A Comparison of WAIS-R Scores with WAIS-R Scores for Mentally Handicapped Students with IQs Below 70 and for Regular Education Students

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A COMPARISON OF WISC-R SCORES WITH WAIS-R SCORES FOR
MENTALLY HANDICAPPED STUDENTS WITH IQS BELOW 70
AND FOR REGULAR EDUCATION STUDENTS

by

Kimberly A. Brennan

A Project Report
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Specialist in Education
Department of Psychology

Western Michigan University
Kalamazoo, Michigan
April 1987

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AND FOR REGULAR EDUCATION STUDENTS

Kimberly A. Brennan, Ed.S.
Western Michigan University, 1987

The purpose of the present study was to investigate the utilization of WISC-R scores as a basis for placement and continuation of services for mental retardates in special education classes throughout their school careers. A comparison of the WISC-R Verbal, Performance, and Full Scale IQs with the WAIS-R counterparts and a statistical analysis was conducted. Regular education students were also tested to determine if the two scales were equal.

The WAIS-R was found to yield higher Verbal and Full Scale IQ scores, but comparable Performance IQ scores. These results suggest that the differences between the two instruments for children of subnormal intelligence are educationally and statistically significant, presenting the possibility of differential classification based on the intelligence test used. Future research should be conducted to determine the full impact of this difference on vocational success and adjustment of the affected group, and in subjects of above-normal intellectual functioning.
ACKNOWLEDGEMENTS

I would like to thank Drs. Howard Farris, Richard Malott, and Galen Alessi for their guidance and feedback. A special thanks is due to Dr. Howard Farris for his belief in the value of this project, his continuous support, and motivational speeches that kept me going.

In addition, I would like to thank Gina Robertson for her editing and computer expertise that enabled me to complete this project.

Most importantly, I would like to thank Tim Mulder who gave me the much needed time to complete this project, and Jim Yanna whose expertise and guidance made this possible.

Kimberly A. Brennan
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CHAPTER I

INTRODUCTION

Assessing the intelligence and special abilities of children and adults includes: (a) an understanding of the test characteristics and test content, (b) interpretation of test findings, and (c) good communication and consultation skills. The assessment process, especially when intelligence tests and other standardized tests form the basis of the evaluation, should never focus exclusively on a score or number (Sattler, 1982). This becomes an even more critical issue when an evaluation is initiated to consider Special Education placement. Three major criteria are used to evaluate and place students in special programs: (1) scores from individually administered IQ tests, (2) measures of adaptive behavior, and (3) academic achievement (Johnson, 1980; Smith & Knoff, 1981). However, Berk, Bridges, and Shih (1981) provided evidence that the IQ score is the crucial variable affecting Special Education placement and is frequently used as the single most important determinant for these decisions.

A problem frequently encountered with school psychologists involves the choice of the most appropriate assessment instrument for children with suspected abnormal abilities to make these decisions. Traditionally, the most widely used test has been the Wechsler Intelligence Scale for Children - Revised (WISC-R) and the Wechsler Intelligence Scale for Adults - Revised (WAIS-R). A recent study by Lubin, Larsen, and Matarazzo (1984) indicated that the WISC-R/
WAIS-R are the most widely used tests for psychological assessment. Although typically regarded as equivalent instruments, the WISC-R and WAIS-R yield significantly different Verbal, Performance and Full Scale IQs for an intellectually subaverage group, with the WAIS-R consistently providing higher scores (Rubin, Goldman, & Rosenfeld, 1985). Implications of this "built-in" increment for issues of eligibility for educational placements and societal benefits are critical for school psychologists and other clinicians who frequently use these instruments for placement decisions.

Upward shifts in the IQ scores of subjects originally tested on the Wechsler Intelligence Scale for Children (WISC) when later evaluated on the Wechsler Intelligence Scale for Adults (WAIS) have been reported in the literature (Caravajal, Lane, & Gay, 1984; Craft & Kronenberger, 1979; Hannon & Kicklighter, 1970; Sattler, Polifka, & Polifka, 1984), with particular focus on the educable mentally impaired (EMI) in special education classes. Previous research which has compared the WISC-R with the WAIS among 16-year-old EMIs (Craft & Kronenberger, 1979; Nagle & Lazarus, 1979) has shown that the WAIS full scale IQs are approximately 12 points higher. Revised versions of both the WISC (WISC-R) and the WAIS (WAIS-R) now appear to demonstrate this disparity of scores in a retarded population, with WAIS-R IQs commonly higher than previous WISC-R IQs.

As a result of a higher WAIS-R IQ, an EMI student may now be reclassified as learning disabled (LD) or even may require regular classroom placement; a trainable mentally impaired (TMI) student may need to be placed in an EMI classroom; an institutional placement may
be ruled inappropriate, de-institutionalization becoming necessary. Such changes might in themselves be desirable, but only if based on valid findings. Psychologists, educators, and others involved in educational and societal placement and programming are faced with such questions that must be addressed and answered before initiating such changes (Rubin et al., 1985). The fact that a student obtains a higher WAIS-R IQ, now that s/he is past the WISC-R testing age, in itself not sufficient basis for program change, especially if this increased score is a psychometric artifact.

Although it is not the purpose of this paper to present the history of psychological testing, some historical perspective in the development of testing instruments is necessary to examine the disparities between the two instruments. In 1955, Wechsler extended and standardized a modified version of the Wechsler-Bellevue Scale (Wechsler, 1939) and renamed it the Wechsler Adult Intelligence Scale (WAIS). In the 1955 standardization, the test age range was extended and included age 16 through adulthood. In 1949, Wechsler standardized the Wechsler Intelligence Scale for Children (WISC) for the age range of children five through 15 years (Wechsler, 1949). The WISC was revised to the Wechsler Intelligence Scale for Children - Revised (WISC-R) in 1974 (Wechsler, 1974) and the WAIS was revised to the Wechsler Intelligence Scale for Adults - Revised (WAIS-R) in 1981 (Wechsler, 1981). The WAIS-R age range remained 16 years through adulthood causing a one-year overlap (the sixteenth year) enabling the examiner to administer either test.

Development of the WAIS took four years (1976-1980) and involved
the efforts of senior psychologists as field supervisors of local
examiners at 115 testing centers in 39 states plus Washington, D.C.
The sample comprising 1,880 individuals was carefully stratified on
the variables of sex, race (white, non-white), geographic region,
occupational group, educational attainment, and urban-rural residence.
No other test currently available, or which is likely to be published
in the foreseeable future is as reliable, valid, or clinically useful
for assessing the measurable aspects of adult intelligence. The
WISC-R is designed primarily to yield scores which indicate at what
level a particular child is functioning with respect to the hypothe­
tical construct of intelligence. The WISC-R remains the best stan­
ardized, most objectively administered and scored test of its kind.
The WISC-R has replaced totally the 1949 WISC as the major instrument
for assessing the intellectual functioning of school-age children.

However, Flynn (1985) states that for individuals with IQs of
55 or below, the relationship between standardization samples and
norms is at its weakest. These scores are 3 or more standard devia­
tions below the mean and include only .14 of 1% of the sample, which
means these individuals are virtually nonexistent in a sample of
2,200. At these levels, different scoring practices rather than
sampling error cause IQ discrepancies from WISC-R test age to WAIS-R
test age. For example, a 16 year old subject must actually earn the
minimum WISC-R IQ of 40 by giving a fair number of correct answers;
that same subject can take the WAIS-R and get its minimum IQ of 46
(at ages 16-17) without giving any correct answers whatsoever
(Wechsler, 1974; 1981). Kaufman (1979) noted that on the WISC-R,
there are not as many easy items on subtests compared to the WISC. Because of this, subjects are scored on what they cannot do rather than on what they can do. Kaufman also noted that practice effects over an interval of about one month are quite pronounced on the WAIS-R. Gains of three points in Verbal, 8–9 points in Performance, and 6–6½ points in Full Scale IQ are to be expected, and must be understood by clinicians who retest adults.

The aforementioned evidence concerning disparities between the two assessment instruments raises the question regarding the relative role that IQ tests should play in identifying subjects with subaverage intelligence. This is further accentuated by the fact that the Diagnostic and Statistical Manual of Mental Disorders (DSM-III, 1980) suggests that the inprecision of IQ tests, i.e., standard error of measurement, be taken into consideration when determining if a child has significantly subaverage intelligence. This sentiment is echoed by Kaufman (1979), who writes, "Precise cutoff points, formulas, or minimum IQ requirements distort the meaning of what is measured and prevent intelligent test interpretation" (p. 13).

In summary, these results emphasize the need for educational decision makers to carefully consider test error above, as well as below the obtained IQ score when making educational recommendations.

In a study involving EMI students, Carvajal et al. (1984) report significant differences between WISC scores obtained at the time of initial placement in EMI programs and higher WAIS scores obtained approximately six years later, and again 10 years later. The investigators attributed these changes to progress made through the
EMI program. They also stated, however, that "The importance placed on IQ scores for initial placement of students in EMI programs appears to remain suspect" (Carvajal et al., 1984, p. 26).

In a longitudinal study of the WISC-R and the WAIS-R with special education students, Sattler et al. (1984) report no significant differences between the respective Verbal, Performance, and Full Scale IQs of the two tests. Regular observation by this examiner of a contradictory state of affairs led to the present study.

The purpose of the present study is (a) to determine the comparability of the WISC-R and WAIS-R among EMI, TMI, and regular education students who are eligible for administration of either test, and (b) to develop a proposal to account for this variability. The results of this study will be of practical benefit to School Psychologists due to: (a) mandatory reevaluations for determining eligibility for continued placement, (b) more EMI adolescents remaining in school since they will be more likely to experience school success, and (c) the universally increased maximum age of public school inclusion due largely to Public Law 94-142.
CHAPTER II

METHOD

Subjects

The subjects of the study were 7 EMI and 7 TMI students attending separate self-contained classrooms in a small rural community. In addition, 7 students randomly picked from an 11th grade regular education class list were also tested to determine whether inflated WAIS-R scores also occurred with regular education students. The subjects' ages ranged from 16 years, 0 months, to 19 years, 4 months. Guidelines for inclusion in the EMI/TMI classes were a measured level of intellectual functioning between two and three standard deviations below the mean and sub-average performance on an individually administered standardized achievement test. This population was not grouped according to age/grade placement, but by academic skills and adaptive behavior, due to their impaired intellectual ability. The EMI/TMI subjects were selected because their cumulative school records contained previous WISC-R and WAIS-R test data, including Verbal, Performance, and Full Scale IQs.

Setting

The study was conducted in a small rural community where the EMI/TMI students attended a self-contained classroom for high school students. The regular education students also attended a small rural
high school where they received regular education programming. The EMI/TMI classroom was designed primarily to teach self-care and survival skills, as this population would profit from this area of instruction as opposed to academic programming. Basic money management, personal hygiene, and simple self-help skills were a few of the objectives that were taught. A token economy system was implemented so that EMI/TMI students who had received a high grade or exhibited appropriate behavior would receive points which could be exchanged for special privileges and rewards.

Materials

The materials used in the experiment included: (a) WISC-R and WAIS-R examining kits which contained protocols, stopwatch, and manuals; (b) the students' previous test results based on a review of their previous psychological report; and (c) a consent form for the regular education students (see Appendix A).

Procedure

The study involved extensive data collection and testing of potential candidates. The present author and an associate conducted the majority of the test administrations to ensure consistency of test measures. The 14 students chosen from the self-contained classroom were divided on the basis of their WISC-R IQ scores. They were assigned to one of two groups: "educable" or "trainable" mentally retarded persons. An IQ of 55 was used to separate the two groups, as called for by the current American Association of Mental Deficiency (AAMD)
standards. The EMI students were assigned to Group A, with the WISC-R administered first, then the WAIS-R. The TMI students were placed in Group B, with the WAIS-R administered first, then the WISC-R. The seven regular education subjects were randomly chosen for three subjects to receive the WISC-R first, and the remaining four subjects to receive the WAIS-R first. This counterbalanced design was implemented to eliminate practice effects. The tests were administered at the school where each student was in attendance, in an acceptable room for testing. Testing was done on two occasions for each student with the time interval between tests varying from three days to five months. The 10 WAIS-R subtests and the corresponding WISC-R subtests were administered. The WISC-R Mazes subtest and Digit Symbol subtest were not included in the study, nor was the WAIS-R Digit Span and Digit Symbol subtest since these were regarded as supplementary tests.
CHAPTER III

RESULTS

The WAIS-R and WISC-R scores were compared on all three IQ scales. The WAIS-R was found to yield statistically significant higher Verbal and Full Scale IQ scores for the EMI/TMI groups. In contrast, differences on the Performance scale was insignificant. The regular education students' WAIS-R scores were higher on all three IQ scales; however, the differences were not significant. An informal comparison noted during testing revealed higher WAIS-R Block-Design and Similarities mean scores. A cautionary note is appropriate here regarding reliability. Object Assembly descends to .52 and six of all the subtests were below .75 for subjects in the 16-17 years' age range. Therefore, interpretation of single subtest scores should be avoided. Matched t-tests were computed to determine the significance of differences between the WISC-R and WAIS-R scores. The mean scores and t-scores are shown in Tables 1, 2, and 3. It should be noted that the WISC-R Verbal, Performance, and Full Scale IQ scores (Group B) displayed in Table 2 are all scored at or below the norm. Had their true score been represented, a greater discrepancy would have been expected.
Table 1

WAIS-R and WISC-R Based Ratio IQ Scores for 7 EMI Students

<table>
<thead>
<tr>
<th>Date Given</th>
<th>Subject</th>
<th>Test</th>
<th>Verbal</th>
<th>Performance</th>
<th>Full Scale</th>
</tr>
</thead>
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<td>A</td>
<td>WISC-R</td>
<td>46</td>
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<td>51</td>
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<tr>
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<tr>
<td>5/01/86</td>
<td>B</td>
<td>WISC-R</td>
<td>54</td>
<td>73</td>
<td>61</td>
</tr>
<tr>
<td>9/04/86</td>
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<td>74</td>
<td>68</td>
</tr>
<tr>
<td>5/01/86</td>
<td>C</td>
<td>WISC-R</td>
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<td>61</td>
<td>57</td>
</tr>
<tr>
<td>9/08/86</td>
<td></td>
<td>WAIS-R</td>
<td>65</td>
<td>70</td>
<td>66</td>
</tr>
<tr>
<td>5/05/86</td>
<td>D</td>
<td>WISC-R</td>
<td>51</td>
<td>52</td>
<td>57</td>
</tr>
<tr>
<td>9/11/86</td>
<td></td>
<td>WAIS-R</td>
<td>59</td>
<td>67</td>
<td>68</td>
</tr>
<tr>
<td>5/05/86</td>
<td>E</td>
<td>WISC-R</td>
<td>52</td>
<td>55</td>
<td>49</td>
</tr>
<tr>
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<td>WAIS-R</td>
<td>59</td>
<td>71</td>
<td>61</td>
</tr>
<tr>
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<td>F</td>
<td>WISC-R</td>
<td>66</td>
<td>82</td>
<td>73</td>
</tr>
<tr>
<td>9/17/86</td>
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<td>WAIS-R</td>
<td>71</td>
<td>76</td>
<td>73</td>
</tr>
<tr>
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<td>G</td>
<td>WISC-R</td>
<td>72</td>
<td>70</td>
<td>69</td>
</tr>
<tr>
<td>9/17/86</td>
<td></td>
<td>WAIS-R</td>
<td>74</td>
<td>63</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>WISC-R MEAN SCORE</td>
<td>57.2</td>
<td>65.4</td>
<td>59.6</td>
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<tr>
<td></td>
<td>WAIS-R MEAN SCORE</td>
<td>65.4</td>
<td>69.8</td>
<td>67.1</td>
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<td></td>
<td>DIFFERENCE</td>
<td>8.2</td>
<td>4.4</td>
<td>7.5</td>
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Table 2

WAIS-R and WISC-R Based Ratio IQ Scores for 7 TMI Students

<table>
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<th>Date Given</th>
<th>Subject</th>
<th>Test</th>
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<th>Performance</th>
<th>Full Scale</th>
</tr>
</thead>
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<td>56</td>
<td>53</td>
<td>51</td>
</tr>
<tr>
<td>9/08/86</td>
<td>WISC-R</td>
<td>45 *</td>
<td>45 *</td>
<td>40 *</td>
<td></td>
</tr>
<tr>
<td>5/02/86</td>
<td>B</td>
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<td>60</td>
<td>51</td>
<td>53</td>
</tr>
<tr>
<td>9/08/86</td>
<td>WISC-R</td>
<td>50</td>
<td>45 *</td>
<td>40 *</td>
<td></td>
</tr>
<tr>
<td>5/05/86</td>
<td>C</td>
<td>WAIS-R</td>
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<tr>
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<td>48</td>
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<td>44</td>
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</tr>
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<td>60</td>
<td>57</td>
</tr>
<tr>
<td>10/02/86</td>
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<td>45 *</td>
<td>40 *</td>
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</tr>
<tr>
<td>5/12/86</td>
<td>F</td>
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<td>62</td>
<td>52</td>
<td>55</td>
</tr>
<tr>
<td>10/06/86</td>
<td>WISC-R</td>
<td>45 *</td>
<td>45 *</td>
<td>40 *</td>
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<tr>
<td>12/12/86</td>
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<td>WAIS-R</td>
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<tr>
<td>12/16/86</td>
<td>WISC-R</td>
<td>52</td>
<td>45 *</td>
<td>43</td>
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</tr>
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</table>

WAIS-R MEAN SCORE 58.7 54.2 54.0
WISC-R MEAN SCORE 47.1 47.7 41.3
DIFFERENCE 11.6 6.5 12.7
OVERALL WAIS-R MEAN 62.1 62.0 60.6
OVERALL WISC-R MEAN 52.2 56.5 50.4
OVERALL DIFFERENCE 9.9 5.5 10.2

*It should be noted that these scores are a conservative estimate of these subjects' true cognitive functioning. Forty-five is the lowest score they can receive when scoring below the norm for Verbal and Performance IQs. Forty is the lowest estimate for Full Scale IQs even though these subjects scored below the norm. A t-test indicated that the WAIS-R yielded significantly higher Verbal scores, (t(26) = 3.04, t(26) = 3.72, p < .01 and Full Scale scores, t(26), 2.83, p < .01.
Table 3

WAIS-R and WISC-R Based Ratio IQ Scores for 7 Regular Education Students

<table>
<thead>
<tr>
<th>Date Given</th>
<th>Subject</th>
<th>Test</th>
<th>Verbal</th>
<th>Performance</th>
<th>Full Scale</th>
</tr>
</thead>
<tbody>
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<td>12/20/86</td>
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<td>WISC-R</td>
<td>112</td>
<td>102</td>
<td>108</td>
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<td></td>
<td>WAIS-R</td>
<td>118</td>
<td>133</td>
<td>128</td>
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<tr>
<td>1/08/87</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>12/20/86</td>
<td>B</td>
<td>WAIS-R</td>
<td>117</td>
<td>117</td>
<td>118</td>
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<tr>
<td></td>
<td></td>
<td>WISC-R</td>
<td>115</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>12/20/86</td>
<td>C</td>
<td>WISC-R</td>
<td>87</td>
<td>109</td>
<td>97</td>
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<tr>
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<td></td>
<td>WAIS-R</td>
<td>93</td>
<td>107</td>
<td>99</td>
</tr>
<tr>
<td>1/08/87</td>
<td></td>
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<td>WAIS-R</td>
<td>132</td>
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<tr>
<td></td>
<td></td>
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CHAPTER IV

DISCUSSION

The present study compared the inter-test differences between the two most frequently utilized intelligence tests currently involved in assessment for Special Education students.

In addition to the study being statistically significant, it is an educationally significant difference as well. Additionally, this investigator noted that Subject A, Group A was previously labelled TMI (trainable mentally impaired) based on the WISC-R full scale score. WAIS-R full scale scores revealed intellectual functioning in the EMI (educable mentally impaired) range. This could result in a change in educational status if the total adaptive functioning range was not included in the placement decision. Also, one of the previously eligible subjects could have his/her special education program terminated utilizing current state criteria for excluding students from the mentally handicapped population because their IQ scores would be greater than 70. Such changed scores could shift placement from one type of class or school to another, with a totally different educational plan and available resources, and perhaps also even present a major shift in funding base. Some of the EMI group may even be considered for some type of "mainstreaming." This could possibly be the best "educational move" for the EMI student, as previous research (Sexton & Street, 1985) indicates that students referred to special education make no educational gains compared
to students with the identical referral who were not placed in special education, but remained in their regular education classrooms.

The implications of these findings for the school psychologist are apparent. Every subject in Group B scored below the norm on all three IQ scales when administered the WISC-R. By comparing their WAIS-R counterpart scores, they were found to be functioning in the TMI high average range. There are very clear inter-test differences between the WISC-R and WAIS-R for children of subnormal intelligence, thus presenting the possibility that a child may be classified differentially on the basis of the selection of an intelligence test.

Many factors were considered as possible explanations for WAIS-R scores consistently higher than WISC-R scores. One fact was inadequate normative data for adolescent and young adult retarded subjects on both the WISC-R and the WAIS-R. This may also be a limiting factor in the accurate assessment by these two instruments. Neither test included in its standardization sample what Wechsler (1974, 1981) called "institutionalized mental defectives" or those with "severe emotional problems" (p. 4). [The WISC-R manual does state that if they were living at home, "suspected mental defectives" were not excluded (p. 5).] The WAIS-R manual notes that "individuals with known brain damage" were not included (p. 6). The manuals for both tests, however, indicate that slightly more than 2% of their respective standardization groups had full scale IQs of 69 or below. This raises the question whether subjects with subnormal intellectual functioning are indeed adequately represented in the standardization samples. Artifacts of WAIS-R scoring also make comparison with the WISC-R difficult for
low-scorers. As previously noted, fewer correct responses are required on the WAIS-R than on the WISC-R to obtain an equivalent scaled score (Flynn, 1985). Further evaluation on the conversion of raw scores to scaled scores would have to occur to assess the precise effects of such artifacts (Rubin et al., 1985).

The subtest order on each of the two tests was also examined as a possible factor for the increased scores. Each subtest was compared and found to be ordered relatively the same with alternating Verbal and Performance subtests. The student's familiarity with the test itself was ruled out when practice effects were controlled for by the administration of the two tests in a counter-balanced order. The same test administrator was consistently used during the majority of the WISC-R and WAIS-R administrations in order to ensure reliability and validity of measures.

Presently the classification of mentally retarded individuals by IQ test scores according to the American Association on Mental Deficiency (AAMD) standards (Grossman, 1973) does not acknowledge test differences among the Wechsler scales. Perhaps such classification systems as the AAMD could be improved by specifying ranges for individual tests so that individuals are not placed into different categories as a result of the test employed. Sattler (1982) noted that, "For children with below normal ability, a more thorough sampling of ability can be obtained from the WISC-R than from the WAIS-R in their present overlapping age ranges" (p. 21). Where persons of subnormal intellectual functioning are concerned, extreme caution must be exercised in interpreting any numerical increases, examining these in
the context of other relevant data. No major change in classification, placement, programming or eligibility for various educational and societal benefits should be effected until and unless other supportive data warrant them.

It is suggested that WISC-R/WAIS-R IQ differences probably are due to inadequate norms for the mentally retarded on both tests, as well as to more generous scoring procedures on the WAIS-R.
Dear Parents,

My name is Kimberly Brennan, a graduate student in the Psychology Department at Western Michigan University. This past semester, I completed an internship (similar to student teaching) in the Gobles Public School System. The final stage of my graduate program requires a research project. My research centers around IQ tests and the differences noted between the children and adult forms of the Wechsler Intelligence Scale. I need students who have recently turned 17. Your son/daughter would be required to take two IQ tests, which would be administered at a time that would not conflict with their regular programming. The testing will require approximately two hours and all results will be kept strictly confidential. Your son/daughter's name will not be used in the research study, but rather the scores they received.

Your cooperation in this project is greatly appreciated, and will be of valuable assistance to me as well as providing important information to School Psychologists throughout the United States. If you are willing to have your son/daughter participate in this valuable study, please sign below and return this form to the high school office by January 9, 1987.

Thank you.

Kimberly A. Brennan, M.A.
BIBLIOGRAPHY


Flynn, J. R. (1985). Wechsler intelligence tests: Do we really have a criterion of mental retardation? American Journal on Mental Deficiency, 90, 236-244.


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