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# Comparison of the Reading Subtests of The Woodcock Johnson Tests of Achievement- Third Edition and the Wechsler Individual Achievement Test-Second Edition

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Comparison of the Reading Subtests of The Woodcock Johnson Tests of Achievement-  
Third Edition and the Wechsler Individual Achievement Test-Second Edition

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the Graduate College of  
Marshall University

In partial fulfillment of  
The requirements for the degree of  
Educational Specialist in School Psychology

by

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### Abstract

A comparison of the reading subtests of the Woodcock-Johnson, Third Edition and the Wechsler Individual Achievement Test, Second Edition using 49 subjects. A t test of significance and the Pearson R Correlations were computed to compare the scores. The purpose of the study is to determine how closely the two tests measure the same reading skills.

## ACKNOWLEDGEMENTS

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Comparison of the Reading Subtests of The Woodcock Johnson Tests of Achievement-Third Edition and the Wechsler Individual Achievement Test-Second Edition

Comparing the Woodcock and WIAT

Why is there a Need to Test Reading?

Sally Shaywitz phrased it best when she wrote: “In the classroom, Reading is King” (Shaywitz, 2003). No other skill is as tightly woven throughout a student’s education. The ability to read and comprehend is essential in almost every academic subject. Reading is one of the first subjects introduced to students in Kindergarten through letters and sounds. It is practiced repeatedly during their academic careers, it will be a skill they will likely need on through adulthood, and it is a skill that they will definitely need to become lifelong learners.

Reading is also one of the strongest indicators of future academic success. Present levels of reading achievement can predict future levels of reading achievement. If educators can determine who is behind in reading, they can implement programs to remediate these skills before the students fall too far behind (Toregesen, Wagner, Rashotte, Rose, Lindamood, Conway, and Garvan, 2002). G. Reid Lyon suggested in his testimony before the Committee on Labor and Human Resources, that early intervention and proven practices may substantially reduce the number of children needing special education in higher grades (Shaywitz, 2003).

What is Reading?

For the purpose of this study, reading will be defined by two distinct categories. The first category is phonological awareness. Phonological awareness is the ability to manipulate the different sounds in reading. It involves seeing individual letters and being able to sound and blend them together for reading. Obviously this skill is of paramount importance because without

it, words and letters would just be scribbles on a page. Without this ability other reading skills such as comprehension become much more difficult (Beers, 2003).

The second category will be defined as reading comprehension. Reading comprehension "is understanding a text that is read, or the process of constructing meaning from a text. Comprehension is a "construction process" because it involves all of the elements of the reading process working together as a text is read to create a representation of the text in the reader's mind"(National Institute for Literacy, 2004). Quite simply it is the reader bringing all of his or her knowledge together to understand what the reader has just read.

#### The Woodcock Johnson Test of Achievement-Third Edition

The Woodcock Johnson Test of Achievement-Third Edition (WJ-III) is an individually administered standardized test. It was developed using the Woodcock-Johnson R. Its purpose is to "provide a set of individually administered, norm referenced tests for measuring academic achievement"(Blackwell, 2001).

The WJ-III yields three different reading scores: Broad Reading, Basic Reading Skills, and Reading Comprehension. All three scores are calculated into Standard Scores (M=100, SD=15), percentile rank, z-scores, t-scores, age equivalents, and grade equivalent (Sattler, 2001).

The Broad Reading score is supposed to represent a student's decoding ability, reading speed, and comprehension ability. The Broad Reading score is derived from scores on the following subtests: Letter-Word Identification, Reading Fluency, and Passage Comprehension (Mather& Jeffe 2002).

The Basic Reading Skills score is a part of the extended battery. It is supposed to measure sight vocabulary, phonics, and structural analysis. The Basic Reading Skills score is measured by Letter-Word Identification and Word Attack. The manual reports that the Basic Reading Skill

score has .93 reliability (Woodcock, McGrew, and Mather 2001).

The Reading Comprehension Score purports to measure reading comprehension, vocabulary, and reasoning. The Reading Comprehension Score, which is a measure in the extended battery, comes from the scores on the Passage Comprehension and Reading Vocabulary subtests. The score's mean reliability for school aged children (5-19) is .90 (Woodcock et al.2001c).

For the Letter-Word Identification subtest the students are told to read words orally from the stimulus book. The examiner scores a 0 for incorrect responses and a 1 for correct responses. The purpose of the Letter-Word fluency is to measure the examinees knowledge of letters and words (Mather et al.2002).

For the Reading Fluency subtest the examinee is asked to read a series of sentences and answer yes or no. The subject is given three minutes to answer as many questions as possible. The purpose of the Reading Fluency subtest is to measure how quickly a student can read (Mather et al.2002).

The Passage Comprehension subtest requires the examinee read passages silently. Next, the subject is asked to give a word that goes into a sentence that is already missing a word. The purpose of Passage Comprehension is to measure how well the examinee understands what he is reading (Woodcock et al 2001c.).

In the Word Attack Subtest examinees are asked to read a series of words that are not real words. This subtest requires that students use phonetic skills to decode the words that they have never seen. The purpose of the test is to gauge phonetic abilities (Woodcock et al. 2001b.).

The Reading Vocabulary Subtest is broken down into three different parts: synonyms, antonyms, and analogies. The first test requires that the examinee read a word and provide a

synonym for it. For the second task the student must read a word and give a synonym for that word. The last test requires the examinee to read an analogy that is missing a single word. The examinee must provide a word to complete the analogy. The Reading Vocabulary Subtest measures the student's ability to read words and use them in a way that is appropriate way (Woodcock et al. 2001a ).

The Woodcock-Johnson-III Technical Manual provides several examples of research involving the WJ-III Tests of Achievement. One study by Laurie Ford, Wendy Simmons, and Kathryn North compared the achievement scores of the Kaufman Test of Educational Achievement (KTEA), the Wechsler Individual Achievement Test (WIATT), and the WJ-III. The sample was made up of 52 students in grades 1-8. The students were randomly selected from both public and private school settings (Woodcock et al. 2001c).

The study showed that the reading scores of the KTEA and the WJ-III were significantly correlated. The correlation coefficients between the different reading subtests ranged from .44 to .67. It should be noted that the subtests that were designed to measure the same type of reading skill correlated higher (i.e. KTEA Reading Comprehension v. WJ-III Reading Comprehension) than subtests that were designed different reading skills. The Mean scores of the reading subtests of the KTEA ranged from 102 to 106.4. The WJ-III scores ranged from 95.9 to 102. The Standard Deviation for both tests ranged from 11.6 to 14.5 (Woodcock et al 2001c.).

The study also suggested that there was a high correlation between the WJ-III and the WIAT. The correlation coefficient of the two tests ranged from .67 to .82. The Mean scores for the reading subtests ranged from 103.2 to 106.7. The Reading Skills subtests of the WJ-II and the WIAT were the most highly related with a coefficient of .82 (Woodcock et al. 2001c).

### Wechsler Individual Achievement Test-II

"The Wechsler Individual Achievement Test-Second Edition (WIAT-II) is a comprehensive, individually administered test for assessing the achievement of children, adolescents, college students, and adults" (Smith, 2002). The test is designed to measure the general academic achievement in several areas like reading, math, spelling, etc.

The Word Reading Subtest is designed to measure phonological processing and reading decoding skills. On this subtest, students must name letters, sounds, provide rhyming words when prompted, blend letters and sounds, and read words from a list (Smith, 2002).

The Reading Comprehension Subtest measures what was defined earlier as reading comprehension skills. In this subtest, examinees are required to match words to pictures or read passages of different length and then answer questions about the passages. The questions range from vocabulary, reading skills, and reading concepts (Smith, 2002).

The Pseudoword Decoding subtest requires the students to read a list of non-words. The words on this test were designed to "be representative of English words". The purpose of this test is to measure a student's phonetic abilities (Smith, 2002).

The WIAT-II examiners manual provides numerous studies comparing the WIAT with several other subtests. The correlation between the WIAT and the WIAT-II Word Reading subtests was .88 and the correlation between the Reading comprehension subtests was .76. As expected the correlation between these two tests was high. One possible reason for such high correlations may be that the tests were designed similarly (Smith, 2002).

The WIAT-II was also compared to the PAL-RW in a study that consisted of 101 examinees. The PAL-RW was designed as a supplement to the WIAT. The correlations between the reading subtests were not as high as the comparison to the WIAT. The correlation

coefficients for the three reading subtests when compared to similar subtest ranged from .56 to .77 (Smith, 2002).

The WIAT-II was also compared to the Wide Range Achievement Test-Third Edition (WRAT3). The sample was a group of 36 examinees from grades 8-12. The WRAT3 reading section covers letter word reading items. The WRAT3 attempts to assess the same skill as the Word Reading subtest. When reviewing the data it was more prudent to compare the WRAT3 scores to the Word Reading subtest. These tests had a correlation coefficient of .73 (Smith, 2002).

In a study of 27 examinees whose ages ranged from 6-9 to 12-14, the WIAT-II was compared to the Differential Ability Scales. The comparison of the WIAT-II and the DAS Word Reading subtest was low (.37). The authors of the examiners manual suggest that this score may be low because "The WIAT-II Word Reading Subtest includes letter recognition and phonological comparison items in addition to word reading items..." (Smith, 2002).

The WIAT-II and the Peabody Picture Vocabulary Test-Third Edition (PPVT-III) were compared using a sample of 64 examinees whose ages ranged from 4-7 years. The correlation coefficient between the two tests was .60 for Word Reading, .70 for Reading Comprehension, and .75 for Pseudoword Decoding, and .68 when comparing composite scores (Smith, 2002).

The WIAT-II was also compared with two group achievement test scores: Stanford Achievement Tests-Ninth Edition and Metropolitan Achievement Tests-Eighth Edition. The WIAT-II had a .77 correlation with the SAT 9 Reading score. In grades 3-5 it had a correlation coefficient of .76. The worst coefficient was with grade levels 6-10 which was .66

#### Need for Study

Reading is of chief importance to every aspect of school. A student who struggles with

reading is likely to struggle in every subject in school. Reading is also one of the most reliable predictors of school success. Since reading is such a critical component to education, school psychologists, special educators, reading teachers and administrators must know instruments that they are using are valid. Educators must know if the tests yield similar results. For instance, if a student obtains an 82 standard score on the WJ-III, would he also obtain similar results on the WIAT-II? Educators want to know if they use one test for an initial evaluation and the other for a reevaluation are they seeing improvement in student performance or the differences in test design and scoring. Because the WJ-III and the WIAT-II are widely used testing instruments, an important question would be: “Do the WJ-III and the WIAT-II yield similar results when administered to the same students?” Another question to be answered is: “Do the subtests that purport to measure the same skills correlate significantly?”

### **Research Questions**

1. Do the Letter Word subtest of the Woodcock Johnson Third Edition (WJ III) and the Word Reading subtest of the Wechsler Individual Achievement Second Edition (WIAT II) tests yield similar results when administered to the same students? This question will be answered by using a t-test to look at the mean of all the scores.
2. Do the Letter Word subtest of the Woodcock Johnson Third Edition (WJ III) and the Word Reading subtest of the Wechsler Individual Achievement Second Edition (WIAT II) tests yield results that are correlated when administered to the same students? This question will be answered by using a Pearson Correlation Coefficient to look at the mean of all the scores.
3. Do the Word Attack subtest of the Woodcock Johnson Third Edition (WJ III) and the Pseudoword Decoding subtest of the Wechsler Individual Achievement Second Edition (WIAT II) tests yield similar results when administered to the same students? This question will be answered by using a t-test to look at the mean of all the scores.
4. Do the Word Attack subtest of the Woodcock Johnson Third Edition (WJ III) and the Pseudoword Decoding subtest of the Wechsler Individual Achievement Second Edition (WIAT II) tests yield results that are correlated when administered to the same students? This question will be answered by using a Pearson Correlation Coefficient to look at the mean of all the scores.

5. Do the Passage Comprehension subtest of the Woodcock Johnson Third Edition (WJ III) and the Reading Comprehension subtest of the Wechsler Individual Achievement Second Edition (WIAT II) tests yield similar results when administered to the same students? This question will be answered by using a t-test to look at the mean of all the scores.
6. Do the Passage Comprehension subtest of the Woodcock Johnson Third Edition (WJ III) and the Reading Comprehension subtest of the Wechsler Individual Achievement Second Edition (WIAT II) tests yield results that are correlated when administered to the same students? This question will be answered by using a Pearson Correlation Coefficient to look at the mean of all the scores.

### **Hypothesis**

1. There is not a significant difference between the scores on the Letter Word subtest of the WJ-III and the Word Reading subtest of the WIAT-II.
2. The scores on the Letter Word subtest of the WJ-III and the Word Reading subtest of the WIAT-II are correlated.
3. There is not a significant difference between the scores on the Word Attack subtest of the WJ-III and the Psuedoword Decoding subtest of the WIAT-II.
4. The scores on the Word Attack subtest of the WJ-III and the Psuedoword Decoding subtest of the WIAT-II are correlated.
5. There is not a significant difference between the scores on the Passage Comprehension subtest of the WJ-III and the Reading Comprehension subtest of the WIAT-II.
6. The scores on the Passage Comprehension subtest of the WJ-III and the Reading Comprehension subtest of the WIAT-II are correlated.

### **Subjects**

This study used data that was collected in the public school setting. The WJ-III and the WIAT-II were administered to 49 students during the 2003-2004 school year. The students who participated in the study had been referred for a Psychoeducational evaluation to determine Special Education eligibility. The researcher for this project does not have access to original protocols or student names.

**Table 1****Ages and Gender of Students**

<b>Gender</b>	<b><u>n</u></b>	<b>Age (Mean)</b>	<b>S.D.</b>	<b>Range</b>
Males	29	118.3	27.3	82-168
Females	20	124.1	29.4	92-184
Total	49	120	28	82-184

**Procedures**

Means and Standard Deviations were calculated to help summarize the test sample used for research. The t Test of significance and the Pearson Correlations were computed to compare the following subtests: WJ-III Letter Word subtest and the WIAT-II Word Reading subtest, WJ-III Word Attack subtest and the WIAT-II Pseudoword Decoding subtest, WJ-III Passage Comprehension and the WIAT-II Reading Comprehension subtest.

**Table 2**

<b>Subtest</b>	<b><u>n</u></b>	<b>Score (Mean)</b>	<b>S.D.</b>
WIAT-II Word Reading	49	80	12.1
WIAT-II Reading Comprehension	49	75.6	14.1
WIAT-II Pseudoword Decoding	49	84	10.3
WJ-III Letter Word	49	82.5	13.2
WJ-III Passage Comprehension	49	81.8	13.5
WJ-III Word Attack	49	84.2	12.3

**Results**

Hypothesis 1: There is a significant difference between the scores on the Letter Word subtest of the WJ-III and the Word Reading subtest of the WIAT-II. The t test ( $t = .9, p > .05$ )

suggests that there is not a significant difference between the scores on the Letter-Word subtest and Word Reading subtests (accept null hypothesis).

Hypothesis 2: The scores on the Letter Word subtest of the WJ-III and the Word Reading subtest of the WIAT-II are correlated. The Pearson r correlation ( $r = .9$ ,  $p < .05$ ) indicate that the scores on these subtests are significantly correlated (reject null hypothesis).

Hypothesis 3: There is a significant difference between the scores on the Word Attack subtest of the WJ-III and the Psuedoword Decoding subtest of the WIAT-II. The t test ( $t = .07$ ,  $p > .05$ ) indicate that there is not a significant difference between the scores on these subtests (accept null hypothesis).

Hypothesis 4: The scores on the Word Attack subtest of the WJ-III and the Psuedoword Decoding subtest of the WIAT-II are correlated. The Pearson r correlation ( $r = .7$ ,  $p < .05$ ) suggests that the scores on the subtests have a significant correlation (reject null hypothesis).

Hypothesis 5: There is a significant difference between the scores on the Passage Comprehension subtest of the WJ-III and the Reading Comprehension subtest of the WIAT-II. The t test of significance ( $t = 2.2$ ,  $p < .05$ ) indicates that there is a significant difference between the scores on these subtests (reject null hypothesis). It should be noted that this data's Effect Size ( $ES = .1$ ) indicates that his particular difference in scores is very small.

Hypothesis 6: The scores on the Passage Comprehension subtest of the WJ-III and the Reading Comprehension subtest of the WIAT-II are correlated. The Pearson r Correlation ( $r = .8$ ,  $p < .05$ ) suggest that there is a significant correlation between the scores on these two subtests (reject null hypothesis).

### Discussion

The reading subtests of the Woodcock Johnson Third Edition and the Wechsler Individual Achievement Test Second Edition are highly correlated. It appears that one test score may be able to predict another.

The subtests used to measure students knowledge of letters and words and the subtests used to gauge phonemic awareness are strongly correlated. This might indicate that the WJ-III

and the WIAT-II give similar scores on basic reading subtests. The similar scores may be a result of the subtests being similar. For example, students must define nonsense words on both tests to test their phonemic knowledge.

As a result, school psychologists and educators should feel comfortable comparing the four scores to check for growth over time. These tests could also be used as a pre and post test after units based around phonetics or letters, etc.

The largest discrepancy between mean scores was between WJ-III Passage Comprehension and the WIAT-II Reading Comprehension subtests. This discrepancy may be a result of the difference in tests. On the Passage Comprehension subtest the students are required to read passages and to produce one word answers. Consequently, on the WIAT-II the students are asked to read a passage and answer questions that require more than a one word answer. It appears the WIAT-II does a superior job in replicating what the students are supposed to do in a classroom setting. As a result when giving a battery of tests the WIAT-II may be the best measure of the what is expected of the students in the classroom.

This study needs to be replicated using a larger and more diverse sample. This study should also include students who have already been identified and students who appear to be doing well in school.

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