SCATTER ON THE WECHSLER ADULT INTELLIGENCE SCALE AS A MEASURE OF PERSONALITY ADJUSTMENT

by

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INTRODUCTION

Much time and effort is being expended today in the search for diagnostic instruments that will reveal the existence of psychological problems within the individual before they become serious and obvious. For effective treatment, these disorders must be discovered as early as possible. By the time these problems become obvious, deterioration may have set in and effective therapy is often exceedingly difficult and prolonged. One of the techniques being tried today that aims at serving the need for early discovery of psychological problems is scatter analysis.

In 1955 Wechsler published the latest revision of his Bellevue Intelligence Examination. Only one form was published which he calls the Wechsler Adult Intelligence Scale (hereafter referred to as the WAIS). The WAIS is essentially a modern version of the Wechsler-Bellevue Test - Forms I and II. In the preface to the WAIS Manual Wechsler refers the examiner to The Measurement of Adult Intelligence (10) for information regarding the use of the test data in the analysis of scatter. This implies that the same method of scatter analysis can be used and that the indications of various difficulties are common to the two tests. Wechsler also maintains that (10, p. 146) "Whenever a mental disorder produces a change in the individual's functioning capacity the

resultant loss is not generally uniform, but effects certain abilities more than others."

Wechsler has set up a table (10, p. 150) of clinical pattern which he arrived at empirically. The examiner, after scoring the test, inspects the table to discover the clinical pattern most nearly approximating the subject's subtest results. Wechsler says that the table is based on associations or correlations between test "signs" and disease entities. One recent study (11, p. 25) has offered evidence that the Wechsler-Bellevue - Form I and the WAIS "...are not interchangeable with one another for the purpose of scatter analysis." West says that (11, p. 5), "At present, methods for analysing scatter patterns are not accepted by many authorities. A review of recent literature on the subject has produced no figures to statistically verify the value of the method."

By far the best study employing scatter snalysis as a clinical diagnostic tool was done by Rapaport et al. at the Menninger Foundation (5). Rapaport says of the Wechsler-Bellevue Scale (5, Vol, 2, p. 29), "All the subtest scores of the Bellevue Scale are translated into weighted scores, which are equated and directly comparable; thus a well-adjusted person should have little discrepancy among his 11 weighted scores. A significant deviation of a subject's weighted score on one subtest from the central tendency of his other weighted scores is a deviation from the norm implicit in these equated scores, and thus is characteristic for his adjustment and may be an indicator of his specific maladjustment."

Other researchers have failed to duplicate Rapaport's findings. Rabin and Guertin (4), and Guertin, Frank and Rabin (3) have reviewed the literature very thoroughly. Among their findings with regard to scatter analysis is that Rapaport's study, from the standpoint of quantitative research and experimentation, has failed to produce any clear-cut or conclusive findings concerning scatter. One gains the impression from the pattern studies reviewed that the findings are inconclusive.

The Rotter Incomplete Sentences Blank - College Form (hereafter referred to as the ISB) is historically related to the word association test (7). It is revised from a form used in the Army by Rotter and Wellerman. Two goals were kept in mind in its development. The first was to provide a simple and easily used screening device. The second was to gain rather specific information of diagnostic value. Rotter begins his manual with this descriptive paragraph (7, p. 3):

> The Incomplete Sentences Blank is an attempt to standardize the sentence completion method for use at the college level. Forty 'stems' are completed by the subject. These completions are then scored by comparing them against typical items in empirically derived scoring manuals for men and women and by assigning to each response a scale value from 0 to 6. The total score is an index of maladjustment.

This instrument was never intended "to provide ratings in finer diagnostic terms. Those scoring above a previously determined cutting score can be referred to counselors for more careful study..." (7, p. 3) The test may provide indications of the type of problem possessed by the testee but should never be used as a single diagnostic tool.

The reliability and validity of the ISB were calculated from groups of college students numbering 195 and 206 respectively (7). Inter-scorer reliability for males was .91 and for females .96. The males' and females' scores were validated separately against ratings by instructors. The biserial correlation coefficients between classification and ISB scores for males and females were .62 and .50 respectively. The normative data was derived from 299 freshmen entering Ohio State University (7). No claim is made for the test other than that it can roughly differentiate the well adjusted from the maladjusted in groups similar to the normative group. Rotter does not claim that the ISB should be used to make a diagnosis but only that it can, with a fair degree of accuracy, point out those who may need more testing and observation and give some suggestion as to the type of problem. If this is true and Wechsler's claims for his "signs" are valid, then the two tests should agree in their indications of the presence or absence of problems. There may be indications in both tests of the type of problem faced but the WAIS and not the ISB should reveal the disease entity toward which the subjects' struggles are carrying them.

STATEMENT OF PROBLEM

Can scatter scores on the Wechsler Adult Intelligence Scale (the WAIS) be used as a measure for the prediction of personality maladjustment as measured by the Rotter Incomplete Sentences Blank (the ISB)?

Neither of these tests has been studied sufficiently to be certain of its value as an instrument for the detection of psychological problems. As can be seen, however, in the introduction of this paper, claims have been made that scatter scores of the various types obtained from the Wechsler tests give evidence of the existence of problems and of the nature of such problems. These claims and the studies performed to support them were originally made for the Wechsler-Bellevue - Form I, but Wechsler has stated (10) that he feels that equivalent analyses can be made by using the WAIS.

The Rotter Incomplete Sentences Blank has been standardized, although not thoroughly, to yield both indications of particular problems and an overall score of adjustment. The present paper is intended to compare the scatter scores with the total adjustment score on the ISB. Considering the low and almost equal level of clinical standardization of the two tests, if no relationship is found there will be no way of knowing which of the two tests is responsible for the failure.

APPARATUS AND PROCEDURE

In this study there were 40 female subjects ranging in age from 17 thru 22. All were volunteers from elementary psychology classes.

Two tests, the Wechsler Adult Intelligence Scale (WAIS) and the Rotter Incomplete Sentences Blank - College Form (ISB), were administered to the subjects individually and in that order. All testing appointments were made for week-day afternoons at hours that did not conflict with classes. Each subject was told that she would be given an interpretation of her test results. It was felt that since one's emotional state can change greatly from day to day, it would be better to administer the WAIS first and follow it immediately with the ISB (2) The manuals for each of the tests were followed carefully in the administration and scoring of the tests.

Each WAIS was given a random number and each ISB was given a different number also randomly chosen. This was done to prevent impressions not obtainable from the blanks from affecting the experimenter.

RESULTS

In this study the three main measures of scatter commonly recommended for the Wechsler-Bellevue Intelligence Scale were employed. The first measure used the weighted vocabulary score as a baseline. The second used the average weighted verbal and performance scores as separate baselines, while the third used the weighted score average as a baseline.[1]

Scatter measured by these three methods does not correlate highly with scores obtained using the ISB. As can be seen in Table I, no correlation attained exceeds the value of .289. The lowest value obtained from this comparison is a .004 which was found to prevail between performance scatter and ISB scores. The other values obtained were .267 and .274. The TABLE also shows the standard deviation of the correlation coefficient and the critical ratios. No correlation attained is significant beyond the 2.28% level and thus none is of much value in prediction. A correlation coefficient of .289 allows one to predict only 8% better than chance.

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[1] In calculating the vocabulary scatter the deviations of each of the weighted subtest scores from the Vocabulary score was determined and the mean found. The verbal scatter and the performance scatter are determined by calculating the average deviation of the verbal scores from the mean of the verbal scores, and the average deviation of the performance scores from the mean of the performance scores. The total scatter score is calculated by figuring the average deviation of the scores from the total weighted score averages. The correlation coefficients reported were arrived at by the use of the product moment formula.

TABLE I

Product Moment Correlations Derived from the Various Measures of Scatter and the ISB Scores

	Product Moment Correlations	Standard Deviation of Correlations	Critical Ratios	Levels of Significance
Vocabulary Scatter and ISB	.267	.1487	1.80	3.59%
Verbal Scatter and ISB	.289	.1467	2.00	2.28%
Performance Scatter and ISB	.004	.1601	0.02	42.07%
Total Scatter and ISB	.274	.1481	1.90	2.87%

TABLE II shows the Fisher "t's" obtained when scatter scores for individuals scoring above 135 on the ISB are compared with scatter scores attained by individuals scoring below 135 on the ISB.[2] These values are, again, low. No Fisher "t" obtained is larger than .635 and thus no difference in average scatter scores to correspond with ISB scores is significant above the 52.6% level. This difference is for verbal scatter. The level of significance of the difference in vocabulary scores for the individuals scoring above and below the cutting score on the ISB is 61.8% The other two levels of significance are 70.3% and 91.3%.

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[2] Rotter (7) says that a cutting score of 135 or above can be used as an indication that further study should be made of the individual to determine the degree of maladjustment.

TABLE II

Fisher "t's" Obtained When Scatter Scores for Individuals Scoring Above 135 on the ISB are Compared with Scatter Scores Attained by Individuals Scoring Below 135 on the ISB.

	Fisher "t's"	Levels of Significance
Vocabulary Scatter and ISB	.499	61.8%
Verbal Scatter and ISB	.635	52.6%
Performance Scatter and ISB	.109	91.3%
Total Scatter and ISB	.382	70.3%

CONCLUSION AND DISCUSSION

1. Scatter analysis of the WAIS does not yield adjustment measures which correlate highly with ISB adjustment scores. The highest intercorrelation obtained was .289 between verbal scatter and the ISB score. This value is significant only at the 2.28% level and is of slight, if any, value for prediction.

2. The Fisher "t's" were obtained by comparing scores for individuals scoring 135 on the ISB with scatter scores attained by individuals scoring below 135 on the ISB. The highest "t" obtained is .635 which is significant only at the 52.6% level of confidence. This correlation is for verbal scatter.

The correlation between adjustment measures on the ISB and the scatter scores on the WAIS are much lower than one would hope to obtain. In fact, they provide little evidence that the two measures, both of which claim to measure adjustment, are measuring the same thing. This lack of agreement cannot, because of the nature of the experiment, be attributed to the inadequacy of one test or the other. Since no independent criterion is available, one or the other or both may be inadequate.

The literature supplies little that would favor one of the tests as a validation instrument for the other. The IBS is relatively poorly standardized. Validation is based upon an analysis of the respon-

ses attained from a total of 206 subjects. Part of these subjects, 150, were taken from classes in effective study and in mental hygiene and were rated as well or poorly adjusted by their teachers in the one of these two courses in which they were registered. Rotter admits that, "The instructor, forced to classify all students in one catagory or the other, doubtless made judgments in many cases when he was relatively unsure of his ratings.(7, p. 8). In addition to these 150 subjects, 10 were tested after being examined and classified as adjusted or maladjusted by "advanced student clinicians", and 46 were either self-referrals to the psychological clinic or had been referred to the clinic by vocational counselors. All of this group of 46 were regarded as maladjusted (7).

The normative data is based on records of 299 freshmen entering Ohio State University. Rotter, basing his judgments entirely upon intelligence measurements, concluded that there was no reason for feeling that these students differed from the freshman class as a whole.(7). Norms were established entirely in terms of percentiles from the normative population. The small sample and the relatively poor criteria employed leaves much to be desired.

The standardization of scatter analysis scores as an indication of adjustment is also weak. The majority of attempts to study statistically the significance of scatter scores have resulted in a lack of agreement with independent criteria. However, many psychologists claim that scatter analysis is of value in diagnosis. Also, the

available experiments on the validity of scatter analysis of Wechsler's tests have been limited to a study of the W-B I. Wechsler (9) feels that it should be possible to use the same method of analysis with the WAIS as with the W-B I but has no evidence beyond an impression of logical equality that such a method of analysis will be successful.

West (11), who recently compared both intelligence quotients and scatter analyses from these two tests, obtained discouraging results. She found a satisfactorily high correlation, .746, between Verbal Intelligence Quotients from the two tests, but low correlations, .321 and .544, between Performance and Full Scale Intelligence Quotients respectively. Of the 232 subtest scores which differed significantly from the average weighted scores, 36.5% were the same and in the same direction for the W-B I and the WAIS. She found that a few subjects attained scores on a subtest which were significantly above their averages for one instrument and significantly below their averages for the other. Only 15 out of 50 calculated rank order correlations between weighted scores on the various subtests of the two instruments were significantly greater than zero in a positive direction; and 3 of the 50 were found to be negative. This evidence would cause one to question the use of either the ISB or the WAIS scatter scores as a validating criterion.

The highest correlation and the largest Fisher "t" found in the present study, between scatter scores on the WAIS and the scores on the ISB, were found for verbal scatter. The coefficient of correlation obtained between verbal scatter and the ISB scores is a .289 which

is significant at the 2.28% level. The Fisher "t" for the difference between scatter scores for the individuals scoring at or above 135 and those scoring below 135 is significant at the 52.6% level of confidence. Considering this probable superiority of verbal scatter as a measure of adjustment, it is interesting to note West's findings (11) that the correlation between verbal scores on the W-B I and the WAIS is relatively high while the correlation between performance scores is so low as to be unsatisfactory. The coefficient of correlation between performance scatter scores and ISB scores is only .004. This might possibly be attributed to a failure of the W-B I and the WAIS performance scale to measure the same thing.

SUMMARY

1. Forty females, ranging in age from 17 thru 22 and registered in elementary psychology classes, took the WAIS immediately followed by the ISB.

2. The correlations between the three main measures of scatter and the ISB scores were too low to be of value for prediction. The highest correlation of .289 was between the verbal scatter and the ISB scores. This value was significant only at the 2.28% level of confidence.

3. Fisher "t's" were computed to determine whether there were significant differences in scatter scores on the WAIS between individuals scoring higher than 135 and those scoring lower than 135 on the ISB. The highest "t" obtained was .635 which was significant only at the 52.6% level of confidence.

4. There was a certain degree of consistency in the statistics in that where correlation coefficients were high or low the Fisher "t's" were similarly high or low.

5. The conclusion was, then, that scatter scores on the WAIS do not measure the same thing as the personality maladjustment score on the ISB. Due to the inadequate degree of standardization of the two tests when employed for this purpose, one cannot tell which, if either, of the two tests is at fault.

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