of the W.B. II the scales may show important differences in discriminating power.

In generalizing these results, it would be well to remember that all subjects were institutionalized mentally retarded persons, selected from a restricted age and ability range. Results are considered meaningful only with similar populations.

#### BIBLIOGRAPHY

1. HAYS, WILLIAM AND SCHNEIDER, BERNARD. "A Test-Retest Evaluation of the Wechsler Forms I and II with Mental Defectives," *J. Clin. Psychol.*, 1951, 7, 140-143.
2. SLOAN, WILLIAM "Validity of Wechsler's Deterioration Quotient in High Grade Mental Defectives," *J. Clin. Psychol.*, 1947, 3, 287-288.
3. SLOAN, WILLIAM AND SCHNEIDER, BERNARD. "A Study of the Wechsler Intelligence Scale for Children with Mental Defectives," *Amer. J. Ment. Def.*, 1951, 54, #4, 573-575.
4. VANDERHOST, LEONETTE, SLOAN, WILLIAM AND BENSBERG, GERARD J. "Performance of Mental Defectives on the Wechsler-Bellevue and the W.I.S.C.," *Amer. J. Ment. Def.*, 1953, 57, #3, 481-483.
5. WECHSLER, DAVID. *The Wechsler-Bellevue Intelligence Scale, Form II*. Manual for Administering and Scoring the Test. Psychological Corporation, 1946.
6. WECHSLER, DAVID. *Wechsler Adult Intelligence Scale*. Psychological Corporation, 1955.